



doi 10.5281/zenodo.10092257

Vol. 06 Issue 10 Oct - 2023

Manuscript ID: #01095

Influence of Science Teaching Methods on the Students' Performance in Homabay Sub-County, Kenya

Okeyo Lucy Akinyi¹, Mount Kenya University
Dr. Joshua Ogal², Mount Kenya University

ABSTRACT

Sciences play a vital role in developing the technological aspect of a country. Teachers play a major role in determining whether or not sciences desired results are achievable. The success or failure of sciences depends on the teachers. The purpose of this study was to determine whether the methods used to teach sciences are contributing towards the poor performance. The study was based on Activity theory on the active involvement of the learners in teaching and learning processes and Farrat theory on the training of teachers. The study utilized mixed method where qualitative and quantitative methods are put into use and convergent parallel mixed method. The target population for this study was 73 head teachers, 637 teachers and 4650 pupils in class 7 and 8 from the 73 Primary schools. The sample size was 14 head teachers, 25 sciences teachers and 465 sciences pupils and equal in gender. The sampling procedures were as follows; pupils were purposely chosen from those taking sciences in form three and four. The research instruments were observation check list and documents analysis, questionnaires for the teachers and pupils and interviews guide for the head teachers. The piloting was done in Rachuonyo East on 10% of the sample size, which is a neighboring sub-county. The researchers tested the reliability of the instrument using the spearman-brownprophecy formula of split half technique which revealed reliability test of 0.85, while the validity of the instruments were ascertained by consulting the experts in the area, the supervisor and the teachers of sciences. The data was analyzed using statistical package for social sciences (SPSS) and results presented in tables, charts and graphs. the results showed that apart from the gender of the sciences teacher, in-service, sciences teachers attitude and education level, and method of teaching influences the performance of sciences pupils. Conclusion was drawn that, poor performance of sciences in pupils can be attributed to poor sciences teachers attitude, lack or proper education level and poor teaching methods. The study recommends that there should be more in-service training for sciences teachers besides proper training of sciences teachers, sciences teachers should have positive attitude and should at all cost try to delimitate the notion that physic as a subject is hard.

KEYWORDS

Academic performance, attitude, motivation, sciences, primary school.



Background to the Study

The American teaching methods of both mathematics and sciences are insufficient; they are mostly focused for most of the part on a very narrow band of procedural skills (Hill and Ball, 2004). Whether PUPILS are in a row working individually or sitting in groups, whether they have access to the latest technology or are working only with paper and a pencil, they spend most of their time acquiring isolated skills through repeated practices. Japanese classrooms spend most of their time solving challenging problems and discussing mathematical concepts as do practicing skills (Stigler and Hiebert, 2009). While many teachers in the USA have replaced the chalkboard with an overhead research project as those in Japan, have not. In US classrooms visual aids functions to guide and control PUPILS attention. The overhead research project or is preferred because it gives teachers, even more, control over what the student is attending (Hill and Ball, 2004). They are not used to control attention but provide a cumulative record of the lesson activities and their results. Japanese teachers do not use the overhead research project or because it is not possible to fit the cumulative record on an overhead transparency (Stigler and Hiebert, 2009). US teachers appear to feel responsible for shaping the tasks into pieces that are manageable for most pupils, providing all information required completing the task and assigning a lot of practice. Teachers act as if confusion and frustrations are a sign that they have not done their work. When they notice difficulty they quickly assist the PUPILS by providing whatever information it takes to get the student back on track.

Japanese teachers, apparently they believe that they are responsible for different aspects of classroom activities (Biggs, 2011). They always start their classes with a challenging problem, and they help the pupils understand and present the problem so that they can begin working on the solution. They also encourage the pupils to keep struggling in the face of difficulty. Sometimes offering hints to support pupils' progress. Rarely would a teacher help a student how to solve problem midway through the lesson. Japanese teachers lead a class discussion. Asking questions about the solutions methods presented, pointing out important features of pupils' methods and showing the methods themselves. Because they tend to believe that learning mathematics and sciences means constructing the relationship between facts, procedures, and ideas, they try to create a visual record of these different methods as the lesson proceeds (Stigler and Herbert, 2009).

