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RELATIONSHIP BETWEEN CULTURAL BELIEFS AND SECONDARY SCHOOL STUDENTS' ACHIEVEMENT IN CHEMISTRY IN SAMBURU COUNTY, KENYA

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ABSTRACT

African Societies have a relatively rich body of Indigenous Knowledge. This is embodied in the Continent's Indigenous Knowledge Systems. This knowledge has been used by the African people for thousands of years to solve their specific problems. According to Kenya National Examination Council reports, secondary school students' achievement in chemistry has been persistently poor. This has been attributed to many factors including cultural beliefs. However, it is not clear how cultural beliefs are related to students' achievement in chemistry. The current concern in Samburu County among parents and other education stakeholders is that, students' achievement in chemistry is poor and is likely to be affected by cultural beliefs that have a bearing on chemistry. This study was designed to investigate the relationship between cultural beliefs and secondary school students' achievement in chemistry in Samburu County. Descriptive Correlational survey research design was used. The target population was all the secondary school chemistry students in Samburu County. The accessible population was all the Form Three chemistry students in the County in the year 2022. Cluster sampling was used to select nine secondary schools as sampling units and this included both public and private schools. Stratified and simple random sampling was used to select a sample of 286 students. Two instruments were used for data collection namely: Students' Chemistry Achievement Test (SCAT) and Students' Cultural Beliefs Questionnaire (SCBQ). The instruments were validated by five experts in educational research. The reliability coefficient of SCAT was estimated using Guttman's Lambda (λ6) formula. This yielded a reliability coefficient of 0.80. Cronbach's Alpha Coefficient (α) was used to estimate reliability coefficient of SCBQ. This yielded reliability coefficients of 0.85. The data collected was analyzed using both descriptive and inferential statistics. Simple Linear Regression was used to establish the relationships between the different variables in the study. All statistical tests of significance were conducted at a coefficient level of alpha (α) equal to 0.05 with the help of Statistical Package for Social Sciences (SPSS) version 23.0 for windows. There was no statistically significant relationship between Cultural Beliefs and students' achievement in chemistry. The findings, however, indicate that there was a gender difference in achievement in chemistry in favour of boys. It is recommended that the Ministry of Education should initiate in-service courses for science teachers to equip them with requisite skills to enhance their effectiveness in teaching of chemistry and science subjects as a whole. The findings of this study would benefit chemistry teachers, curriculum developers, teacher educators and policy makers in addressing necessary interventions to facilitate meaningful learning of chemistry and thus improve students' achievement in the subject in secondary schools Countrywide.

KEYWORDS Relationship, Cultural Beliefs, Students' Achievement, Chemistry.

Introduction

Culture has received considerable attention in science education. Culture depicts a people's peculiar pattern of values, attitudes, knowledge, skills, behaviours and technology (Irungu, 2019). Culture refers to the sum total of the learned behaviour of a group of people that were generally considered as their tradition and was transmitted from generation to generation in various forms (Ogunleye, 2009). Cultural differences and characteristics manifest themselves in different domains and at varying depths. Applying UNESCO's general definition, domains of culture include spiritual, material, intellectual and emotional features of a society or a group, in addition to their art and literature, lifestyles, way of living together, value system, traditions and beliefs (Nnamani & Oyibe, 2016). The assumptions that culture was the primary determinant of academic achievement could be dangerous and counterproductive if misinterpreted (Palt, 2018).

Cultural knowledge takes many forms such as taboos, rituals, norms, beliefs, cultural practices and traditions depending on the particular historical and cultural background. According to Kei (2011), education was influenced by the prevailing economic, social, technical, religious and political systems. Cultural beliefs were used to sustain community development and also advancement in technology. In support of that, former president of Tanzania, Mwalimu Julius Nyerere, described Cultural education as an integral part of life (Kigotho, 2015).

Learning was known to be culture dependent (Almut, 2017). A major cause of under-achievement has been traced to the misconceptions which students brought to science classrooms, especially chemistry (Ivowi, 2010). Research had shown that students' explanations of scientific phenomena were influenced by what they perceived from their cultural beliefs and practices (Okoye, 2007). That had resulted to divergence between students' daily experience in the classroom and the scientific world with most of the students having significant difficulties in describing, interpreting and predicting natural phenomena (Jamil, 2011). Science educators were very conscious of the need to relate science more closely to the students' cultural environment in order to minimize the possible conflicts that might arise from their view of the world and that of science. This could be done by carefully considering the cultural point of view that had appropriate relationship to students' achievement in chemistry.

