

**THE RELATIONSHIP BETWEEN PERFORMANCES IN
PHYSICS AND COMPUTER STUDIES IN KCSE
CASE STUDY GUCHA DISTRICT-KENYA**

BY



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DECLARATION

I Paul Ogembo Gesimba, hereby declare that this report is my original work and has never been published or submitted for any other degree to any other University, College or any other educational institution before.

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Signature  _____

Date 12/09/08 _____

APPROVAL

This research report has been submitted by Paul Ogembo Gesimba for examination with my approval.

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DEDICATION

This work is dedicated to my late wife Jackline, my children Gloria, James and Monyangi for the support they gave me while I was writing this project report. May God bless them.

ACKNOWLEDGEMENT

I wish to extend my sincere gratitude to my university supervisor Kampala International University ICDS who gave the professional throughout all stages in this project. I also wish to thank all those that in one way or the other offered their ideas for the success of this project.

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ABSTRACT

The performance in Physics, Computer studies and sciences has been low over the years. The sciences borrow heavily from Mathematics concepts and principles. The research was on the relationship between performances in Physics and Computer Studies. The research was carried out from secondary sources based on textbooks, magazines, KCSE results of selected schools over three years. The findings were based on the summary of the facts gathered from literature review. The findings were presented objective by objective, drawing contrast, similarities and identifying on new inferences from the study. The researcher's opinion is given at the end.

Recommendations stated were centered on the loop holes identified during the study. It includes adding value to the teaching-learning experiences in Physics and ICT, enhanced team teaching amongst Physics and Computer Studies teachers. Secondary schools should invest in the building of library facilities, equip computer laboratories for the students to access reference textbooks of sciences, mathematics and ICT. This will encourage individualized study among students and that will definitely improve performance.

CHAPTER ONE

“

1.0 INTRODUCTION

1.1 BACKGROUND

Physics and computer studies in secondary school curriculum are optional subjects. The time allocations between the two subjects are the same. The two subjects are related in one way or the other in terms of concepts and application of skills and knowledge learnt, in this respect the following are the definitions of the subjects.

In the 15th edition of the Encyclopedia Britannia (1978), physics is defined as, the science that deals with the structure of matter and the interaction between the fundamental constituents of the observable universe. In the broadest sense physics which has a long natural philosophy (from the physikos) is concerned with all aspects of nature on both the microscopic and sub-microscopic level. Its scope of study encompasses not only the behavior for the objects under the action of given forces but also the nature and origin of gravitational, electromagnetic and nuclear force fields. Its ultimate objective is the principle that brings together and explains all such desperate phenomenal (micropadia Vol.7 p44)

In the same article computer studies is defined as the science of structure, order and relation that has evolved from the medieval elemental practice of counting, measuring and describing the shape of objects. It deals with logical reasoning and quantitative calculations (miropaedio Vol.7 p933). The study of computer studies and sciences (mathematics, physics, chemistry and biology) is the key to technological advancement. This is a requirement for all the Engineering

courses world over, the fields of nuclear technology weaponry, medicine, law, teaching, administration, social sciences and the natural sciences. Hence it's good and desirable for many people world wide to get exposure to the subjects. The significance and importance of Computer studies was observed by the KNEC secretary in 2000 KCSE examination report that;-

“Computer studies is very important not only because of the type of skills and knowledge that learners acquire from learning the subject but also because of its use in the learning of other subjects of the curriculum and its application in industry and commerce after school”

This has made it necessary to increase the learning time from three to four lessons per week.

1.2 STATEMENT OF THE PROBLEM

Performance in Physics has been decried in most parts of the world in general. For instance, in December 1996 the issue of Physics world a monthly magazine by the institute of Physics (UK), it was found from research in British Schools that at A-level, a class of 100 students when given a choice between Law, Economics, Accounting, Biology and Physics, the students will select as follows 35, 25, 20, 14 and 6 respectively. And after about six months of the six doing Physics, if given the opportunity to reselect two more will drop the subject and opt for a different subject. This has been attributed to high amounts of man-hour needed to internalize the physics concepts and the abstract nature of the physics concepts. Many researches done in Kenya have revealed that the poor performance in Physics is due to lack of adequately qualified personnel, poor and inadequate preparations of the teachers before going to class, lack of adequate and sufficient resources in most schools especially reference materials, laboratories which are well equipped, lack of motivation on students from teachers, parents, other students and other stakeholders. Students negative attitudes towards physics. The

researcher therefore has decided to carry out this research project to determine, the relationship between computer studies and physics in terms of performance at KCSE due to close linkage between the two (computer studies and physics).

