

**ENVIRONMENTAL FACTORS AND ACADEMIC PERFORMANCE OF
GIRLS IN SCIENCE SUBJECTS ON SHANDEREMA SECONDARY SCHOOL
IN KAKAMEGA SOUTH
DISTRICT, KENYA**

**A RESEARCH PAPER SUBMITTED TO THE INSTITUTE OF CONTINUING
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BY



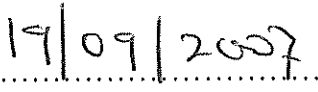
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DECLARATION

I Saisi Opata, do declare that this research report is my original work and has never been submitted to any institution of learning for any award.

Signed: 

SAISI OPATA

Date: 

APPROVAL

The work on this research report was done under the supervision of Mr. Kamagara Edison of the Institute of Distance and Continuing Studies of International University, who approved it for submission to the university. 0.

Signed: 

Date: 

DEDICATION

This work is dedicated to my beloved children, Stella and Yitzak.

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May God bless you all.

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ABSTRACT

For long time, the academic performance of girls in science subjects in Shanderema Secondary School has been poor. There are very few girls whose names appear on hounors roll in the principal's office. The number of girls pursuing science-related courses in institutions of higher learning has remained low. As a result, there are very few women professionals in science- related field, graduates of Shanderema.

The researcher has investigated the various environmental factors namely culture, religion and mass media that greatly contributed to this low performance. These factors have been effect on the academic performance of girls in science.

The research recommends to the community around Shandarema Secondary School, the government, non governmental organizations and other stake holders to weed out bad elements in the culture and beliefs of the people, and instill good values that can enhance the learning of science. The research also recommends to media houses to enrich their work with scientific articles that are educative.

CHAPTER ONE

BACKGROUND OF THE STUDY

1.0 Introduction

Shandrema Secondary School is a provincial, mixed boarding school located in Kakamega South district of Western Province, Kenya. The school has an enrollment of about five hundred students in forms one to four. Girls population in the school is one hundred and twenty six.

For a long time, the academic performance of girls in Shanderema secondary school has been poor in science subjects. Each year, very few girls obtain quality grades in science subjects as compared to their counterparts in other provincial schools. It is also observed that their performance in science subjects is lower than in arts subjects. Boys in the same school, on other hand, register higher academic performance in science subjects. Girls in other provincial schools have shown higher academic performance in science subjects.

As a consequence, the number of girls who qualify to join public universities has remained low. Worse, is to note that only a handful of girls from the school enroll to study prestigious science-based courses like medicine or engineering at the universities.

Kakamega district has a number of industries, among them being West Kenya Sugar company. These industries employ graduates from universities, technical institutions. Very few women are employed in these industries as technicians. Of the few in employment, the natives of Kakamega district are very few if not none at all. It is sad to note that poverty is rampant in the district despite the many agricultural activities or industries dottign the region.

A national project dubbed strengthening mathematics and science in secondary education (SMASSE) was launched in Kakamega district over five years ago. The programme has not achieved mush in terms of academic performance of girls in science subjects, despite the fact that all teachers of science at Shanderema secondary school are SMASSE complaint.

The programme has recorded remarkable successes in many schools of Bangoma and Nairobi districts. As a project, SMASSE emphasized good teaching methods needed by teachers. It pays little attention on the learner and other environmental factors that affect performance. There is need, therefore to complement the work of SMASSE by addressing issues not considered by SMSSE.

This study will explore the other environmental factors that impact on the academic performance of girls in science subjects. The researcher is a science teacher teaching at Shanderema secondary school, Kakamega south district. Besides teaching, the researcher serves as the Director of Studies in the school.

He is involved in the analysis of examination results in the school and at the district. He helps students make long range educational plans and career choices as outlined by the Ministry of Education.

1.1 Statement of the problem

The academic performance of girls in science subjects in Shanderema secondary is low and the number of girls who graduate from the school to join institutions of higher learning to study science – based courses is very small. Prior to this study however, there was no adequate information to explain this challenge which forced the researcher into the study.

1.2 Purpose of the study

This study seeks to determine the various factors which affect the academic performance of girls in science subjects in Shandrema Secondary School.

