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Editorial

Praise be to Allah, and peace be upon His Prophet,

The Research Unit at Mogadishu University continues its scientific path at a slow and steady pace and publishes the seventh issue of its annual research journal in both Arabic and English, overcoming the difficulties and obstacles that hinder the path of higher education and scientific research in Somalia, and thus bypassing the stage of establishment and starting to the stage of production and participation in establishing the foundations of scientific research, laying the infrastructure for it, and contributing to enriching the ground of science and knowledge.

From this standpoint, the seventh issue that is in your hands is issued, which includes twelve research papers, six of which are written in Arabic and the other six in English, and these papers cover part of the scientific disciplines that the university's faculties and centers, and most of the study in this issue focuses on topics that include education, language and literature, engineering, and information technology.

As usual, both the editorial families and the research unit at the university are pleased to welcome scientists, researchers and academics from various disciplines concerned with scientific research from inside and outside the university, and from inside and outside the country as well, and invite them to contribute their research on various topics in both Arabic and English in the various issues of the journal.

Finally, on behalf of the editorial team, I extend my thanks and appreciation to all the researchers participating in their research in the various issues of the journal and to all the administrators and technicians who participated in their efforts in accomplishing this great work and in its continuation.

I especially thank the university president, Dr. Ibrahim Muhammad Mursal, and the head of the research unit at the university, Dr. Said Abubakar Sheikh Ahmed. All of them have my thanks and appreciation.

Thanks Allah first and last.

Editor-in-Chief



***Evaluating Students' Performance of Social Work
Department Using K-means and Two-step Cluster
"A Case Study of Mogadishu University"***

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Abstract

The study aims at evaluating the results of semester seven obtained by students of the Social work department at Mogadishu University to determine their academic performance. Descriptive statistics, K-means, and Two-step clusters in SPSS, as well as RATTLE in R-Studio, were used to examine 126 students' scores for the seven courses. The findings of the study revealed that the performance of the students is good. Finally, the study recommends the need to improve achievement test quality in particular and assessment modes in general.

Key words: Evaluating, Students' Performance, Social Work, K-Means, Two-step Cluster

Introduction

Academic achievement or performance is the accomplishment or acquired proficiency within the performance of an individual in a given skill or body of knowledge (Kaur, 2017). It is the measurement of student success across various academic subjects conducted by teachers and education officials using classroom performance, graduation rates and results from standardized tests https://ballotpedia.org/Academic_performance.

Higher education institutions are interested in student academic achievement and graduation rates. In addition, the academic success of university students has been a hot subject in the field of higher education. (Shahzadi & Ahmad, 2011).

An achievement test is a type of test that is restricted to specific content covered in a curriculum over a set period of time and is given after a course has been completed (Aisyah, 2018). As a result, the achievement test is an educational instrument for determining the level of a student's success against pre-determined goals in a given course.

The key problem in evaluating students' achievement in higher education is sorting students into separate groups based on their performance, which is a difficult challenge. Obtaining a holistic view of the state of the students' success while also discovering crucial information about their time-to-time performance is challenging for the traditional classification of students based on their average grades. (Oyelade, Oladipupo, & Obagbuwa, 2010). Built on that, the *k*-means algorithm by MacQueen, 1967 and Anderberg, 1973 is one of the mostly used clustering algorithms, is classified as a partitioned or

nonhierarchical clustering method(Rafi, Ramakrishna, Sabitha, Mohanty, & Rao, 2011). Clustering is a way that classifies the raw data(Singh & Singh, 2012). The k -means clustering algorithm is one of the widely used data clustering methods where the datasets having “ n ” data points are partitioned into “ k ” groups or clusters (Haraty, Dimishkieh, & Masud, 2015). Clustering provides insight on the nature and structure of data. The aim of clustering is organizing a set of data into clusters, the elements in each cluster are similar and different from those in other clusters (Pérez-ortega, Almanza-ortega, Zavala-díaz, & Martínez-rebollar, n.d.). As K-means cluster analysis, Two-step analysis is other method applied in data analysis. A two-step Cluster is an exploratory method for revealing normal groupings or clusters within a data set that would otherwise be invisible. This procedure's algorithm has some attractive characteristics that set it apart from traditional clustering techniques. (IBM, 2017). The SPSS Two Step Clustering Component is a scalable cluster analysis algorithm designed to handle very large datasets. It is capable of handling both continuous and categorical variables (SPSS, 2009).

Social work is an organized profession to extend the helping hands to an individual, group and community, for their betterment as well as sustaining them to help themselves by adopting varies professional strategies (Dhavaleshwar & Responsibility, 2017).

The purpose of social work is to promote or restore a mutually beneficial interaction between individuals and society in order to improve the quality of life for everyone(Revisited, 1981). Based on this

importance, Social work discipline is a new program for the tertiary education in Somalia supported by UNICEF. Three universities run in Mogadishu city are the first instructions provide this specialization namely, Somali National University, Mogadishu University, and City University with the same curriculum. The assessment modes adopted by the three universities are following the standardized assessment methods include: presentations, essays, course work, case study analysis, examinations, and field practicum (Social Work England, 2019). Based on that, the author thought it was necessary to conduct this study in order to determine the degree of the students' achievement in the third year of the Mogadishu University's social work department using three statistical analyses: descriptive statistics, K-means analysis, and Two-Step Clusters.

Methodology

The study is descriptive research designed to analyze students' test scores in the third year of semester seven for the social work department at Mogadishu University. Analysis of 126 students' scores was conducted in this study. Scores of seven courses were analyzed and coded, namely; Introduction to Management (IM), SWK Sustainable Social Development (SSSD). Economics for Social workers (EC), Social Work Research Methods (SRM), Principles of Statistics (PS), Communication Skills (CS), and SWK Project Planning & Management (SPPM). In this study, analysis of RATTLE Application in (R-Studio) was applied to limit the number of clusters, K-means cluster, Two-step cluster to examine the clusters, and Optimal Scaling to determine discrimination measures were applied in SPSS. Edraw Mind Master was used to visualize the steps of data analysis.



Figure 1. Steps of Data Analysis Using Edraw Mind Master

To determine the academic performance of the students through cluster analysis, the following Academic Performance Index was used:

Table 1. Academic Performance index of the Clusters Outputs

Interval Weighting Index	Decision
>90	Excellent
80-89	Very Good
70-79	Good
60-69	Average
50-59	Fair
< 50	Poor

Results and Discussion

In this part, the author presents the results of the study. The area to be analyzed and discussed include; reliability and convergent validity as the first step of the analysis. Descriptive statistics of the student's scores for the courses for the second analysis followed by K-means cluster for the third analysis and Two-step cluster analysis for the fourth analysis. The fifth analysis is discrimination analysis all in SPSS.

Reliability Analysis

To measure the internal consistency among the students' scores of the seven courses, The Cronbach's alpha in SPSS was calculated. The results showed ($\alpha=0.91$) for whole data. For the cluster one is ($\alpha=0.938$) and ($\alpha=0.856$) for the cluster (2). According to the general rule of thumb is that a Cronbach's alpha of 0.70 and above is good, 0.80 and above is better, and 0.90 and above is best. <https://www.statisticssolutions.com/cronbachs-alpha/>. Thus, the reliability of whole data ($\alpha=0.91$) and cluster 1 ($\alpha=0.938$) are best reliability and a better for the cluster 2 ($\alpha=0.856$). Thus, the reliability analysis suggests that students' scores for the seven courses examined in this study is internally consistent.

Convergent Validity

To determine the convergent validity, Pearson's coefficient of correlation in SPSS was calculated. The result presented in table (2) showed a positive significant correlation among the seven courses of the study. It is observed that all the Pearson Correlation Coefficients are strong (> 0.5) and ranges between (0.508- 0.784). Thus, the convergent validity of the data was confirmed.

Table (2) Inter-Item Correlation Matrix

Courses		IM	SSSD	EC	SRM	PS	CS	SPPM
IM		1						
SSSD	Pearson Correlation	.685**	1					
	Sig. (2-tailed)	.000						
EC	Pearson Correlation	.751**	.608**	1				
	Sig. (2-tailed)	.000	.000					
SRM	Pearson Correlation	.731**	.652**	.784**	1			
	Sig. (2-tailed)	.000	.000	.000				
PS	Pearson Correlation	.540**	.538**	.599**	.683**	1		
	Sig. (2-tailed)	.000	.000	.000	.000			
CS	Pearson Correlation	.569**	.568**	.652**	.589**	.508**	1	
	Sig. (2-tailed)	.000	.000	.000	.000	.000		
SPPM	Pearson Correlation	.731**	.689**	.770**	.752**	.570**	.629**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics Analysis**Table (3) Results on Analysis of the Students' Scores of the Courses**

Courses	Codes	N	Mean	Std. Deviation
Introduction to Management	IM	126	78.8	11.6
SWK Sustainable Social Development	SSSD	126	72.6	8.99
Economics for Social workers	EC	126	67.6	22.7
Social Work Research Methods	SRM	126	71.7	11.4
Principles of Statistics	PS	126	73.6	13.07
Communication Skills	CS	126	67.4	15.8
SWK Project Planning & Management	SPPM	126	62	14.38
Grand Mean			70.567	14

Results in table (3) and figure (2) illustrate descriptive statistics analysis of students' scores for seven courses of social work department

at Mogadishu University. The results show the course “Introduction to Management” scored up a mean of 79 with SD. 11.6. The second rank made up the course” Principles of Statistics” (M=73.6), and (SD.=13), while the course “SWK Sustainable Social Development” attained the third rank (M=72.6, SD=8.9). The fourth rank received by the course “Social Work Research Methods” a mean of 71.7 with SD.11.4. However, the fifth and sixth courses ranked as “Economics for Social workers” (M=67.6, SD.=22.7), and “Communication Skills” got (M=67.4, SD.=15.8), whereas, the course ” SWK Project Planning & Management” scored up the seventh rank (M=62), and (SD.=14.3). The grand mean of the scores for the courses indicated (70.5). Thus, these results show that the students of the social work department 3rd year at faculty of Arts and Humanities, Mogadishu University have a good performance.

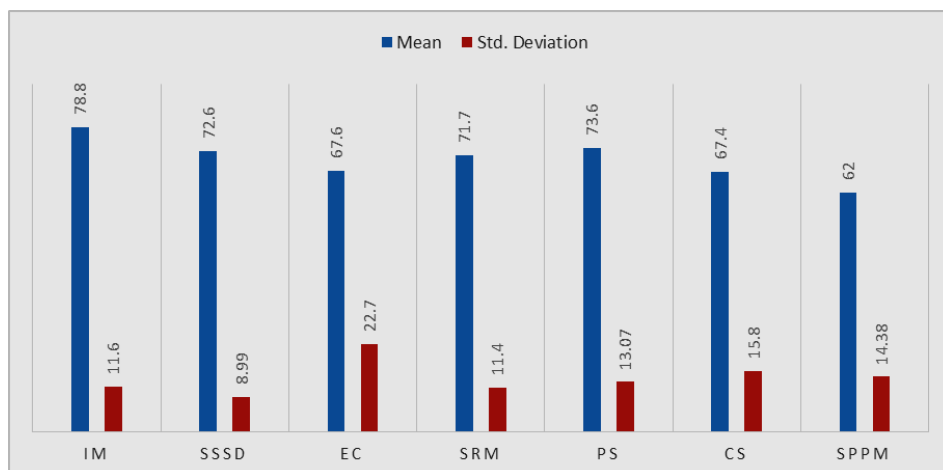


Figure (2)..Results of Analysis on the Scores of the Courses

K-means Cluster Analysis

Before applying K-mean cluster analysis. RATTLE in R-Studio was used to identify the number of clusters. The outcome was two clusters as shown in figure (3).

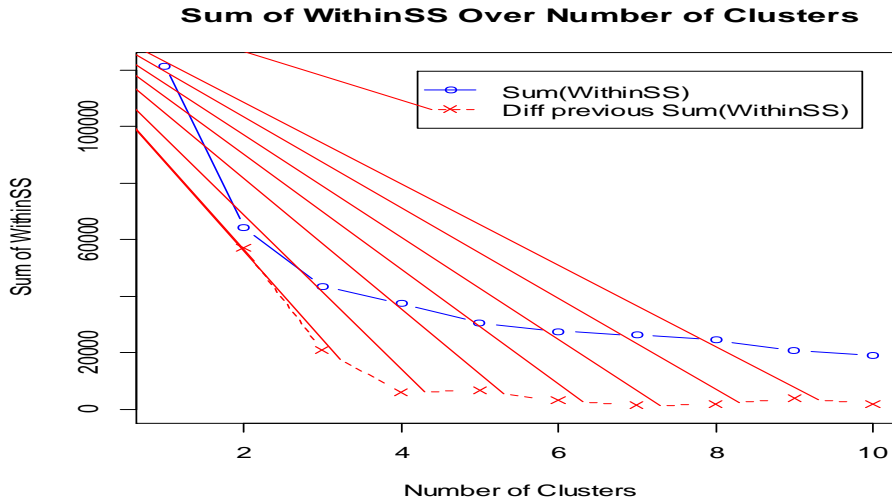


Figure (3) Number of Clusters

After the number of clusters was limited, K-means cluster analysis was applied in SPSS as shown in table (4).

Cluster one contains 58 students (46%) while cluster two consists of 68 (54%).

Table 4. Number of each cluster

Clusters	Frequency	%
Cluster 1	58	46%
Cluster 2	68	54%
Total	126	100%

Table 5. presents values of the final cluster centers for the two clusters so the values in cluster two are higher than cluster one. For the overall performance of the two clusters as illustrated in table (5), it is found that cluster (1) size 58 out of 126 is 61% as an “Average Performance” while cluster (2) size 68 out of 126 is 79% is “Good Performance” .Both decisions are depicted in the academic performance index of the table(1).

Table (5) Final Cluster Centers

Courses	Codes	Cluster	
		1	2
Introduction to Management	IM	71	86
SWK Sustainable Social Development	SSSD	67	77
Economics for Social workers	EC	49	84
Social Work Research Methods	SRM	63	79
Principles of Statistics	PS	65	81
Communication Skills	CS	57	76
SWK Project Planning & Management	SPPM	52	70
Grand Mean		61	79

Table (5) and figure (4) compare means between the two clusters where the course “Introduction to Management) has high value both cluster one and cluster two (M=71)and (M=86) whereas the course “Communication Skills” has the lowest value for the two clusters. However, cluster one extending (52-71) with a grand mean (61)while cluster two ranging between(70-86) with a grand mean(79).

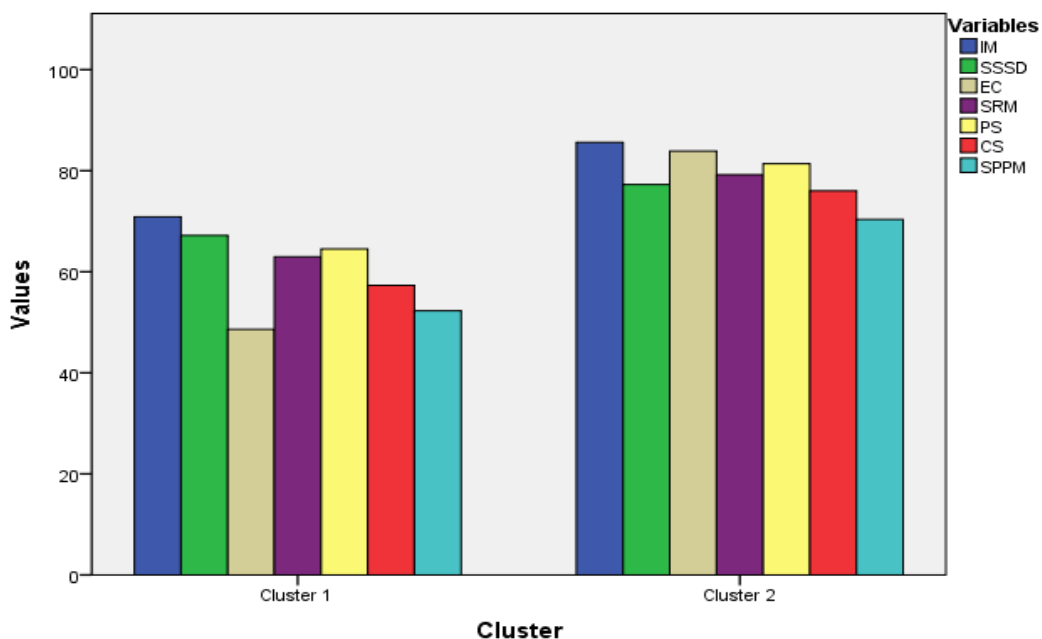


Figure (4) Final Cluster Center

Table (6) ANOVA Analysis

Course	Codes	Cluster		Error		F	Sig.
		Mean Square	df	Mean Square	df		
Introduction to Management	IM	6801.626	1	80.945	124	84.028	.000
SWK Sustainable Social Development	SSSD	3168.050	1	55.949	124	56.624	.000
Economics for Social workers	EC	38990.476	1	207.905	124	187.540	.000
Social Work Research Methods	SRM	8270.735	1	65.578	124	126.121	.000
Principles of Statistics	PS	8921.386	1	100.295	124	88.952	.000
Communication Skills	CS	10947.989	1	164.054	124	66.734	.000
SWK Project Planning & Management	SPPM	10209.255	1	126.319	124	80.821	.000

Table (6) above presents the differences among variables (courses scores) in the two clusters, the P-values of all courses $\leq (.000)$ less than (0.05). Thus, there are variances among the scores of the seven courses.

Results of Two-step Cluster Analysis

In this section, the Two-step cluster was another statistic method conducted by the author in an attempt to identify the similarity and differences between the outputs of the K-means cluster and the former cluster. Figure (5) visualizes the model summary produced by a Two-step analysis of seven inputs (data of courses) grouped into two clusters as well cluster quality where silhouette measure of cohesion and separation intervals (-1 to 0.2 Poor | 0.2 to 0.5 Fair | 0.5 to 1 Good). Based on that, the indicator passed to the green region (0.5). Thus, the cluster quality is "Good". Table (7) displays the cluster size and ratio of the largest cluster to the smallest cluster which is (2.15), this value is less than (3), therefore, is an acceptable ratio.