Close home researchers have looked at the assumed that teachers have no problem and have been almost completely ignored. This study, therefore, intends to assess the teacher contribution towards performance in Farrat, (2008) gives the form of training as pre-service training, induction and in servicing. Pre-service is usually provided in teaching colleges where the student teacher is introduced to knowledge and skills needed to do the job in teaching. It nearly introduces the student teacher to practical work of actually teaching in a school but it is no more than an initiation, the student teacher is introduced to principles of teaching such as aims of teaching, the curriculum, and the nature of the characteristics changes from being part time teacher. Visiting schools for only a few weeks and takes on the responsibility of the full-time professional. The impacts of the rapid technological change and automation on existing skills and jobs means that is a continuing function and that programs for retraining teachers for the new occupation will be necessary. On in-servicing, Farrat asserts that it is a lifelong process in which a teacher is always learning and adapting to the new challenges of the job.

Farrat, (2008) gives the form of training as pre-service training, induction and in servicing. Pre-service is usually provided in teaching colleges where the student teacher is introduced to knowledge and skills needed to do the job in teaching. It nearly introduces the student teacher to Farrat, (2008) gives the form of training as pre-service training, induction and in servicing. Pre-service is usually provided in teaching colleges where the student teacher is introduced to knowledge and skills needed

to do the job in teaching. It nearly introduces the student teacher to practical work of actually teaching in a school but it is no more than an initiation, the student teacher is introduced to principles of teaching such as aims of teaching, the curriculum, and the nature of the characteristics changes from being part time teacher. Visiting schools for only a few weeks and takes on the responsibility of the full-time professional. The impacts of the rapid technological change and automation on existing skills and jobs means that is a continuing function and that programs for retraining teachers for the new occupation will be necessary. On in-servicing, Farrat asserts that it is a lifelong process in which a teacher is constantly learning and adapting to the new challenges of the job.

The teacher is introduced to principles of teaching such as aims of teaching, the curriculum, the nature of the characteristics changes from being part time teacher (Larsen-Freeman and Anderson, 2013; Richards and Rodgers, 2014). Visiting schools for only a few weeks and takes on the responsibility of the full-time professional. The impacts of the rapid technological change and automation on existing skills and jobs means that is a continuing function and that programs for retraining teachers for the new occupation will be necessary. On in-servicing, Farrat asserts that it is a lifelong process in which a teacher is constantly learning and adapting to the new challenges of the job. This study, therefore, intends to look into the teacher's influence in Sciences performance in KCPE in Homa bay Sub County

Sciences is an important subject in the realization of vision 2030 as enshrined in the Constitution of Kenya 2010 (Maritim, 2009). It, therefore, should be taken with the weight it deserves any country in the world to develop in the technical aspect. Sciences is poorly performed in Kenya and Homa bay in particular. It is one of the science subjects studied in primary schools in Kenya and all over the world and the teachers playing a pivotal role in its performance than when it is performed poorly there is a need for a study. This subject is necessary for the realization of the Millenniums Development Goals (MDGs) as enshrined in the Constitution of Kenya 2010. In the world sciences is a prerequisite to many advanced careers. A student has to score high grades in sciences and other science subjects to undertake bachelor's degree in sciences at any university in the world.

The primary purpose of education is to educate individuals within the society, to prepare and qualify them to work in the economy as well as to integrate them into society and teach values and morals of the society. In the developing countries, education is seen as the solution to poverty and many development problems (Eshiwani, 2008), Sciences as a subject is taught in primary schools in Kenya and is a vital aspect in the realization of the technological development and vision 2030 as enshrined in the Constitution of Kenya 2010. In Kenya, the primary yardstick to measure educational output is a performance in the examination. As stated in Kenya national examination councils (KNEC) mission statement, "to objectively evaluate learning achievements to enhance and safeguard nationally and internationally acceptable certification standards" (Kenya national examination council, 2010). Achievements in education at primary school level are determined mainly by Kenya National Examination Council (KCPE) examination, administered to pupils as summative evaluation after pupils have undertaken a four-year course at the primary level. Percentage scores in subjects award pupils grades'. A and B is considered good performance, C is average while D and E are considered a poor performance.

Statement of the Problem

The study assesses the teaching methods influence that affect the performance of sciences in Kenya Certificate of primary Education in public schools in Homa Bay Sub County, Homabay County. Primary schools in Homa Bay Sub County performed very poorly in sciences. The poor performance

in sciences has persisted despite the efforts that have been put in place. Every year when the results are announced, the sub-county continuously performs poorly, and parents and other stakeholders continue complaining, which instigates this study. It is accepted that the competence of the teachers and commitment is of paramount importance for improvement in performance in academics. What is striking though is much as a lot of researches have been done on general issues that affect performance in sciences, little has been done in teacher-related issues that could be resulting in the poor performance, particularly in sciences.

