

ASSESSMENT OF CRITICAL THINKING SKILLS AMONG SECONDARY SCHOOL LEARNERS IN KENYA: A COMPARATIVE STUDY OF PUBLIC SECONDARY SCHOOLS IN NYERI AND NAIROBI COUNTIES

Perminus Githui¹, Johannes Njagi Njoka², Margaret Mwenje³

^{1,2} Department of Psychology and Communication Technology, Karatina University, Karatina;

³ Department of Social Sciences, Karatina University, Karatina,
KENYA.

ABSTRACT

This paper evaluates critical thinking skills among learners in public secondary schools in Kenya. The study adopted the descriptive survey research design. The research was guided by the Cognitive Development Theory, postulated by Jean Piaget as its theoretical framework. The target population comprised of form three students from the selected schools in the two counties. Schools were stratified into boys, girls and co-educational. A sample of schools from the two counties was selected using Kothari sampling formula which gave 30 (10%) schools from both counties. The sampled schools were as follows; 2 boys' schools from each county, 3 and 2 girls', 4 and 17 co-educational schools from Nyeri and Nairobi Counties respectively. Data was collected by means of a questionnaire administered to the sampled students. The study used a sampling formula by Kathuri and Pals to determine the sample size which yielded 376 respondents. The results of the study on a scale of 1 to 5, showed that learners from Nairobi County had relatively better critical thinking skills with a mean of 3.31 while Nyeri County scored 2.85. It had been hypothesized that there was no significant difference in critical thinking abilities between learners in Nyeri and Nairobi Counties, to establish thus, t-test was calculated which gave a p-value of .000 against the α -value of .05, the null hypothesis was thus rejected. It was concluded that the difference in critical thinking among students in Nairobi and Nyeri Counties was statistically significant. The study further sought to find out if there were statistically significant differences between students' critical thinking skills from single gender and co-educational schools. One way Analysis of Variance (ANOVA) was computed. From the results, it was evident that there were statistically significant differences in the critical thinking skills of students from in the different school categories. The computed P-value = 0.010 was more than the alpha value $\alpha < 0.05$. Therefore the null hypothesis was rejected and concluded that the critical thinking abilities among students in the three categories of schools were dissimilar. It was therefore concluded that there is need to strengthen critical thinking skills among students in according to county and school category in order to inculcate good citizenship, problem solving, high levels of academic performance, conflict resolution mechanisms among all secondary school students in Kenya.

Keywords: critical thinking, public secondary schools, academic performance

INTRODUCTION

Since the age of Socrates, educationalists have acknowledged the importance of critical thinking as a highly esteemed outcome of education (Fahim, 2012). More recently, several countries have acknowledged the role of critical thinking as a significant skill necessary to prepare individuals to make thoughtful decisions for effective participation in the workplace, increased academic achievement, and for inculcation of practical democratic principals in the

society (Tapper 2004). There seems to be a consensus across a wide range of individuals and organizations that critical thinking adds value to the workplace and to society. Moreover Stupnisky (2008) and Facione (2009) states that development of critical thinking skills results in improved student confidence, better academic achievement and protection of democratic principles in society. Critical thinking includes analyzing arguments, making interpretations, reasoning, evaluating, and solving problems and making decisions. According to Elander, Harrington, Norton, Robinson and Reddy (2006) critical thinking skills are not just transferable to other live contexts, but prompt individuals to progress from inactive recipients of information to dynamic, participants in society. Elder and Paul (2010) argues that critical thinking is an important part of the learning processes and adds that critical thinking is a vital skill for students when making decisions about the choice of careers or when selecting activities for skill and personal development. AACU (2013) points out that critical thinking enables students to make informed evaluation of knowledge, developing skills as an individual learner and gradually decreasing their reliance on other people. Tsai, Chen, Chang, and Chang (2013) found that enhancing the critical thinking among students in science classes helped the students to comprehend the scientific concepts better as well as inspiring students to develop experimental and inquisitive aspects of the sciences.

