EFFECT OF SUBJECT MATTER KNOWLEDGE ON THE ACADEMIC PERFORMANCE OF PUPILS IN PUBLIC PRIMARY SCHOOLS IN HARGEISA DISTRICT

Written by **Gulled M. Yassin**

PhD Candidate in Education, Lecturer at the University of Hargeisa, School of Graduate Studies

ABSTRACT

This study examined the effect of teachers' subject matter knowledge on pupils' academic performance (AP) in public primary schools in Hargeisa, Somaliland, with the aim of using subject matter knowledge as a strategies for enhancing academic quality and ultimately education quality in Somaliland. The study was prompted by the fact that the standard of education in Somaliland had deteriorated, which had been attributed to teachers' lack of subject knowledge and other factors. The increasing number of failures on the SLNECB exams reflected the deteriorating academic results. In the last five years, the percentage of students with AP in public primary schools has dropped to 21%. Despite a rise in failure, as demonstrated by Somaliland's national exam results, the effect of subject matter knowledge on student performance had been segregated. The study used a cross-sectional research design. Data was obtained using a questionnaire from a stratified random sample of 160 teachers in Hargeisa District public primary schools, and document analysis was analyzed using ANOVA. As a result of the research, it was discovered that teacher subject matter knowledge has an effect on students' academic success in Hargeisa district public primary schools. The better the teacher's subject matter expertise, the better the students' results.

INTRODUCTION

Interest in teachers' subject matter knowledge has been on the rise in recent years. Ruhama (1990) defines subject matter as holding solid knowledge on the subject and the capability for teaching

his/her students to attain a meaningful understanding of the subject. Ball, Richert, Wilson and Shulman (1987) define subject matter as the quantitative term that does not reflect as the number of courses a teacher has taken during his university studies. Nevertheless, Annu (2004) pointed out that subject matter is the scientific study of learning and instruction within school subjects. All these definitions concur with the solid knowledge of the teacher on a particular subject and his/her accurate instructions in classrooms.

The subject matter is attributed to the content-area knowledge and the knowledge to curriculum (Bonney, 2015). In a given subject or content field, content knowledge is defined as the body of knowledge and information that teachers teach and that students are expected to learn (Education Reform, 2016). The term curriculum refers to the lessons learned in a school or in a particular course or program and the academic content (Education Reform, 2015). Curriculum is also broadly described in the educational process as the entirety of student experiences (Kelly, 2009).

Subject matter has been associated with academic performance of students. For example, a study conducted by Peerzada (1990) examined the impact on the output of the students of the teachers' subject matter expertise. For this reason, information was gathered through explicitly crafted Likert scale questionnaires of 5 points. Responses were received from the students of three separate schools in classes VII, VIII , IX and X. The data analysis showed a major relationship between student success and knowledge of the subject matter of the instructor.

In the same line, an in-depth analysis by Harbison and Hanushek (1992) of rural Brazilian students found that teacher subject matter test ratings in mathematics had a positive effect on the achievement of their students. In addition, a research conducted by Olowoyeye (2014) explored the effect of teachers on the academic performance of English language students.

For the analysis, a descriptive research design of the survey form was adopted and a total of 500 students and 10 teachers constituted the sample chosen by a simple random sampling method. Observation checklists were the main resources for the analysis. The study showed that there was

a clear positive connection between the awareness of teachers' subjects and the success of students in English.

Although many studies have been carried out on the factors that affect the poor academic performance of pupils in public primary schools, there is no research that delved into the effect of teacher subject matter on the performance of pupils.

There has been a great concern over the deterioration of Somaliland education after increased percentage fails of students in primary schools as depicted by Somaliland National Exams. The academic performance of pupils in primary schools in Somaliland fell to 21% for the last five years (SLNECB, 2018).

Teacher is the most determinant factor that may affect the performance of his/her student. This study will explore the effect of teachers' subject matter on the performance of pupils in public primary schools. The paper endeavors to help Ministry of Education improve the education system of Somaliland.

METHODS

The study was conducted in Hargeisa district, Somaliland. Hargeisa district was selected because Somaliland National Examinations (2018) revealed that 80 % of the pupils who failed National Primary Exams hailed from Hargeisa. This study was conducted through a cross sectional survey design. This is a descriptive research design which examines phenomena it is without the manipulation of variables (Oso, 2016). The accessible population was 330 teachers from 21 primary schools in Hargeisa District. These 21 schools can be reached by the researcher, within the allocated time and resources. The sample size consisted of 178 teachers. Krejcie and Morgan (1970) recommend that a population of 330 will use 178, at level of confidence 95%, and 5% margin error. The research used the process of stratified sampling to pick the sample. It is used when there are separate and mutually exclusive subgroups in the population; this implies that a

member does not simultaneously belong to more than one subgroup (Oso, 2016). Since 178 teachers from 21 schools where each teacher can not belong to two schools are involved in this analysis, a proportionate stratified sampling approach was adopted.

In this case, the proportionate stratified sampling aims to reflect, in proportions proportional to their population size, the sub-group in the sample.

The sample size of each stratum (sub-population) was be determined as:

Sub-group sample size = sub group (stratum) population x sample size

        Total population

Sample of each

$$\text{School} = \frac{number\ of\ teachers\ in\ each\ school}{total\ number\ of\ all\ teachers} \times sample\ size$$

For example, the sample size of the number of teachers in Alifdoon school was determined as:

$$\text{School} = \frac{15}{330} \times 178$$

        = 8 teachers.