It is for this reason that this study intends to look into reasons behind the shortcomings of the expected improvement in performance in sciences, particularly in Homa Bay Sub County. Therefore, the evidence base is very weak and urgent steps are needed to develop a comprehensive study in this area with a view to identifying the teacher influences that may be leading to poor Kenyan primary schools performance in sciences that require attention by education stakeholders if the Millennium Development Goals, (MDG) are to be achieved. This study therefore, assesses the role teacher's play in influence that may lead to poor performance in sciences in Homa bay Sub County.

Literature Review

One of the subjects offered in primary schools in Kenya is science, however at the primary school level and beyond, this subject is divided into three main areas namely, Biology, Chemistry, and sciences. The three areas are however interested since they are all human attempt to explore the universe and its content by establishing facts through observation and experimentation. Sciences is particularly crucial in such careers as engineering, information, science, and technology, radiotherapy among others.

A study by Ulug, Ozden and Eryilmaz (2011) in Istanbul placed emphasis on teachers' attitudes on pupils' performance. According Ulug *et al.* (2011) teachers teaching method and his or her attitude provide a mental and healthy personality for the student, which are key to student's success. This study uncovers how attitudes of teachers affect the personalities and performances of pupils. Therefore, the study provided the emic understanding of education and the dynamics of relationship between teachers and pupils beyond the limited areas of classes and courses. The research consisted of sample group of research consisting of totally 353 pupils from different departments of istanbul kultur university and maltepe university. The study results noted that teachers' positive attitudes have positively influenced pupils' personality besides their performance.

A study by Kalu (2008) in Nigeria noted that the main difference between teachers whose student perform well in sciences and those, whose student fail, is on how the teachers and pupils interact during sciences lessons. in his study (kalu, 2008) the purpose of the study was to observe and code the interaction patterns during sciences lessons and to relate the identified patterns to pupils' post-instructional attitude towards sciences and achievement in low and high academic tasks. The sample consisted of 516 ssi pupils and 15 sciences teachers drawn from 15 selected primary schools in calabar education zone of cross river state, Nigeria. Each teacher/ classroom was observed for 4 lesson periods spaced over a period of 8 weeks and the interaction patterns coded using the science interaction categories. Two other instruments were used to collect data on pupils' attitude and achievement in sciences. The results of data analysis indicated, that a significantly positive relationship exists between interaction pattern and pupils' post-instructional attitude and low academic task achievement.

In a study by Haas (2002) in Virginia sort to find the relationship between teaching methods and pupils achievement for algebra i for primary teaching. The study employed meta-analysis methodology with a sample of 34 studies with 62 sizes, six categories for teaching methods. The study results indicated a positive correlation between teachers teaching method and student performance.

Another study by Ganyaupfu (2013) whose purpose was to investigate the differential effectiveness of teaching methods on pupils' academic performance. The study employed a sample of 109 undergraduate pupils from the college's department of economic and business sciences in South Africa. Using the inferential statistics course, pupils' assessment test scores were derived from the internal class test prepared by the lecturer. The differential effectiveness of the three teaching methods on student academic performance was analysed using the general linear model based univariate anova technique. The $f(2, 106)$ statistic ($= 10.125$; $p < 0.05$) and the turkey had post-hoc results indicate significant differences on the effectiveness of the three teaching methods. the mean scores results demonstrate that teacher-student interactive method was the most effective teaching method, followed by student-centered method while the teacher-centered approach was the least effective teaching method. The study hence concluded that teaching method positively affects the pupils' performance.