Table (7) Cluster Size and Ratio Sizes

Size of Smallest Cluster	40 (31.7%)
Size of Largest Cluster	86 (68.3%)
Ratio Of Sizes: Largest Cluster to Smallest Cluster	2.15

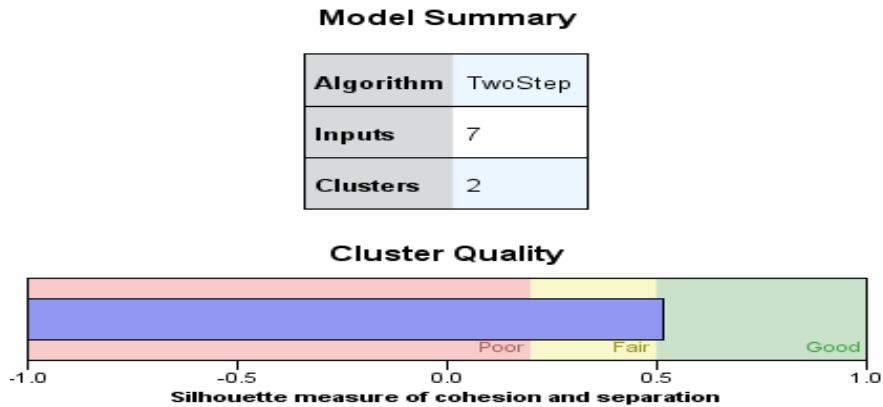


Figure (5) Model Summary and Cluster Quality

Figure (6) demonstrates the relative importance of each predictor in estimating the cluster model (IBM, 2017). The sum of the values for all predictors on the display is 1.0. The Importance measure of cluster cohesion is (0 to 0.2 Poor | 0.2 to 0.6 Fair | 0.6 to 1 Good). According to these interval values, the course “Social Work Research Methods SRM” scored up the optimal value of predictor importance while the courses ‘Economics for Social workers EC, “SWK Project Planning & Management SPPM” and “Principles of Statistics PS” are the region (0.6-0.8) as “Good” level of predictor importance. The courses “SWK Sustainable Social Development SSSD, “Introduction to Management IM, and “Communication Skills CS” are the region (0.2-0.6) which features a “Fair” level predictor importance. However, all variables (courses) contributed to establishing the cluster model with an acceptable level of predictor importance.

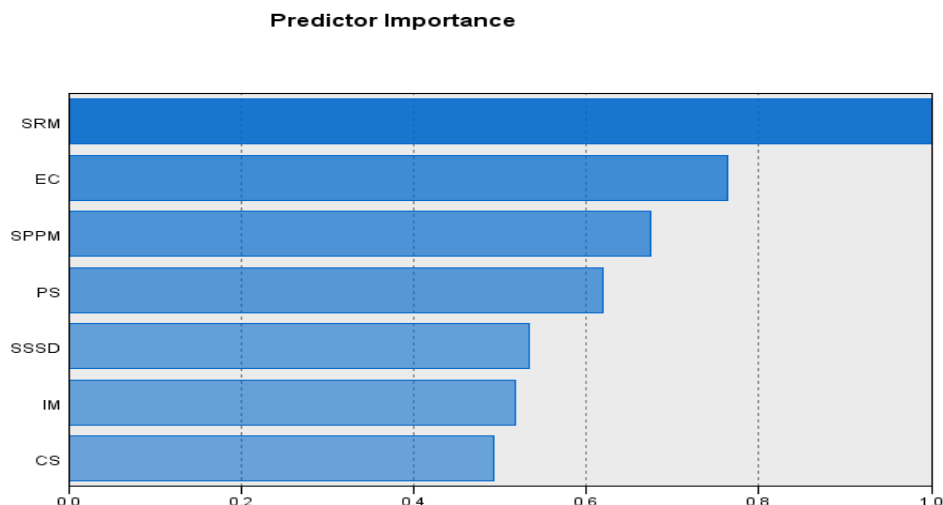


Figure (6) Predictor Importance for the Seven Courses in the Cluster

Table (8) and figure (7) illustrate comparing means of the two clusters made up by Two-steps cluster modular. The values of the cluster (2) are higher than those in cluster (1). The values in cluster two rankings (75-90), while values in the cluster one ranking (55-74). To determine the performance of the students in two clusters, the grand mean of each cluster was calculated. Therefore, the overall performance of the two clusters was judged. It is found that cluster (1) size 86 out of 126 is 65% as an “Average Performance” while cluster (2) size 40 out of 126 is 84% as “Very Good Performance”. Both decisions are described in the academic performance index of table (1).

Table (8) Input Means of Clusters

Cluster	1	2
Size	 68.3% (86)	 31.7% (40)
Inputs	IM 74.23	IM 88.68
	SSSD 69.02	SSSD 80.35
	EC 57.13	EC 90.28
	PS 68.05	PS 85.58
	CS 61.30	CS 80.58
	SPPM 55.70	SPPM 75.68

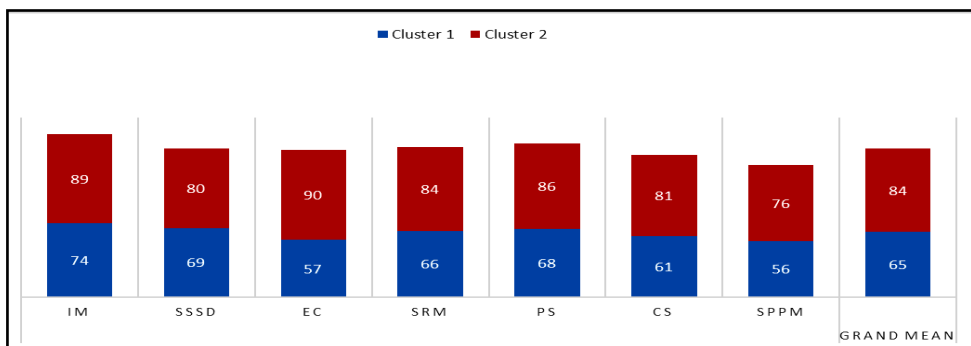


Figure (7) Comparing Means of Two Clusters

Table (9) shows a comparative analysis of the overall performance of the students in light of the three analysis methods applied in this study. K-mean cluster analysis explored (70%), Two-step cluster analysis showed (74.5%) and the descriptive analysis (70.5%). These results ranging (70-74.5) and indicate that the performance of the students of the social work department is a 'Good level'.

Table (9). A Comparison among The Results of the three Analyses

Analysis Methods	Overall Performance		Overall performance Average	Decision
	1	2		
K-Means Cluster	61	79	70	Good
TwoStep Cluster	65	84	74.5	Good
Descriptive Statistics	-		70.5	Good

Discrimination Analysis

To estimate the discrimination indicators of test scores for each variable (course), the Optimal Scaling in SPSS was used. Table (10) and figure (8) below show the discrimination measures. The most discriminant variables (courses) of two dimensions (clusters) is "Social Work Research Methods (SRM)" (M= 0.745) followed by "SWK Project Planning & Management (SPPM)" as second rank (M=0.708), while "Economics for Social workers (EC), Introduction to Management (IM), and Communication Skills (CS)" discriminated as third, fourth and fifth ranks (M= 0.698, 0.643 and 0.620). The courses "SWK Sustainable Social Development SSSD (M= 0.557)" and "Principles of Statistics (PS) with the mean (0.458) indicate sixth and seventh levels of discrimination.

The overall mean of discrimination for the cluster (1) shows high discriminant (72.941) than cluster (2) which made up (53.583). However, the grand mean of the seven courses revealed (63.262). Thus, the discrimination result of each course and their grand mean demonstrate the high level of discrimination.

Table (10) Discrimination Measures

Courses	Codes	Dimension		Mean
		1	2	
Introduction to Management	IM	0.725	0.562	0.643
SWK Sustainable Social Development	SSSD	0.627	0.487	0.557
Economics for Social Workers	EC	0.839	0.558	0.698
Social Work Research Methods	SRM	0.803	0.686	0.754
Principles of Statistics	PS	0.595	0.321	0.458
Communication Skills	CS	0.723	0.516	0.620
SWK Project Planning & Management	SPPM	0.794	0.621	0.708
Active Total		5.106	3.751	4.428
% Of Variance		72.941	53.853	63.262

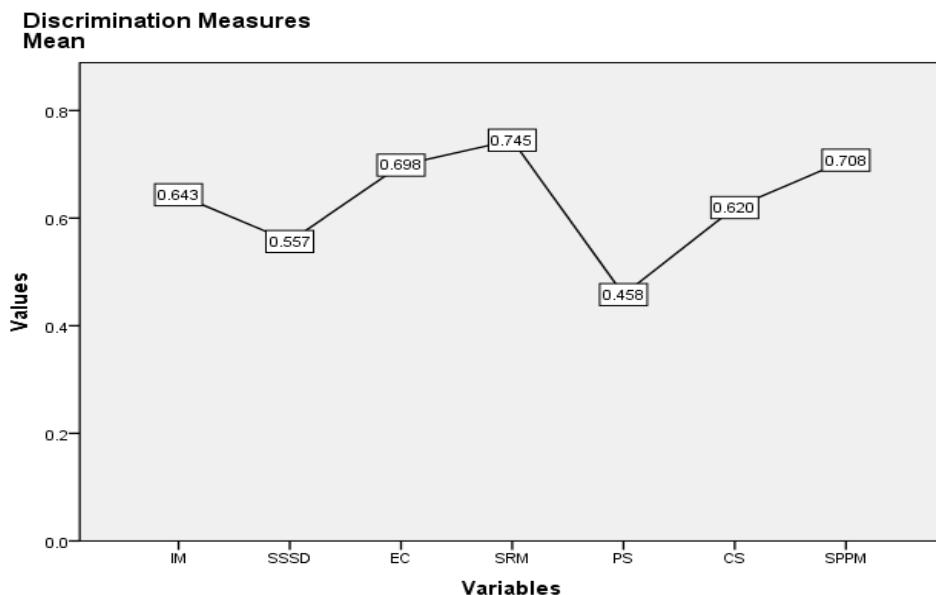


Figure (8) Grand Means of Discrimination for Variables (Courses)

Conclusion and Recommendations

Based on the results of the study, several statistical methods were employed to determine student performance. The reliability, convergent validity, cluster quality, and discrimination of the data were calculated. All indicators were accepted statistically. It was found that the level of students for the social work department in the third year at Mogadishu University was good where the descriptive statistic results showed the grand mean of scores for the seven courses (70,567) as well as the result of K-mean two clusters; the cluster one made up 61% as an 'Average performance' while the cluster two scored up 70% is a 'Good performance' while Two-step Cluster results revealed (65%) for the

cluster (1) is an ‘Average performance’ and (84%) for the cluster(2) as a ‘ Good performance’ according to the Academic Performance Index of the study. Based on these results, it is recommended to improve assessment modes in general and the achievement test in particular, to be aligned with teaching and learning methods to uphold the performance of the students. It is also highly recommended to conduct evaluation studies on students’ performance in the light of their exam scores for other departments at Mogadishu University.

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***Analysis on Recovery and Innovation of Education in Somalia:
Educational Programs, Pedagogy, and Teaching Tools***

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Abstract

This study spotlights the recovery and innovation in the Somali education system especially educational programs, pedagogy, and teaching tools. It focused on the elaboration of interactive educational programs and strategies, from the pre-primary level to the higher education. These programs also should be adapted to different contexts and numerous needs to be aligned with the fixed objectives to be accomplished. The recovery leads to the high mobility of education resources to demonstrate skills that are in keeping with those required by the Somali society. Globalization exposes education to free competition throughout the world. The new rules it has set in motion impose further difficulties for Somali education systems, which are and trying to adjust its education systems, and standards.

This study analyses the current educational programs, pedagogy, and teaching tools comparison in the internationally agreed definition as a reference classification for organizing educational programs and related qualifications by education levels and fields. There are substantial differences in educational programs, pedagogy and teaching tools and technology, and its modes of organization and functioning in Somalia.

The results of the study are presented in; to achieve the expected results, contents, and resources to meet certain criteria of quality of UNESCO, ISCED, 2011. This view requires the expansion of interactive educational programs and strategies, from the pre-primary level through higher education.

Keywords: Programs, Pedagogy, Standard, Teaching tools, Quality, Teaching

Introduction

State collapse fragility has badly affected the Somali education sector for decades. This has deeply wedged upon education standards and the quality of the education systems and programs. Evidence shows a clear correlation between strategies and quality control scheme, which embarked on the major components characterized as courses, units, or modules such as educational activities and practices and research projects. (MOEHE, 2012-2016)

The introduction covers two important topics: The first is the basic comprehensive framework for organizing education programs and

qualifications by applying uniform and internationally agreed definitions to facilitate comparisons of education systems in Somalia. The second deliberates on the quality of education, and the effects of the International Standard Classification of Education (ISCED) to Somali educational programs, pedagogy, and teaching tools.

The world's education systems vary widely in terms of structure and curricular content. Consequently, it can be difficult to compare national education systems with those of other countries or to benchmark progress towards national and international goals. To understand and properly interpret the inputs, processes, and outcomes of education systems from a global perspective, it is vital to ensure that data are comparable. Applying the International Standard Classification of Education (ISCED) and the standard framework used to categorize and report cross-nationally comparable education statistics. (ISCED; UNESCO, 2011)

Statement of the Problem

Until recently, quality and standard management of education programs, teaching, and learning have not been a paramount focus of policy-making in education service in Somalia. The oversight is now being addressed by the development of national and international quality assurance systems and standards in teaching and learning.

This is expected to strengthen mechanisms of implementing, enforcing and monitoring educational programs, pedagogy and teaching tools. The question focus on: What is the indication on the ineffective educational programs, pedagogy, and teaching materials in comparing with the International Standard Classification of Education (ISCED) levels? And

how the school curriculum and guidance materials are best support effective pedagogy in Somalia?

Objectives

The purpose of the study is to analyze the quality of education programs, pedagogy, and teaching tools, and the effects education systems in Somalia facilitating comparisons to apply uniform and internationally agreed on definitions especially to the International Standard Classification of Education (UNESCO, ISCED). The study aimed to review existing evidence on the related topic to inform program design and policymaking undertaken by the Ministry of Education, Culture and Higher Education (MECHE), private education sectors, international organizations; identifying analytical indications to guide the development of educational programs, pedagogy and teaching strategies in the education field in the country.

Methodology

The methodology of the study is based mainly on significant experiences observed in the Somali education system. The educational programs, pedagogy, and teaching experiences are analyzed and evaluated from the angle of the assessments drawn up by the leading federal Ministry of Education, Culture and Higher Education (MECHE), up to date documents, local education umbrellas, and international organizations working in the area of research study on education. The methodology used and adherence to international standards and guidelines, especially the International Standard Classification of

Education (ISCED) levels, 2011, to determining quality of education and functioning structure in Somalia.

Background of the Study

Somalia education system has difficulty in terms of governing and financing. There is limit public schools comparison with number of tremendous private education service delivery.

Public education schools still require intensive recovery to improve access to quality education. The ministry of education launched a national curriculum coupled with the development of learning resources. The MOECHE has developed the Education Sector Strategic Plan (ESSP) in 2018-2020, which is guided by the National Development Plan, The Education Act, and draft national policies. The ESSP focuses on seven subsectors such as Education in Emergency, Early Childhood Education, Primary Education, Secondary Education, Higher Education, TVET, and ABE. (MOECHE, School Mapping and Needs Assessment, July 2019).

In the recent past, the subject of education quality has been concerned due to the realization that the system quality as well as standards, management of teaching and learning has not been a paramount focus of policy-making in all education institutions in most countries. Consequently, tools have to be put in place to strengthen mechanisms of implementing, enforcing, and monitoring education quality in the systems. This includes review and enhancement of educational programs, pedagogy, and quality of teaching and learning facilities.

The current process of globalization has led to the internationalization of standard education, leading to competition not only for funding but also for quality students and staff. A reasonable quality assurance system in any education system, therefore, needs to incorporate indicators such as programmed objectives or the completion of a specified set of educational errands.

Successful completion of an education program is the achievement of the learning objectives of the program typically validated through the assessment of acquired knowledge, skills, and competencies. The award of an educational qualification usually documents the successful completion of a program. (ISCED 2011).

Sometimes the Somali schools are uses regularly intensive education programs due to education in emergence for the completion of a program level; therefore the responsibility rely on to avoid the education system fraud concerning to promoting students into qualification and certification without achievements of the related education level programs. This is one of constrains causes the real problem of high number graduate to be unemployment, which indicates an insufficient skill training regarding the acquisition of skills that is strongly aligned to the labor market needs.

Lack of strong quality control mechanisms caused by the untrustworthy in qualifications, programs studied quality, level of the teaching staff and teaching tools and reliable data in many education institutions in Somalia.

1. Educational Programs

An educational program is defined as a collection of educational activities, which are organized to accomplish a predetermined objective or the completion of a specified set of educational tasks. (OECD, 2017). Levels of education are an ordered set grouping education programs together in relation to gradations of learning experiences, as well as the knowledge, skills and competencies which each program is designed to impart (OECD, 2017). The ISCED level reflects the degree of complexity and specialization of the content of an education program, from foundational to complex. (UNESCO, ISCED, 2011).

Table 1, ISCED 2011 and ISCED-97 levels compared

ISCED 2011		Years ISCED		ISCED-97
01	Early childhood educational development	No duration Criteria	0	Pre-primary education
02	Pre-primary education	4 to 7 common is 6	1	Primary education or first stage of basic education
1	Primary education	2 to 5 common is 3	3	(Upper) secondary education
3	Upper secondary education	2 to 5 common is 3	2	Lower secondary education or second stage of basic Education
2	Lower secondary education	2 or 3	4	Post-secondary non-tertiary Education
4	Post-secondary non-tertiary education	3 to 4	5	First stage of tertiary education not leading directly

ISCED 2011		Years ISCED	ISCED-97	
5	Short-cycle tertiary education	2 to 3		to an advanced research qualification (5A, 5B)
6	Bachelor's or equivalent Level	3 to 4		
7	Master's or equivalent level	1 to 4	6	Second stage of tertiary education leading to an advanced research qualification
8	Doctoral or equivalent level	minimum of 3		

Source: ISCED 2011

Table 2, ISCED, UNESCO 2011 Description

Levels	Description
Early childhood education (level 0)	The level is a pre-primary, pre-school, provided programs in day-care centers, and nurseries. Programs at this level are designed with a holistic approach to support children's early cognitive, physical, social and emotional development.
Primary education (level 1)	Designed to provide fundamental skills in reading, writing and mathematics (i.e. literacy and numeracy) and establish a solid foundation for learning and understanding core areas of knowledge, personal and social development, in preparation for lower secondary education.
Lower secondary education (level 2)	Programs at this level are usually organized around a more subject-oriented curriculum, introducing theoretical concepts across a broad range of subjects. The aim is foundation for lifelong learning and human development upon which education systems may then expand further educational opportunities.

Levels	Description
Upper secondary education (level 3)	Is designed to complete secondary education in preparation for tertiary education or provide skills relevant to employment, or both. Programs at this level offer students more varied, specialized and in-depth instruction than programs at Lower secondary education.
Post- secondary non-tertiary education (level 4)	Provides learning experiences building on secondary education, preparing for labor market entry as well as tertiary education. It aims at the individual acquisition of knowledge, skills and competencies lower than the level of complexity characteristic of tertiary education. Programs are typically designed to provide a non-tertiary vocational qualification; or graduates from upper secondary vocational programs may choose to increase their level of qualifications or specialize further.
Tertiary education (levels 5-8)	Builds on secondary education, providing learning activities in specialized fields of education. It aims at learning at a high level of complexity and specialization. Tertiary education includes what is commonly understood as academic education but also includes advanced vocational or professional education. It comprises: Bachelor's or equivalent level, Master's or equivalent level, and doctoral or equivalent level, respectively.