Ausubel (2000), argued that the construction of new knowledge in science was strongly influenced by prior knowledge, which conceptions were gained prior to the new learning. Chemistry is a science subject taught in secondary schools. It relates with both physical and chemical phenomena, and how they were connected to man's daily lives. There was, therefore, a likelihood of cultural beliefs having an influence on students' learning and achievement in chemistry. This study, therefore, was aimed at investigating the relationship between cultural beliefs and students' achievement in chemistry.

Globally, a positive tradition in science by students played a major role in advancement of modern technology of any country in the world. America, Britain, Japan and China had excelled in industrialization because of being well established with scientific skills on innovation and creativity (Akinsolu, 2010). Kenya envisions being a middle-income Country by the year 2030. However, looking at students' achievement in science subjects at secondary education level, the realization of the vision might be in doubt because of students' negative perception of Mathematics and Sciences leading to poor achievement by students at Kenya Certificate of Secondary Education (SMASSE project, 1998). Many students in Kenya choose to drop Science Subjects when given a choice and even for those who take them, the performance is below average (Sifuna & Kaime, 2007). The poor

achievement is evident from results in Table 1, which show students' achievement in chemistry and other science subjects from 2018 to 2021.

Table 1

National Students' Achievement in KCSE Chemistry and other Science Subjects

Subject	2018 Candi.	Mean %	2019 Candi.	Mean %	2020 Candi.	Mean %	2021 Candi.	Mean %	Average Mean %
Biology	509,982	29.19	545,663	23.93	593,965	25.90	629,538	27.69	26.68
Physics	149,790	39.77	160,182	35.04	173,573	39.88	183,969	40.43	38.78
Chemistry	566,836	23.72	606,515	24.05	660,204	26.24	699745	28.57	25.65

Source: KNEC Report, 2022

Table 1 shows that the average mean scores in Biology and Physics was 26.68 and 38.78% respectively, while the average mean score for Chemistry was 25.65%. These differences in achievement might be as a result of the effect of cultural beliefs held by students towards science subjects but in this particular case, it was more pronounced in chemistry than other science subjects. Improving performance in science education is a great societal challenge in Kenya not only for industrialization of the Country but also for producing scientifically empowered citizens with adequate scientific skills for handling science related challenges. The poor students' achievement in sciences and mathematics prompted the Government of Kenya through the Ministry of Education Science and Technology (MoEST), with assistance of the Government of Japan through Japan International Corporation Agency (JICA) to initiate a programme on the Strengthening of Mathematics and Science in Secondary Education (SMASSE) (Juma & Simatwa, 2014). The programme was implemented in Samburu County from 2004 and a remarkable improvement noticed but students' achievement in these subjects, especially Chemistry among the sciences continued to be below average in spite of that intervention (KNEC Report, 2021), as shown in Table 2.

Table 2

Samburu County Students' Achievement in 2019 to 2021 KCSE Examinations in Sciences

Subject	2019				2020				2021			
	Female No. Sat.	Mean %	Male No. Sat.	Mean %	Female No. Sat.	Mean %	Male No. Sat.	Mean %	Female No. Sat.	Mean %	Male No. Sat.	Mean %
Biology	401	21.56	582	23.11	440	27.60	718	30.50	470	27.56	820	30.60
Physics	63	20.06	150	22.67	67	22.25	170	25.50	182	22.06	240	29.67
Chemistry	440	15.60	710	17.56	420	16.20	740	19.06	490	17.11	840	21.00

Source: Ministry of Education, Samburu County Education Office, 2022

From Table 2, two observations could be made;

i. Achievement of boys and girls in chemistry for the specified period was poor.

ii. Even though the achievement fluctuated, it was evident that the gender disparity in achievement existed: females continued to score lower than males mostly in chemistry.