The Kenya institute of education describes sciences as a dynamic subject that responds to constant environment changes (kie, 2008). malus (2008) emphasized that fact by stating that methods of teaching sciences and social studies should be dynamic to cope with the environmental changes. Among the methods that have been tested and proved for teaching,sciencesare referred to as traditional methods. These methods include discussion, demonstration, research project and field trip methods. Wachira Kagotho in his article entitled: new teaching methods could curb extermination cheating in our schools: asserts that most teachers in Kenya primary schools use old methods of teaching and as such the pupils are not fully prepared and lack confidence required going through the examination on their own, (Wachira, 2009). Other teaching methods of sciences include; questioning and answering, the new methods of teaching sciences such as discovery process, laboratory / experimentation, and assignments. Economists are hard to put to decide whether to look certificates obtained and their quality as outcomes of education or just numbers graduating at each level. And even if this was done, how can the love of learning inculcated in an individual through learning be measured? (Ayot and Briggs, 1992). Indeed in the absence of a better educational output, economists have settled on cognitive tests. Of course, exterminations have serious drawbacks of not being able to measure returns of schooling such as values and attitudes acquired, but it is the only practical method so far devised to measure educational outputs. In Kenya the only adequate measure of academic achievements is the examination score; a school with high achievement score is judged to be more efficient than one with lowexamination scores.

Norris (1993) rightfully observed that exterminations measure systems goals, record change and provide information relevant for judging the efficiency of a system since the student's performance are a function of many inputs such as teacher's experience, teacher pupil ratio, and teaching methods. This study explores the contribution of all the factors that contribute to the performance of pupils in sciences in the national examination in public schools in Homabay Sub-County, Homabay County and Kenya in general.

In developing countries, instructional time is very vital to learners due to lack of adequate resources. Haddad (1985) argues that trained teachers in developing countries are practically important in the performance of the instructional task and teacher centered activities and that pupil's performance highly depends on the quality of the instructions what the teacher provides. Anderson (2006) says

many activities that aim at raising student’s performances are banked on the fact that teacher’s pedagogical skills do affect the student’s performance.

Research Methodology

The study was based on Activity theory on the active involvement of the learners in teaching and learning processes and Farrat theory on the training of teachers. The study utilized mixed method where qualitative and quantitative methods are put into use and convergent parallel mixed method. The target population for this study was 73 head teachers, 637 teachers and 4650 pupils in class 7 and 8 from the 73 Primary schools. The sample size was 14 head teachers, 25 sciences teachers and 465 sciences pupils and equal in gender. The sampling procedures were as follows; pupils were purposely chosen from those taking sciences in form three and four. the research instruments were observation check list and documents analysis, questionnaires for the teachers and pupils and interviews guide for the headteachers. The piloting was done in Rachuonyo East on 10% of the sample size, which is a neighboring sub-county. The researchers tested the reliability of the instrument using the spearman-brownprophecy formula of split half technique which revealed reliability test of 0.85, while the validity of the instruments were ascertained by consulting the experts in the area, the supervisor and the teachers of sciences. The data was analyzed using statistical package for social sciences (SPSS) and results presented in tables, charts and graphs. the results showed that apart from the gender of the sciences teacher, in-service, sciences teachers attitude and education level, and method of teaching influences the performance of sciences pupils.

Results

Sciences as one the key science subject is particularly crucial in such careers as engineering, information, and science, and technology, radiotherapy among others. Performance in sciences has been poor as compared to other subjects. Among the causes of poor performance has been attributed to teaching methods and other factors that are related to scienceteachers, such as educational level, attitude, gender and in-service training.

The study also seeks to investigate the method used in teaching physic if the method is effective.

Descriptive Statistics on Methods of Teaching by Sciences Teacher

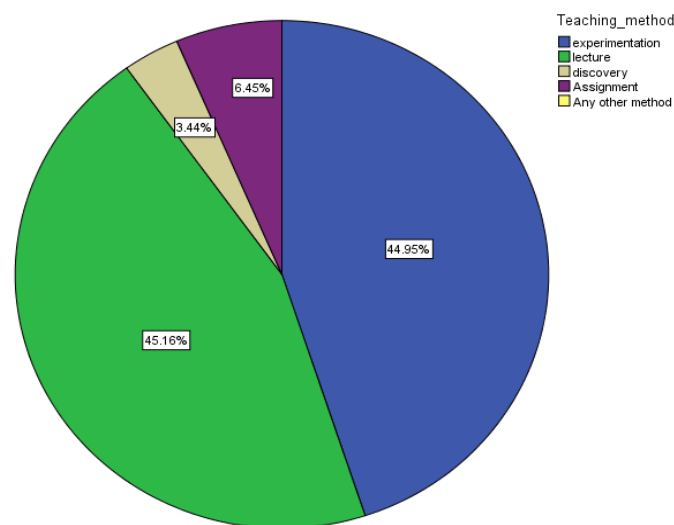


Figure 1: Pupils’ responses to teachers’ methods of teaching and their performance in sciences

From Figure 1, the most used teaching method is lecture while discovery is a hardly used method. Experimentation is also used largely as portrayed by the respondent's response, that is 44.95% \approx 45%. As depicted in Figure 2 below, most of the teaching method used is good and excellent as the response depicts 58.92% and 37.63% respectively.