A study by the Organization for Economic Cooperation and Development (OECD), have shown that complex thinking and analytic skills are key components of learning at all stages of development (OECD, 2008). McKim (2007) observes that the education system in the USA attempts to address the needs of the holistic development of the child by not just focusing on the quest for higher test scores but also inculcating the values of the society, however a study conducted by Hove (2011) revealed that high school students were struggling to improve their critical thinking abilities. Similarly, studies by Allamnakrah (2013) and Alwehaibi (2012) reported that high school students in the Kingdom of Saudi Arabia lacked the ability to think rationally and critically. This was attributed to the failure of teachers' to impart critical thinking abilities among learners, noting that teachers lacked theoretical and practical understanding of critical thinking. The research by Egege and Kutieleh (2004) established that critical thinking was lacking in Asian-based learning systems. According to the finding, students from Asian countries such as China, Vietnam, Korea, Singapore and Japan avoid a critical approach to academic tasks. Andrews (2007) attributed the non-criticality of learners in Asian Countries to their educational system which is based on rote-learning; the reverence to teachers where cultural norms construe any form of scrutiny as being rude and disrespectful. There are concerns regarding the ineffectiveness of knowledge, skills and attitudes gained from secondary schools in the light of inculcating students critical thinking skills.

Studies by Shaid (2005) and Wedgwood, (2005) in Tanzania faulted secondary school teachers for devoting more attention in teaching students in memorization of facts and little time in coaching students to think critically; as a result most learners complete their studies with superficial knowledge and devoid of critical understanding of small issues surrounding them. The Kenya Government has enacted educational reforms and curriculum amendments in order to address concerns of poor critical thinking abilities among learners; notable towards achieving this goal was the introduction of Life Skills Education in the school curriculum in 2008. However, despite this Raji (2015) observes that Kenya's educational system offers very little at primary and secondary school levels in terms of equipping learners with critical thinking abilities, consequently, majority of students lack functional critical thinking skills. This is exemplified by rising incidents of student misconduct, academic failure, STIs, HIV, and AIDs among others. In addition high school graduates lack abilities to

effectively participate in the workplace or contribute in democratic decision making processes in the society.

This study chose critical thinking as an area of attention because of its significance to quality education and preparation of learners for life beyond school. In this regard, application of critical thinking skills relate to effective involvement of individuals in the workplace, increased academic performance and also is essential for the protection of democratic principals in society. However, only a limited number of studies have so far been conducted in Kenya, thus critical thinking is one of the most neglected areas of research in the country. This necessitates studies to be conducted to generate empirical data that can inform policy on the acclaimed educational outcome of critical thinking by the learners in Kenya. This study sought to fill the knowledge gap that exists in respect to students' critical thinking skills in Kenya. To allow for focused and quality analysis, this research narrowed its scope to the area of critical thinking in public secondary schools in Nyeri and Nairobi Counties.

STATEMENT OF THE PROBLEM

Critical thinking is a vital dimension in the secondary school curriculum given the need to inculcate good citizenship, problem solving, high levels of academic performance, acceptable conflict resolution mechanisms as well as in addressing persistent issues such as youth unemployment, harmonious co-existence and gender inequality among secondary school students in Kenya. In this regard critical thinking is an important skill that is necessary to prepare learners for post-secondary education and the workforce; it is a crucial skill in making appropriate career choice or selecting activities for personal development.

In view of this, the Government of Kenya has demonstrated its commitment to this educational dimension through the introduction of Life Skills Education in the secondary school curriculum which incorporates, critical and creative thinking. The government ratified several international conventions, such as the Jomtien Declaration on Education for All (EFA), the Dakar World Education Conference in (2000) and the Convention on the Rights of the Child (CRC) (1993), all of which underpin the importance of critical thinking as an important outcome of education. However, despite the widespread recognition of its importance of critical thinking, the government's heavy investment and the expensive curriculum amendment, the expected outcomes of enhanced ability by students to scrutinize arguments, make interpretations, use of reasoning, evaluating, and solving problems or making decisions is doubtful. Studies demonstrate that majority of learners in secondary schools lack functional critical thinking skills, as exemplified in prevalence of irrational acts such as; rising occurrences of student unrest, arson, truancy, teenage pregnancies, dropout, drug abuse, STIs, HIV, AIDs and academic failure among others which casts misgivings on the students critical thinking abilities. Despite this, only a limited number of studies have so far been conducted in Kenya pertaining to students' critical thinking thus making it one of the most neglected areas of research in the country.

As a result there is limited literature on learners' critical thinking abilities, especially on a comparative study between an urban, cosmopolitan population and rural contexts among secondary schools students in Kenya. This necessitates the need for this study in order to generate empirical data that can inform policy on the acclaimed educational outcome of critical thinking by the learners in Kenya. The study addresses the knowledge gap that exists in respect to students' critical thinking skills in Kenya. This study sought to fill the knowledge gap that exists in respect to secondary school students' critical thinking skills from urban and rural environments in Kenya.

OBJECTIVES

The study was guided by the following objectives which were to:

1. Compare the level of critical thinking skills among students in public secondary schools in Nyeri and Nairobi Counties.
2. Analyze the critical thinking skills among learners in single gender and co-educational public secondary schools in Nyeri and Nairobi Counties.