1.3 Objectives

1.3.1 General objectives

This study will determine the impact of environmental factors on the academic performance of girls in science subjects of Shanderema secondary school in Kakamega district.

1.3.2 Specific objectives

This study seeks o;

1. Determine the profile of the respondents

1.1 Social demographic data

1.1.1 Age

1.1.2 Academic level

1.1.3 Number of sisters

1.1.4 Academic level of sisters

1.1.5 Number of sisters with a science related job

1.2 Income of parents

1.3 Parents educational level

3. Determine the level of academic performance
4. Determine if there is a significant relationship between the degree of environmental factors and the level of academic performance.

1.4 Significance of the study

The study will benefit the following disciplines:

The Ministry of Education will be able to achieve the national learners goals of education which include providing learners with the necessary skills for technological and industrial needs, promoting individual development and self-fulfillment. These goals are a must as Kenya strives to become an industrialized nation by the year 2030.

The teachers of science will be able to realize good results from their students. This will be possible because the girls will provide a better audience to the teachers and take keen interest in the learning of science.

The girls students will be able to gain skills in science which will not only enable them to pass national examinations, but also promote individual development and self-fulfillment by landing the girls into marketable course and possibly well-paying jobs.

Industrialists will benefit from the results of this study as they will be able to get skilled labour needed to increase production. Cost of hiring skilled labour from foreign countries will be reduced.

To the researcher the study gives him a chance and will be able to discover the many problems that lead to poor performance of girl in science subjects.

The entire community will be able to gain from the scientific skills achieved by their girls. These skills will be employed to fight poverty eradication, poor health practices, poor farming methods and other vices. In all, the living standards of the people in Kakamega will improve.

1.5 Scope / delimitations of the study

The study was conducted among girls students of Shandarema secondary school in Kakamega district, Western province, Kenya.

The study contains findings about socio demographic data of the girls, effects of culture, religion and mass media on their academic performance in science. The study was conducted in July, 2007.

1.6 Limitations of the study

As a distant student, I found it challenging every time I needed to consult something from my supervisor who was several hundreds of kilometers away. This forced me to make several trips to go and meet my supervisor who attended to me.

The respondents have never answered a questionnaire before. The first time I gave them the questionnaire; they were confused and gave inaccurate answers. I conducted an informative training session and gave them fresh questionnaires. This time round they gave accurate and appropriate responses.

1.7 Definition of terms

For the purpose of this study the following terms are defined operationally;

1. Academic performance

A measure of the acquired skills or knowledge in a subject of study usually expressed as grades ranging from A to E.

2. Environmental factors

Social objects or subjects and the associated experiences are derives from them at school, home or society in general.

3. Social demography

The scientific study of family details.

4. Mass media

The main ways that large numbers of people receive information and entertainment.

5. Culture

The customs and beliefs, way of life and social organization of a group of people.

6. Religion

The belief and the activities that are connected with the worship.

CHAPTER TWO

REVIEW OF THE RELATED LITERATURE

According to Belt Azar (1997) whereas genetics is important, the environment plays a big role on what one turns out to be. As soon as cells of an embryo are implanted in the mothers' uterus, it is unique because its experiences (environment) are different. Although identical twins are in effect clones, they are only 50% concordant on most traits, indicating that the environment accounts for the other 50%. As one goes through more diversified experiences the traits controlled by the environment become more prevalent compared to those that are genetically controlled.

The academic performance of girls in science subjects appears to be modeled by environmental factors; culture, religion, etc.

According to Beth Azar (1997), fetus can respond to certain stimuli. They learn to prefer certain sounds, flavours and vibrations. Fetus respond to nipples placed close to their mouths as if they expected to receive milk from them.

Environmental experiences that come early in life can quickly shape behaviour of children. When these effects are sustained, they lead to prolonged lingering in life resulting in increased learning ability or decreased learning ability. Conversely, absence of these early experiences may lead to stagnant learning abilities, the consequence being low academic performance. According to Sharon Begley (1996), a baby's brain is a work in progress. It has trillions of neurons waiting to be wired into a mind. The experiences of childhood help form the brain circuits for tasks in music, mathematics, science, etc.