Poor achievement in chemistry has been attributed to many factors. They included over enrolment, students' poor attitude towards the subject and inadequate resources (Oluoch, 2014). The Ministry of Education in Kenya through its various organs has made considerable efforts to minimize the causes of poor achievement in chemistry. Such efforts include among others, adequate training of chemistry teachers and provision of basic training materials, organizing for in-service courses for chemistry teachers and in some occasion's revision of the secondary school curriculum. Despite the above efforts, students still perform poorly in chemistry (KNEC, 2021). This implies that the problem that leads to students' poor achievement in the subject has not been adequately addressed. While the above factors might contribute to such achievement, there could be yet other critical factors that contribute to poor achievement in the subject. Among these are the cultural beliefs. Cultural beliefs have been identified as having some influence on achievement of students in science and by extension in chemistry (Oluoch, 2014). As evidenced in Table 2, there exists a gender disparity in students' achievement in chemistry. Several scholars have identified attitude related factors such as low self-esteem, poor self-concept, fear of success, cultural influence and lack of confidence as having an influence on girls' achievement in mathematics and the sciences (Ongeri, 2012). Therefore, the relationship between cultural beliefs and students' achievement in chemistry could be attributed to psychological and social factors. There is need to explore more on the relationship between cultural beliefs and students' achievement in chemistry with a view of suggesting possible intervention strategies, hence the need for this study.

Study Objective

The study was guided by the following objective:

To investigate the relationship between cultural beliefs and secondary school students' achievement in chemistry in Samburu County.

Conceptual Framework

The conceptual framework used in this study was based on the Cross- Cultural Theory presented by Barry (1969). To successfully adapt Barry's Cross- Cultural Theory, the conceptual model representation illustrated in Figure 1, guided the study.