Source: (ISCED; UNESCO, 2011)

In Somalia, the education system levels consist: 2 years of early child development (ECD), 4 years lower primary education, 4 years upper primary education level, 4 years secondary and 4 years university

education. Early child development (ECD) and Non-formal Education (NFE) are the basic education. (Education Law, JUL 30, 2017)

Table 3, Summarizes the Levels of Programs in Somalia

Education	School/Level	Grades	Age	Years
Primary	Primary Education- Elementary Cycle	1–4	6–10	4
Middle	Primary Education- Intermediate Cycle	5–8	11–14	4
Secondary	Secondary School	9–12	15–18	4
Vocational	Technical and Vocational		15–18	4
Tertiary	Bachelor			4
Tertiary	Post-Graduate			?

Source: Education Law, JUL 30, 2017

Table 4, Description of Somalia Education Levels 2021

Level	Description
Early child development (ECD)	Quranic and Kindergartens Schools. Designed to teach children the Holy Qur'an and learn Arabic spelling, and prepare them learn to read and write letters and numbers.
Primary (Level 1)	Provide the student with fundamental skills, reading, writing, learning and understanding areas of knowledge, personal and social development.
Secondary (Level 2)	Provides a variety of knowledge, built on the foundations of science, technology, introducing theoretical concepts, competent knowledge improving the quality of his life and that of his community. Secondary education is divided into: Normal secondary school with a study period 4 years. Islamic institutes with a study period of 3 years to four years. Technical secondary schools with a study

Level	Description
	period of 3-4 years. And vocational secondary schools with a study period of 2-3 years.
Tertiary (Level 3)	The level consists: universities or other institutions, Educational institutions and educational organizations and research centers. It provides academic knowledge, research development and quality education.

Source: MOECHE, Education Law, July 30, 2017

The level of an educational program should be determined by its educational content. It is very difficult, however, to directly assess and compare the content of the educational programs in a way that is internationally comparative. (ISCED; UNESCO, 2011)

2. Curricula Centered on Educational Programs

The curriculum is part of a long-term approach that is closely connected with the choice of educational policies and governmental strategies on education. Among the aspects that distinguish curricula from study programs, focusing on the outcomes of education occupies a determining position. Thus, in a curriculum, efforts will be made to express the goals of the education system in reference to what is expected from learners, whereas in a study program, the interest will center more on what the teacher should do to obtain these results. (Depover, C. (2006).

Curricula are too diverse, multi-faceted, and complex to allow for clear judgments that one curriculum for students of given age or grade belongs to a higher level of education than another. (ISCED; UNESCO,

2011) The curriculum concentrates exclusively on what the students will be capable of achieving on the basis of those subjects. In this case, is to set up a permanent observatory on education that could eventually contribute to programs designed to evaluate the skills appropriated by students.

Educational programs in Somalia reflect the general objectives of the curriculum specifically units and their results, teaching and learning methods, learning materials, assessment process, and curriculum implementation, and student progress. (MECHE, Education Law, July 30, 2017). But must take into account the major political decisions and system quality. Although many schools and skills training centers have been established in Somalia, teachers and instructors have been trained, curricula developed and textbooks provided somehow, but the demand for quality education is far outstripping its availability (MOECHE, 2019).

It is very important to state the links between the curriculum and educational policy in order to understand clearly the reason of the curriculum. The fundamental principles of the curricula approach in Somalia needs to address the demands for lifelong quality education for all and the introduction of the skills that are necessary for the personal development of individuals in their environment; and the languages of instruction and teaching. (MOEHC, Curriculum Framework, Mogadishu, 2017)

Lifelong quality education for all, it is necessary to draw up curricula based on educational measures and a stronger interrelationship between theories, practices and experiments. The educational programs in Somalia

should be designed for all levels of education and teaching, taking into consideration of the demands of inclusive and quality persists in long life education. (MECHE, Education Law, July 30, 2017) Ambitions for education are essentially captured in (SDG 4) of the 2030 Agenda, which aims to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” by 2030. The roadmap to achieve the education goal, adopted in November 2015, provides guidance to governments and partners on how to turn commitments into action. (<https://en.unesco.org>)

The lasting acquisition of skills needed for personal development throughout a lifetime require an evaluation of the teaching programs and activities applied at different levels of education and training, from early childhood to higher education. For this purpose, every country will equip itself with structures for evaluating and managing its education system, or will reinforce already existing ones. Based on a systemic approach, the priority of periodic assessments will be to define the quality and relevance of the education offered. (UNU, 2009)

Skills development, the accomplishment of the skills needed for personal development throughout a lifetime in teaching programs and activities and applied at different levels of education and training from early childhood to tertiary education. “Personal skills development is an acquisition or modification of information, knowledge, understanding, attitudes, values, skills, competencies or behaviors through experience, practice, study or instruction”. (ISCED- 2011). Skills required for employment can be divided into: Basic and foundation skills, transferable

skills, technical and vocational skills, professional and personal skills, including individual attributes relevant to work such as honesty, integrity, reliability, work ethic, and judgment. (<https://cdn.sida.se>)

Languages of instruction and teaching: Languages of instruction and teaching in Somalia are trilingual: Somali language, Arabic and English. “the objective of this policy depended on that the language is a fundamental factor in the interaction between education, culture and participation in society while the languages in education influence language status, and language structures. According Somali federal education law, languages of instruction, and teaching in the different levels of the schools in detail are:” (MOECHE, Education Law, 2017)/

1. Primary education (1-8) is taught by Somali language. But improved English language as a subject begins in 3rd grade.
2. Primary education (1-8) Levels in the country can be taught by other languages if there are authorized mandate from the Ministry of Education with accordance of the curriculum policy approved by the Ministry. Teaching Somali language, Arabic and Islamic education as a subject will be compulsory.
3. Somali language, Arabic language or English are used as instruction languages in upper secondary education.
4. Quality Arabic language and Islamic studies that are taught in Arabic are mandatory for all classes; which begins in the Kindergarten.
5. Social studies subject is a requirement subject in all the classes; it is taught by Somali language.

Technical and Vocational educational programs in Somalia now is based on a short-term approach programs, now, the training programs are not sufficiently turned into the planned occupation quality. (MOECHE, ESA 2021). In Technical and vocational programs, some programs devoted to subsidiary subjects than the main subject matter of the projected occupation. According ISCED criteria such a programs and their resulting qualifications should be classified in the vocational field associated with the intended occupation or class of occupations. This is an exception to the rule on the classification according to the majority or predominant subject as it is important to be able to identify separately target occupations of vocational programs and qualifications. (UNESCO, ISCED, 2013).

In 2018, labor market needs survey, funded by the EU, indicated the persistent mismatch between skills and education programs acquired by trainees and the expectations from the market (MOECHE, SHEDS, 2018).

The tertiary education in Somalia is a part of the world; it needs to develop the international standards, principles and requirements. The widespread privatization of higher education in the country obligates them to adopt vital strategic management practices to boost up their performance, innovation and quality.

On a different level of tertiary education level, the higher education institutions have challenges to face. These challenges concern the relevance of the courses available, the research undertaken and international visibility. Students attending in the humanities programs are

outstripping the programs of science. The balance enrolment basic on the programs offered in the universities is dichotomy, 46% having been enrolled in humanity based faculties, while 54% enrolled in science-based faculties. (MOECHE, EMIS, 2020).

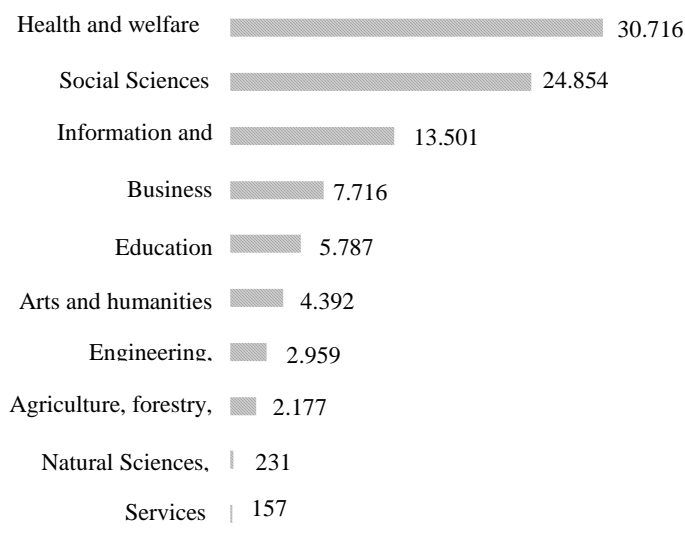


Figure 1. Somalia student enrolment on the programs 2019/2020

Source: MOECHE, EMIS, 2020

ISCED fields of Education and Training (UNESCO, 2013) define ten fields of training, which the various faculties have been merged. In 2020, the population estimates show that there were more than 2 million youth aged 18-24. (UNPD, 2019) They can be considered to have been eligible for technical, vocational and university or tertiary education. (ISCED-2011)

Available data shows that only 103,400 trainees and students were enrolled in accessible institutions, this enrolment representing only 5

percent of the eligible population youth aged 18-24. This result demonstrates the large number of eligible youth who are not reached by the post-secondary programs. (MOECHE, EMIS, 2020).

Table 5: Participation Rates in Higher Education

	Male	Female	Total
Enrolment in TVET	5,129	5,747	10,876
Enrolment in Universities	-	-	92,490
Total enrolment (2019/20)	5,129	5,747	103,366
UNFPA 2014 (ESA 2016)	-	-	145,309
Population (18-24)	1,077,946	1,074,243	2,152,189
Tertiary GER			4.8%

Source: MOECHE, EMIS, 2020

This means, Somalia reveal low access rates in tertiary education, especially in the context of SDG4 which contemplates that countries will create opportunities for all eligible youth by 2030.

Table 6: The Total Number of Students Graduating from Universities in 2019-2020

<i>Total</i>	<i>Boys</i>	<i>%</i>	<i>Girls</i>	<i>%</i>
17,548	12,196	(69.5%)	5,352	(30.5%)

<i>The four section with the highest number graduate of students</i>		
<i>Section</i>	<i>Number of students</i>	<i>%</i>
Accounting, Human Resource and Banking and Finance	2,644	(15.10%)
Public administration	2,571	(14.65%)
Nursing and Midwifery	2,270	(12.94%)
Computer Science and IT	1,772	(10.10%)
<i>The four section with the low number graduate of students</i>		
Dentist	4	(0.02%)
Pharmacy	14	(0.08%)
Journalism	17	(0.10%)
Statistics	27	(0.15%)

Source: (Iftin Foundation, Sahanka Qalinjebiyaasha dalka, 2020)

Somalia, only two sources of data on learning outcomes originated from national exams and school-level assessments are exist. Both sets of exam data were limited with grade eight national exam data only available for the 2019/2020 school year while grade 12 exam data is available from its inception in 2015 to the present. The recentness of these learning assessments has affected their levels of uptake, limiting the comparability of trends over time. As such, it is more pertinent to consider results as a snapshot of current learning trends than as comprehensive indicators of the quality or evolution of the system. Furthermore, still, the management of the majority of education functions

sits with state-level governments; while evaluation at both the primary and secondary level is responsible for of the FGS (MOECHE, ESA 2021).

3. Pedagogical Innovation and Teaching Practices

In terms to understand the extent to which curriculum and teacher education are enabling factors in the most effective pedagogies identified, it must be recognized that the curriculum is the reference point for the pedagogical strategies and practices used by teachers, and that teacher education formally introduces teachers to the curriculum and its pedagogy and the teaching profession. Successful pedagogies focus on more concrete pedagogical strategies and practices to understand what worked and what did not. The related pedagogy questions are: How teachers are teaching? Where pedagogies are identified as successful? and what reasons are put forward to success in their context?

The teacher training policy introduced in 2020, the policy outlines that to be considered a qualified teacher in Somalia at the primary level, individuals must have completed at least secondary education as well as have taken an eighteen-month to a two-year primary teacher training course, complete mandatory practical teaching, and pass a requisite examination (MOECHE, 2020). Secondary school teachers are required to undertake a degree course that may take up to four years, resulting in either a Bachelor of Education or a postgraduate Diploma in Education, with the latter requiring additional practical training before qualification (MOECHE, 2020). However, this includes only those that have trained specifically in education, while others who have achieved higher studies

in other subjects are “under-qualified,” indicating teachers who have achieved higher studies, whether it be a bachelor's or master's degree, without a specialization in education. (MOECHE, 2020). Thus, this is comparable with the ISCED's standards.

The teacher training in Somalia currently has no unified training curriculum. The MOECHE is attempting to change this through its new policies for teachers introduced in 2020, which promises the development of a detailed teacher training syllabus to be used in approved teacher training institutions. (MOECHE, 2020) However, the quality of education provided at existing training institutions is widely variable, often resulting in a lack of pedagogical skills and subject knowledge.

Pedagogy is seen to be the weakest area of knowledge for both primary and secondary teachers. Teachers have greater subject-level knowledge specifically in Islamic Studies and the Somali language, rather than practical teaching skills, limiting their ability to deliver content to students in an effective manner. (MOECHE, 2020). The curricula adopted seem to be relevant to the presented, anticipated future needs of the learners, and thus correlate with needs information due to circumstances changed such as life skills, civic education, and the environment.

4. Class Size and Pupil Teacher Ratios (PTR)

A class with large numbers of students led to an increased number of academic and pedagogical issues, which in turn, lead to increased administration and management responsibilities. The large-sized classes yield reduced student levels of active involvement in the learning

process, reduced frequency and quality of instructor interaction with and feedback to students, reduced student motivation, and reduced development of cognitive skills inside the classroom (TEDI, 2003).

The size of classes and their effectiveness depend directly on the number of schools and classrooms available, as well as the number of pupils and teachers. “Somali education is characterized by the low pupil to teacher ratio (PTR) in some area probably due to the low enrolment of pupils in schools and the high number of teachers that are placed in those schools”. (MOECHE, ESA, 2021).

Unqualified teachers with some form of educational qualification including degree level are in some cases recruited as teachers affecting the PTR of a class. In an ideal situation, a low PTR is regarded as a situation where teachers give targeted individual attention to each learner (MOECHE, School Mapping, July 2019). The pedagogical methods practiced by teachers depend largely on the class size. The advantage of direct participation by pupils in the learning process has been proved since the introduction of active methods based on established psychological and organizational knowledge. (UNU, 2009)

The results are mixed when examining the number of pupils per classroom, with a large range and the lowest ratios seen in some schools, to the high student’s ratios per classroom in other area schools. Classroom ratios are seen to be similar to PTRs, suggesting the use of single classrooms per grade, when accommodating the prevalence of the double-shift system. (MOECHE, ESA, 2021).

5. Textbooks and Teaching Aids

Textbooks are under-supply in some schools in government schools and private schools (MOECHE, ESSP 2017). Its short supply with the lowest ratios is in early grades, but textbooks provision consistently increasing each year, leading to highest ratios in form four due to particular concerns given as secondary terminal year in which students require learning materials to succeed in examinations. (MOECHE, ESA, 2021).

The government has been unable to reach its target in the former Education Sector Strategic Plan (ESSP) in 2018-2020 for the distributing textbooks to 100% of schools by the end of 2020. (MOECHE, 2017). Therefore, a shortage of learning materials indicates that the quality of education to below as well.

6. ICT and Education in Somalia

ICT Sector Support in Somalia contributes to an enabling environment and encourages efficiency and equity in access to connectivity. This includes supporting legislation and connectivity for higher education institutions. (World Bank, Multi-Partner Fund, 2017).

ICT has drastically changed how people work, communicate, learn and live. The United Nations considers one of its Sustainable Development Goals (SDG) to "significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in the least developed countries by 2020." (UN.org).

Somalis education system has benefited greatly from ICT to manage COVID-19 frequent lockdowns. “Somalia had a population of 16.12 million in January 2021. There were 1.95 million internet users in January 2021. The number of internet users increased by 329 thousand (+20%) between 2020-2021. Internet penetration in Somalia stood at 12.1% in January 2021. (Datareportal.com).

This means “School closures offer a powerful moment for reorienting education from school attendance to learning”. (UNICEF, 2020) for example, online ZOOM applications became popular in daily distance learning in Somalia.

Education can harness three key opportunities: (UNICEF, 2020)

- a. **Digital learning.** Governments have widely expanded their use of technology to support distance and home learning, including online learning, and via radio, television, SMS and interactive voice response media. These expansions represent an opportunity for enhancing quality education provision for in- and out-of-school children through digital technologies, including those most hard to reach.
- b. **System-wide focuses on learning.** For example, the Research on Improving Systems of Education (RISE) program promotes evidence-based knowledge sharing on subjects such as incentivizing teachers in remote areas, and how to improve teaching practice.
- c. **Life-wide learning.** “Life-wide” learning is a term to capture the learning that takes place across a child’s life experiences, not just in school. Parents and primary caregivers play a leading role in how learning and intellectual stimulation in and around the home can be

structured. The COVID-19 response has seen a massive scale-up of learning in the home and offers opportunities to further capacitate parents, caregivers and communities as facilitators and supporters of learning, and to reinforce life-wide learning as a critical component of a quality education.

Analysis and Discussion

What is the indication on the ineffective educational programs, pedagogy, and teaching materials in comparing with the International Standard Classification of Education (ISCED) levels? And how the school curriculum and guidance materials are best support effective pedagogy in Somalia?

It is clear that education recovery in Somalia generally is bearing in the right direction. Some education infrastructures are restored. Government develops some strategies through the education system improvement plans such as curriculum reform, teacher training and recruitment, improving policies and strategies towards education, but still a lot have to be done to fill education gap indicators, facilitating education program standard, foundations for the structured pedagogy framework and teaching materials enhancement.

The literature and ministry of education document review show that 2016-2020 education policies and strategies not fully implemented specially transformation of good quality education service bases and standards. There are some education gaps related to monitoring, oversight, and quality assurance of what is going in the classrooms. Limited inputs of quality in terms of infrastructure and associated facilities are a major

concern in the education system. There is no reliable updated data confirming the present situation, especially in the educational programs, pedagogy, and teaching tools. There is a weak transition to the labor market, with a persistent mismatch between training and skills demanded by the market, whose root cause is the lack of a harmonized curriculum and teaching tools.

Despite most schools in Somalia are run by private umbrellas, the government made it compulsory to take centralized final exams in leaving certificates in the secondary and intermediate schools. The federal ministry of education and the state governments can't reach many schools in the country due to insecurity. The argument is, who knows what sort of education programs implementing in those schools? And how teaching and learning materials could be accurately match the education objectives?

The above indicator proved practically, in 2019/2020 Ministry of Education announced the results of the secondary school certificate final examination. The examination was covered by four regional states in Banadir region. The results showed that the number of students in the Banadir region who failed the final exams was estimated (30.94%); it means the total of 25,449 students from Banadir region failed 7,873 students. (MECHE, 6 September 2020). The consequence created a big question that needed to address scientifically and technically. However, some research findings occluded: (AbdiShakur, 2020):

- a. Students in Banadir region did not get enough opportunity to study due to COVID-19 early lockdowns. All the education classrooms are suspended randomly without alternatives.