Trillions of neurons are like pentium chips in a computer before the factory preloads the software. They are pure and of almost infinite potential, improgrammed circuits that might one day do calculus. If the neurons are used, they may become integrated into the circuitry of the brain by connecting to other brains; if they are not used, they may die.

Taking girls through good environmental experiences may prepare them for the scientific tasks ahead. When these experiences are not availed the relevant neurons may die which might lead to one's poor performance in science.

Put differently, when these experiences are replaced with other mutilated or biased experiences, wrong neurons become integrated in the circuitry of the brain resulting in failure to prepare the girls brains for the scientific tasks ahead.

According to John Abbot (1997), the structures and processes of the brain are a direct response to the complexity of environmental factors faced by humans.

Ernest Hall, an English entrepreneur understands the transforming power of learning. At the age of eight, his teacher played a recording of 'Apollo Lyre' that later transformed his life. At twelve, Ernest played piano so well that his parents told him to leave school and earn a living by playing piano in pubs.

Ernest saw this as trivial. He had an ambition of making more money by playing piano at 'bigger' places. In the consequent years, he was able to purchase and own a textile mill that housed art galleries, working studios and concert halls. He earns real money from this complex.

Every girl has the potential to develop to her particular ability. Ability is to innate; it is bred by right environmental experiences. To every girl child, we should say, "you are special, you are unique but to develop your genius you have to work at it and stick at it with it year after year.

According to Marc Peyser and Anne Underwood (1997), genetics and environment work together to determine the personality of one. Some experiences can actually alter the structure of the brain. An aggressive toddler, under the right circumstances, can essentially be wired to channel her energy more constructively. No child need to held captive to her genetic blue print. For the trait to be expressed, a gene, often must be 'turned on' by an outside force before it does its job.

Our girls have the genes of curiosity. This curiosity is highly needed in the learning of sciences. But, the genes must be triggered by correct environmental experiences to yield good academic performance. Wrong environmental experiences fail to trigger the genes of curiosity and leads to poor academic performance.

According to Nancy Gibbs (1995), emotions and not I.Q, may be the true measure of human intelligence. Over the time, natural talents seem to ignite in some people and dim in others. Similarly, the smartest kid in class will probably not end up the richest.

Emotional intelligence embraces qualities like understanding one's own feelings and regulating the emotions in a way that enhances learning. When children are still young, there is a neurological window of opportunity. This is so because the brains prefrontal circuitry, which regulates how we act on what we feel (emotional intelligence – EQ) probably does not mature until late adolescence.

Emotional skills taught to girls in any kind of formal, classroom way and a training to analyze their feelings may guide them to employ the natural gifts and use them for their own good. According to Anne Murphy Paul (1998), much of what enters our consciousness comes from the culture around us.

At an early age, girls have definite and entrenched stereotypes about mathematics and science. They view them as hard subjects and a males domain. They have no choice about whether to accept or reject these conceptions since they are acquired well before they have the cognitive abilities or experiences to form their own beliefs.

It is on this basis that the girls' environment has to be progressive and must compete with all forces that would promote and perpetuate these stereotypes; namely culture, peer pressure, religion, influence of mass media, etc.

According to Anne Murphy Paul (1988), heredity is a force to be reckoned with but another powerful force at work is group socialization or the shaping of one's character by peers. Group socialization binds and captivates ones mind. This socialization takes the outfit of a mini culture and one finds it difficult to break away from is norms.

As children grow older and peer influence grows stronger, they come to prefer the ways of peers to those of parents or teachers. Our personality becomes less flexible as we grow older so that the personality acquired in childhood and adolescent peer groups persist with little modification.

Parents can influence things like religious affiliation and choice of career for their girls; but their effect on the child's future psychological characteristics in weak. Perhaps, the most important way parents

CHAPTER THREE

METHODOLOGY

3.0 Research design

A quantitative and qualitative cross – sectional design was used in this study. Respondents gave data which was both figurative and analytical. These data was used to determine the effect of environmental factors on their level of academic performance.

Area and population of the study. The study was conducted in Shanderema secondary of Kakamega district, Kenya. The study was conducted among forty two girls out of the one hundred and twenty six girls in the school.