Figure 1

Relationship between Cultural Beliefs and Students' Achievement in Chemistry

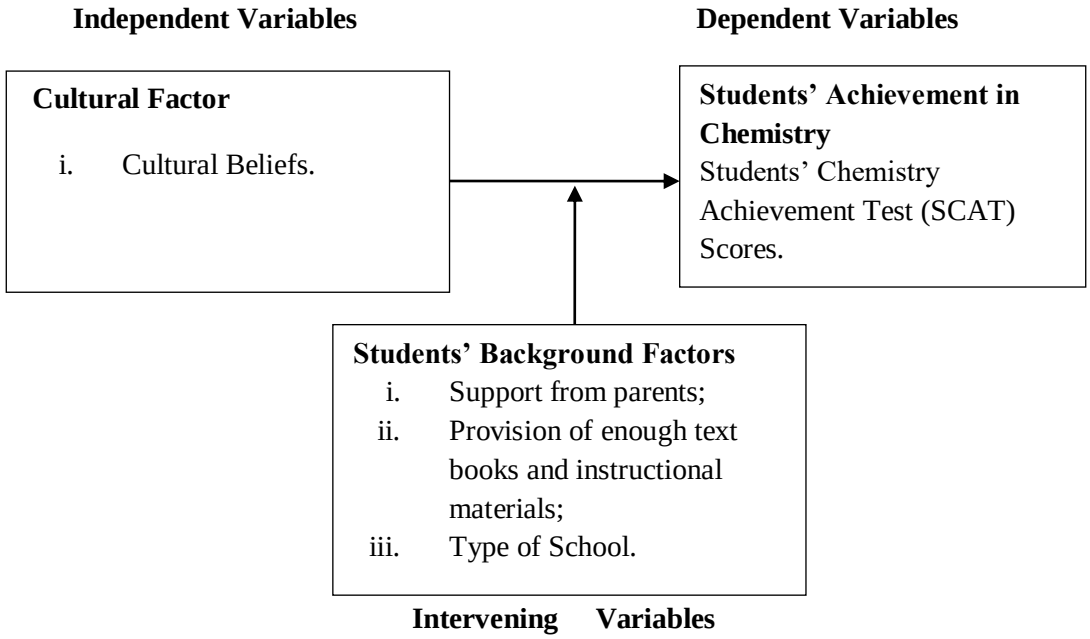


Figure 1 illustrates the conceptual framework that was used to guide the study. It has three main interrelated variables namely; independent, dependent and intervening variables. The independent variables are the cause and their values are independent of other variables in the study. The dependent variables are the effect and their values depends on changes in the independent variables. Lastly the intervening variables are variables that link both the independent and the dependent variables, allowing the relationship between them to be better explained. The intervening variables in this study were support from parents, provision of enough text books and instructional materials, and lastly the type of school. These were controlled as follows: - Support from parents, provision of enough text books and instructional materials was controlled by involving Form Three students who did not miss classes because of indiscipline cases, being out of school due to lack of school fees or even text books and other instructional materials for use in school. Type of school was controlled by involving both public and private secondary schools which had Form Three students, trained chemistry teachers and fully equipped science laboratories. This would help students to develop scientific skills and better understanding of chemistry concepts. In this study, cultural beliefs was the independent variable while students' achievement in chemistry was the dependent variable. Enhanced students' achievement in chemistry was the expected outcomes and finally students' background factors in this study were the intervening variables.

However, the following gaps were identified from the literature review: First a number of studies discussed in the literature review were conducted in different contexts in relation to the study at hand. The researcher also established that there was no empirical research known to have been undertaken to study the above factor and its relationship to students' achievement in chemistry in Samburu County. Therefore, to fill in the gap above, in this study sufficient data on cultural beliefs that had a bearing on students' achievement in chemistry in Samburu County was collected.

Research Methodology

The study was employed a Correlational research, where Descriptive Correlational survey design was used. The design involved the measurement of two variables and correlating them to establish the magnitude and direction of relationship that might exist (Leedy, 2010). The importance of correlation research has been emphasized by Kuhn (2014) and Carvallo (2005). The design was relevant in this study because it would provide a way of establishing relationships between cultural beliefs and students' achievement in chemistry. The study, therefore, would give an analysis of the relationships between the variables, hence the relevance of the design for the nature of the subject of inquiry in this study.

Sample Size and Sampling Procedures

The sampling units were the secondary schools. Cluster sampling technique was used to select nine secondary schools with adequate teaching/learning resources. The schools were visited to ensure that they were suitable for the study. Class lists were used as sampling frames and only students of the Samburu ethnic community were selected for the study. Stratified and simple random sampling was used in selecting boys and girls in single sex and mixed schools because it gave each unit in the population an equal opportunity to be involved in the sample (Kathuri & Pals, 1993). Nkapa (1997) argues that, there is no first hand rule for determining a sample size. However, in this study, the expression, $n = \frac{Z^2 PqN}{(N-1)e^2 + Z^2 Pq}$ was used in determining a sample size (n) as with Kothari (2004) method of sample size determination from a finite population as shown in appendix (V) where: -

n = Required Sample Size,
Z = Value of Standard Variate =1.96 @ 95% Coefficient Interval (Cl),
N = The given Population Size (N = 1,238),
e = Acceptable Error and Degree of Accuracy (e = 0.05),
P = Proportionate Target Population with Particular Characteristics (P = 0.141),
q = 1- P = 0.859.
Using this formula, a sample size of 286 was proportionately selected which included 114 girls and 172 boys from nine secondary schools. Therefore, the minimum number of girls that were selected per school was 19, while on the other hand the minimum number of boys was 29. The total sample size was selected as shown in Table 3.

Table 3:

Selection of the Sample Size per School Type and Gender

School Type	Total no. of Schools	Total no. of Girls	Total no. of Boys	Total
Girls' schools	3	84	-	84
Boys' schools	3	-	109	109
Co-educational	3	30	63	93
Total	**9**	**114**	**172**	**286**

Source: Field Data, 2022

From the total sample of 286 in Table 3, 114 were girls and 172 boys which translated to 40 (%) percent and 60 (%) percent respectively. Cluster sampling was used to ensure that each category of schools was equitably selected for the study. Using cluster sampling technique, schools in each of the sub-Counties in Samburu County were grouped into a cluster, such that schools in every sub-County formed a separate cluster for easy studying. Because of the homogeneity of the schools across the sub-Counties in the County, small size sub-Counties with one or two secondary schools were merged with large sub-Counties with many schools falling on the same side of the County, hence having two major sub-Counties which were Samburu North and Central. For the purpose of sampling, distribution of schools in each of the two major sub-Counties was based on the type of school category as shown in Table 4.