Summary of the teaching method responses from pupils' perspective are presented in table 1.

Table 1: Summary of the teaching method response from pupils' perspective

	N	Minimum	maximum	mean	std. deviation
Teaching method	465	1	4	1.71	.813
Method rating	465	1	4	1.66	.557
Method effective	465	1	1	1.00	.000
Valid N (listwise)	465				

From the Table 2, it is clear that all the responses have a standard deviation less than unity, the conclusion can be drawn from the response since there is less variation from the mean.

When teachers were asked about the teaching method, majority of the respondents preferred lecture method as shown in figure 2.

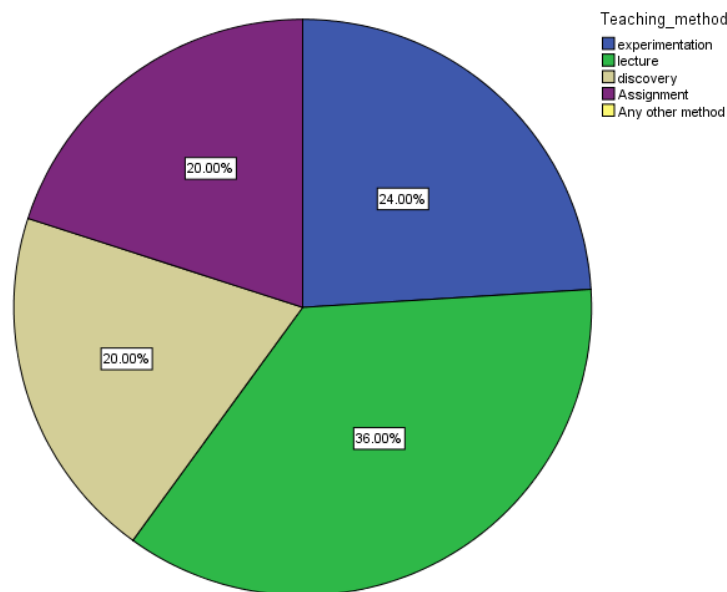


Figure 2: Teachers response to their methods of teaching and PUPILS' performance in sciences

From Figure 2 above, teachers confirmed that lecture is the most popular teaching method, while assignment and discovery are the least preferable.

Summary of the teaching method response from teachers' perspective is shown in table 2.

Table 2: Summary of the teaching method response from teachers' perspective

	N	minimum	maximum	mean	std. deviation
Teaching_method	25	1	4	2.36	1.075
find_method_effective	25	1	1	1.00	.000
Valid N (listwise)	25				

From the Table 2, teaching method has standard deviation greater than 1 but almost equal to 1, that is $1.075 \approx 1$ while finding the method effective std. is 0, implying that it has no variation from the mean. Hence conclusion can be drawn that indeed all the teacher find their method effective.

When head teachers were asked about the teaching method, a minority of the respondents preferred recitation method as shown in figure 3.