3.1 Sample selection and size

Forty two girls were selected for the study using the following criteria:

- Form 1: A third of the total girls' population that is $\frac{1}{3}$ of 32 or 11 girls were randomly selected for the study.
- Form 2: A third of the total girls' population was selected for the study that is $\frac{1}{3}$ of 44 girls were randomly selected for the study.
- Form 3: A third of the total girls population was selected that is $\frac{1}{3}$ of 26 or 8 girls were randomly selected for the study .
- Form 4: A third of the total population was selected for the study that is $\frac{1}{3}$ of 24 of 8 girls where randomly selected.

3.2 Research instruments used

A researcher made questionnaire was used to collect data.

The questionnaire consisted of two types of questions

- Structured questions: Where respondents filled blank spaces of boxes.
- Open-ended questions: Where respondents selected the best response to the question.

The responses were;

- (4) Strongly agree (Agree with no doubt at all)
- (3) Agree (Agree with some doubt)
- (2) Disagree (Disagree with some doubt)
- (1) Strongly disagree (Disagree with no doubt at all)

3.2 Data Analysis

Data was analyzed using both qualitative and quantitative techniques. The objectives were analyzed using Tables and Charts in which frequencies and percentages were generated. Conclusions and recommendations were generated from the analysis.



CHAPTER FOUR

PRESENTATION OF THE FINDINGS

4.1 Profile of the respondents

The first factor the researcher investigated was the profile of the respondents namely age, academic level, number of sisters, number of sisters in employment, income of parents and parents academic level. The following tables show the findings of the study.

Table 1: Age

Category	Frequency	Percentage
Early adolescent	7	16.7%
Middle adolescent	21	50.0%
Late adolescent	14	33.3%
Total	42	100%

The majority of the respondents (50%) are in the middle adolescence and late adolescence. The respondents are therefore mature enough to have the study conducted on them. Furthermore, the respondents are at the right age to be in secondary school. Thus age is not a factor influencing their academic performance.

Table 2: Academic level of respondents

Category	Frequency	Percentage
Form 1	11	26.2%
Form 2	15	35.8%
Form 3	8	19.0%
Form 4	8	19.0%
Total	42	100%

The respondents were drawn from all the classes. The number of respondents selected in each class was proportional to the girls population in the class. The study was, thus, fair and purposive.

Table 3: Number of sisters

Category	Frequency	Percentage
0 - 2	17	40.5%
3 - 5	21	50%
Over 5	4	9.5%
Total	42	100%

The majority of the respondents (59.5%) have three or more sisters. It is likely that these sisters passed through Shanderema secondary school or the sisters are yet to pass through Shanderema secondary school. Either way, the sisters may have fallen victims of the problem or they are potential victims. The study, not only addresses the problem in its current state but also reflects at the damage the problem has caused in the past and possible future damages.

Table 4: Academic level of sister

Category	Frequency	Percentage
Primary	35	33.7%
Secondary	45	43.3%
College	18	17.3%
University	4	3.8%
None	2	1.9
Total	104	100%

The majority of the sisters (78.9%) have not gone beyond secondary level. The study shows that the background of the respondents is dominated with fellow girls (women) who have not achieved much in education and thus cannot be good role models. Only 21.1% of the background have gone up to higher institutions of learning and are outright good role models.

Table 5: Number of sisters with a science related job

Category	Frequency	Percentage
None	30	71.4%
1	5	11.4%
2	2	4.8%
3	2	4.8%
4	3	7.1%
Total	42	100%

The study shows that the majority of the respondents (71.4%) have no sister who is employed in a science-related job. This portrays the effects of the problem under study to the community given that most of the job sisters learnt at Shanderema. On the other hand, the study shows a deficiency of role models among the respondents.

Table 6: Income of parents (Ksh per month)

Category	Frequency	Percentage
Below 1000	12	28.6%
1000 - 10000	16	38.1%
10000 - 50000	13	30.9%
Over 50000	1	2.4%
Total	42	100%

The study shows that the majority (66.7%) of the respondents come from families whose parents have a low income (that is less than shs. 10000 per month or \$ 5 per day. According to the United Nations rating these families are slightly above the poverty line or are active poor. Their resources are not sufficient to provide for all the needs of their families. It is on this basis that the facilities the girls are exposed to both at home and at school are poor. These poor facilities (or sometimes absence of facilities) lead to low academic performance in science.