The same scenario was used all the other schools to select the required number of teachers at that school. The study used structured questionnaire, and document analysis checklist. Structured questionnaire is a questionnaire that contains a set of standardized close ended questions with a fixed scheme (Bryman & Bell, 2015). The structured questionnaire enabled the researcher to collect data on teacher quality within a short period of time. Documents to be examined included the first term examination. The researcher obtained permission from the Ministry of Education and Science. The researcher also received the permission of the management of the 21 schools. The researcher also obtained the informed consent of each teacher before data collection. Data was analyzed using one-way ANOVA and was reported in tables and figures.

RESULTS

The study intention was to determine effect of subject matter knowledge on academic performance of pupils in primary schools in Hargeisa district. The subject matter knowledge was operationalized into content-area knowledge and knowledge to curriculum. Respondents responded several items on each variable and the responses were used to determine subject matter of the teachers in public primary schools. The descriptive statistics of subject matter and academic performance is shown in Table 1.

Table 1

Descriptive Statistics of Subject Matter Knowledge and Academic Performance

Subject Matter	N		Average Performance	S	ε
Low	92	43	12.08	1.26	
Moderate	37	48.5	7.45	1.22	
High	31	71.55	7.61	1.36	
Total	160	50.20	14.87	1.17	

Note. N = Sample, S = Standard deviation, ε = standard error.

Table 1 shows the descriptive statistics of academic performance of pupils in primary schools in Hargeisa district against different subject matter knowledge. The table shows that the mean performance of students taught by teachers with high subject matter knowledge (71.55%, S = 7.61) was higher than the performance of students taught by pupils of teachers with moderate subject matter knowledge (48.5%, S = 7.45) and teachers with low subject matter knowledge (43%, S = 12.08). Consequently, the data implied to the fact that academic performance of pupils boosts with an increase of teachers' subject matter knowledge. The results demarcate that teacher subject matter knowledge affect academic performance of pupils in public primary schools in Hargeisa.

As a result, the better the subject matter knowledge, the better the academic performance of pupils in public primary schools in Hargeisa district.

Hypothesis states that subject matter knowledge does not affect the academic performance of pupils in public primary schools in Hargeisa.

There is no significant difference in the average performance of students taught under teachers with Low, Moderate and High subject matter knowledge.

H_{O3}: $\text{SMK}_\text{L} = \text{SMK}_\text{M} = \text{SMK}_\text{H}$

H_{A3}: $\text{SMK}_\text{L} \neq \text{SMK}_\text{M} \neq \text{SMK}_\text{H}$

Where SMK_L is low subject matter knowledge; SMK_M is moderate subject matter knowledge and SMK_H stands for high subject matter knowledge.

The results for ANOVA are shown in Table 2.

Table 2

F-Statistics of Performance of Pupils with Subject Matter Knowledge

Source of difference	Sums of Squares	df	Mean square	F	P
Between	18148.516	2	9074.258	83.650	.000
Within	17031.084	157	108.478		
Total	35179.600	159			

Note. F(2,157) =3.06

Table 2 presents the ANOVA statistics of the performance of pupils taught by teachers with low, moderate and high subject matter knowledge. The results indicate that there is a significant difference in the performance of pupils taught by teachers with low, moderate and high pedagogical processes, Fo = 83.650 > F (2,157) = 3.06; p = .000. This led to the rejection of the null hypothesis. It shows that there is a significant difference in the performance of pupils taught

by teachers with low, moderate and high subject matter knowledge. The study, therefore, established that teacher subject matter knowledge affects academic performance of pupils in public primary schools in Hargeisa district. The higher the knowledge to subject matter of the teacher, the better the performance of the pupils.

More so, LSD post-hoc yielded a significant difference between the performance of pupils with teachers of low and moderate subject matter knowledge, (I-J = 4.867, *P* = .018) and with low and high subject matter knowledge teachers (I-J = 27.874, *P* = .000). There is also a significant difference between moderate and high subject matter knowledge teachers (I-J = 23.008, *P* = .000). Therefore, teachers with high subject matter knowledge (71.55%, S = 7.61) have higher performance than teachers with low subject matter knowledge (43%, S = 12.08). Also, teachers with moderate subject matter knowledge have higher student performance (48.5%, S = 7.45) than teachers with low subject matter knowledge (43%, S = 12.08).

The eta-square returned an average value of $\eta^2 = 51.6\%$. Therefore, subject matter knowledge of the teacher accounts for 51.6 % of the variance in academic performance of pupils in pubic primary schools in Hargeisa. The rest 48.4 are due to factors not investigated here, and errors in measurements. Academic performance can be affected by up to 51.6% through manipulation of subject matter knowledge.

DISCUSSION

The study found that subject matter knowledge is a significant factor that affects the academic performance of pupils of primary schools in Hargeisa districts, Fo = 83.650 > F (2,157) = 3.06; p = .000.. This finding can be grasped that teachers with high subject matter knowledge could better boost the performance of pupils. This means that the higher level of subject matter knowledge of the teacher, the better performance of pupils in public primary schools. This is compatible with Olowoyeye (2014) who examined the impact of teachers; subject matter knowledge on the academic performance of students in English Language and found out that teachers with strong

background subject matter had better performed students than their peers. Likewise, Peerzada (1990) stated that the teachers' subject matter had a strong relationship with the academic performance of the pupils. In addition to that, Bonney (2015) described the body of knowledge on subject determines to obtain high academic performance of the students.

The above finding agrees with previous findings. Kiamba, Mutua and Mulwa (2018) conducted a study in Kenya on the influence of teachers' subject matter knowledge on students' academic performance of Kiswahili Language (r=0.618, p-value=0.000), which establishes the significance of subject matter knowledge of the teacher to the performance.Therefore, the current finding supports the previously found findings. Hence, this generally enforces the common view of that teacher subject matter knowledge is associated with academic performance of pupils in primary schools in Hargeisa District.

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