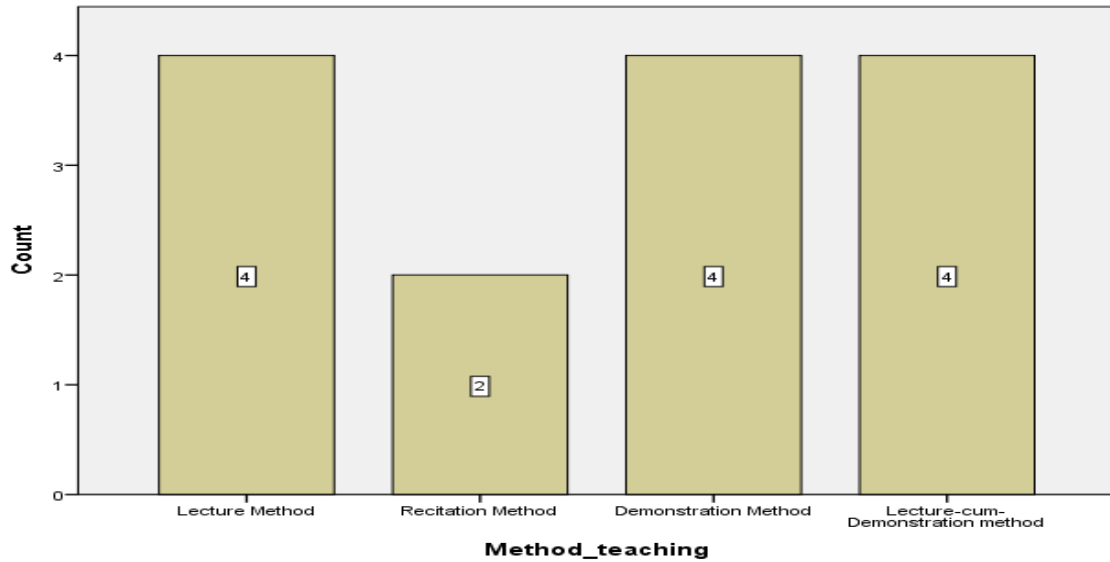


Figure 1: Head teacher response on teaching method and pupils’ performance in sciences

The summary of the descriptive statistics from the head teachers’ response on teaching method is presented in table 3.

Table 3: Summary of the teaching method response from head teachers’ perspective

	N	minimum	maximum	mean	std. deviation
Method teaching	14	1	4	2.57	1.222
Rate method	14	1	4	1.86	.949
Valid N (listwise)	14				

From the table 3, a method of teaching have standard deviation greater than 1 but almost equal to 1, that is $1.222 \approx 1$ while a rating of the method std. is $0.949 \approx 1$, implying that it had there was variation from the mean, but not much, hence conclusion can be drawn that indeed all the head teachers find the teaching method effective.

Inferential Statistics on Teaching Methods and Pupil’s Performance in Sciences

This was done to prove the following hypothesis;

H_0 :Teaching methods influences the pupils’ performance in sciences

H_1 :Teaching methods does not influence the pupils’ performance in sciences

The table generated from SPSS below gives the value one-way ANOVA for pupils' response as shown in table 4.

Table 4: Hypothesis testing (One- way ANOVA) from student's response

Student performance					
	sum of squares	Df	mean square	f	sig.
Between Groups	4.228	3	1.409	2.666	.047
Within Groups	243.686	461	.529		
Total	247.914	464			

The sig. or p-value ($\alpha = 0.05$) is used to reject or accept the null hypothesis. In this case, the *sig. value* = 0.047, which is less than the cut-off point, hence the null hypothesis is rejected and alternate is accepted, therefore conclusion can be made from the pupils' perspective that: teaching methods does not influences the pupils' performance in sciences.

The F-statistic on the other side is simply a ratio of two variances, the larger the F-statistic, the larger the dispersion from the mean. In the above cases, the values are more than 1. The conclusion can then be drawn from the pupils' response that teaching method, does not influence the performance of pupils in sciences and this is inconsistent.

The table generated from SPSS below gives the value one- way ANOVA for teachers' response is shown in table 5.

Table 5: Hypothesis testing (One -way ANOVA) from teachers' response

PUPILS performance					
	sum of squares	df	mean square	f	sig.
Between Groups	3.307	3	1.102	3.543	.032
Within Groups	6.533	21	.311		
Total	9.840	24			

The sig. or p-value ($\alpha = 0.05$) is used to reject or accept the null hypothesis. In this case, the *sig. value* = 0.032, which is less than the cut-off point, hence the null hypothesis is rejected and alternate is accepted, therefore conclusion can be made from the teachers' perspective that: Teaching methods does not influences the pupils' performance in sciences.

The F-statistic on the other side is simply a ratio of two variances, the larger the F-statistic, the larger the dispersion from the mean. In the above cases, the values are more than 1. The conclusion can then be drawn from the teacher' response that teaching method does not influence the performance of pupils in sciences.

The table generated from SPSS below gives the value one -way ANOVA for pupils' response as shown in table 6.

Table 6: Hypothesis testing (One -way ANOVA) from head teachers' response

PUPILS performance					
	sum of squares	Df	mean square	f	sig.
Between Groups	1.714	3	.571	.952	.452
Within Groups	6.000	10	.600		
Total	7.714	13			

The sig. or p-value ($\alpha = 0.05$) is used to reject or accept the null hypothesis. In this case, the *sig. value* = 0.452, which is more than the cut-off point, hence the null hypothesis is accepted and alternate is rejected, therefore conclusion can be made from the headteachers' perspective that: Teaching methods influences the pupils' performance in sciences.