- b. Some schools in Banadir region were suspected to include their lists some students who did not complete the required education level for the sake of profit.
- c. The exam questions in previous years was consist only the form four curriculum, but this year the questions were expended and was taken from the whole four years of the secondary program course units, so many students weren't prepare themselves for it.
- d. The exam has a lot of essay questions, so it may be difficult for many students, while answer of the students were not being corrected properly by skilled teachers and financial problem.

In terms of the teachers, the under-qualification and non-qualification of teachers are predominant across the country and even when teachers are trained, they lack pedagogical skills. This places a constraint on the quality of education that can be provided in the education systems. The focus needs to be placed on addressing the currently under and unqualified teachers, as well as ensuring future recruitment contains more qualified teachers.

Ministry of education document review shows that textbooks are severely undersupplied across states levels and education authorities. The absence of a national textbook policy, which outlines all the responsibilities, is also a challenge, textbook acquisition constraints to implement improved or redistributive policies. (MOECHE, ESA, 2021)

Large proportions of schools in Somalia still lack access to key infrastructures such as electricity, water, and toilet facilities. There is also

a clear undersupply of desks to schools. Examining infrastructure at the many regions in Somalia shows a more targeted approach and view of potential areas for infrastructure upgrades. (MOECHE, ESA, 2021).

Exam results are relatively strong but highlight some subjects, which may require particular attention, such as Math, Biology and Chemistry at the form four levels. The newness of grade eight exams makes it difficult to provide concrete recommendations. (MOECHE, ESA, 2021). However, Attention should be given to maintaining the high proportions of enrolled students sitting these exams in the coming years.

The problem with higher education is that there are no evaluated educational programs and qualified teachers. All university education programs haven't had an accreditation assessment, the value of credit hours is not known, and many university teachers' qualification does not meet the standards of higher education programs they are working in it. Many private universities have opened for economic purposes; however, the ratio of the second graduate student's population is less than the number of universities in the country. The question is where do all universities get enrolled, students?

The ISCED standard comparison of education programs in Somalia needs to be addressed. ISCED defines educational program should be allocated to a particular level of education on the basis of its educational content, which in practice is determined by applying classification criteria such as typical starting ages, entrance qualifications, and type of qualification awarded. (ISCED, 2011) The educational program is the main building block for international statistical comparisons in education.

The higher education commission appointed in July 2019 is supposed to be a key driver of quality of education in the universities but apparent lack of political will and competence skills in support, and its functions will continue to keep the sector in reform mode for too long. (MOECHE, ESA, 2021)

Main Findings

1. Somalia education, having been in recovery through policy reforms, curriculum review, production of teaching and learning materials, education sector assessment, and certification of formal primary and secondary school and tertiary education. The need finds ways of innovating and improving the impact of its quality.
2. Teaching practices are not based on socio-constructivist theories, which became popular in educational philosophy. “Which supported by empirical research, the methods based on the ideas, for example, student-oriented practices and cognitive. (Vieluf S., et al., 2012) The majority of the teachers are using the teacher-centred approach. Therefore, focusing on one method in the classroom-teaching practices influenced by pedagogical backgrounds. Somalia needs more professional teachers in the field of teaching and learning.
3. Higher education constrains include to quality of teaching and learning facilities, faculty and other staff, development, review and enhancement of academic programs, monitoring of students assessments, student support services among others.
4. Most universities do not have good research mechanisms, because there is no national policy on research in placed. Research contributes

significantly to a university's professional profile as well as access to funding and quality human resources.

Recommendation

1. To escalate the quality of education, this needs to adopt a systemic approach, establishing reliable education policies; teacher training, research, and skill needed programs, teaching methods and pedagogical materials.
2. Giving more attention to the gaps usually observed between the prescribed programs, the programs planned by teachers for application in their class and the programs taught.
3. Enhancing processes of curriculum development, review, assessment of learning outcomes, staff and student evaluation, data collection and analysis, utilization of research findings for improvement;
4. The study suggests implementing pedagogical programs separately from policies and teacher training, to assist transform-targeting policies into real achievements.
5. To offer in-service teacher training to the large number of the teachers that are working within the system, alongside pedagogical training opportunities in order to provide teaching specific qualifications to those with non-education specialized types of higher education qualifications.
6. The language of instruction knowledge is a precondition for provision education of a high standard, facilitating understanding by the learners, and achieving the objectives fixed by the teaching of the education programs.

7. The study suggests that with the standardization of teacher training institutions and curriculums, investments need to be made in upgrading the skills of qualified teachers within the system as well, especially in pedagogy and teaching practices.
8. Greater emphasis is needed on school-based assessment for all grades, to provide a more comprehensive picture of learning programs, learning material, and learning outcomes, rather than only the terminal grades.
9. The university should have not-for-profit programs and activities to solve societal problems around them and beyond.
10. The research agenda should be addressed, therefore; tools ought to be put in place to measure research productivity and impact.
11. The study suggests giving more concern to education as a global system that gives meaning to the Somali systems comprising it, especially to meet certain criteria of quality of UNESCO, ISCED, 2011, to achieve the expected results, contents, and resources.

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***An Investigation of the Factor that Influence Teacher’s Intention
to Use Online Classroom at Primary and Secondary Schools in
Mogadishu – Somalia during COVID-19***

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Abstract

The study's purpose is at examining insights into teacher’s intention to use online classrooms during Corona Virus Pandemic. The theory of reasoned action was used as a basis to develop and confirm a research model. Using systematic random sampling one-hundred-fifty questionnaires were distributed to the primary and secondary teachers in Mogadishu – Somalia. Data were analyzed using a descriptive analysis and multivariate analysis special structural equation modeling (SEM) with AMOS – SPSS. The study implications indicate that the internet connection problem is the reason why teachers do not like to teach students online. Furthermore, the research proposes that internet

availability, perceived training, attitude toward online, and perceived value teaching are significant to the teacher's intention to use online classrooms. The suggestions of these effects and researcher limitations are discussed.

Keywords: Internet Availability, Perceived of Training, Attitude, Perceived of Value and Teacher's Intention.

1. Introduction

COVID -19 has been noted in effects all areas of the human activity but special strongly impacted in teaching and learning. At the middle April 2020, approximately 1.723 billion learners have been affected due to school closures in response to the pandemic(Mustafa, 2020). 191 countries have implemented the closure of schools, universities and other education institution has affected 990 million students worldwide and over 3 million of students in Somalia(UNESCO, 2020). In March 3, 2021 all face-to-face education activities were suspended in an online teaching mode in Mogadishu – Somalia. This suspension occurred after two months in the second half of school term. Somalia has several challenges like security issue, socio-economic an instability policy to handle than countries worldwide. During the country-wide lockdown, the Somali government had to resort to online classroom for education. Teachers in Somalia have been using traditional methods for teaching like chalk-talk method for a long time. The majority of the universities have compelled shift to the online mode for education but primary and secondary schools in Somalia have been difficult to shift online for many reasons like there was not much planning on how to take classroom online, internet

availability to the secondary students, . Shea & Bidjerano (2009) “Most of the terms (online learning, open learning, web-based learning, computer-mediated learning, and blended learning, m-learning, for ex.) have in common the ability to use a computer connected to a network that offers the possibility to learn from anywhere, anytime, in any rhythm, with any means”. The process of educating others via the internet. Several platforms are exist some are Google products: Gmail, (b) Google Forms, (c) Calendars, (d) G-Drive, (e) Google Hangouts, (f) Google Jam board and Drawings, (g) Google Classroom and other platforms Zoom, Webex, Microsoft teams. In Somalia, WhatsApp becomes of the most of social platform for communication between students, teachers, and parents. With that comes the need to have a smart device and reliable internet connection (Menon & Unni, 2020). The research verifies the theory of reasoned action (TRA). Further, the researcher seeks empirical evidence for the confirmation of theoretical models and constructs under the less-developed country like Somalia. Thus the research questions are: (1) to what extent does internet availability and perceived training effects teacher’s intention to use online classrooms? (2) To what extent does perception of value and attitude affects teacher’s intention to use online classrooms? Theoretical framework and hypotheses

Theory of Reasoned Action

Fishbein & Ajzen (1981) developed the Theory of Reasoned Action (TRA), which posited that behavioral intentions drive individual behavior, which in turn is affected by individuals’ attitudes toward the

behavior and the subjective norms surrounding the performance of the behavior. According to Fishbein and Ajzen, the factors that affect an individual's behavior include: behavioral beliefs, attitude toward the behavior, normative beliefs, subjective norm, behavioral intentions, and actual behavioral control. Figure 2 illustrates the relationships between the factors.

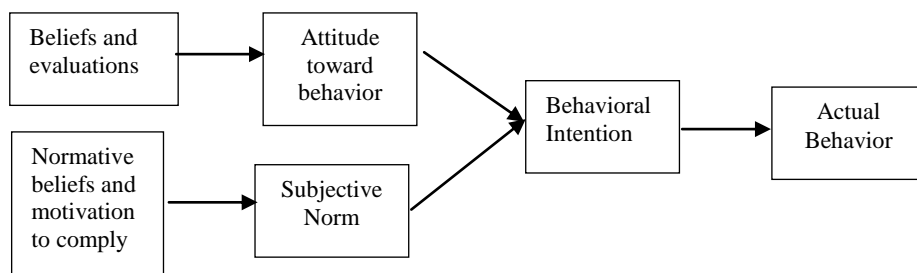


Figure 1. Theory of reasoned action (TRA)

The factors displayed in Figure 1 can be elaborated as follows:

- Behavioral beliefs link the behavior of interest to predicted outcomes. These beliefs and the subjective values of the expected outcomes govern the main attitude toward the behavior.
- Attitude toward a behavior is the degree to which the exhibition of the behavior is valued (positively or negatively).
- Normative beliefs are the perceived behavioral expectations of significant individuals or groups - family or coworkers. The assumptions are that these beliefs, combined with the motivation to comply with the significant individuals or groups, will determine the prevailing subjective norm.

- Subjective norm is the perceived group pressure to be involved or not to be involved in behavior and includes the strength of each normative belief.
- Intentions are indications of a people's readiness to perform behaviors. Intentions are immediate predictors of behaviors and are accredited to attitudes toward the behavior, subjective norms, and perceived behavioral controls. The predictors are valued as significant to the behavior and population of interest.
- Behaviors are the visible responses in situations targets. Theoretically, strong perceived behavioral controls restrain the effect of intention on behavior producing favorable intentions produces the behavior.

Yoon and Kim (2013), propose that the actual behavior is affected by behavioral intention, which is affected by behavioral attitude and subjective norm. The structural equation modeling results revealed that the models performed well in terms of their ability to predict intention.

Internet Availability

From 2002 in Somalia especially Mogadishu, people started using the internet for general purposes such as research and send emails with their counterparts. In 2003 people started using instant messaging like MSN. Eventually, the need for the internet increase in Somalia according to several services such as finance, education, and other main services. The internet connection problem still existing in many cities in Somalia. Therefore, this research proposes internet availability plays an important role in the possibility of the online classroom.

Perceived of Training

Training is an effort initiated by an organization to foster learning among its workers, and development is the effort that is oriented more towards broadening an individual's skills for future responsibility (Engetou, 2017). In the context of the online classroom, training is the degree to which the individuals needed to study the features of the online classroom meeting applications (Zoom, Google Meeting, Team, etc.). Perceived training plays an important role to enhance the teacher's skills related to these platforms. Hence, this research proposed that perceived training has positively related to the teacher's intention to use online classrooms.

Attitude towards Using Online Classroom

In the context of technology usage, attitude is the extent to which an individual is interested in using a system (Cheung & Vogel, 2013). In a study to explain factors affecting their intentions to use technology. Other research identified students' attitudes toward using technology as having a strong effect on their behavioral intentions to use technology (Little, 2017). Therefore, the research posits that attitude plays an important role in the teacher's intention to use online classrooms.

Perceived of Value

Individuals' perceptions of value affect their use of e-learning system (Chang, 2013), the low perceived value of e-learning is one of the obstacles to educators' use of e-learning system (Allen

&Seaman.2013) and educators' perceptions can influence learners' perceptions (Marrs, 2013). Therefore, the study proposes that perceived value effect the teacher's intention to use online classroom.

Intention to Use Online Classroom

According to the Cambridge Advanced learner's dictionary, the word intention is defined as something that you want and plan to do. The intention in an attitude-behavior relationship is influenced by the level of effort required to exercise the behavior (Bagozzi, Yi, & Baumgartner, 1990). Posit that beliefs about outcomes of behaviors, beliefs about resources, and perceived beliefs of referent individuals are antecedents of attitudes and intentions of behavior (Burak et al., 2013). Hence, the research proposes online classroom presentations depend on the teacher's intention to use these platforms.

Based upon the above discussion the researcher formulated the following hypotheses:

- H1:** There should be a positive effect of internet availability and teacher's intention to use online classrooms at secondary school.
- H2:** There should be a positive effect of having training and teacher's intention to use the online classroom at secondary school.
- H3:** There should be a positive effect of perceived attitude and teacher's intention to use online classrooms at secondary school.
- H4:** There should be a positive effect of perceived value and teacher's intention to use online classrooms at secondary school.

2. Methods

Research Design

This is a quantitative study to understand the type of online teaching application use by primary and secondary teachers and their experience taking online classrooms. The researcher followed an explanatory approach to determine the relationship between internet availability, perceived training, perceived value, and attitude to teacher's intention to use online classrooms. An explanatory approach is a method to make people understand something by describing or illustrating. The name itself states that it intends merely to explore the research questions and does not offer final and conclusive solutions to existing problems.

Participant and Sample

The population of the study is 800 of the primary and secondary teachers in Mogadishu – Somalia. but the hundred and fifty teachers were randomly selected. The researcher used kobo toolbox forms to design the questionnaire and administered it via social media platforms to get the responses from the target group. The researcher, therefore, used a simple random sampling technique to administer the study questionnaire to selected individuals after the purpose of the study was explained to them and confidentiality assured. Additionally, the survey software was to restrict the participant's response to a single option and required all questions to be answered before submission, eliminating the issue of double answers and missing data.

Data analysis

The data were collected using a 38 – items survey instrument except 4- items for participant’s profile data included such as teacher’s gender, age, level of education, and method of teachers use when representing online classroom to confirm that the sample represented the population. The items or questionnaire developed using previously validated measurable items. The items included four independent constructs like internet availability, perceived training, attitude, and perceived value which were assessed as indicators of teacher’s intention to use online classrooms. According to Polit, D.F., and Beck (2010), the most common descriptive statistics that are analyzed to describe and summarize data are averages and percentages. The weightings of the responses from research questions computed using means values intervals as options of; Very high (VH) = 4.20-5.00 points; High (H) = 3.40-4.19 points; Moderate (M) = 2.60-3.39 points; Low (L) = 1.80-2.59 points and Very low (VL)=1.00-1.79

. Furthermore, a multivariate analysis was conducted using structural equation modeling (SEM) to explain the effect of the independent variables on the dependent variable.

3. Results and Discussion

Background of Respondents

Table 1 indicates the background of the respondents. The purpose of the background information about the respondents was to verify that the sample was illustrative of the population. Male respondents made up

93.3% of the sample while female made up 6.7%. This indicates that male teachers are more than female teachers at primary and secondary schools in Somalia special in Mogadishu. The majority of the teachers aged between 25- 30 Years (66.0%), 20-25 Years (14.7%), 30-35 Years (28.0%), while the lowest percentage of the teachers aged (35-40 Years (6.0%). For the education level of the teachers , bachelor of education degree(64.7%); bachelor no education degree(23.3%); Diploma (7.3%) and master of education(4.7%). There are several methods for online learning like Zoom App, Google Teams, Microsoft Team and Recorded lessons posted in groups of the students so the majority of the teachers used recorded lessons method(92.7%); Zoom App(4.7%) and Google Team(2.0%).

Table 1 Respondents' Profile (n = 150)

Characteristics	Frequency (N)	Percentage (%)
<i>Gender</i>		
Male	140	93.3
Female	10	6.7
<i>Age(years old)</i>		
20 – 25	22	14.7
25 – 30	77	66.0
30 – 35	42	28.0
35 – 40	9	6.0

Characteristics	Frequency (N)	Percentage (%)
<i>Level of education</i>		
Bachelor No education degree	35	23.3
Bachelor of education degree	97	64.7
Diploma	11	7.3
Master of education	7	4.7
<i>Which method do you use for online teaching?</i>		
Zoom App	7	4.7
Google teams	3	2.0
Recorded lesson and post in the group	138	92.7

Resources and Challenges for Online Classrooms

The two tables below show the results of participants' perception of resources for the online classrooms and challenges. Table 2 revealed that the teachers use the phone with a high level of mean $M = (3.39)$, while they use a laptop for teaching and mobile data and have two facilitators of the internet that can take over the classrooms with low level means $M = (2.26, 1.83)$. However, the grand mean explored that the teachers have resources for the online classrooms with very low levels (1.31).

Table 3 indicates that the teachers have high challenges for the online classrooms. All weighted means of the items except item 2 "Learning over the internet is very limited" WITH $M = (2.11)$, scored up high levels extending (3.66-4.96). The higher challenge facing teachers is "Learning is mainly slow and downwards" with a mean (4.96). while item 2

“Learning over the internet is very limited” is considered the lowest challenge with a mean(2.11). However, the grand mean demonstrates a high level of challenges for the online classrooms (3.8).

Table 2 Resources for Online classrooms

Resources for online classrooms	N	Mean	SD	Decision
I use my phone to take classrooms	150	3.93	1.48	H
I use my laptop for teaching and use mobile data	150	2.26	1.34	L
have two facilitators of internet that can take over the classrooms	150	1.83	0.99	L
Grand Mean		1.31		VL

Very high (VH) = 4.20-5.00 points; High (H) = 3.40-4.19 points; Moderate (M) = 2.60-3.39 points; Low (L) = 1.80-2.59 points and Very low (VL)=1.00-1.79

Table 3 Challenges for Online Classrooms

Resources for online classrooms	N	Mean	SD	Decision
Sometimes there are connection issues, most of students take time to join and we end up wasting time	150	4.02	0.95	H
Learning over the internet is very limited	150	2.11	1.10	L
Learning is mainly slow and downwards.	150	4.96	1.23	VH
I cannot see the expression of the student and I cannot observe them properly.	150	4.12	0.85	H
Students are not focusing the lesson when online classroom.	150	3.74	0.75	H
Unable to check their notes	150	4.02	0.67	H

Resources for online classrooms	N	Mean	SD	Decision
Absolutely terrible for online teaching	150	3.66	0.83	H
School management are cutting my salary	150	4.15	0.52	H
Grand Mean		3.8		H

Very high (VH) = 4.20-5.00 points; High (H) = 3.40-4.19 points; Moderate (M) = 2.60-3.39 points; Low (L) = 1.80-2.59 points and Very low (VL)=1.00-1.79

Structured Equation Modeling

Structural equation modeling technique was applied to detect relationships among constructs. There are two main of modeling: Measurement model testing and structural model testing.