1.3 PURPOSE OF THE STUDY

The purpose of the study was to determine the correlation between performance in physics and computer studies. This would be used in making recommendations for the reorganization in teaching of computer studies to improve its performance and that of physics. It may also act as a baseline in making physics and computer studies compulsory for creating enough manpower for technological advancement and industrial growth.

1.4 OBJECTIVES OF THE STUDY

The following were the objectives of the study;-

- . To determine the correlation between performance in computer studies and physics by taking statistical treatment of the raw data (scores) for the last three years i.e. 2002, 2003 and 2004
- . To compare the performance of students in computer studies and physics at KCSE for five secondary schools of Ogembo Division of Gucha District.
- . To suggest how the teaching of computer studies can be used to supplement and improve the teaching of Physics.

1.5 RESEARCH QUESTIONS

The following are some of the questions that were derived from the objectives.

1. What are the correlations between the scores in computer studies and physics for the three years?
2. What are the levels of scores for computer studies and physics by students for KCSE?

3. How can the teaching of computer studies be used to supplement and improve the teaching of physics?

1.6 SIGNIFICANCE OF THE STUDY

The world is becoming a global village due to technological advancements and the use of sophisticated communication network, Kenya in particular aims to join the newly industrialized countries through Sessional Paper entitled Vision 2030. Therefore it is important to seek ways of improving the performance of sciences and computer studies as they form the backbone of technological development.

For instance the trends in living standards are directly related to levels of technology. Economic success heavily relies on industrial break-through as noted in some countries of the world among them South Korea, Japan, and China. These countries started by making solid scientific innovations. Since the best measure of understanding which is reliable is examinations, the study will help teachers and curriculum developers to identify the causes of poor performance in physics and computer studies in order to find solutions and ways of improving the performance. The study will reveal the relationship between the various topics in Physics and computer studies for quantitative requirements. The correlation found between computer studies and physics will help the teachers to take remedial steps to improve the understanding and performance of physics and computer studies in Secondary Schools. This will make the teaching and learning of physics to be more relevant to real life situations with a possibility of looking into how various topics could be reorganized and taught co-currently in Physics and computer studies.

1.7 LIMITATIONS OF THE STUDY

The study will be limited to five secondary schools of Ogembo Division of Gucha District

because of the following reasons:-

The selected schools are the only ones offering computer studies as an examinable subject.

- To minimize traveling costs during data collection since most schools are far.
- The data will be restricted to only those students taking both Physics and computer.
- The study will be limited to scores of the last three years i.e. 2002, 2003 and 2004.

1.8 ASSUMPTION OF THE STUDY

The researcher assumed that the sample from the five schools and the scores for three years were a proper representation of all the categories of secondary schools in Kenya.

1.9 DEFINITION OF TERMS

Population; the universe of interest that is the total number of students who did both Physics and computer studies at KCSE from 2002 to 2004.

Sample; is a fair representative of the population selected for research such as the candidates for Physics and computer studies for the last three years.

8-4-4 System; Kenyan education system comprising of eight years of primary education, four years secondary education and four years of university education.

KCSE; Kenya Certificate of Secondary Education

ICT; Information Communication and Technology

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

The importance of physics and computer studies to mankind is unequalled by any other sphere of learning. According to Kopiyo (1986) in a paper entitled Changing the Face of Physics Education in Secondary Schools says; “Science is the greatest intellectual and cultural achievement of modern man. It’s a fact that in those achievements Physics plays a role alongside other Science disciplines, if not more” Physics provides an opportunity for man to know more about nature and to understand himself and get power over his destiny which should not be a mystery; it also opens situations where all arithmetic gymnastics applies. The purpose of understanding the physical world around him both intellectually and culturally is that the learner uses that understanding to explain the behavior of matter that surrounds him and to utilize the environment for his own good. On the other hand Howson and McLone (1983) noted that mathematics represents to one either a challenging intellectual stimulation and enjoyment or failure and drudgery. He observed that this is so because an accountant who miscalculates may waste time and money, while a nurse who miscalculates may kill someone. Its clear from the statement that mathematics is very important for our life for it controls virtually all our daily activities. For this reason performance in mathematics and science related subjects i.e. Physics, Chemistry and Biology has been of greater concern to examiners teachers, parents, curriculum developers and the world at large. The introduction of computer studies has also widened this focus.