Table 7: Parents academic level

Category	Frequency	Percentage
University	2	4.8%
Middle level college	11	26.2%
High School	22	52.4%
Elementary school	6	14.3%
None	1	2.3%
Total	42	100%

The study shows that 69% of the parents have acquired education not beyond high school level. Once again, this shows the serious deficiency of role models in the families. Further to this, the parents cannot offer the academic guidance that is up to data given their basic education.

Objective 4.2 degree of environmental factors. One of the environmental factors the research investigated was culture or the culture of community around Shandarema secondary school. The students, most of them come from around the school. The results are presented in the following data.

Table 8: Science is a hard task

Response	Frequency	Percentage
Strongly agree	37	88.1%
Agree	5	11.9%
Disagree	0	0%
Strongly agree	0	0%
Total	42	100%

All the respondents (100%) agreed to some extent that according to their culture, science is viewed as a hard task. This is a natural drawback that affects their academic performance in science, since it is dictated to them by culture.

Table 9: Hard tasks are boys' or men's preserve

Response	Frequency	Percentage
Strongly agree	25	59.5%
Agree	10	23.8%
Disagree	2	4.8%
Strongly disagree	5	11.9%
Total	42	100%

The majority of the respondents (83.3%) agreed to some extent that hard tasks, according to culture, are meant for males. Science (already seen as a hard task by the same culture) is therefore considered not suitable for girls. Again this is a natural setback that contributes to low academic performance.

Table 10: Girls doing tough tasks are not normal ladies

Response	Frequency	Percentage
Strongly agree	18	42.9%
Agree	13	30.9%
Disagree	11	26.2%
Strongly disagree	0	0%
Total	42	100%

Over half the respondents or 73.8% agreed that girls seen performing hard tasks contradict the norms of their culture and are thus not normal. The girls tend to shun the tasks (including science) to save themselves being branded not normal ladies.

Table 11: Basic education, ideal for a girl

Response	Frequency	Percentage
Strongly agree	10	23.8%
Agree	17	40.5%
Disagree	9	21.4%
Strongly disagree	6	14.3%
Total	42	100%

Table 14: Scientific practices are against religious beliefs

Response	Frequency	Percentage
Strongly agree	10	23.9%
Agree	18	42.8%
Disagree	10	23.9%
Strongly disagree	4	9.5%
Total	42	100%

The study shows that 66.7% of the respondents feel that scientific practices are against religion beliefs. Since the girls were first exposed to religion and its beliefs, scientific beliefs have no room in their minds. They tend to ignore the scientific practices and this leads to poor attitude towards science, culminating in poor academic performance.

Table 15: Science de-means God's work

Response	Frequency	Percentage
Strongly agree	19	45.2%
Agree	10	23.9%
Disagree	13	30.9%
Strongly disagree	0	0%
Total	42	100%

The study shows that the majority of the respondents (69.1%) feel that science de-means God's work. The girls develop a barrier against scientific skills and approaches in fear of being excommunicated from their sects. This stance taken by the girls leads to low academic performance.

Table 16: Science and religion cannot complement each other

Response	Frequency	Percentage
Strongly agree	21	50%
Agree	10	23.9%
Disagree	7	16.6%
Strongly disagree	4	9.5%
Total	42	100%

The findings above show that 73.9% of the respondents feel that science and religion cannot assist each other. They do not see science as important to help them understand religion. To this end, they discard science and its practices. This develops into a wrong attitude which leads to low academic performance in science.

Table 17: Spiritual nourishment is enough for ones development into her potentiality

Response	Frequency	Percentage
Strongly agree	12	28.6%
Agree	14	33.3%
Disagree	5	11.9%
Strongly disagree	11	26.2%
Total	42	100%

The results show that a large section of the respondents (61.9%) feel that spiritual nourishment is all one needs to develop her potentiality. To them, science plays a very insignificant role. They are therefore not bothered with the serious learning of science since it is not a necessity in life. This explains the low academic performance in science.

The last environmental factor investigated by the researcher is effect of the mass media. The following tables show the results obtained.