Measurement Model Testing

Using AMOS- SPSS and Excel spreadsheet, the researcher first examined the data to assess the reliability and validity before testing the structural model. Reliability and validity are two important criteria used to assess the quality of a research study and are common methods used to measure research variables (Polit, D.F. and Beck, 2013) The result of the confirmatory factor analysis in table 3 indicated that most items loaded well on their corresponding constructs as suggested by Gefen and Straub (2004) none of the items were less than 0.60. To achieve convergent validity, it should be higher than the limit point suggested by (Kline, 2013). The reliability for this study was calculated using Composite reliability (CR) and Cronbach's alpha. According to Drost (2011), Composite reliability scores should be or higher in research on predictor tests of the construct to indicate internal consistency. The average

variance extracted (AVE) values for all of the constructs were above (Fornell & Larcker, 1981). The below table 3 represents the factor loading, composite reliability(CR), and average variance extracted(AVE) for each construct perceived value(PV), attitude towards using online(ATO), Internet availability(IA), perceived of training(PT), Teacher's intention to use online classroom(IUO). Table 3 Reliability and Validity of the data.

Perceived of value	Loadings	Square of loading	CR	AVE
I use online classrooms to improve my performance	0.854	0.729	0.885	0.566
I use online classrooms to make my teaching easier	0.843	0.710		
I use online classrooms to enhance my effectiveness	0.659	0.434		
I use online classrooms to improve my quality	0.72	0.518		
I use online classrooms to perform my task efficiently	0.82	0.672		
I use online classrooms to meet teaching objectives without difficulty.	0.578	0.334		
Attitude towards using online classroom	Loadings	Square of loading	CR	AVE
I like to use online classroom	0.824	0.678976		
Online classrooms provide an attractive teaching environment.	0.802	0.643204		
Using online classrooms is a good idea	0.769	0.591361		

Perceived of value	Loadings	Square of loading	CR	AVE
Using online classrooms is beneficial	0.529	0.279841	0.894	0.551
Using online classrooms is pleasant	0.723	0.522729		
Using online classrooms is a positive step toward teaching	0.652	0.425104		
Taking online classrooms has helped me to learn new skills	0.850	0.7225		
Internet Availability	Loadings	Square of loading	CR	AVE
I have a low –speed internet connection at home	0.952	0.906304	0.816	0.539
I suddenly lose my internet connection, it disturbs the classroom	0.744	0.553536		
Cost of the internet is cheap	0.652	0.425104		
My school management provides the teachers a laptop with connected internet	0.524	0.274576		
Perceived Training	Loadings	Square of loading	CR	AVE
My school management organized training to deliver online classrooms	0.793	0.628849	0.862	0.515
I intend several workshops on how to teach using online classrooms	0.631	0.398161		
I am familiar with a great deal of the features online classrooms has to offer.	0.586	0.343396		
I have no attended any training on how to use online	0.756	0.571536		

Perceived of value	Loadings	Square of loading	CR	AVE
The School offers(gives) training to the teachers on how to better use online classrooms	0.653	0.426409		
Teachers do self – training to improve their skills of online classrooms.	0.853	0.727609		
Teacher's intention to use online classrooms	Loadings	Square of loading	CR	AVE
I plan to continue using online teaching whenever possible	0.924	0.853776	0.865	0.571
I intend to continue using to learn new software skills	0.739	0.546121		
If I could, I would like to continue my use of online teaching	0.562	0.315844		
I intend to use an online classroom whenever needed	0.65	0.4225		

The above table 3. Therefore, composite reliability tests and average variance extracted are used to verify the reliability and validity of the data. This study range in composite reliability between 0.816 and 0.894 which is highly reliable. Therefore, the results of this study are reliable and can be generalized.

Structural Model Testing

Using AMOS – SPSS, the researcher tested the proposed model. The results in the figure 2 and summarized table 4. The figure 2 below shows the relations between study variables. Arrows are used to point the hypothesized relations between constructs.

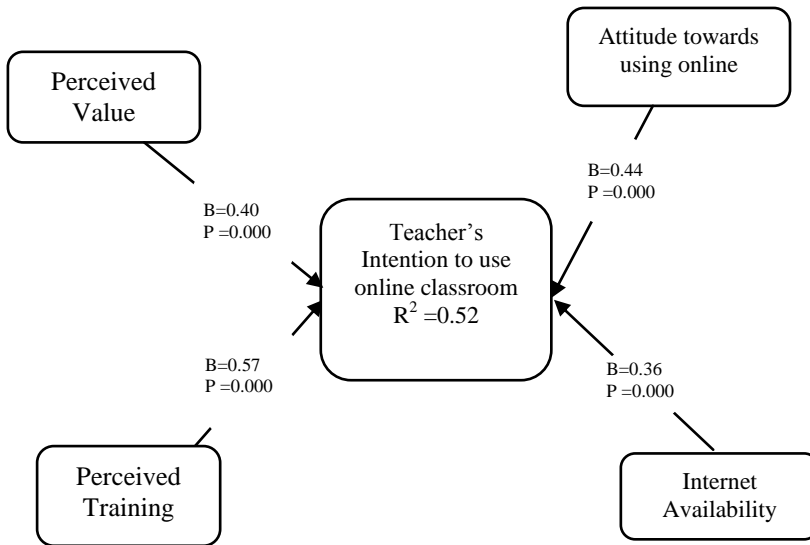


Figure 2 Research Model

Results of structural equation modeling are indicating the positive effect of perceived value, internet availability, perceived training, and attitude towards using online classrooms on the teacher's intention to use online classrooms in secondary schools. Figure 2 shows the coefficient estimate values for study variables which are further explained in Table 4.

Table 4 explains the statistical results of structural model testing analyzed by using AMOS – SPSS software. Arrows in the table show the effect of one construct on another construct. Estimated number (B) is the estimate of the coefficient which shows the values of the effect of one variable on the other variable. Usually, the estimated value is multiplied by 100 to come up with a percentage value for example perceived value has 40% of the impact on the teacher's intention use of the online

classroom. S.E. means Standard Error which represents the average distance from which the observed values fall from the regression line. Smaller values are better because it indicates that the observations are closer to the fitted line. The larger the standard error of the coefficient estimate, the less precise is the measurement of the coefficient. In table 4 standard error values for all the correlations are quite lower which indicates that observations are much closer to the regression line or the average distance of the observed value from the regression is smaller compare to the others. All squared multiple correlations (R-square) must be at least 0.40 (Bollen, 1989). Regarding to the study, the R-square is 0.52 that indicates there is a strongly relationship between variables.

Table 4 structural model testing

			Estimate	S.E.	C.R.	P	Label
Intention	<---	Perceived Value	.404	.117	3.453	***	
Intention	<---	Availability	.362	.087	4.161	***	
Intention	<---	Training	.578	.091	6.351	***	
Intention	<---	Attitude	.436	.098	4.467	***	

C.R. means critical ratio which is measured with t-value or z-value based upon the sample size. C.R is determined by dividing the regression weight estimate and the estimate of its standard error. Intention and perceived value for example $z = \frac{0.404}{0.110} = 3.453$ as well and the rest of the variables. Therefore, C.R. value is used to determine the significance of the results. Moreover, the probability value or P-value is also used for determining the significance of the results. C.R. value and P-value are used to explain the level of significance and to reject the null hypothesis

or to accept the alternate hypothesis. For statistical significance, the absolute value of the C.R is expected to be greater than 2 and the P-value to be less than 0.05 for rejecting the null hypothesis. Usually, the researcher explains the level of significance based upon choosing one value between C.R. and P-value. In Table 4, all the C.R. values are greater than 2 and P-values are less than 0.01. Therefore, by considering the P-value as a parameter, all the relationships are considered significant as P-value is below 0.01.

The following are major findings of the study: (1) perceived value and teacher's intention to use online classroom are positively related; (2) Internet availability is a significant predictor of teacher's intention to use online classroom; (3) perceived of training has a positive relationship to the teacher's intention to use online classroom; (4) Attitude towards using online classroom has strong relationship to the teacher's intention to use online classroom. To conclude, all the relations are significant with a P-value below 0.01. Based on these estimates, all the relationships are positive and significant effect as per hypothesized relations. Depending on the results of table 4, this study accepts all the alternate hypotheses.

Table 5. Summary of support for hypotheses.

Hypothesis	Findings
H1: There should be a positive effect of internet availability and teacher's intention to use online classrooms in secondary school.	Supported
H2: There should be a positive effect of having training and teacher's intention to use online classroom in secondary school.	Supported
H3: There should be a positive effect of perceived attitude and teacher's intention to use online classrooms in secondary school.	Supported

Hypothesis	Findings
H4: There should be a positive effect of perceived value and teacher's intention to use online classrooms in secondary school.	Supported

4. Theoretical and practical contributions

This study has several suggestions for both theory and practice. From the theoretical point of view, there are at least two contributions. First, it identifies two-dimensional elements in the online classroom context: perceived training and internet availability. The finding of the two dimensions provides an important role to teacher's intended use of the online classroom which is particularly important for the success of the online classroom. Second, the theoretical framework presented in this study successfully creates perceived value, attitude towards online use, internet availability, and perceived training through the theory of reasoned action (TRA). The finding of this study shows that the theory of reasoned action provides a theoretical framework of teacher's intention to use online classrooms. The practical implications for this study are that the school managers should build a strategy and models for the online classroom when comes a coronavirus or other emergencies.

Limitation and future studies

Like all other studies, this research has limitations. First, since this study mainly focuses on the effect of perceived training, internet availability, perceived value, attitude, and intention, there are some other factors such as perceived ease of use, usefulness, and enjoyments that influence teacher's intention to use online classrooms. Thus, future

studies can look for other factors affecting online classroom teaching. Second, the sample of this study is only secondary school teachers it needs to include other participants like the ministry of education, school managers, students, and parents. Future research may consider conducting qualitative research to obtain deeper insights into the perception of teacher's intention to use online classrooms.

Conclusion

The study has two main goals. The first is to study the effect of internet availability and perceived training on the teacher's intention to use the online classroom. The second objective was to explore the impact of perceived value and attitude toward using online classrooms on teacher's intention to use the online classroom. Theoretical support of this research for predicting teacher's intention to use online classrooms was provided by the theory of reasoned action (TRA). The reliability, validity of the model, and the correlation among variables were tested using AMOS software and four important factors according to the teacher's intention to use the online classroom. Based on the statistical results, this research concludes that internet availability, perceived training, perceived value, and attitude significantly affect the teacher's intention to use the online classroom.

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***Teachers' Perceptions of Factors Contributing Student
Performance at Secondary Schools in Benadir Region, Somalia***

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Abstract

The study is a descriptive research design to explore the factors the contribute to the Student Performance at Secondary Schools in Benadir Region, Somalia according to the perception of the teachers. 107 teachers from Mogadishu Secondary schools were randomly selected. The author used SPSS for data analysis. According to the findings, sequentially, the Teacher is the most important factor that contributes to a student's performance followed by Parents, School Environment, and Student. Furthermore, all hypotheses of the study were not statistically significant supported. Based on gender, age, or other factors. Finally, the study recommends the factors that may enhance education at secondary schools.

Key Words: Teacher's Perception, Academic Performance, Mogadishu Secondary Schools.

1. Introduction

The study on issues connected to secondary students' academic performance became the topic of significant interest among educators. The student academic performance is an important in having high graduates who will contribute as great leaders and manpower for the country, and thus be essential for its economic and social progress (Ali et.al, 2009). Academic achievement or performance refers to an individual's attainment or acquired competency in a certain skill or body of knowledge (Kaur,2017).

Factors Affecting Academic Performance of the Students

Despite research on the factors affecting student performance, these factors differ from other areas. Several studies have found that a variety of factors influence students' academic achievement, including student and teacher attitudes, study habits, instructor qualifications, and teaching ability.

According to Mart, E. (2003), Academic success is influenced by intellectual level, personality, motivation, abilities, interests, study habits, self-esteem, and the teacher-student relationship.

Teacher

Teachers are fully accountable for translating policy into action, and concepts based on practice during student-teacher interaction as well as

they play a significant role in educational achievement. According to Wamai (1991), one of the most important elements that influence student academic progress is the educational qualification of teachers. Furthermore, if the teacher is ineffective, the students who are under his or her teaching will not make adequate academic progress. Teachers have an impact on students' performance. Competent teachers appear to be effective with students of all ages of achievement, regardless of the individual differences in their classrooms. Teachers, according to Tope and Ometere (2012), are the single most important factor influencing student achievement. The capacity of a teacher to create an interesting learning environment is enhanced by his or her competency.

Parents

Various home factors may have an impact on the student's academic performance. Students' academic performance is highly dependent on parental involvement in their academic pursuits in order to obtain a higher level of quality in academic achievement (Barnard, 2004).

Furthermore, Anythony Abaidoo (2015) discovered a positive relationship between parent education level and gender and academic accomplishment. Parents who are educated can create an environment that is conducive to their children's academic performance (Marzano, 2003).

Another element that influences student performance is the social economic factor, because academic performance is negatively correlated with parents' low socioeconomic status, as it prevents the individual from having access to teaching materials and resources (Lopez, O. S. 1995).

School Environment

The availability of teaching and learning materials, adequate physical facilities, the teacher-student ratio in the classroom, and the school's location all have a significant impact on students' academic performance. Educational achievements in schools are linked to the use and appropriateness of teaching and learning resources in a variety of ways, low educational attainment is caused by poor utilization, underutilization, and unprepared teachers (Johan,2004). Kissau (2006) found that students in both urban and country settings performed similarly. This result is in agreement with Obioma's findings (1989).

Student

Another factor that determines academic achievement is the characteristics of students as well as their attitudes toward learning. Learners' attitude influences their learning performance due to their beliefs and perceptions of the subject matter. Students' characteristics that affect their academic performance come into internal and social elements. Internal elements that influence students' academic success include interest in a subject's substance, internal pleasure, and aspiration (Maric & Sakac,2014).

Student's abilities, willingness to learn, actions done, and problem-solving solutions are all determined by their attitude towards to the subject. It influences the level of commitment, interest, and personal effort required to achieve (Garden & Smith,2001).

The education system in Somalia after the collapse of central government 1991 up to 2021 was dominated by the private sector and the

role of the ministry of education was limited, however, when the period of transition government ended in 2017, the ministry of education come to control and reform the education system in terms of curricula, education policy, and examination system. This led to curriculum unification and holding the central exam for the general secondary certificate. Benadir region where Mogadishu city, Somali capital located in a large city in Somalia in terms of population and education institutions both public and private sector. For the academic year 2020/2021, the most failed students in the exam of the general secondary certificate were from Benadir region as shown in table (1). This problem raised many questions among educators. The researcher felt the necessity of searching the solution to this problem to find out the most factors that influence students' performance at secondary schools in Benadir Region, Somalia.

Table (1) Results of the Examination for the General Secondary Certificate in Academic Year 2019/2020 as the Hierarchy of Regional Administrations and Banadir Region.

The hierarchy of regional administrations and Banadir region					
No	Name of State	Number of Students	Passed	Failed	Average Points of Students marks
1	Jubaland	991	987	4	77.00%
2	Galmudug	2,020	1,987	33	74.31%
3	K. Galbeed	3,363	2,886	477	71.58%
4	H. Shabeelle	1,904	1,741	163	70.08%
5	Banaadir	25,449	17,576	7,873	63.81%

Source: Ministry of education 2020

Table (1) indicates the Somali Secondary school certificate performance results for academic 2019/2020 in the hierarchy of regional administrations and the Banadir region. The most failed students were from Banadir (7,873) students. The highest average point of total student's marks obtained by Jubaland State (77%,) while the Banadir Region has 63.81%. This shows that the performance of the students in the Banadir region is lowest rank.

Objectives of the Study

Main objectives: main objective of the study is to explore Teacher's Perception of Factors Contributing Student Performance at Secondary Schools in Benadir Region, Somalia

The specific objectives of this study are to:

Determine the effect of teachers, students, parents and environment on the Student Performance at Secondary Schools in Benadir Region, Somalia according to the perception of the teachers.

1. Find out the variance of perception of teachers at a statistically significant level ($\alpha=0.05$) in terms of gender, age, experience, and Education level at Mogadishu Secondary Schools.

Study Questions: this study sought to answer the following questions:

1. What are the most factors that Contribute to Student Performance at Secondary Schools in Benadir Region, Somalia according to the variables of the teachers, students, parents, and environment?
2. Is there a statistically significant difference at level ($\alpha=0.05$) in the perception of teachers at Secondary Schools in Mogadishu? according to the gender, age, experience and level of education?

Hypotheses of the study: the researcher formulated the following component hypothesis to ensure if there are variances in teachers' perception of the factors that Contribute to Student Performance at Secondary Schools in Benadir Region, Somalia according to the gender, age, experience and level of education.

Methodology

The study adopted a descriptive research design to discover the Teacher's perception of factors causing poor Performance among Graduate Students at Mogadishu Secondary Schools. The random sampling technique was applied to draw the sample size of 107 teachers.

The questionnaire was the research instrument used for data collection. The questionnaire was made up of 22 items. The construction of the questionnaire was guided by research questions and based on the five -points rating scale of Strongly Agree (5), Agree (4) Neutral (3) Disagree (2), and (1) strongly disagree, The weight of the responses from research questions were computed using means values intervals as options of; Very high = 4.20-5.00 points; high = 3.40-4.19 points; moderate = 2.60-3.39 points; slightly = 1.80-2.59 points and not at all =1.00-1.79 points. For the reliability of the instrument that the researcher established by using SPSS, the result showed a high level of acceptance with (0.898) For the data analysis, a descriptive analysis was carried out built on mean and standard deviations of the items as well as ANOVA in SPSS to determine the variance among respondents by testing hypotheses pre-stated by the researcher.

Results and Discussion

Demographic Characteristics of Respondents

The characteristics of the sample respondents were categorized into Gender, Age, Experience and Educational level variables.

Table 2. Gender

Gender	Frequency	Percent %
Male	102	94.4
Female	5	4.6
Total	107	99

The above table (2) shows that the male teachers in the study represent 102 (94.4%) while the female stands for 5 (4.6%). However, this means the number of female teachers in secondary schools in general, and particularly in Mogadishu schools, is less than the number of male.

Table 3. Age

Age	Frequency	Percent %
25-30	75	70
31-40	25	23
41 and above	7	7
Total	107	100

Table (3) summarizes the age of teachers. 25-30 of respondents represent 70% while 31-40 stands for 23%, and 41 and above represent the lowest percentage. 7%.

Table 4. Experience

Experience	Frequency	Percent %
Less than 5 years	46	43
6 to 10 years	61	57
Total	107	100

The above table (4) indicates that teachers' experience is less than 5 years with the number 46 (43 %) while 6 to 10 years stands for 61 (57%), so the most experienced are those who have been working at least 6 to ten years.