Whitney (1966) writes that, “The study of Physics is important It consists of applying physical principles for our needs and pleasures. The motor cars, trains, aero planes, cameras and electronic gadgets require the knowledge of Physics to exist. In addition to this, the national committee on Educational objectives and Policies (Gachati Commission 1976) noted that science contributes distinctive skills, concepts and perceptions different from those offered by other disciplines. The acquisition of those skills is greatly facilitated by structured formal education”

The teaching and learning of computer studies and physics involves transmission of knowledge, Scientific skills and attitudes to learners by an experienced person called a teacher. Its carried out in such a manner as to encourage each student to:-

- Understand the environment and apply accumulated knowledge and exposure to deal with the problem posed by it.
- Utilize experimental approaches to acquire the ability to device, carry out experimental observations and record data.
- Appreciate the place of science in today’s world.
- Heighten the students’ to curiosity of scientific inquiry.
- Improve his capacity to criticize his own work, admit errors where possible and respect other points of view.
- Understand the arithmetic and scientific methods of data analysis, reaching conclusions, draw generalizations and learning to test them.

2.2. NATURE OF PHYSICS

Physics is a science that deals with matter in relation to energy. Its learned through experimentation and observation where results from experiments are collected and analyzed

before valid conclusions are drawn which should conform with the existing laws and principles of physics. It is used in measuring, counting, description of shapes and phenomena, other concepts taught and learnt include time, money, distance, volumes and areas among others. It employs logical reasoning and quantitative calculations used in almost all branches of knowledge such as business, engineering, applied science, research and social studies. As a branch of knowledge it heavily relies on abstract knowledge (abstraction). According to world book encyclopedia vol.13 pg 238, physics is the most useful and fascinating division of man's knowledge. It helps us to explain why and how some things happen in nature. For example why there is day and night and has the power to solve some of the deepest puzzles man must face.

English scientist Roger Bacon (1267) wrote Physics is the gate key to sciences. Most scientists depend on physics for exact descriptions and formulae of observations, experiments and analysis which involve data processing. Most scientific problems have become complicated that only highly sophisticated technology working with sophisticated giant electronic computers can supply the required answers/solutions. The physical sciences such as astronomy, Chemistry depend heavily on physics. In the social sciences and Economics/Accounting there is a remarkable increase in the use of computer technology for data collection, data analysis and research project

2.3. PHYSICS AND COMPUTER STUDIES.

Physics as a subject is closely related to computer studies in both nature and method. While physics is seen as the normal and the only mode of the knowledge, computer studies is viewed only as a tool of science. Dan (1992 pg. 188, 189) points out that science without physics is

inconceivable. No science can be exact without the application of physics directly. Physics can be said to be the language of science. In studying of computer studies the knowledge of graphs, equations, statistics, curricular and other arithmetical processes such as ratios, proportions and drawing are necessary. All these require the knowledge of physics.

Physics and computer studies are mainly inductive hence the convergence. Physics is confined to physical realities UNESCO handbook for science teachers (1988, p24), it is reported that both philosophers (Hirst and Phenix) agree that physics is empirical and is classified as a science. Hirst puts physics under logic. While Phenix puts physics in language. There is no doubt that physics is a language that is much used by scientists. Since it allows them to say beautifully and confidently in a half a line symbolic language what might take a whole book of words in language subjects such as mother tongue.

Physics is one of the essential aid by which other sciences, pure and applied are able to forge their way forward. Physics techniques are continuously being developed to meet the faster changing technological requirements of Chemistry, Biology, Psychology, Engineering, Electronics and other sophisticated technological advancement. To understand and master these techniques, it is essential and important that more elementary knowledge, techniques, skills and concepts in which they are used must be mastered. The lack of understanding of physics in our schools today is not a good preparation for scientific career opportunities.

Physics is an important ingredient in bringing order to one's life, in being able to mobilize one's thinking process. It enables us to see patterns and relationship of objects and incidents

and also to express the same with economy and precision included in Physics. Physics is therefore the only means by which ideas can be formulated with a real natural phenomena.

Most scientific principles and concepts originate from abstract ideas, which are later on probed and verified empirically. Hence abstract thinking is a necessity for the development of these ideas. Some of these major themes and ideas in Physics include Newton's law of motion, Einstein's theory of relativity and Maxwell's equation of electromagnetic induction. The theory of relativity and $E=mc^2$ equation though formulated from abstract mathematics, is the brainchild of nuclear science. Maxwell's four equations which are mathematically derived led to the generation and transmission of alternating current and electromagnetic waves which led to large scale industrial, technological and communication development.