Table 4:
Selection of School Category for Sample Size

School Type	Samburu North	Samburu Central	Total
Boys	1	2	3
Girls	2	1	3
Co-education	1	2	3
Total	**4**	**5**	**9**

Source: Field Data, 2022

The advantage of cluster sampling was that, it ensured the inclusion into the sample sub groups which otherwise would be omitted entirely by other sampling methods because of their low population (Mugenda & Mugenda, 1999). To ensure that all parts of the County would be represented, equal

number of schools from each school type was selected randomly from each of the two major sub-Counties since most of the schools in Samburu County had one stream.

Data Collection and Analysis

To facilitate access into the school, a research permit was sought from the state agency that authorizes research in the Country; the National Commission for Science, Technology and Innovation (NACOSTI). The research instruments; the SCAT and SCBQ were self-administered, where the respondents were given enough time to respond to items in both instruments on two different visits in each school.

The SCAT and SCBQ were scored so as to generate the quantitative data. Quantitative data generated by SCAT and SCBQ was analyzed using Simple Linear Regression and with the use of Statistical Package for Social Sciences (SPSS) version 23.0 for windows (Kothari, 2004). Regression analysis is a quantitative research method which is used when the study involves modelling and analyzing several variables, where the relationship included a dependent variable and one or more independent variables. In simple terms, regression analysis is a quantitative method used to test the nature of relationships between a dependent variable and one or more independent variables.

The basic form of regression models included unknown parameters (β), independent variable (X), and the dependent variable (Y). Regression model, basically, specifies the relation of dependent variable (Y) to a function combination of independent variable (X) and unknown parameter (β), $Y = f(X, \beta)$. Regression equation could be used to predict the values of 'y', when the value of 'x' is given, and both 'y' and 'x' are the two sets of measures of a sample size of 'n'. Data analysis involved use of hypotheses as a guide for analyzing data. To make reliable inferences from the data, all tests of significance were performed at a significance of Coefficient level of alpha (α) equal to 0.05.

Results

Results of Students' Chemistry Achievement Test (SCAT)

Students' Chemistry Achievement Test (SCAT) was administered on all the 286 students. Data was collected, analyzed and presented in a tabular form using figures and the results are summarized in Table 5.

Table 5:
Students' Chemistry Achievement per Sub- County (N= 286)

Sub- County	No. of Respondents	Mean (%)
Samburu North	115	28.90
Samburu Central	171	19.53
Total	286	23.64

Source: Field Data, 2022.

Results in Table 5 show that Samburu North Sub- County was on the lead with a mean of 28.90% while Samburu Central was second with a mean of 19.53% and this could be attributed to having few and adequately equipped schools in Samburu North Sub-County than in Samburu Central. In the sampled schools, both boys and girls were involved in the study. The results for Students' Chemistry Achievement Test (SCAT) administered and scored by gender of students are presented in Table 6.

Table 6

Students' Chemistry Achievement Test (SCAT) Scores by Gender (N= 286)

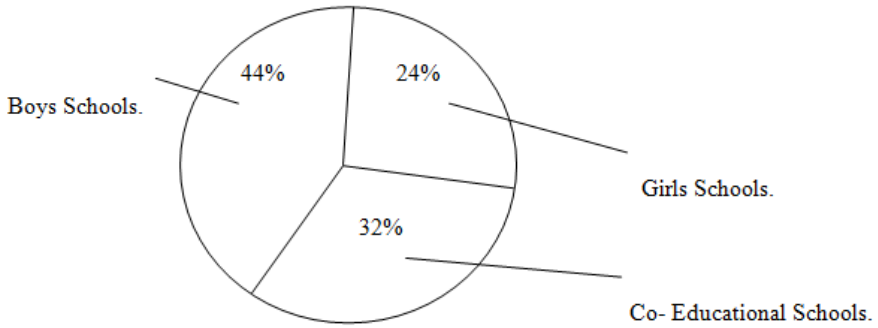
Gender	No. of Respondents	Mean (%)
Female	114	17.12
Male	172	26.80
Total	286	23.64

Source: Field Data, 2022.

Results in Table 6 indicate that male students performed better than female students as indicated by their respective mean scores. This could be attributed to the general notion that sciences were for males and not for females. Results of different school categories on students' achievement in chemistry administered are presented in a pie-chart shown in figure 2.

Figure 2

Pie- Chart of the different School Categories on Students' Chemistry Achievement Test (SCAT)



Results for students' cultural beliefs scores are summarized in Table 7.