HYPOTHESIS

The study tested the following three null hypotheses:

Ho1: There is no statistically significant difference in critical thinking skills among students in public secondary schools in Nyeri and Nairobi Counties.

Ho2: There is no statistically significant difference in critical thinking skills among students in single gender and co-educational public secondary schools in Nyeri and Nairobi Counties.

THEORETICAL FRAMEWORK

This study was anchored on the Cognitive Development Theory (CDT) of Jean Piaget. Piaget (1936) presumes students in secondary school are in the formal operational stage. Individuals in this stage are expected to have the ability to think critically, which denote the processes of careful inquiry, intellectual analysis, and unbiased judgment. Slavin (2000) argues that since the highest level a man can attain is the formal operational stage, the skills in formal operational stage are fundamental in the learning of higher order skills that are elaborate in critical thinking. This theory was found suitable in relation to the study because according to CDT critical thinking skills happen in the same manner as the formal operations of the mind and constant assimilation and accommodation occur in the mental processes of an individual. Since these skills are insightful and cognitive in nature, it is expected that they influence the students' level of knowledge and mastery. They include the following: social regard for learning, the learning environment, the diversity of learners, curriculum, planning, assessing and reporting, community linkages, personal growth (Teacher Education Council, 2009).

METHODOLOGY

The study adopted a descriptive survey research design. This design was appropriate for the study because it enabled description of the conditions as they were without being manipulated by the researcher. The study used questionnaires to collect data from selected respondents from Nairobi and Nyeri Counties pertaining to students' critical thinking skills abilities.

Target Population

The target population for study comprised of students in public secondary schools in the Nyeri and Nairobi Counties. There were 86 public secondary schools in Nairobi with a student population of 10,796 (MOE, 2013). Nyeri had 214 public secondary schools with an enrollment of 58,424 students (Nyeri County office, 2013). The overall enrollment of students in from the two counties was 69, 220. The form three students were 18,305.

Sample Size and Sampling Techniques

The schools were first stratified into single gender (boys and girls) and co-educational institutions. A representative sample of schools from the two counties was selected using Kothari (2004) 10-30% which gave a total of 30(10%) schools from both counties.

The single gender schools sampled were as follows; 2 boys’ schools from each county and 3 and 2 girls’ schools from Nyeri and Nairobi Counties respectively. In addition the study sampled, 4 and 17 co-educational schools in Nairobi and Nyeri Counties respectively, which constituted 10% in accordance with Kothari formulae (see Table 1). Overall, 30 secondary schools were selected for the study. The study sampled only the form three students because they had been in secondary school for three years and were expected to have developed considerable levels of critical thinking skills. There were 18,305 form three students enrolled in both counties. The study used a sampling formula by Kathuri and Pals (1993) to determine the sample size. According to this formula a population of 18,305 students is represented by a sample of 376 respondents. Since this sample was distributed in the 30 sampled schools, the number of respondents drawn from each of the sampled schools was 13. In co-educational schools stratified random sampling was used to select a sample that was representative of each gender according to its population (see Table 1).

Table 1. Sample Size

County	Total No. of schools			Schools Sampled			Students Sampled	
	Boys	Girls	Mixed	Boys	Girls	Mixed	Boys	Girls
Nairobi	20	24	42	2	2	4	52	52
Nyeri	19	25	170	2	3	17	137	150
Total	39	59	212	4	5	21	189	202

RESULTS AND DISCUSSION

The results and discussion are presented in accordance with the objectives and hypothesis of the study. These were;

- a) The first research objective sought to compare the critical thinking skills among students in public secondary schools in Nyeri and Nairobi Counties. The respondents were asked to indicate their opinions in a five point likert scale ranging from strongly agree (5), agree (4), not sure (3), disagree (2) and strongly disagree (1). The scores obtained on a scale of 1 to 5 were used to compute a mean score (\bar{x}) of critical thinking ability for the respondents according to county (see Figure 1). Data analysis revealed that students Nairobi County had the highest level of critical thinking abilities ($\bar{x} = 3.31$) compared to students in Nyeri County ($\bar{x} = 2.85$), the combined critical thinking abilities of students in both counties was 2.96. The apparent high critical thinking ability among students in public secondary schools in Nairobi County, in comparison to Nyeri County, can be inferred in two ways. The urban and cosmopolitan nature of Nairobi County could be exposing learners to additional novelties, materials and technology compared to students in rural Nyeri County who have limited exposure to such socio-economic and technological variables. This concurs with Floyd (2011) who observed that students from rural areas have low levels of critical thinking compared to learners from urban settings. This variance is attributed to strong cultural orientation of learners in rural areas. In addition, this view in complemented with aspects such as linguistic aptitude and educational experience as contributing factors to learners’ capability to exhibit higher levels of critical thinking. Similarly, Willingham (2007) emphasized the importance of background knowledge in facilitating the development of critical thinking skills among learners. Consequently, the apparent paucity in critical thinking skills among student in Nyeri