2.4 PERFORMANCE IN PHYSICS AND COMPUTER STUDIES

Poor performance in Physics and Computer studies is experienced in Kenya. It's of great concern to teachers, examiners, parents and curriculum developers. For it locks out most students in their pursuit of science and technology related courses in Universities and National Polytechnics. Howso and Melon (1983) noted that physics represents to one either a challenging intellectual stimulation and enjoyment or failure and drudgery. He observed so because an engineer who miscalculates wastes time and money, while a doctor who miscalculates may kill someone. From this statement its clear that physics is very important to our life for it controls virtually all our daily activities. Many people in public circles and among students in various levels of education have a notion that physics is difficult. A report appearing in The Blackboard magazine of The Daily Nation of (15th June 1993) says physics has always been a hard subject 8-4-4 notwithstanding.



Other science subjects however do not enjoy the same negative reputation. Most students embark on the study of science subjects especially on the junior classes of schools with lots of enthusiasm, interest and curiosity. The apathy and negative attitudes towards science subjects develops at later stages, apparently when they begin to employ concepts which depend more on physics concepts. In an article appearing in The Academic Standard examinations has been poor. Under the 7-4-2-3 education system the same sentiments were raised in Kenyan schools. It appears that indeed the main cause of poor performance in the sciences as well as the emergence of poor attitudes towards sciences is physics concepts. By the advent of the 8-4-4 system of education it became compulsory for students to take all science subjects in Form I and Form II and at least two science subjects in Form III and Form IV. It has been a common thing that the third subject being dropped by most students in most schools is Physics. Those who take Physics are either forced to do so by the schools or are relatively better in mathematics and more so they are all round students. So the 8-4-4 system has not addressed the problem of deteriorating performance in both computer studies and science subjects.

This problem has been around for a long time. This is explained in the report by the National Committee in Educational Objective Policies (1976, NCEOP) popularly known as the Gachathi Committee. The report says in part that there has been a general deterioration on Computer studies and sciences throughout the formal system of education. The problem is compounded by the persistent poor performance by students in national examinations in these subjects. Kimame (1985) describes attitude as a feeling and behavior about activities and can either be positive or negative. Attitudes towards computer studies and Physics have been

associated with achievements by many scholars, researches by Eshiwani (1974), Sheikh (1977) showed that generally girls tend to have negative attitudes physics and this tended to affect their performance.

According to an article in the Daily Nation (10th Feb. 1996, p.19) a lecturer at Egerton University indicated that the most probable causes of negative attitudes towards physics among learners are:-

- The scoring nature of the subject.
- Accuracy demanded in working out problems.
- The number of concepts which require learners to discriminate or differentiate may also attribute.

All these mathematical aspects create anxiety which greatly affects students' perception of the subject and performance. Another complaint carried in the same copy of the Daily Nation (10th Feb. 1996 p.20), someone observed that physics deals with properties and ideas which are applicable in the real world, but are rarely connected to actual feeling. Hence, thus leads to little appreciation of the subject by learners. Thus the dislike of physics and other concepts related to in some topics of computer studies.

The above account indicates that the underlying causes of poor performance are not technically limited to the examinations, but also the teaching-learning process of the subject. The trend of poor performance is endemic even in universities which admit the best candidates. The mass failure of the first 8-4-4 students of the faculties of engineering and science of the University of Nairobi illustrates that better. It was baffling to the top students when they ended up not

measuring to the expectations of academics. This grave problem must be having a root cause because the students are average citizens and thus the problem lies somewhere in the system. The accusing finger has been pointed at physics as an excuse. The common thread between physics and other subjects is only mathematical concepts applied in the sciences. Physics employs inductive empirical approach as in computer studies. This research hypothesizes that it's the lack of the understanding of physics which causes poor performance amongst students of computer studies.