The F-statistic on the other side, is simply a ratio of two variances, the larger the F-statistic the larger the dispersion from the mean. In the above cases, the values are more than 1. Conclusion can then be drawn from the head teachers' response that teaching method influences the performance of pupils in sciences.

Conclusion

As per the findings arrived at in this study, the study drew the following conclusions: That teachers dynamics are key the poor performance of sciences. Teachers' academic levels were of paramount importance as it increased confidence in their teaching and this directly influenced their pupils' confidence and eventually performance. The study further found out that the proud attitude of the teacher was a major hindrance to good performance.

Recommendations

From the findings of the study the researcher recommends the following:

Teaching methods that are pupils that encourage understanding and discovery should be used. Teachers of sciences should be given fewer lessons so that they have more time to prepare for the classes and more practical lessons should be allocated in the timetable per week. Career guidance sessions should be encouraged in schools to guide learners on their subject choice.

References

- Abagi, O & Sifuna, D., (2007). National legal framework in domesticating education as human Right in Kenya: Nairobi: Jomo Kenyatta Foundation.
- Adeyemo, S. A. (2011). The effect of teachers' perception and PUPILS' perception of SCIENCES classroom learning environment on their academic achievement in senior PRIMARY schools SCIENCES. *International Journal of Educational Research and Technology*, 2(1), 74-81.
- Anderson, D. & Burnham K., (2002), Model selection and multimodel inference : A practical information-theoretic approach, springer publishing company, New York.
- Ayeni, A. & Akinola, O. (2008). Influence of Headteachers Leadership Styles and Motivation of Teachers on Quality Assurance in PRIMARY schools: Case study of Ondo State .Ife Journal of theory and research in Education, 2(1-2)162-170.
- Ayot, O & Briggs, S. (2006). Education for Social Economic Development: University of Nairobi; Kenya; Unpublished.
- Balta, N., Arslan, M. & Duru, H. (2015). The Effect of In-Service Training Courses on Teacher Achievement: A Meta-analysis Study. *Journal of Education and Training Studies*, 3(5), 254-263.
- Biggs, J.. (2011). *Teaching for quality learning at university: What the student does*. McGraw-Hill Education (UK).
- Cohen, L., & Manion, L. (1994) Research Method in Education (4th Ed).Rutledge: London.
- Creswell, J., Plano, V., Gutmann, L., & Hanson, W. (2003). Advanced mixed methods research designs. *Handbook of mixed methods in social and behavioral research*, 209, 240.
- Digolo, O. (2003), Response to paper entitled: "Education sector review: How far have we come since independent and what still needs to be done to meet the educational. Needs of all Kenyans". Paper presented in Education conference .Nairobi: Government Press.
- Duncan, C. (2006). Pastoral Care: An Antiracist/Multicultural Perspective. Basil Blackwell Ltd Publishers. England:
- Durojaiye, M. (2005). A New Introduction to Educational Psychology: Evans Brothers Publishers. London
- Eshiwani, G. (2006), Education in Kenya since independence. East Africa Educational Publishers. Nairobi
- Farrant, S. (2005). principles and practices of education. longhorn Publishers. England
- Feldman S. (2003). Power Learning. McGraw Hill Publishers, New York:
- Fennema, E. (2007). Mathematics and gender: Influence on teachers and PUPILS.