Table 18: Exposure to new scientific discoveries hardly reach them in the community

Response	Frequency	Percentage
Strongly agree	14	33.3%
Agree	13	31.0%
Disagree	7	16.7%
Strongly disagree	8	19.0%
Total	42	100%

The results above show that 64.3% of the respondents are not exposed to new scientific discoveries through the media as soon as they are out. This could be because the school is in a rural setting that is easily not easily accessed by the media. Lack of this exposure leads to failure of enthusiasm being aroused and consequent low academic performance in science.

Table 19: Media carries a lot of coverage that is not science-based

Response	Frequency	Percentage
Strongly agree	9	21.4%
Agree	33	78.6%
Disagree	0	0%
Strongly disagree	0	0%
Total	42	100%

From the results above, all the respondents (or 100%) feel that the media give the widest coverage on science-based programmes or articles such as politics, entertainment, etc. The media does not support the learning of science and this leads to low academic performance.

Table 20: Media should carry scientific and educative features

Response	Frequency	Percentage
Strongly agree	38	90.5%
Agree	4	9.5%
Disagree	0	0%
Strongly disagree	0	0%
Total	42	100%

The results show that all the respondents (or 100%) agree with the point that there is need for the media to carry scientific features that are educative. This indicate the deficient ingredient in the learning of science. This deficiency has been a contributing factor to the low academic performance in science.

Table 21: Level of academic performance

Category	Frequency	Percentage
Primary exam		
Grade		
A	0	0%
B	9	21.4%
C	33	78.6%

D	0	0%
E	0	0%
TOTAL	42	100%
Present Rating		
A	0	0%
B	7	16.7%
C	24	57.1%
D	7	16.7%
E	4	9.5%
Total	42	100%

Observation on table 3.1

All the respondents were either average or above average at the primary school level in the academic performance in science.

After joining Shanderema secondary school, some of the girls have dropped in their academic performance in science. To be exact, 26.2% of the girls are now scoring below average. On the other hand, in secondary school, the number of girls who score above average has reduced from 100% (at the primary level) to 78.8%.

Environmental factors seem to have a bigger effect at secondary level than at primary level. It is at secondary level that girls appreciate many aspects of their environment by for example culture, mass media, etc.

Table 22: Significance of environmental factors and level of academic performance

Response	Frequency	Percentage
Strongly agree	42	100%
Agree	0	0%
Disagree	0	0%
Strongly disagree	0	0%
Total	42	100%

The results indicate that all the respondents (or 100%) agree very strongly that the environmental factors of culture, religion and mass media affect the level of academic performance. This discovery is in accordance with the null hypothesis the researcher stated.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Summary of objective one

The age and the academic levels of the respondents show that respondents are the right group of people to be in school and at the level in which they are.

Presence of sisters who are not working in a science related field indicate that the problem of poor academic performance in science at the school has been on for a long time and still persists.

The low income of the parents, points that vital facilities cannot be avoided to the girls. This contributes to low academic performance in science.

Low academic level of parents is an indication of the lacking role models at home to inspire the girls to perform well in science.

5.1.1 Summary of objective two

Culture was found to have a very pronounced effect on the low academic performance of girls in science.

The religion of the community greatly kills the morale of the girls towards learning science. This low morale leads to the low academic performance in science.

Mass media was found to be another factor causing low academic performance in science. In some cases, the girls lack exposure to various discoveries in science due to lack of the media. In other cases, the media is biased against science.

5.1.2 Summary of objective three

The academic performance of girls in science at the primary is fair and tends to dwindle as the girls enter secondary school. This is as a result of effects of the environmental factors discussed above being strongest at secondary school level.

5.2 Conclusion

The academic performance of girls in science in Shanderema secondary school is controlled by the environmental factors such as culture, religion and mass media within the community.

Outstanding features of these factors include low income of parents, lack of role models at home, a biased culture that does not regard girls as beings capable of handling any task. Others are religious beliefs that portray science as evil, the mass media that are not only scarce, but also deficient of scientific coverage.

Since the school is in the rural area, effects due to these environmental factors are homogeneous and almost with far reaching effect on academic performance.

5.3 Recommendations

As seen in the previous sections, the problem of poor academic performance in science being girls in Shanderema secondary school is rooted in the environment, at home and at school.