may be due to the fact that this rural county has lucid societal norms where traditional values are stressed. In this regard, rural communities place a lot of prominence on displaying regard for authority and compliance to the demands of societal values rather than questioning or standing out on individual convictions (Khanal, 2016). This could be among the variables contributing to differences in critical thinking abilities between learners in Nyeri and Nairobi counties.

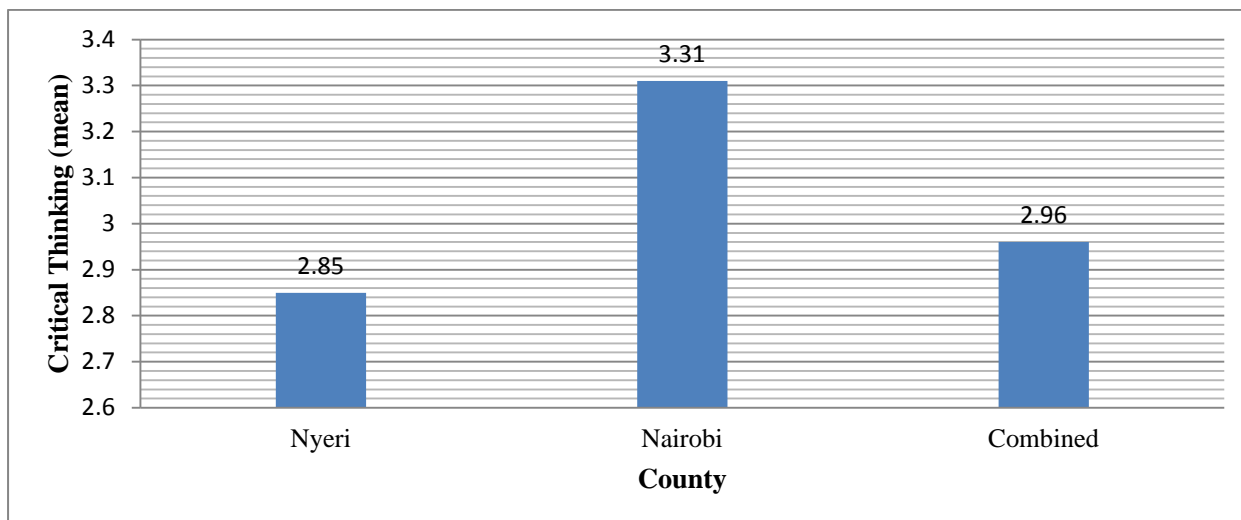


Figure 1. Critical Thinking among Learners in Nyeri and Nairobi Counties

In order to establish whether there existed a statistically significant difference in critical thinking abilities among learners in Nyeri and Nairobi Counties, independent sample t- test was computed for the scores of the two counties. This was to test the first research hypothesis thus;

Ho1: There is no statistically significant difference in critical thinking skills among students in public secondary schools in Nyeri and Nairobi Counties.

The findings (Table 2) indicate that the level of significance .000 was less than the p-value (.05). Therefore we reject Ho1 (at $\alpha = .05$) and conclude that the critical thinking abilities among students in Nairobi and Nyeri Counties were significantly different. Kadzamura (2006) noted that the working environment in the most schools in rural areas is deplorable, characterized by dilapidated school structures and large classes which compromise effective curriculum implementation. The low level of critical thinking abilities in Nyeri County may be attributed to neglect of schools in the poor rural areas compared to the affluent urban setting of Nairobi County.