The poor performance in computer studies and physics presents worries to policy planners for industrial or technological take off by the year 2020. The way forward lie on the application of Physics and information communication technology to industrial development, but the performance in the two areas is precarious. The Academic Magazine, East African Standard (10th Sep.1994) reports that the trend is worrying. Because sciences form the backbone of industrialization, industrialists and policy planners have a cause to worry about. The Academic Magazine (16th Sep.1995) also reported that it has been said that no country can expect to advance technologically if it has no clear cut policies on the teaching of the science subjects in its educational institutions. Developed countries have done exactly that and that is why they have advanced both scientifically, economically and technologically. As shown by diverse literally comments in this topic, the problem of poor performance in physics and computer studies is known. The question is whether the poor performances on these subjects are related or not. Therefore, this research project seeks to determine the level of association between performance in computer studies and Physics at secondary schools KCSE examination.

CHAPTER THREE

1.0 RESEARCH METHODOLOGIES

1.1 INTRODUCTION

This chapter examines methods used in carrying out the research. Various methodologies and techniques which were used to achieve the stated objectives will be discussed. These methods provide a basis for analyzing and presenting data. Some of the aspects looked into include:-sample design, sources of data, nature of data collected, techniques of data analysis and presentation.

3.2 THE SAMPLE FRAME

The study was conducted in five secondary schools of Ogembo Division – Gucha District. The study was undertaken through inquiry into the performance of students taking computer studies and Physics. These secondary schools in the Division formed the universal population due to limited resources. It was not possible to cover completely the universal population (all secondary schools in the District). A random sample frame of five was selected as a representative of the universal population.

The target population was the students studying both physics and computer studies. KCSE examination records of all the students' performance from 2002, 2003 and 2004 results were examined and each considered for analysis. The performance of both physics and computer studies will reveal the relationship in performance and the correlation which exists between the two subjects.

3.3 THE NATURE OF DATA COLLECTION

The availability and quality of the data plays an important role in the research undertaking.

The types of data outlined below were collected to achieve the research objectives;

- Data on performance in both Physics and computer studies.
- Data on the number of students who did both Physics and computer studies
- Data on the number of schools offering for KCSE examinations

3.4 RESEARCH INSTRUMENT

The content analysis and survey of records was used for data collection. This involves document analysis method for KCSE results, for computer studies and Physics for the three years 2002, 2003 and 2004.

3.5 DATA COLLECTION PROCEDURES

Data was collected from the examination files on the selected schools, where the researcher extracted the required scores for the period under study. These were listed in tabular form with four columns i.e. school, pupil, computer studies scores (CS) and Physics scores (PHY). The scores were in form of grades attached to the points acquired by individual students as follows:-

A=12 A=11 B+=10 B-=8 C+=7
C=6 C-=5 D+=4 D=3 E=1

TABLE FORMAT

SCHOOL	PUPIL	COMPUTER STUDIES(CS)	PHYSICS (PHY)
A			
B			
C			
D			
E			

3.6 DATA ANALYSIS.

In order to assess the variation in the magnitude or association of the various variables (parameters) under study, various statistical techniques were utilized in analyzing the research findings, namely descriptive and inferential statistics.

3.6.1 Descriptive Statistics

Descriptive statistics will involve the use of basic statistics techniques like tables and graphs.

The table will be used to indicate the description of performance indices in the given subjects i.e. physics and computer studies.

3.6.2 Inferential Statistics

These are statistical techniques that enable one to make inferences or generalizations about a large group on a sub-set of that group (sample), given that certain assumptions can be made. It will test whether the variables are related or what had been observed could have happened by chance rather than representing a real connection. Inferential statistics employed were regression analysis and correlation analysis.

3.6.2.1 Regression Analysis

This is a statistical technique through which one can analyze the relationship between a dependent and independent variables. In broad terms it's defined as the analysis of relationships among variables. The general linear regression analysis assumes that the underlying relationships among the variables are linear and additive. Regression was employed both as a descriptive and inferential tool. As a descriptive tool it was used to show the kind of relationship that exists between the dependent variable and the independent variable. While an inferential tool regression analysis was used to establish the functional relationship that exists between the variables. This relationship was expressed in the form of an equation connecting

variable (y) and the independent variable (x). The regression equation (line) is written as follows

$$y = a + bx$$

Where: - a is referred to as the y – intercept

b is the slope coefficient

3.6.2.2 Correlation Analysis

In order to validate the obtained linear equation, correlation analysis was necessary to test the goodness of fit. In other words, the accuracy of the estimates of y that are given by the regression line. To achieve this, correlation coefficient (r) was computed. It was a measure of how well the model fits the observed data. It indicated the strength and the direction of the linear relationship. Correlation coefficient r_{xy} hence measure the relationship between y and x. It's computed as:- $r_{xy} = \frac{S_x}{S_y} b$

S_y

Where: - S_x - the standard deviation of the variable CS.