There is need for parents to increase their income. This can be done by venturing into projects that can generate more money. With better income, the parents will be able to provide for the social, educational needs for their children.

Certain cultural and religious beliefs which do not go down well with science should be discarded. The government, non governmental organizations and other stake holders should launch crusades to educate people to change certain element in their culture. In particular, leading elites from Shanderema should fall back and participate in educating the people to shed off sections of their culture and religious beliefs.

Schools should organize tours, trips, outings or innings for their students to expose them to new cultures. The girls are expected to interact with other girls from different setups and learn useful trends and values that can enhance the learning of science.

Organizations, companies and the leading people in the community should come up with awards, trophies or scholarships for the top performing girls in science. This will encourage other girls to have a positive attitude towards science and work hard to excel.

The media houses should increase their area of coverage to reach rural areas. This will encourage people to own radios, television sets or even buy the papers. Their children will be exposed to the media.

Alongside this, the media houses should enrich their work by ensuring that some programmes or articles are science-based and educative. These programmes should be aired during specified times of the day convenient enough for students. For the case of newspapers, they should contain scientific articles in their pull outs for students.

The Ministry of Education through the Curriculum Development Centre should come up with films about certain scientific skills. These films should be shown in rural schools where the media does not infiltrate easily.

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APPENDIX A

QUESTIONNAIRE

Read each statement below and write in the box against it your answer.

The information you give will be treated be uttermost confidence.

1. Socio demographic data

1.1.1 What is your age?

.....

1.1.2 What is your academic level?

.....

1.1.3 How many sisters do you have?

.....

1.1.4 What are their academic levels?

.....

1.1.5 How many of your sisters (if any) are employed as technicians, nurses or any science-related job?

.....

1.2 What is the approximate income of your parents per moth

Below Ksh. 1000

Between Ksh. 1000 – 1000

Between Ksh. 1000 – 50000

Over Ksh. 50000

1.3 What are your parents educational qualifications?

University ☐

College ☐

High school ☐

Elementary school ☐

None

Please tick the appropriate number that expresses your feeling about each of the following statements.

Use the guide below

- (4) Strongly agree (Agree with no doubt at all)
- (3) Agree (Agree with some doubt)
- (2) Disagree (Disagree with some doubt)
- (1) Strongly disagree (Disagree with no doubt at all)

According to the culture of your people

2.1.1 Science is viewed as a hard task

- (4) (3) (2) (1)

2.1.2 Hard tasks are reserved for boys or men

- (4) (3) (2) (1)

2.1.3 Basic educational achievement is considered adequate for a girl

- (4) (3) (2) (1)

2.1.4 Girls who are good at tough tasks (including science) are looked down upon and are regarded as not normal ladies

- (4) (3) (2) (1)

2.1.5 A lot of emphasis is put on a girl's development into a good wife and not her educational or professional achievement

- (4) (3) (2) (1)

2.1.6 Certain aspects of science contradict cultural beliefs and are looked at as conflicting

- (4) (3) (2) (1)

According to your religion

2.2.1 Certain scientific practices are against our religion beliefs

(4) (3) (2) (1)

2.2.2 Science attempts to de-mean God's work

(4) (3) (2) (1)

2.2.3 Science and religion cannot complement each other

(4) (3) (2) (1)

2.2.4 Spiritual nourishment is sufficient for one to develop her potentialities. Science plays a very insignificant role

(4) (3) (2) (1)

According to the mass media (radio, TV, newspapers, etc) that serve your area.

2.3.1 Expose to new scientific discoveries through the mass media hardly reach your community

(4) (3) (2) (1)

2.3.2 The media carried a lot of coverage that is not science based

(4) (3) (2) (1)

2.3.3 There is need for the media to carry meaningful programmes that are scientific and educative

(4) (3) (2) (1)

3.1.1 What performance grade did you score in science in the primary course examination?

(A) (B) (C) (E)

3.1.2 How do you rate your academic performance in science now?

(A) (B) (C) (E)

4.1 There is a significant relationship between the degree of environmental factors (culture, religion, media) and any level of academic performance.

- (A) Strongly agree
- (b) Agree
- (c) Disagree
- (d) Strongly disagree