Table 2. T-test on Critical Thinking Skills of LSE in Nyeri and Nairobi Counties

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Critical thinking	3.352	.068	-4.869	409	.000	-.46846	.09621	-.65759	-.27933
			-5.127	192.381	.000	-.46846	.09137	-.64867	-.28825

b) The second research objective investigated whether there were differences in critical thinking abilities among learners in single gender (boys or girls) and co-educational public secondary schools in Nyeri and Nairobi Counties. The respondents were asked to indicate their opinions in a five point likert scale ranging from strongly agree (5), agree (4), not sure

(3), disagree (2) and strongly disagree (1). Data analysis (see Figure 2) revealed that students' critical thinking scores were higher among learners in Nairobi County as compared to students in the corresponding school categories in Nyeri County. In Nairobi County students in boys schools had a mean of 3.41, girls' schools ($\bar{x} = 3.24$) and mixed schools ($\bar{x} = 3.31$). In Nyeri County, students in girls' schools had the highest mean ($\bar{x} = 2.89$), this was followed by mixed schools ($\bar{x} = 2.86$) while boys schools came last ($\bar{x} = 2.73$). Floyd (2011) states that there are widespread perceptions that students from rural areas have low critical thinking skills compared to learners from urban settings due to their strong cultural orientation. In support of this view, credence is given to aspects such as linguistic aptitude and educational experience as contributing factors to learners' capability to exhibit critical thinking which are evident in urban setting. The perceived deficiency in critical thinking abilities among students in Nyeri County may be due to these variables.

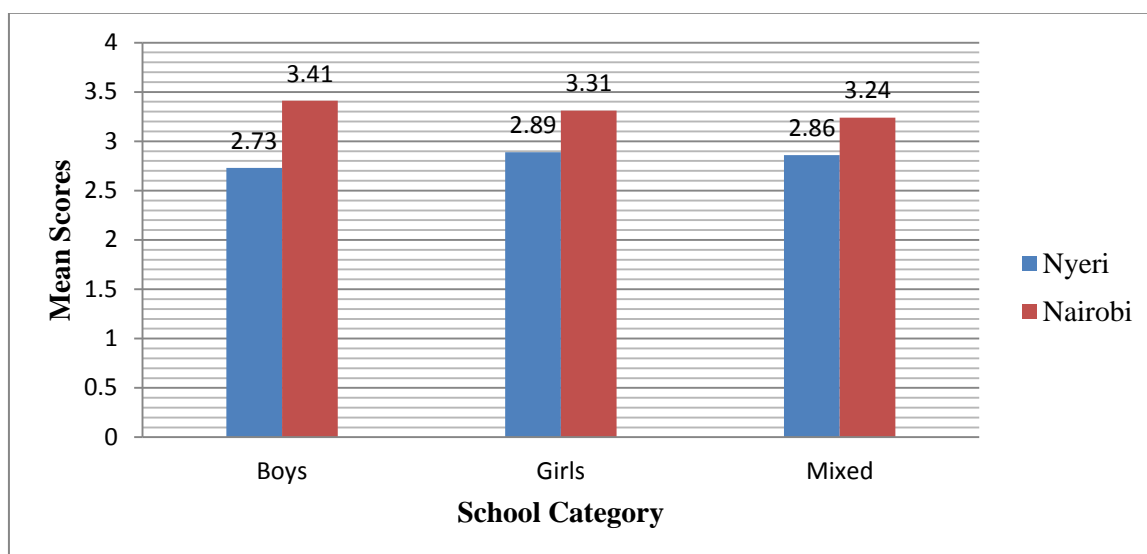


Figure 2. Critical Thinking according to School Category and County

In order to establish whether there were significant differences between students' critical thinking skills from single gender (boys only and girls' only schools) and co-educational schools. One way Analysis of Variance (ANOVA) was computed. From the results, it was evident that there were no statistically significant differences in the critical thinking skills of students from single gender and co-educational secondary schools. The computed P-value = 0.694 was more than the alpha value $\alpha < 0.05$ (see Table 3). Therefore the null hypothesis was accepted and concluded that the critical thinking abilities among students in the three categories of schools were relatively similar.

Table 3. One way Analysis of Variance (ANOVA) of the Students' Critical Thinking

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.221	29	.525	.849	.694
Within Groups	234.935	380	.618		
Total	250.156	409			

CONCLUSION

The findings of the study indicate that critical thinking skills were overall higher among learners in Nairobi County compared to their counterparts in Nyeri County. Additionally,

concluded that the critical thinking abilities among students in the three categories of schools were relatively similar. The study further established that there was no statistically significant difference in the critical thinking skills of students from single gender and co-educational secondary schools.

RECOMMENDATION

Based on the findings of the study, it is recommended that there is need to strengthen critical thinking skills among students in secondary schools in order to inculcate good citizenship, problem solving, high levels of academic performance, acceptable conflict resolution mechanisms as well as in addressing persistent issues such as youth unemployment, harmonious co-existence and gender inequality among secondary school students in Kenya. This implies the need to enforce adherence to the implementation of the LSE policy with a view to compel schools to actualize the impacting learners with critical thinking skills of the subjects as stipulated by the school curriculum.

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