S_y - the standard deviation of the variable PHY.

r_{xy} - the correlation between CS and PHY.

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CHAPTER FOUR

4.0 RESEARCH FINDINGS AND DISCUSSIONS

4.1 INTRODUCTION

This chapter presents results of data analysis. The results are also interpreted and discussed to provide possible answers to the research questions. Therefore what is considered in the chapter are those data that answer the set objectives of the study. These include:-

- (a) Data mean scores and standard deviations for computer studies and Physics.
- (b) Correlation coefficients for computer studies and Physics.

The researcher collected the data from five secondary schools all of which were boarding schools. The results from students who sat for KCSE examinations in both computer studies and Physics were collected. The data analysis for the five secondary schools (i.e. M, N, O, P and Q) for the three years were tabulated as below and discussion done for each school.

4.2 PERFORMANCE IN COMPUTER STUDIES AND PHYSICS AT KCSE

The student performance may be summarized as follows in the tables:

Where: \bar{x} stands for computer studies mean score.

\bar{y} stands for Physics

σ_x stands for standard deviation for computer studies

σ_y stands for standard deviation for Physics

r_{xy} stands for correlation coefficients

N stands for total number of students enrolled for computer studies and Physics

Discussion

As indicated in the table above, the candidates enrolment for both Physics and computer studies ranged within 19 and 42, where the 2003 recorded the highest enrolment. In the year 2002 performance in computer studies was better than that of Physics with a mean of 8.1(1dp) and 5.4(1dp) respectively. The correlation coefficient of 0.895 shows strong positive relationship between the two subjects. In the year 2003, the mean of computer studies and Physics were low with mean scores 4.7 and 4.8 respectively. There is a strong positive relationship between performances in computer studies and Physics as indicated by $r_{xy} = 0.98$. In the 2004 the mean score for computer studies dropped further to 3.15 from the previous year. But that of Physics improved to 6.19 from the previous year's performance. This shows that the performance in the year in review was better in Physics than in computer studies. The correlation coefficient of $r_{xy} = 0.87$ shows strong positive relationship. The standard deviation varies within 1.50 to 3.53 for computer studies and 2.06 to 2.64 as shown in the table above

Table 3

Data Analysis For KCSE 2002-2004 For School O.

\bar{x}	δx	Xdn-1	$\sum x$	$\sum x^2$	\bar{y}	δy	Ydn-1	$\sum y$	$\sum y^2$	a	b	R	$\sum xy$
6.325	2.54	2.58	253	1859	3.60	1.53	1.55	144	612	0.051	0.5611	0.93297	1056
3.79	2.57	2.61	163	903	4.79	1.65	1.67	206	1104	2.423	0.6247	0.9747	959
4.96	2.64	2.67	228	1450	4.24	2.30	2.32	195	1009	0.2189	0.8111	0.9318	1226

Discussion

The candidates enrolment for school O varied between 40 and 46 because the school is double streamed. In 2002 the performance for computer studies was better than Physics with a mean score of 6.32 And 3.60 respectively. The correlation coefficient of $r_{xy} = 0.93$ indicated a strong

positive relation between performance of the two subjects. In 2003 the performance index of computer studies dropped to 3.79 and that of Physics improved to 4.79, which shows better performance in Physics than computer studies. The correlation coefficient of $r_{xy} = 0.97$ shows a strong relationship between the two subjects.

In 2004 the performance index for computer studies improved slightly to 4.96 and that of Physics dropped to 4.24. This shows that there was a slightly better performance in computer studies than Physics. The standard deviation for both computer studies and Physics ranged from 2.54 to 0.64 and 1.53 to 2.30 as shown in the table above.

Table 4

Data Analysis For KCSE 2002-2004 For School P.

√	X	δ_x	Xdn-1	$\sum x$	$\sum x^2$	Y	δ_y	Ydn-1	$\sum y$	$\sum y^2$	a	b	r	$\sum xy$	r_{xy}
4	6.67	3.39	3.46	160	1342	5.54	2.20	2.25	133	853	1.5627	0.59685	0.9197	1051	0.920
5	6.83	2.92	2.97	239	1931	6.71	2.51	2.55	235	1799	1.0434	0.8305	0.9656	1853	0.966
7	7.05	2.77	2.81	261	2125	5.46	1.87	1.89	202	1232	0.9103	0.6449	0.9560	1608	0.955

Discussion

The candidates enrolment for the three years in this school ranged from 27 to 37 as can be seen from the table 4 above. In 2002 the overall performance in computer studies was better than in Physics, which recorded a performance index of 6.67 and 5.54 respectively. The relationship is a strong positive with the coefficient of 0.92 that was obtained. In 2006 the mean grade for computer studies and Physics was 6.83 and 6.71 for computer studies and Physics respectively. The correlation coefficient of $r_{xy} = 0.97$ shows a strong relationship.