- Fowler Jr, F. (2013). Survey research methods. Sage publications.
- Fraenkel, J. & Wallen, N. (2007). How to Design and Evaluate Research in Education. (6th Ed). McGraw Hill. Boston
- Ganyaupfu, M. (2013). Teaching methods and PUPILS academic performance. *International journal of humanities and social science invention*, 2(9), 29-35.
- Gay, L. (2006). Educational Research, Macmillan Publishing Company, New York
- Goddard, V, & Leask, M. ((2005). The Search for Quality, Paul Chapman Publishing: London.
- Haas, M. (2002). *The Influence of Teaching Methods on Student Achievement on Virginia's End of Course Standards of Learning Test for Algebra I* (Doctoral dissertation).
- Hill, H. & Ball, D. (2004). Learning mathematics for teaching: Results from California's mathematics professional development institutes. *Journal for research in mathematics education*, 330-351.
- Holmes, (2006). Problems in Educational Comparative Approach. Rout Ledge and Keegan Paul Ltd. London, U.K
- Haddad, W. (2003), monitoring novice teacher: education motives, process and outcomes from mentor: Endocrine Society Journals and *Publications*, port of Vienna, Austria
- Igberadja, S. (2016). Effects of teachers' gender and qualification on PUPILS' performance in vocational technical education. *Journal of Technical Education and Training*, 8(1).
- K.I.E (2008). PRIMARY school syllabus. Kenya institute of education, Nairobi
- Kairu, K. (2008). Institutions Standard assessment report .A paper represented during induction of new QASOs at Kisumu. Kisumu, Kenya
- Kalu, I. (2008). Classroom interaction patterns and PUPILS' learning outcomes in SCIENCES. *Social Sciences*, 3(1), 57-60.
- Kerlinger, F. (2004). The methodology of Education Research: Methods Approach. Library Anxiety: Theory, Research and Application, Tusu Printers, Berlin
- Kimalat, F. (2007). Ministry of Education and Human Resources Development, Industrial Area, Jomo Kenyatta Foundation. Nairobi
- Kisala, S. (2008). Misconceptions in SCIENCES among high school PUPILS in Kenya. Unpublished MED thesis. Kenyatta University, Nairobi, Kenya
- Kothari, (2005). Research Methodology: Methods and Techniques 2005, KWTS Publishers, Texas, U.S.A.
- Larsen-Freeman, D., & Anderson, M. (2013). *Techniques and Principles in Language Teaching 3rd edition-Oxford Handbooks for Language Teachers*. Oxford university press.
- Lincoln, W. & Guba, E. (2006). Naturalistic Inquiry, Newbury Park, CA Sage Publication.

- Longdon, D. (2006). *The Effective School Headteacher*. Prentice-Hall Publishers, Mexico
- Malusu, K. & Wachira, L (2008). *Distinction education*, Kenya literature bureau. Nairobi.
- Maritim, E. (2009). The distance learning mode of training teachers in Kenya: challenges, prospects, and suggested policy framework. *Open Learning*, 24(3), 241-254.
- Masara, S. (2009). *Why Teachers Hate Inspectors*; Nairobi, Kenya.
- Ministry of Education Science and Technology, (2007). *School Management guide*, Jomo Kenyatta foundation, Nairobi, Kenya
- Ministry of education science and technology, (2005-2010). *Delivering Quality and Training to all Kenyans*, Kenya Education Support Program; Kenya Literature Bureau. Nairobi, Kenya
- Mugenda & Mugenda. (2003). *Research methods: Qualitative and Quantitative approaches*. Kenya African Centre of Technology Studies (A.C.T.S), Nairobi, Kenya
- Nyamu, Z. (2006). *Study of Supervisory Strategies Employed by Primary School Head Teachers in Supervising Teacher Curricular Instruction in Northern Division of Nairobi*” Nairobi University, Nairobi, Kenya; unpublished M.ED Thesis.
- Olembo, J. (2007). ”Education administration, management and supervision in Kenya schools “Nairobi, education lecture series Vol.1Kenyatta University College, Nairobi, Kenya
- Orodho, J. (2005). *Elements of Education and Social Sciences Research Methods*. Nairobi. 1st Ed. Bureau of education research .K.U. Masola publishers, Nairobi, Kenya.
- Owolabi, O., & Adedayo, J. (2012). Effect of teacher’s qualification on the performance of senior PRIMARY school SCIENCES PUPILS: Implication on technology in Nigeria. *English Language Teaching*, 5(6), 72.
- Pigor, P. & Myers, C. (2007). *Personnel Administration*. McGraw Hill Publishers, New Delhi, India
- Richards, J, & Rodgers, S. (2014). *Approaches and methods in language teaching*. Cambridge university press.
- Southworth, G. (2006). *Staff Selection in Primary School* Basil Blackwell Ltd Publishers, England:
- Stigler, J. & Hiebert, J. (2009). *The teaching gap: Best ideas from the world's teachers for improving education in the classroom*. Simon and Schuster
- Trotts, A. (2008). *Improving Efficiency in Educational Training*, Nichol publishing Company, New York:
- Ulug, M., Ozden, S., & Eryilmaz, A. (2011). The effects of teachers’ attitudes on PUPILS’ personality and performance. *Procedia-Social and Behavioral Sciences*, 30, 738-742.
- Yadav, M. (2002). *The Teaching of Science*. Anmol publications ltd, New Delhi, India