Table 5. Educational level

Educational level	Frequency	Percent %
Secondary school	4	4
Diploma	3	3
Bachelor	100	93
Total	107	100

Table (5) summarizes that level of education that the respondents are categorized into Seconder School, Diploma, and Bachelor, where the latter which scored up 100 (93%), the second rank is Secondary School 4 (4%) whereas the third is Diploma with 3 (3%).

Analysis of the Research Questions

Research Question: What are the most factors that Contribute to Student Performance at Secondary Schools in Benadir Region, Somalia according to the variables of the teachers, students, parents, and environment?

Table 6. Results of Teacher Variable

Items	Statement	Mean	Std. Deviation	Decision
Q1	Teachers' professional qualifications affect students' performance.	4.70	.536	Very high
Q2	Teachers' teaching methodologies have a great effect on students' academic performance	4.63	.575	Very high
Q3	Teachers' mastery of the subjects effects students' academic performance.	4.70	.499	Very high
Q4	The use of relevant teaching materials affects students' academic performance.	4.21	.789	Very high
Q5	Teacher's follow up during the teaching and learning process enhances students' academic performance.	4.06	.930	High
Q6	Continuing assessment during the teaching and learning process has a great role in students' academic performance.	4.36	.794	Very high
Q7	The Teacher –parent relationship highly effects students' academic performance.	4.21	.988	Very high
Grand mean		4.41	.265	Very high

Very high = 4.20-5.00 points; high = 3.40-4.19 points; moderate = 2.60-3.39 points; slightly = 1.80-2.59 points and not at all =1.00-1.79 points.

The above table (6) showed that item one and two are the highest ones (Teachers' professional qualifications affect students' performance) has a mean of 4.70 and standard deviation (.536) and (Teachers' mastery of the subject effects students' academic performance.) has mean of 4.70 and standard deviation (.499) while factor item seven (The Teacher – parent relationship highly effects students' academic performance) has a mean (4.21) and standard deviation (.988) is the lowest factor item.

A competent instructor, according to the researcher, is key to a student's success. 'Students taught by teachers without qualifications indicate poorer average growth scores than students taught by teachers with standard certification,' according to Karin (2004). Teachers' teaching education and skills, according to Strauss and Vogt (2001), are important.

The findings, on the other hand, showed that subject mastery by teachers is an important aspect of the teaching and learning process. This result is supported by Monk and King (1994), who demonstrated that teachers' subject-matter mastery has an impact on students' achievement. The grand mean of all items reached very high level (4.41).

Table 7. Results Parents Variable

Items	Statement	Mean	Std. Deviation	Decision
Q1	The level of parents' education affects students' academic performance.	4.19	.826	High
Q2	The relationship between parents and students at home improves students' academic performance.	4.50	.732	Very high
Q3	The level of follow-up by the family affects students' academic performance.	4.11	.861	High
Q4	Parents' socio-economic status influences their children's academic performance.	3.79	1.097	High
Q5	Parental perception of educational value supports students' academic performance	4.34	.846	Very high
Q6	The degree to which parents monitor their children's progress has a significant impact on their academic performance.	4.24	.822	Very high
Q7	Parents' motivation for their children highly contributes to their academic performance.	4.50	.664	Very high
Q8	Family conflict has a negative impact on students' academic performance.	4.15	1.080	High
Grand mean		4.23	.231	Very high

Very high = 4.20-5.00 points; high = 3.40-4.19 points; moderate = 2.60-3.39 points; slightly = 1.80-2.59 points and not at all =1.00-1.79 points.

The result on the table (7) showed that item two and item seven are the highest ones (The relationship between parents and students at home improves students' academic performance) has a mean of 4.50 and standard deviation (.736) and (Parents' motivation for their children highly contributes to their academic performance) has mean of 4.50 and standard deviation (.664). The findings demonstrate that having a positive relationship with one's parents at home increases academic success. This result is in line with Hara & Burke (1998) discovered that parental involvement in a child's early schooling is consistently associated to a child's academic success.

Chukwudi, O.C. (2013) investigated the impact of the family environment on secondary school academic performance in Nigeria opined that Parents with the strong educational background are more likely to encourage their children to participate in their academic work, which improves student achievement, according to the study's findings.

Furthermore, the analysis shows that parents' motivation for their children has an impact on their academic performance, which supports, Deci and Ryan's (1985) found that once students are motivated, they may have a strong desire to achieve their life goals. Students obtain school-based competency, a desire to learn, and the ability to improve their learning. However, the grand mean of all items made up very high scores (4.23).

Table 8. School Environment Variable

Items	Statement	Mean	Std. Deviation	Decision
Q1	The availability of teaching and learning resources has a great effect on students' academic performance	4.20	.840	Very high
Q2	Appropriate Physical Facilities affect the performance of the students	3.83	.995	High
Q3	The teacher-student's ratio in the classroom affects the performance of the students.	4.06	.899	High
Q4	The location of the school has an impact on the performance of the students.	3.76	1.063	High
Grand mean		3.963	0.2037	High

Very high = 4.20-5.00 points; high = 3.40-4.19 points; moderate = 2.60-3.39 points; slightly = 1.80-2.59 points and not at all =1.00-1.79 points.

Table (8) showed that item one is the highest one (The availability of teaching and learning resources has a great effect on students' academic performance) has a mean of 4.20 and standard deviation (.840), while the rest of the items got the level of (High). The grand mean of all items scored up the level of 'High' (0.3.96).

Table 9. Student Variable

Items	Statement	Mean	Std. Deviation	Decision
Q1	Characteristics of students contribute to their performance.	3.60	1.106	High
Q2	Students' attitudes towards learning affect their performance.	4.18	.845	High
Q3	Keeping the Educational Ladder for the students during the schooling process affects their performance	3.91	.896	High
Grand mean		3.897	.2902	High

Very high = 4.20-5.00 points; high = 3.40-4.19 points; moderate = 2.60-3.39 points; slightly = 1.80-2.59 points and not at all =1.00-1.79 points.

Table (9) showed that item two is the highest one (Students' attitudes towards learning affect their performance) has a mean of 4.18 and standard deviation (.845) while item three (Keeping the Educational Ladder for the students during the schooling process affects their performance) has a second rank with meant (3.91) and standard deviation (.896) is the lowest factor item. However, the grand mean showed a 'High' level (3.897). Based on the preceding analysis, according to Maric and Sakac (2014), students' characteristics that affect their academic achievement can be classified into internal and social aspects. According to the research, internal elements that influence students' academic accomplishment include interest in the subject's substance, internal comfort, and aspiration.

According to some of the studies, a student's capacity, motivation to study, actions done, and problem-solving solutions are all influenced by their attitude toward the subject including the level of commitment, ambition, and personal effort required to succeed. (Smith,2001)

Table 10. Comparative Statistics among Grand Means of the Factors of the Study

Factors	Grand Mean
Teacher	4.41
Parents	4.23
School	3.96
Student	3.897

Very high = 4.20-5.00 points; high = 3.40-4.19 points; moderate = 2.60-3.39 points; slightly = 1.80-2.59 points and not at all =1.00-1.79 points.

Table (10) shows that the factor 'teacher') got the highest rank (4.41), 'Parents second rank (4.23), and the third rank gained by 'School' (3.96), while the factor 'Student' obtained the fourth rank.

Table 11. Correlation Matrix among the variables

Correlations					
		Teacher	parents	School Environment	Graduate Students
Teacher	Pearson Correlation	1	.690**	.559**	.452**
	Sig. (2-tailed)		.000	.000	.000
	N	107	107	107	107
Parents	Pearson Correlation	.690**	1	.608**	.558**
	Sig. (2-tailed)	.000		.000	.000
	N	107	107	107	107
School Environment	Pearson Correlation	.559**	.608**	1	.574**
	Sig. (2-tailed)	.000	.000		.000
	N	107	107	107	107
Student	Pearson Correlation	.452**	.558**	.574**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	107	107	107	107
**. Correlation is significant at the 0.01 level (2-tailed).					

Table (11) shows correlation analysis among variables. The results showed a positive relationship among the four variables, and all P-values in the table (.000) are less than (0.01)

Testing Hypotheses

The researcher demonstrates below testing the hypotheses pre-stated to determine whether they supported/ accepted or rejected:

Hypothesis (1): There is a statistically significant difference at level ($\alpha=0.05$) among the perceptions of teachers based on Gender to the factors that contribute to the academic performance for the Students at Secondary Schools in Benadir Region, Somalia.

Table 12. Results of Hypothesis (1) Related to the Gender

ANOVA							
		Sum of Squares	DF	Mean Square	F	Sig.	Decision
Teachers	Between Groups	2.025	1	2.025	.236	.628	Rejected
	Within Groups	901.804	105	8.589			
	Total	903.829	106				
Parents	Between Groups	19.797	1	19.797	1.313	.254	Rejected
	Within Groups	1582.618	105	15.073			
	Total	1602.415	106				
School Environment	Between Groups	5.528	1	5.528	.988	.322	Rejected
	Within Groups	587.288	105	5.593			
	Total	592.817	106				
Student	Between Groups	3.838	1	3.838	1.264	.263	Rejected
	Within Groups	318.735	105	3.036			
	Total	322.573	106				

The summary of the result presented in Table (12) indicates that there is no significant difference in perception between male and female teachers towards the factors that contribute to the academic performance for the Students at Secondary Schools in Benadir Region, Somalia due to all P-values are greater than ($\alpha=0.05$). thus, the null hypothesis was accepted.

Hypothesis (2) There is a statistically significant difference at level ($\alpha=0.05$) among the perceptions of teachers based on the Age to the factors that contribute to the academic performance for the Students at Secondary Schools in Benadir Region, Somalia.

Table 13. Results of Hypothesis (2) Related to the Age of Teachers

ANOVA							
		Sum of Squares	DF	Mean Square	F	Sig.	Decision
Teachers	Between Groups	4.309	2	2.154	.249	.780	Rejected
	Within Groups	899.520	104	8.649			
	Total	903.829	106				
Parents	Between Groups	10.643	2	5.321	.348	.707	Rejected
	Within Groups	1591.772	104	15.306			
	Total	1602.415	106				
School Environment	Between Groups	3.035	2	1.517	.268	.766	Rejected
	Within Groups	589.782	104	5.671			
	Total	592.817	106				
Student	Between Groups	.909	2	.455	.147	.863	Rejected
	Within Groups	321.664	104	3.093			
	Total	322.573	106				

The result shown in Table (13) indicates that there is no significant difference in perception between teachers based on their age to the factors that contribute to the academic performance for the Students at Secondary Schools in Benadir Region, Somalia due to all P-values are greater than ($\alpha=0.05$). thus, the alternative hypothesis was rejected and null hypothesis was supported.

Hypothesis (3) There is a statistically significant difference at level ($\alpha=0.05$) in the perception of teachers based on their experience to the factors that contribute to the academic performance for the Students at Secondary Schools in Benadir Region, Somalia

Table 14. Results of Hypothesis (3) Related to Teachers Experience

ANOVA							
		Sum of Squares	DF	Mean Square	F	Sig.	Decision
Teachers	Between Groups	2.907	1	2.907	.339	.562	Rejected
	Within Groups	900.921	105	8.580			
	Total	903.829	106				
Parents	Between Groups	.073	1	.073	.005	.945	Rejected
	Within Groups	1602.342	105	15.260			
	Total	1602.415	106				
School Environment	Between Groups	.001	1	.001	.000	.989	Rejected
	Within Groups	592.815	105	5.646			
	Total	592.817	106				
Student	Between Groups	.032	1	.032	.010	.919	Rejected
	Within Groups	322.541	105	3.072			
	Total	322.573	106				

The result illustrated in Table (14) shows that there is no significant difference in perception between teachers based on their experiences to the factors that contribute to the academic performance for the Students at Secondary Schools in Benadir Region, Somalia due to all P-values are greater than ($\alpha=0.05$). thus, the alternative hypothesis was nor supported and null hypothesis was supported.

Hypothesis (4): There is a statistically significant difference at level ($\alpha=0.05$) in the perception of teachers based on their educational level to the factors that contribute to the academic performance for the Students at Secondary Schools in Benadir Region, Somalia.

Table 15. Results of Hypothesis (4) Related to Educational Level of the Teachers

ANOVA							Decision
		Sum of Squares	DF	Mean Square	F	Sig.	
Teachers	Between Groups	24.806	2	12.403	1.467	.235	Rejected
	Within Groups	879.023	104	8.452			
	Total	903.829	106				
Parents	Between Groups	73.186	2	36.593	2.489	.088	Rejected
	Within Groups	1529.229	104	14.704			
	Total	1602.415	106				
School Environment	Between Groups	9.068	2	4.534	.808	.449	Rejected
	Within Groups	583.749	104	5.613			
	Total	592.817	106				
Student	Between Groups	3.980	2	1.990	.650	.524	Rejected
	Within Groups	318.593	104	3.063			
	Total	322.573	106				

The result displayed in Table (15) shows that there is no significant difference in perception between teachers based on their education level to the factors that contribute to the academic performance for the Students at Secondary Schools in Benadir Region, Somalia due to all P-values are greater than ($\alpha=0.05$). thus, the alternative hypothesis was not supported and null hypothesis was supported.

Conclusion and Recommendations

Based on the objectives of the study concerning the factors that contribute to the students' performance at secondary schools in Benadir Region, Somalia, the results of the data collected from the perception of the teachers revealed that all grand means of the items of the factors, namely; Teacher, Parents, Student, and School Environment scored up a high level of importance to contribute to the students' academic performance. Furthermore, all hypotheses of the study were tested and showed that there is no statistically significant difference among teachers' perceptions towards the factors in terms of their gender, age, experience, and Recommendations.

It is hereby recommended that:

- The Ministry of education should provide criteria for teacher recruitment and selection based on qualifications and skills.
- Ministry of education should create, distribute, and enforce standards to guarantee that all providers (public and private) adhere to the regulations.
- The importance of having qualified teachers in the field of education should be underlined.
- Private and public schools should work together to enhance teaching and learning process in line with National and International standards.

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***Rainwater Harvesting at Mogadishu University Main
Campus: Key Sustainability for Saving Water***

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Abstract

The largest environmental challenge that Somalia faces today is the scarcity of water. Many methods have been suggested to increase the sources of water supply; one alternative source is rainwater harvesting, in the absence of run-off sewer systems in most Somalia rural and urban areas, rainfall harvesting from roads, parking lots, and rooftops can increase water supply for various domestic uses and help struggle the chronic water shortages in the country. This paper presents a feasibility analysis of rainwater harvesting systems for the Mogadishu University Main campus. The results show that a maximum of 15.5 480 m³/y of rainwater can be collected from the roof Faculty of Education buildings provided that all surfaces are used and rain falling on the surfaces is collected. Also, results indicate that in stations like engineering,

education, and health science buildings where rainfall water is scarce, and cannot meet up demand per annum, a large catchment roof area is required to improve the collection of water to meet the demand within these buildings. The administration building only meets up the demand per annum. It should be noted that roof rainwater harvesting is only able to provide sufficient water Gardenias and vegetable plots. Finally, this research offers some recommendations to overcome the present challenges as well as to guide future development projects, donor communities, and the Government of Somalia to improve the rainwater and sanitation situation in Mogadishu Main Campus. Therefore, a great potential for exploitation of rainwater harvesting from building roofs is possible at Mogadishu University-Main Campus.

Keywords: Water harvesting; Water supply; Rainwater; Household; Water savings; Mogadishu University Main Campus.

1. Introduction

Definition of rainwater harvesting is defined as a method for inducing, collecting, storing, and conserving local surface runoff for agriculture in arid and semi-arid regions (Boers, Th M, and Ben-Asher, 1982). The hydrological cycle of water movement involves the greatest flow of any substance in the biosphere(JACKSON, 2001). Society must move toward the objective of effective and adequate use of water for a sustainable urban future. Rainwater harvesting plays a major role in this mission (Abdulla & Al-Shareef, 2009). In Germany a study performed by (Herrmann & Schmida, 2000) showed that the potential of potable water saving in a house might vary from 30% to 60%, depending on the

demand and roof area. (Coombes & Kuczera, 2002) analyzed 27 houses in Newcastle and concluded that rainwater usage would promote potable water saving of 60%.

In Brazil, a study performed by (Ghisi, Montibeller, & Schmidt, 2006) showed the potential water saving by using water harvesting in 62 cities ranges from 34% to 92%, with an average potential for potable saving of 69%. Rainwater harvesting is a technology used for collecting and storing rainwater from rooftops, land surfaces, road surfaces, or rock catchments using simple techniques such as pots, tanks, and cistern as well as more complex techniques such as underground check dams (Abdulla & Al-Shareef, 2009). A sustainable source of clean water that is suitable for domestic and landscape uses is collected rainwater. Structural stormwater management involves reducing the volume and contaminants from small storms by capturing and reusing stormwater, such as rainwater harvesting systems, detention and retention systems, green roofs, porous surfaces, and bioswales, increasing infiltration and evaporation, among two main categories of structural and non-structural methods of stormwater management. No management of structural stormwater decreases the amount of runoff, primarily by conserving natural areas (Ranasinghe, 2019)

1.2 Importance of Rainwater Harvesting

Campisano, Gnecco, Modica, & Palla, (2013) examined the performance of a domestic RWHS for toilet flushing in 44 Italian cities by using a non-dimensional approach characterized by a demand and storage fraction. Regression curves were developed to describe the

relationship between the water-saving efficiency and the modified storage fraction that allowed the RWHS systems to be sized based on the desired water-saving performance level.

Ghisi & Schondermark, (2013) An RWHS investment feasibility study for the residential sector for five cities in the state of Santa Catarina, Southern Brazil, was presented. They observed that the ideal tank capacity would be conservative for high rainwater demands and in such cases an investment feasibility analysis should be carried out in order to obtain a more appropriate tank capacity. Supplying adequate water to meet social needs and ensuring equity in access to water, particularly in urbanized regions is a subject of concern. Among the various alternative technologies to increase freshwater resources, rainwater harvesting is one of the decentralized and environmentally sound solutions (UNEP, 2002). Numerous advantages and benefits of rainwater harvesting have been described by previous researchers (Jackson, 2001); This is enough to see rainwater harvesting as a countermeasure to the management of water supplies and flood control during the climate change crisis. Despite having some obvious advantages over other outlets, because of its limited capacity or water quality issues, rainwater use has not been widely acknowledged. It is very important to quantitatively assess its effectiveness on multiple variables, such as flood control and water availability, to encourage rainwater harvesting effectively. (Kim & Furumai, 2012). DRWH has recently become an important activity in water resource management worldwide, especially for urban and suburban areas affected by limited freshwater availability. Rainwater harvesting systems can also mitigate the impact of sewer storm water

flows, as these systems are usually fitted with storage tanks to absorb and store amounts of rainfall (Campisano et al., 2013).