Table 7

Students' Cultural Beliefs Scores (N = 286)

Questions	**Total Cultural Beliefs Scores**
1. When someone travels and a black Cat cross in front is an indication of a bad luck.	803.00
2. An Owl making noise near a homestead very early in the morning or late in the evening is an indication that one of the family member will die.	945.00
3. Someone giving birth to a mutant is an indication of a curse from the family or very close relative.	795.00
4. Rainbow means rain will not fall	1015.00
5. Rain falls and Sun shines, means the Hyena is giving birth.	669.00
6. Brightness of the moon is an indication that rain will not fall.	804.00
7. Using hand to collect rain water can cause thunderstorm to strike.	621.00

8. Wearing a red colour material when raining can cause thunderstorm to strike.	853.00
9. Standing at the doorpost when raining can cause thunderstorm to strike.	780.00
10. The presence of whirlwind is an indication of evil spirit.	691.00
11. Heavy and Stormy rain that causes damages is an indication of the wrath of God on man.	786.00
12. When lake/river flows over the bank is an indication that the goddess of the lake/river is angry	546.00

Source: Field Data, 2022

Table 7 shows the total scores per question according to students' responses on the SCBQ questionnaire. Students' responses on the SCBQ questionnaire were rated according to their level of agreement in the level of assigning weights from 1 to 5 for each position on the rating scale. Statistical Package for Social Sciences (SPSS) version 23.0 for windows was used to compute total scores on students' responses for each question in the SCBQ questionnaire. From the total cultural beliefs scores, question four with 1,015 scores was the most popular question to students while question twelve with 546 scores was the unpopular question to students.

Relationship between Cultural Beliefs and Students' Achievement in Chemistry

Students' Chemistry Achievement Test (SCAT) scores and total cultural beliefs scores obtained using students' questionnaires were used in computing the relationship between cultural beliefs and students' achievement in chemistry. The statistical method used was Simple Linear Regression. The results are presented in Tables 8 and 9 respectively.

Table 8

Model Summary for the Relationship between Cultural Beliefs and Students' Achievement in Chemistry (N= 286)

Model	R	R^2	Adj. R^2	Std. Error Estimate	Change Statistics R^2 Change	F Change	df 1	Change Statistics df 2	Sig. F. Change
1	0.043[a]	0.002	- 0.002	14.14651	0.002	0.532	1	284	0.466

a. Predictors: (Constant), Cultural Beliefs.

The adjusted R^2 – Value of -0.002 indicate that -0.2% change in students' achievement in chemistry is explained by cultural beliefs with a P- Value of 0.466. This means that, the value of Adjusted R^2 was not significantly different from Zero and was probably due to chance (adjusted $R^2 \neq 0$). Results on the coefficients for the relationship between cultural beliefs and students' achievement in chemistry are summarized in Table 9.

Table 9:
Coefficients for the Relationship between Cultural Beliefs and Students' Achievement in Chemistry (N= 286)

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	ß(Beta)	Std. Error.	Beta		
1 (constant)	26.281	3.712		7.080	0.000
Cultural Beliefs.	-0.865	1.187	-0.043	-0.729	0.466

The Correlation is not Significant at 0.05 level (2- Tailed).

a. Dependent Variable: Chemistry Achievement.

r- Value = -0.002, P = 0.466, P > 0.05.

Source: Field Data, 2022.

Equation for the Model

Y = 26.281 – 0.865X.
Y = Students' Achievement in Chemistry.
X = Students' Cultural Beliefs.

Hypothesis one of the study sought to find out the relationship between cultural beliefs and students' achievement in chemistry. Results in Table 9 reveal that for every unit change in the cultural beliefs, there was a drop of – 0.865 in students' achievement in chemistry. However, the change was not statistically significant at alpha (α) equal to 0.05 (r = -0.002, N = 286, p > 0.05). This reveals that cultural beliefs had no relationship with students' achievement in chemistry. This was attributed to students' not being able to clearly understand the relationship between cultural beliefs and chemistry. Since p-value of 0.466 was greater than the level of significance at alpha (α) equal to 0.05, meant that, there was insufficient evidence on the relationship between the variables (See appendix I and II). Therefore, the null hypothesis was accepted.