In 2004 there was a further improvement in computer studies performance to a mean score of 7.05 while Physics dropped in performance to a mean score of 5.46 as in the table. The

relationship is a strong positive as seen from the coefficient obtained of $r_{xy} = 0.96$. The standard deviations varied between 2.77 and 3.39 for computer studies and also 1.87 and 2.51 for Physics as indicated in table 4 above.

Table 5

Data Analysis For KCSE 2002-2004 For School Q

N	\bar{x}	δ_x	Xdn-1	$\sum x$	$\sum x^2$	\bar{y}	δ_y	Ydn-1	$\sum y$	$\sum y^2$	a	b	r	$\sum xy$	Rxy
20	6.75	2.12	2.17	135	1001	5.50	2.25	2.31	110	706	-1.4568	1.0306	0.97154	835	0.971
60	4.58	2.87	2.90	275	1755	5.35	2.53	2.55	321	2101	1.3953	0.8628	0.97968		
46	6.37	2.33	2.35	293	2117	3.98	1.79	1.81	183	875	- 0.70571	0.73537	0.96044	1350	0.957

Discussion

For the three years the number of candidates enrolled for computer studies and Physics ranged from 20 to 60 as shown in table 5 above. In 2002 the performance index for computer studies was 6.75 and that of Physics was 5.5. The relationships between the two subjects is strong positive as shown by coefficient of $r_{xy} = 0.971$. In 2006 there was a drop in performance index for both subjects where the mean scores were 4.58 and 5.35 for computer studies and Physics respectively.

In 2004 there was an improvement in computer studies with a mean score of 6.37 but still a drop in performance index for Physics with a mean of 3.98. This indicates that in this particular year there was better performance in computer studies than in Physics. The correlation coefficient of 0.957 indicates a strong positive relationship. The standard deviation for the three years ranged within 2.12 and 2.87 for computer studies and 1.79 and 2.53 for Physics.

4.3 DISCUSSION OF THE SCHOOLS RESULTS 2002-2004

Table 6

2002-2004 KCSE Results Analysis

SCHOOL	COMPUTER STUDIES		PHYSICS		NUMBER OF STUDENTS	CORRELATION COEFFICIENT
	\bar{x}	δx	\bar{y}	δy	N	R _{xy}
M	6.46	2.83	5.64	2.71	55	0.923
N	5.31	2.52	5.26	2.26	94	0.945
O	5.03	2.58	4.21	1.83	129	0.945
P	6.85	3.03	5.90	2.19	96	0.947
Q	5.90	2.44	4.93	2.19	126	0.964
ALL	5.91	2.68	5.19	2.24	500	0.938

Discussion

Generally in all schools analyzed students who take both computer studies and Physics tend to do better in both subjects as indicated in table 6 above. The overall mean for each school for the three years indicated that computer studies is better performed. This implies that Physics contributes to good performance in computer studies. The correlation coefficients are generally greater than 0.70 that shows that the relationship between performance in Physics and computer studies is strongly positive. Hence they are interdependent.

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

In this chapter, conclusions and recommendations are presented based on the literature relating to the two subjects, KCSE results for the three years under review and analysis of findings in the previous chapter.

5.2 CONCLUSIONS

The findings and analysis in the previous chapter reveals that:-

- Performance in computer studies is normally better than physics for students taking both computer studies and Physics at KCSE. Most students taking both subjects tend to be better in other subjects.
- There is a very strong positive correlation between performance in computer studies and Physics. This is due to the greater proportions of computer studies syllabus which requires physics manipulation and the portion which needs qualitative approach borrows a lot from the other portion.
- The symbolization abstraction nature of some physics principles also applies to some extent to computer studies. Therefore, that results to strong positive correlation in performance.
- The skills of physics are highly needed for effective teaching of computer studies. This is because physics tests high level skills while computer studies tests low level skills.