For many domestic uses, such as toilet flushing and garden watering, rainwater may replace potable water (Campisano et al., 2013), Literature research has shown that the housing demand for toilet flushing can achieve up to 30% of the household consumptions, thus suggesting significant water-saving benefits from the implementation of DRWH systems (Mukhopadhyay & Akber, 2001).

The rainwater harvesting system has been seen as a sound alternative water source technique for increasing water supply capacities (Hatibu & Mahoo, 1999). Urban development and rising demand for water put stress on current water supplies. Attention is now focusing on alternatives such as rainwater catchment systems as supplementary water sources with multi-purpose functions. Roofs constitute a significant proportion of the large impermeable areas protected by towns, thereby providing a significant opportunity to gather rainwater (Villarreal & Dixon, 2005).

Although rainwater harvesting has been historically used in areas where water supply was limited by climate or infrastructure issues, more recently such a practice has been undertaken also in humid and well-developed regions to mitigate the environmental impact on freshwater sources and also to reduce stormwater runoff volumes manage urban flood risk and decrease urban waterlogging problems (Mitchell, Deletic, Fletcher, Hatt, & Mccarthy, 2007).

An integrated urban stormwater harvesting system should provide five core functions: (a) collection, (b) treatment, (c) storage, (d) flood and

environmental flow protection, and (e) distribution to end-users (Mitchell et al., 2007).

Rainwater Harvesting (RWH) can be used in this scenario as one of the best climate adaptation methods for water conservation (Julius & Prabhavathy, 2013). Rainwater harvesting is a simple low-cost process that collects, stores, and reuses rainwater, requiring minimal specific knowledge and expertise (Ranasinghe, 2019)

1.3 Research Objectives

The present study emphasizes the value of roof rainwater harvesting systems at Mogadishu University-Main Campus for domestic water supply. The objectives of this paper are to:

1. Evaluate the potential for water savings by using rainwater in different sector of the campus buildings
2. To investigate quantitatively the effectiveness of rainwater harvesting in supplying water for selected usages (toilet flushing, air conditioning, garden irrigation, and cleaning) indifferent building types
3. To recommend future utilization rainwater harvesting for domestic water supply.

1.4 Significant of Research

The RWHS is used to conserve mains water in urban areas, where the supply of mains water is present. As water is becoming scarce, it is important to achieve self-sufficiency to fulfil the water needs of the day. Problems are when all of the water becomes surface runoff when the rain

falls. Surface runoff from the source of rainwater harvesting must be decreased. The Greater attraction of a rainwater harvesting system at Mogadishu University's main campus is the low cost of rainwater harvesting and utilization. Rainwater harvesting is used for collecting and storing rainwater from rooftops at Mogadishu University-Main Campus. The potential rainwater harvesting volume is estimated based on the total roof area, the average annual rainfall, and the runoff coefficient.

2. Materials and Methodology

It was necessary to obtain rainfall data, potable water supply, student number, and dwellings in each building to achieve the objectives set out above. The study covers faculties Engineering, Education and Computer science, and Health Sciences buildings as well as and Administration building. The total roof area in each building was calculated based on the average area of different dwellings and their number. Based on the total roof area, the average annual rainfall, and the runoff coefficient, the possible rainwater harvesting volume is estimated. Then the potential saving percentage is calculated by dividing the potential volume of harvested rainfall by the annual domestic demand. Data on population and number of dwellings was needed to calculate the number of people per dwelling in each building on the campus. The amount of water that can be harvested was calculated according to the equation: Water supply = Rainfall (mm/year) x area of the catchment (nr) x runoff coefficient (n)

2.1 Calculation of Potential of Collectable Rainwater

The capacity of collectible rainwater in a region depends on the amount of rainfall, the distribution of rainfall in different seasons, the

quantity of water, the area of rainwater collection, and the coefficient of surface runoff. Rainfall is not spread uniformly over various seasons and is typically concentrated in monsoon climate zones in certain months (rainy season). Due to the amount of rainfall in some rainfall events is not enough to form runoff in some months, the seasonal loss coefficient (the ratio of rainfall in the rainy season to annual rainfall) should be taken into account in the calculation of the potential of collectible rainwater.

2.3 Designing Rainwater System

For the design of a rainwater harvesting system, rainfall data is needed for a period of at least 10 years. The more accurate and precise the data is, the better the design would be for the area. Due to socio-economic conditions and different uses of domestic water, water consumption and demand for domestic purposes are also expected to vary across these regions. People may use as little as a few litres per day. A 20 lpd (gallons or capita per day) is the commonly accepted minimum (WHO, 2004). (Jo, 2003) suggested that water demand can be computed from the following expression: $\text{Water Demand} = 20 \times n \times 365$ litres / year, with n = number of people in the household.

2.4 Coefficient of Use

The coefficient of use represents the percentage of rainwater that can be captured and used in the building. A coefficient of use of 80 % was applied in all of the campus buildings because of concrete roof. Thus, losses of 20 % of the rainwater that is discarded for roof cleaning and evaporation.

2.5 Water harvesting potential of a site

The supply of rainwater depends on annual rainfall, the surface of the roof and the runoff coefficient. Table 1 gives types of catchments material and their runoff coefficient.

Table 1: Types of catchments materials and runoff coefficients
(Adapted from (Adrain, 1989))

Type of catchments	Materials	Runoff coefficients (n)
Roof catchments	Tiles	0.8-0.90
	Corrugated metal Sheets	0.7-0.90
Grand surface coverings	Concrete	0.6-0.80
	Brick pavement	0.5-0.60
Untreated ground catchments	Soils on slope less than 10 percent	0.0-0.30
	Rocky natural catchments	0.2-0.50
	Green area	0.05-0.1

Based on the above factors, the water harvesting potential of an area could be estimated using Equation 1: Water supply = Rainfall (mm/year) x area of catchment (nr) x runoff coefficient (n)

Rainwater collected from the top of the roof/catchment area collectively considered the volume of storm water controlled in the area, assisted by local mitigation of flash floods.

Table: 2 Building Parameters

Building Name	Width (m)	Length (m)	Area (m ²)
Faculty of Engineering	22	46	1,012
Faculty Health Science	29	40	1,160
Faculty Education	30	50	1500
Administration apartments	38	38	1,444

3.0 Result and Discussion

This chapter presents the research results and analysis of the first two research objectives and discussion for all parts

3.1 Water Demand Calculations

Engineering Building

There is an average of 250 students in the compound, and then water demand for engineering building will be:

Water demand = $20 \times n \times 365$ litres/year, n = number of students in the building;

Water demand = $20 \times 250 \times 365 = 1,825,000$ litres/year for the engineering building which is about 152,083 litres/month. This implies that for a given dry period of six months, the required minimum storage capacity will be 912,499 liters (228,124 gallons). This is however a rough estimate of 1 gall = 4 litres.

For a concrete roof of 572 m² and a runoff coefficient of 0.8.

Water supply = $400 \times 572 \times 0.8 = 183,040$ litres/years (45,760 gallons/year).

To compute that of Education building, the average of 700 students in the compound. Water demand for the building will thus be:

Water demand = $20 \times 700 \times 365 = 5,110,000$ litres/year which is about 851,666 litres/month the required minimum storage capacity will be 5,109,999 litres (1,277,499 gallons/year).

Water supply = $400 \times 1500 \times 0.8 = 480,000$ litres/years (120,000 gallons/year).

To compute that Health science building, the average students is 700 the water demand for the building will thus be:

Water demand = $20 \times 700 \times 365 = 5,110,000$ litres/year which is about 851,666 litres/month the required minimum storage capacity will be 5,109,999 litres (1,277,499 gallons/year).

Water supply = $400 \times 1,160 \times 0.8 = 371,200$ litres/years (92,800 gallons/year).

The administration building, assume that there is an average of 50 people in the building, then water demand for administration building will be:

Water demand = $20 \times 50 \times 365 = 365,000$ litres/year which is about 30,416 litres/month the required minimum storage capacity will be 182,499 litres (45,624 gallons/year).

Water supply = $400 * 1,444 * 0.8 = 462,080$ litres/years (92,800 gallons/year).

Table: 3 Estimated Values for Average Water Demand Required, Minimum Storage Runoff Coefficient and Water Harvesting Potentials

Building	Roof Area (m ²)	Average rainfall (mm)	Runoff coefficient of concrete	Water demand per average of Students in building	Water demand for a household litres/month	Required minimum storage capacity	Water harvesting potential of each litres/gallon station (rainwater supply) litres/annum
Engineering campus	1,012	400	0.8	1,825,000	152,083	912,499	183,040
Education campus	1500	400	0.8	5,110,000	851,666	5,109,999	480,000
Health science campus	1,160	400	0.8	5,110,000	851,666	5,109,999	371,200
Administration building	1,444	400	0.8	5,109,999	30,416	182,499	462,080

Table 3 presents estimated values of water harvesting potentials for the four building stations at the Mogadishu University. From Table 3, it could be seen clearly that for a roof area of engineering 572 m² and an average rainfall of 400 mm, a person can gladly store 183,040 liters, which is above the maximum storage requirement of 912,499 liters for a six-month duration of dry months in the engineering building. Also, in the case of education building, it will be observed that a person can gladly store 480,000 liters/year which is above the minimum storage requirement for a household of 5,109,999 liters for six dry months.

Results also indicate that stations like engineering, education, and health science where rainfall water is scarce, and cannot meet up demand per annum, large catchment roof areas are required to improve the collection of water to meet the demand within these buildings. Administration building a person can gladly store 462,080 liters, which is below the maximum storage requirement of 182,499 for six dry months. Therefore, the administration building only meets up the demand per annum. It should be noted that roof rainwater harvesting is only able to provide sufficient water for a small vegetable plot. Such rainwater collection is strongly recommended for practice in Mogadishu University-Main Campus.

4. Conclusion and recommendation

Great potential for exploitation of rainwater harvesting from building roofs is possible at Mogadishu University-Main Campus. Results show that a maximum of 15.5 480 m³/year of rainwater can be collected from the roof faculty of Education buildings provided that all surfaces are used and all rain falling on the surfaces is collected. There is a need to improve understanding of the social impact, potential, and performance of partial rainwater harvesting as practiced by educational institutional campuses in the city, assessing its cost and benefits, and improving the domestic roof rainwater harvesting technology itself. The results of this study provide useful information for the further development of the rainwater harvesting program in Mogadishu.

Based on the findings of the elaborations, the following recommendation emerges:

1. To improve understanding of the social effects, capacity, and efficiency of partial rainwater harvesting as practiced in small houses by families, evaluate its costs and benefits and enhance the technology of domestic roof rainwater harvesting itself.
2. Rainwater harvesting cannot only provide a source of water to increase water supplies but also can involve the public in water management.
3. Policymakers should consider new domestic rainwater harvesting policies and improve and implement existing legislation and policies in Somalia on domestic or site-specific rainwater harvesting systems.
4. State or municipal codes need to address public health concerns by specifying water quality

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***Factors Affecting Academic Achievement of the Foreign
Undergraduate Students at Sudanese Universities
“A Case Study of Somali Students”***

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Abstract

The present study investigated factors affecting the academic achievement of undergraduate Somali students at Sudanese universities. A sample of 169 participants was selected with non-probability sampling and data collected through a questionnaire. The study employed descriptive and inferential statistical analyses. The findings of the study revealed insignificance of gender and residence concerning the academic achievement of students. However, the analysis indicated the statistical significance of age and year of study. Moreover, the study concluded insignificance of institutional factors and study habit factors. The findings of this study have important implications for higher education

institutions in general and for the lecturers and instructors whom they are entrusted to enhance the academic performance of the students. Thus, the researcher has recommended at the end of the study some measures that can be taken into consideration to enhance the academic achievement of undergraduate students and foreign students in particular.

Key words: factors, Academic Achievement, Foreign Student/ International Student, Undergraduate Student, Sudanese Universities, Somali Students.

Introduction

The postsecondary education in general is a new experience to the students who are their first time enrolled into university which comprises students of different cultural backgrounds and diverse norms and values. Therefore, the high education institutions have to contain these differences among the students in educational setting that correspond to their learning styles.

In this context, Sudan has become attractive study destination for students looking for higher education from different countries particularly from Africa and Asia. Furthermore, Sudanese higher education institutions have offers scholarships to many students from Africa including students from Somalia who are the focus of this paper. According to Hassan et al (2015) there are many research studies conducted in certain context to examine the various factors influencing the academic achievement of the students but their findings and conclusions are not - in many cases- consistent with one another despite the same factors under study. The disagreement among the researches is

due to the different specific contexts in which the study has been carried out. As result, this study is being carried out in peculiar context in terms of location and participants from particular country.

Review of Literature

Concept of Academic Achievement

The measurement of academic performance according to Okorie (2014) can be measured in several ways for most of educational institutions use grading system an indicator of students' academic achievement. Therefore, grades are certainly the most well-known indicator of academic achievement and thus grades are the student's "score" for their classes and overall tenure. To ascertain the quantitative nature of measuring student's achievement, Mutua (2015) elaborated that the most highly valued method of determining whether a successful completion has taken place for a learner is quantitative in nature. Some researchers like Steve (2000) as quoted by Mutua (2015) raised semantic arguments and contended that academic achievement is distinctive from academic performance in a sense that academic performance is defined as the observable or measurable behaviour of a person in a particular situation usually experimental situation. This means that performance measures the aspect of behaviour that can be observed at a specific period. But the academic achievement is cumulative and progressive.

Factors Affecting Academic Achievement of Students.

This research sought to examine factors affecting academic achievement of students and specific attention is given factors relevant to

foreign students although most of factors are commonly shared between foreign and national students.

Gender

The relationship between sex of the student and the academic achievement has been an issue of discussion among the educational practitioners and researchers. According to Eshetu (2015) gender difference in attitudes and behaviors as well as differential course taking and biological differences between the sexes may all be instrumental in giving rise to gender differences in achievement. Some studies (Farooq et al, 2011) have found a gap between the achievement of boys and girls, with girls showing better performance than boys in the subjects of mathematics and English as well as cumulatively. It is also identified by Mazharul Islam (2014) that gender of student is a significant determinant of academic performance.

Some researchers argue that girls receive higher grades than boys because they exert more effort, work harder, and their academic culture is more study oriented than boys. Woodfield and Earl-Novell (2006 cited in Jayanthi, et al., 2014) observed after analyzing more than a million graduating students that female students did better than male students. On the other hand, Raychaudhuri, et al (2010) in their study have inversely showed that boys are performing better than girls, and by this result disproved the prevalent assumption that girls perform better than the boys. This is also supported by the result of study conducted by Eshetu (2015) that showed male students performed better than females and the results were statistically significant.

Age

Human being passes through age stages in the life circle and each stage has its unique experiences even though education is lifelong learning process. In this regard, Mlambo (2011) posited that issue of student age and recent changes in educational policies around the world have led to an increase in the number of mature-age admissions in educational institutions. While a large proportion of undergraduate students are still 19-year olds, the ages of students in classes are now more variable than 10 to 15 years ago.

Diaz (2003) confirmed that age as an important factor in explaining the academic accomplishment of the students. Diaz further elaborated that as student get older the scores observed for academic environment, academic motivation and social support perceived by the student decreased. On the other hand, there are some studies (Kyoshaba, 2009; Lake and Boyd, 2015; Mlambo, 2011) that reported age has no influence on academic achievement of the student.

Student's Place of Residence

It is a wide held view that there are academic benefits to living on campus that many colleges and universities require their students to live on campus during part and sometimes their entire college career. Most often, colleges and universities require traditional degree seeking students to live on campus during their freshman year (De Araujo and Murray, 2010). According to Nelson, et al. (2016) Students, who live on-campus, at least during their freshman year, have been shown to be more likely to complete their degrees than are students who live off-campus.

Living off campus allows for a student's time to be directed towards other obligations which may hinder the opportunity for a student to "develop a sense of place". Some studies like Zhang & Dunkel (2017) revealed that students who lived in campus housing had a higher first year to second year retention rate in three years among four year cohorts and a higher fall to spring retention rate for two cohorts. Campus housing was positively related to a higher retention rate.

However, Shehry and Youssif (2017) disputed with those findings and conversely reported a highly significant relationship between long distance between home and the campus which affects the educational attainment of the students. They further elaborated that arriving home late, difficulty in getting ready for exams, tiredness, inability to do homework and exercises, inability to concentrate in classes, repeated absences during lectures etc. are also important factors.

Effect of Study Habit on Academic Achievement

Learning skills and study habits refer to how students deal with their studies and manage their course workloads to accomplish different tasks required for the academic program. Thus, the application of effective study skills and the use of learning strategies is associated with the academic success of the students. According to Abisola and Kudirat (2017), some students lack fundamental practices of good study habits as they do not attend classes, do not take down notes, and do not do their assignments, do not read their books, or make use of the library. These attitudes may negatively affect their academic performances. In this regard, Siah and Maiyo (2015) concluded that the academic

achievements of the students having good and poor study habits differ significantly and the students having good study habits achieve higher than the students having poor study habits. In a related study, Mazharul Islam (2014) reported that time spent in study, particularly time spent more than 14 hours per week, showed a significant positive effect on achieving very good to outstanding results. Similarly, Ali et al., (2013) described that study time is one of the most important factors affecting student scores. It is also reported by Tesfaw and Derebew (2014) who indicated that absent from school and department preference have a negative impact on the academic achievement of students. This is in line with Mazharul Islam (2014) who stated that student's level of attendance in class also showed a significant positive association with better results.

Learning Resources and Facilities

The availability of learning resources and facility in the university have major impact on the student's academic performance. The first impression of the student in general and foreign student in particular is the university environment both physically and academically in terms of resources available and facilities and services in place. Adeniyi and Adeniyi (2017) stated that there are independent factors that can affect student satisfaction based on services offered by universities. These include quality of teaching, student research facilities, library book collections and services, campus infrastructure, canteen facilities, space for group discussions, sport programmes, ICT (PC and Internet) facilities. In similar manner, Ogbogu (2014) posited that institutional resources and facilities have significant impact on students' performance.

Additionally, Benware and Deci (1984 cited in Ogbogu (2014) suggested the need for Universities to provide some of the following physical facilities within its environment to enhance performance: conducive hostel facilities with inbuilt study rooms, special facilities for the physically challenged who encounter greater academic challenges, career centre designed to provide career counselling activities, equipped libraries and provision of computer and internet facilities.

Foreign Students' Adjustment and Academic Integration

The movement of students across cultures and geographic boundaries in pursuits of international education, credential and exposure has been intensified because of the globalization and internationalisation trends. Students who are looking for post-secondary education are no longer constrained by national boundaries (Mazzarol et al., 2001).

As explained by Aderi et al., (2013) there are tremendous studies revealed that students experience an adjustment period after their entrance into the institution of higher education. Student adjustment includes academic, social and personal-emotional adjustment which relates to experiences such as developing and maintaining goals, expectation, identities, roles, and social networks, as well as student attrition. It is also stated in a study carried out by Rienties et al. (2012) that foreign students are insufficiently adjusted to higher education in their host country, both academically and socially. Henceforth, foreign students experience adjustment strains within their host environment that are unique to them, such as cultural differences, language constraints, and social behaviors. It is further delineated by the study of Gebhard (2012)

cited in Mesidor and Sly, 2016) that multiple factors contribute to the academic, social, cultural, and psychological adjustment of foreign students. The study further explained that foreign students encountered problems in adjustment in language barriers, unfamiliarity with available resources and how to access those resources.