Discussion

Results of Students' Chemistry Achievement Test (SCAT)

The results obtained reveal that, boy's schools performed better than girls and co-educational schools. From the results, boy's schools had a percentage of 44%, girl's schools with 24% and co-educational schools with 32%. The mean percentage for all boys sampled was 26.80%, and that of girls was 17.12%. The overall mean percentage for the whole sample was 23.64%. The general performance was below average as shown in Table 6. The findings of this study were consistent with those of Sifuna and Kaime (2007) which indicated that, many students in Kenya choose to drop science subjects when given a choice and even for those who take them, the performance was below average. At this point then, it was important to point out that students' background was a broad concept which comprised of very many factors and varied from community to community. This was for example perception towards education varied depending on the community. Poverty lowered the parent's ability to pay fees and purchase learning materials for their children (Ongeri, 2012). Cultural factors were also another community based factors which condemned women to be married off at an early age before completing their education. Those factors contributed to poor achievement in academics and also led to school dropout particularly at secondary school level (Irungu, 2019).

Relationship between Cultural Beliefs and Students' Achievement in Chemistry

The results obtained in this study, concurred with the findings of Oluwatosin and Ogbeba (2017) that, cultural beliefs evolved in the local environment so that it was specifically adapted to the requirements of local people and conditions. It was also creative and experimental, constantly incorporating outside influence and inside innovations to meet new conditions. It was usually a mistake to think of cultural beliefs as non-confirmative to contemporary issues in the community. From the results on the correlation between cultural beliefs and students' achievement in chemistry, results revealed an insignificant negative relationship between cultural beliefs and students' achievement in chemistry at alpha (α) equal to 0.05 ($r = -0.002$, $N = 286$, $P > 0.05$). This meant that cultural beliefs had no relationship with students' achievement in chemistry. The findings of this study concurred with the research findings of Madhusudhana (2016) that, cultural knowledge in research projects and management plans gave it legitimacy and credibility in the eyes of both local people and outside scientists, increasing cultural pride and thus motivation to solve local problems with local ingenuity and resources. Local capacity - building was a crucial aspect of sustainable development, researchers and development specialists should design approaches which support and strengthen cultural knowledge and institutions.

Madhusudhana (2016) also observed that people should nonetheless challenge imperial ideologies and relations of production which continually characterized and shaped academic practices. Furthermore, that the exclusion of cultural beliefs from the academy leaved unchallenged space for the (re)colonization of knowledge and cultures in local environments and contexts (Adesoji, 2008). Rogoff (2014) argued that if cultural beliefs were to hold any promise of contributing to Africa's transformation and reconstruction then education had a pivotal role to play. The transformational challenge for education was a dual one; education must transform for its own sake and was also crucial to the transformation of other spheres of social life (Kamau, 2006). The transformation challenge for education had implications for all dimensions of education but the main focus would be on curriculum and research. Hardman (2014) viewed 'curricula as the selection and organization of knowledge on beliefs and research as the production of knowledge about reality' in nature.

Secondly, indigenous people could provide valuable input about the local environment and how to effectively manage its natural resources. Outside interest in cultural beliefs systems had been fueled by the recent worldwide ecological crisis and the realization that its causes laid partly in the overexploitation of natural resources based on inappropriate attitudes and technologies. Researchers in science recognized that indigenous people had managed the environment in which they had lived for generations, often without significantly damaging local ecologies (Vander, 2016). Many researchers in science felt that cultural beliefs could thus provide a powerful basis from which alternative ways of managing resources could be developed for use now and in future.

Conclusion

Based on the findings of the study, the following conclusion was made:

i. The correlation between cultural beliefs and students' achievement in Chemistry, results revealed that there was no statistically significant relationship between the variables. This meant that, cultural beliefs had no relationship with students' achievement in chemistry.

Recommendations

On the basis of the results of this study, the following recommendations were made:

(i) The Ministry of Education should initiate in-service courses for science teachers to equip themselves with the skills and knowledge of the relationship between cultural beliefs and students' achievement in chemistry so as to enhance their effectiveness in teaching of science subjects.

(ii) Learning of Chemistry and other science subjects in secondary school curriculum should be practical oriented and student centered. This could help students interpret their cultural beliefs in scientific phenomena to modern science hence enhancing their understanding of chemistry and other sciences.

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