5.3 RECOMMENDATIONS

From the above conclusions and observations the researcher has come up with the following recommendations:-

- Physics teachers should teach hand in hand with computer studies teachers in that the physics concepts required in computer studies are taught before topics in computer studies are tackled.
- The importance of physics in computer studies should be stressed by Physics teachers, mathematics teachers, administrators, parents and curriculum developers and other stakeholders to the learners.
- A research be carried out to give reasons as to why performance to Physics is homogenous than that of Mathematics at KCSE.
- Secondary schools should invest in library and computer laboratory facilities so that students can have enough reference books for sciences and computer studies at their disposal. This will encourage individualized study among students in order to improve performance.
- Regular in servicing of teachers is necessary to keep them abreast with the reforms and changing methods and content in Physics and computer studies.
- Physics and computer studies teachers should use teaching approaches and methods which help students discover knowledge on their own in order to cultivate interest and confidence in the subjects.

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APPENDIX

CANDIDATE POINTS FOR COMPUTER STUDIES (CS) AND PHYSICS (PHY) FOR KCSE

RESULTS 2002 - 2004 FOR FIVE SCHOOLS OF OGEMBO DIVISION

APPENDIX A

SCHOOL M	
CS	PHY
A	B+
A-	A-
A-	B+
A-	B+
B+	C+
B+	B

B	B
B-	C
B	B
B	B
D	C
B	C+
B	B
D	C

B	C+
B	B-
D	C-
B-	C
B-	B-



APPENDIX B

SCHOOL N	
CS	PHY
A	A-
D	D
A	B+
B	B-
D-	D
A	B
D	D
A	B-
B	C+
D	D
A	C+
B-	C+
D-	D-
A-	C
C+	C
D-	D-
A-	C
C+	C
B+	C
C+	C
E	E
B	C-
C+	C
E	E
B	C-
C	C-
E	E

C	C-
C+	D
C	C-
C	D
C	C-
D+	D
C	C-
D	D
C-	C-
D	D
C-	D+
D	D-
C-	D+
D-	D-
C	D-
D+	D+
D+	D+
D+	D
D+	D
D+	D
D+	D
D	D
D	D
D	D
D	D
B	B+
C	B+
C-	B+
D+	B-
D+	B-
D+	B-
D+	C+
D+	C+
D	C+
D	C+
D	C+

APPENDIX C

SCHOOL O	
CS	PHY
A	A-
B	B+
B	B-
D-	D
B	B-
D-	D
B	C+
D-	D
B	C+
D-	D
A	C+
D-	D
A	C+
B-	C+
D-	D-
A	C+
D-	D-
B	A-
C+	C
B+	C
C+	C
E	E
B	C-
C+	C
E	E
B	C-
C	C-
E	E
D	D-
C	C-
C+	D+
C-	C

APPENDIX D

SCHOOL P	
CS	PHY
B	B
D	D
A	B+
B	B-
D-	D
A	B
B	B-
D-	D
A	B-
B	C+
D-	D
A	C+

APPENDIX E

SCHOOL Q	
CS	PHY
D	D
A	B+
B	B-
D-	D
A	B
D-	D
A	B-
B	C+
D-	D
A	C+

Appendix F



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FACULTY OF EDUCATION

December 20, 2007

TO WHOM IT MAY CONCERN

Dear Sir/Madam

This is to introduce you Mr. / Ms. PAUL GESIMBA Registration No. BED/10082/52/DF who is a student of our University in the Faculty of Education.

He/She is undertaking a resource project which requires your input as part fulfillment for the completion of his / her programme of study.

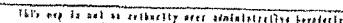
I kindly request you to avail him/her with all the necessary assistance.

Thank you.

With kind regards

A handwritten signature in black ink, appearing to read 'Okirima Michael'.

OKIRIMA MICHAEL
DEAN, Faculty of Education
Kampala International University



Appendix H.

5.0 RESEARCH PROJECT BUDGET ESTIMATES

PARTICULARS	COST PER UNIT (Ksh)	AMOUNT (Ksh.)
10 Ball pens	@ 25.00	250.00
4 Pencils	@20.00	80.00
1 Rubber	@15.00	15.00
3 Razors	@5.00	15.00
1 Ream of Photocopy paper	@400.00	400.00
Flash drive	@1000.00	1000.00
Local travel and transport	2000.00	2000.00
Subsistence and accommodation	2500.00	2500.00
Typing, typesetting and printing	2000.00	2000.00
TOTAL		8260.00