According to Severiens et al. (2009) there are formal and informal integration, each of which is important for successful integration. For formal academic integration it includes the academic consultations related to studying and the contacts with faculty members. On the other hand, informal academic integration involves contacts between teachers and students outside the direct context of the learning environment, i.e. whether students and teachers consider themselves to be at more or less the same level socially, and whether they discuss personal matters with each other.

Objectives of the Study

The main objectives of the research were to:

1. Explore the effect of demographic factors (age, gender, residence and year of study) on academic achievement of the undergraduate students from Somalia.
2. Analyse the impact of the institutional factors (University) on academic achievement of undergraduate students from Somalia.
3. Determine the effect of study habits of students on academic achievement of university students from Somalia.

Hypotheses of the Study

1. There is no statically significant difference at level ($\alpha=0.05$) among Somali undergraduate students' achievement according to gender.
2. There is no statically significant difference at level ($\alpha=0.05$) among Somali undergraduate students' achievement according to their residence.
3. There is no statically significant difference at level ($\alpha=0.05$) among Somali undergraduate students' achievement according to their age.
4. There is no statically significant difference at level ($\alpha=0.05$) among Somali undergraduate students' achievement according to their year.
5. There is no a statically significant influence of the institutional factors on academic achievement of students at level ($\alpha=0.05$).
6. There is no a statically significant effect of study habits on academic achievement of undergraduate students at level ($\alpha=0.05$).

Method and Procedure

The study adopted a descriptive research design to explore the ideas and views of the respondents to identify factors associated with Somali undergraduates' academic achievement at Sudanese universities.

Population and Sample of the research

The population in this study is the foreign undergraduate students of the academic year 2018-2019 from Somalia. The study selected two universities which are; International Africa University and the Ahfad University of Women, both are located in Khartoum, the capital city of

Sudan. These two universities host a bulk number of Somali students in Sudan.

The researcher randomly selected 169 participants; 143 of them are from the International University of Africa and the remaining 26 are in Ahfad University of women and distributed questionnaires through the Somali students union.

Instrumentation

For this study, the researcher developed an instrument which is a questionnaire based on the reviewed literature. The questionnaire comprised a demographic section that included 9 items that provided the personal information of each participant that related to gender, age, and language of instruction in high school, University, year of study, residence, and CGPA (cumulative grade point average). And students' questionnaire comprised 19 items which are about two components of factors affecting the academic achievement of foreign undergraduates from Somalia. These components are; Institutional Factors and study habits. This section of the questionnaire is designed using a 5 point Likert scale which is coded and scored as follows: 1= Strongly Disagree, 2=Disagree, 3= Undecided, 4= Agree, 5= Strongly Agree.

Data Analysis and Interpretation

The data was sorted, coded, and keyed in, then analyzed using Statistical Package for Social Sciences data analysis software (SPSS Version 20). To come up with the findings and results of hypothesis tests, a descriptive statistical analysis such as frequencies and percentages were

used, as well as inferential statistical analysis namely, T-tests, ANOVA, and Multiple Regression Analysis.

Descriptive analysis of demographic patterns of the participants

In this study, the researcher selected the relevant variables for the research in order to analyze for their relationship and determine their reciprocal effects. Thus, demographic variables of this study were; age, gender and residence. Table 1 summarized demographic information of the participants and explanation follows.

Table 1: Descriptive statistics of the participants

University	Gender	Residence	Age range	Year of study
N (%)	N (%)	N (%)	N (%)	N (%)
IUA: 143 (84.6%)	Male: 100 (59.2%)	On campus: 101 (59.8%)	19-21: 49 (29%)	2 nd year: 73 (43.2%)
AUW: 26 (15.4)	Female: 69 (40.8%)	Off campus: 68 (40.2%)	22-24: 89 (52.7)	3 rd year: 37 (21.9%)
			25-27: 27 (16%)	4 th year: 59 (34.9%)
			28+: 4 (2.4%)	

N= Number IUA= International University of Africa AUW= Ahfad University of Women

As shown in Table 1, the overwhelming majority of 84.6% (N=143) of the study participants were from the International University of Africa. It is also indicated that a great percentage of 59.2% (N=100) were male students and female students counted 40.8% (N=69). Similarly, a remarkable majority of 59.8% (N=101) were campus residents whereas the remaining 40.2% (N=68) were residing outside of the campus. About the age ranges of the study participants, a considerable majority of 52.7% (N=89) were in the age range of 22-24 years old. Moreover, the table

depicted participants' year of study whereas the great majority of 43.2% (N=73) were in the second year of the study and it is followed by students in the fourth year with the percentage of 34.9% (N=59).

Analysis of Institutional Factors Component

The questionnaire of the study consisted of items related to institutional factors to measure student's perspective on institutional factors that might have impact on their academic achievement. These factors include Orientation and academic integration, language courses, equipment and teaching materials, services and facilities, extracurricular activities and academic support. Table 2 summarized scored frequencies and percentages on the statements and a discussion follows.

Table 2: Frequencies and Percentages of Students' Responses on Item Related to Institutional Factors

	Item	SD	D	UD	A	SA
1	I could have chosen another faculty	50 (29.6%)	16 (9.5%)	20 (11.8%)	44 (26%)	39 (23.1%)
2	Orientation program helped my integration	27 (16%)	20 (11.8%)	43 (25.4%)	56 (33.1%)	23 (13.6%)
3	Language courses contribute into adjustment	36 (21.3%)	29 (17.2)	40 (23.7%)	42 (24.9%)	22 (13%)
4	comfortable with equipment and teaching materials	28 (16.6%)	32 (18.9%)	32 (24.9%)	41 (24.3%)	26 (15.4%)
5	Facilities available in the library helped	21 (12.4%)	17 (10.1%)	31 (18.3%)	64 (37.9%)	36 (21.3%)

	Item	SD	D	UD	A	SA
6	Participation in extracurricular activities	32 (18.9%)	34 (20.1%)	39 (23.1%)	43 (25.4%)	21 (12.4%)
7	Services and facilities in the hostel	45 (26.6%)	33 (19.5%)	32 (18.9%)	38 (22.5%)	21 (12.4%)
8	Support from faculty members and other staff	40 (23.7%)	38 (22.5%)	29 (17.2%)	45 (26.6%)	17 (10.1%)
9	Satisfied with studying at university	15 (8.9%)	8 (4.7%)	29 (17.2%)	62 (36.7%)	55 (32.5%)

SD= Strongly Disagree D= Disagree UD= Undecided A= Agree SA= Strongly Agree

As displayed in Table 2, almost half (49.1%) of the participants agreed that “they could have chosen another faculty” if they were given chance at the beginning according to their wish. About the integration and adjustment as foreign students, a remarkable percentage of 46.7% agreed with the benefits of orientation programs while less 37.9% agreed that language courses helped their academic integration and adjustment to the university environment. Moreover, it is observable that about 25% of the participants were undecided about items related to integration and adjustment. Additionally, a remarkable majority of 59.2% of the students agreed that they were satisfied with the Facilities available in the library. But, on other hand, about 39.7% of the participants expressed that they comfortable with the equipment and teaching materials. The most disagreed items are related to “services and facilities in the hostel” and “Support from faculty members and other staff” with percentages of

46.1% and 46.2% respectively. Overall, an overwhelming majority of the participants with a percentage of 69.2% expressed their general satisfaction with their study at university.

Analysis of Study Habit Factors Component

The survey instrument of the study comprised items related to study habits to explore the effect of the study habit on the academic achievement of the student. Among the items included are; attendance, taking notes, on-time submission of assignments, daily schedule of study, allocating time for the library, setting goals, and time management. Table 3 summarised frequencies and percentages of participant's responses.

Table 3: Frequencies and Percentages of Students' Responses on Items Related to Study Habits

	Item	SD	D	UD	A	SA
10	Attending the class with having read about the lecture	22 (13%)	35 (20.7%)	39 (23.1%)	46 (27.2%)	27 (16%)
11	Taking notes during the lecture in the class	7 (4.1%)	14 (8.3%)	26 (15.4%)	77 (45.6%)	45 (26.6%)
12	Submission of assignment on time	7 (4.1%)	19 (11.2%)	39 (23.1%)	65 (38.5%)	39 (23.1%)
13	Discussing with students out of class	14 (8.3%)	25 (14.8%)	37 (21.9%)	65 (38.5%)	28 (16.6%)
14	Putting daily schedule for studying	16 (9.5%)	30 (17.8%)	41 (24.3%)	53 (31.4%)	29 (17.2%)
15	Allocating time for the Library	14 (8.3%)	24 (14.2%)	29 (17.2%)	61 (36.1%)	41 (24.3%)

	Item	SD	D	UD	A	SA
16	Studying seriously when exam approaches	7 (4.1%)	10 (5.9%)	22 (13%)	47 (27.8%)	83 (49.1%)
17	Relating the topic studied with experiences	5 (3%)	13 (7.7%)	60 (35.5%)	61 (36.1%)	30 (17.8%)
18	Setting goals for the study for motivation	4 (2.4%)	11 (6.5%)	41 (24.3%)	60 (35.5%)	53 (31.4%)
19	Making efficient use of time	13 (7.7%)	15 (8.9%)	38 (22.5%)	57 (33.7%)	46 (27.2%)

SD= Strongly Disagree D= Disagree UD= Undecided A= Agree SA= Strongly Agree

As illustrated in Table 3 a percentage of 43.2% of the participated students agreed upon “Attending the class with having read about the lecture” while a relatively considerable percentage of 34% disagreed. Moreover, a great majority of 72% of the respondents agreed with the statement “Taking notes during the lecture in the class”. It is also agreed upon “Submission of assignment on time” with the remarkable majority of 62% even though nearly a quarter of the respondents of 23% were undecided. The item “Allocating time for the Library” scored up 60.4% and “Making efficient use of time” gained an agreed percentage of 70% but 49% of the respondents agreed on the item related to “Putting daily schedule for studying” while about 27% disagreed with the later. Meanwhile, almost 55% of the respondents agreed on “Discussing with students out of class” while a percentage of 23% disagreed with it. About “Relating the topic studied with experiences” a great majority of 54% agreed upon it, but a remarkable percentage of 36% were undecided.

Additionally, a great majority of the respondents agreed on “Setting Goals for the study for motivation” with the majority of 67%. However, the highest agreed item of the study habit components was “Studying seriously when exam approaches” with the vast majority of 77% which connote to students’ tendency to last minute rush, a negative habit that overturns other positive characteristics. However, it might suggest that students pay more effort and time during the examination period in addition to previous exertions and common endeavours.

Testing Hypotheses

The research is interested to find out variations of academic achievement by the demographic variables which are; gender, age, year of study, and residence. Thus to determine these variations based on the research hypotheses, Independent Samples T-test, Analysis of Variance (ANOVA), and Multiple Regression were conducted as demonstrated underneath. Based on that, the researcher presents below results of the six hypotheses of the study:

The researcher used an independent T-Test to examine hypothesis I and 2 for the variables; ; gender and residence which stated as underneath;

1. There is no statically significant difference at level ($\alpha=0.05$) among Somali undergraduate students’ achievement according to gender.
2. There is no statically significant difference at level ($\alpha=0.05$) among Somali undergraduate students’ achievement according to their residence.

Table 4: Summary of T-Test Analysis of Students' Difference in Their Academic Achievement According to Gender and Residence

Variables	T	df	Sig. (2-tailed)	Decision
Gender	1.016	167	.311	H ₀ Accepted and supported
Residence	-.580	167	.562	H ₀ Accepted and supported

The summary of the result presented in Table (4) indicates P-values of variables; Gender and (0.311) and Residence (0.562) are great than ($\alpha=0.05$). The implication of this result is that there is no statically significant difference at level ($\alpha=0.05$) among Somali undergraduate students' achievement according to their gender and residence.

Tasting hypotheses 3, and 4 of the variables; age and years of the study as presented below, the researcher used ANOVA:

3. There is no statically significant difference at level ($\alpha=0.05$) among Somali undergraduate students' achievement according to their age.
4. There is no statically significant difference at level ($\alpha=0.05$) among Somali undergraduate students' achievement according to their year.

Table 5: Summary of One-Way ANOVA of Students' Difference in Academic Achievement According to Age Groups

Age groups	Sum of Squares	Df	Mean Square	F	Sig.	Discussion
Between Groups	7.181	3	2.394	3.479	.017	H ₀ was Rejected
Within Groups	113.518	165	.688			
Total	120.698	168				

The summary of the result shown in Table (5) explores the P-value of the age group of the study is (0.017) less than ($\alpha = 0.05$). Thus, there is a statically significant difference at level ($\alpha = 0.05$) among Somali undergraduate students' achievement according to their age. Therefore, the null hypothesis was rejected.

Table 6: Mean Scores of Academic Achievement Within Age Groups Based on GPA

Age group	N	Mean	Std. Deviation
19-21	49	2.37	.951
22-24	89	2.73	.750
25-27	27	2.93	.874
28 and above	4	2.25	.500
Total	169	2.64	.848

As shown in Table 6 age group of 25-27 scored up the highest score of GPA grade points average with a mean of 2.93 followed by the age

group 22-24 with a mean of 2.73, the least scores were obtained by the age group of 19-21 compared to other age groups of 25-27 and 22-24.

Table 7 Summary of One-Way ANOVA of Students' Difference in Academic Achievement According to Year Of Study

Age groups	Sum of Squares	Df	Mean Square	F	Sig.	Discussion
Between Groups	9.059	2	4.530	6.735	.002	H ₀ was rejected
Within Groups	111.639	166	.673			
Total	120.698	168				

The P-value of the study's age group is 0.002 smaller than ($\alpha=0.05$), according to the summary of the results demonstrated in Table (7). As a result, there is a statistically significant difference among Somali undergraduate students' achievements based on their years of study. As a result, the null hypothesis was rejected.

Table 8: Mean Scores of Academic Achievement According to Year of Study Based on GPA

Year of study	N	Mean	Std. Deviation
2nd Year	73	2.40	.878
3rd Year	37	2.97	.726
4th and above	59	2.75	.801
Total	169	2.64	.848

As indicated in the descriptive Table 8 there is a statistically significant difference of mean scores of GPA among the respondents

according to the year of study. The senior respondents of third and fourth and above have scored the highest scores of GPA 2.97 and 2.75 respectively. The least mean of scores were obtained by the second year students with mean score of 2.40.

Testing hypotheses five and six as stated below, the researcher used Multiple Regression Analysis in order to determine the impact of institutional factors and habitual factors on academic achievement of student.

5. There is no a statically significant influence of the institutional factors on academic achievement of students at level ($\alpha=0.05$).
6. There is no a statically significant effect of study habits on academic achievement of undergraduate students at level ($\alpha=0.05$).

The outcome of the two independent variable; institutional factors, habitual factors and dependent variable; academic achievement of student was displayed in table (8).

Table 9: Coefficients (significance of variables)

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.640	.456		5.795	.000	1.741	3.540
	Institutional Factors	-.064	.100	-.051	-.642	.522	-.261	.133
	Study Habits	.056	.115	.039	.489	.625	-.171	.283

a. Dependent Variable: Academic Achievement

Table 9 showed Beta coefficients that resulted from multiple linear regression analyses to determine the effect of the independent variables (institution and study habit) on the dependent variable (academic achievement). Institutional factors have the least Beta weight of $B = (-0.064)$ with $p\text{-value} = (0.522)$ which is greater than $p\text{-value} = (0.05)$ which indicates a statistically insignificant level. So we accept the null hypothesis that stated: "There is no *a statically* significant influence of the institutional factors on academic achievement of students". In the same table 9, the study habit is the independent variable that has a beta weight of $B = (0.056)$ with a $p\text{-value}$ of (0.625) that is greater than $(p=0.05)$ which is also statistically insignificant and accordingly we accept the null hypothesis that stated; "There is no *a statically* significant effect of study habit on academic achievement of Somali undergraduate students".

Discussion

The study employed multiple statistical analyses of descriptive and inferential to test the hypotheses formulated. Demographic variables such as; gender, age, residence, and year of study were investigated as a determinant of academic achievement of the undergraduate Somali students. The result of t-tests revealed insignificance of gender to the academic achievement of students. This result is consistent with other studies (Akesse and Dhufera, 2015; Cyril, 2015; and Remali et al., 2013) who reported the insignificance of the sex of student to academic achievement. However, there are other studies (Mazharul Islam et al,

2014; Mehari and Ayalew, 2016; Alam et al., 2014) that concluded gender of students as a significant determinant of academic performance.

The residence was also one of the demographic variables examined in this study and a similar result to gender which is the insignificance of residence to academic achievement was revealed by the t-test analysis. This result is consistent with other studies (Shehry and Youssif, 2017; Ali et al., 2013) that reported there was an insignificant relationship between student's academic achievement and the area that students live in. The other demographic variable included in this study was age and the Analysis of Variance (ANOVA) resulted in the significance of age factor to academic achievement of Somali undergraduate students. The outcome of the significant impact of the age on academic achievement is in line with the reviewed literature (Ali et al., 2013; Alam et al., 2014; Nyikahadzoi et al., 2013; Nelson et al., 2016) that reported the significance of the age variable as a determinant of academic achievement of the student. On the other hand, there are some studies (Kyoshaba, 2009; Lake and Boyd, 2015; Mlambo, 2011) that reported age does not influence the academic achievement of the student.

The other investigated variable in this research was institutional factors to academic achievement of the student. The result of multiple regression analysis revealed insignificance of the institutional factors about the academic achievement of the student. The finding of this study for statistical insignificance of institutional factors is in line with the study of Ogbogu (2014) who investigated the institutional factors which affect the performance of Public Administration students in a Nigerian

University which revealed that the institutional variables considered did not have any significant impact on students' performance. However, some studies (Odeh et al., 2015; Zenebe, 2015; Akomolafe and Adesua, 2015) indicated inconsistency with the finding of this study and revealed that institutional resources and facilities have a significant impact on students' performance.

Lastly, this study investigated the study habit variable concerning the academic achievement of the student. A multiple regression analysis was conducted to determine the predictive level of significance of study habits to the academic achievement of the student. The result indicated that there is a statistical insignificance impact of study habits on the academic success of the student. This finding is in disagreement with literature (Adamu, and Duna, 2018; Rabia et al., 2017; Chandana, 2014; Nonis & Hudson, 2010; Miguel & Ksenia, 2015; Tesfaw and Derebew, 2014; Abisola and Kudirat, 2017; Ayodele and Adebisi 2013) who reported study habit is powerfully predictive of academic achievement of the student.

Conclusion

The transition from high school to university combined with traveling to study abroad is a very crucial stage of students' academic pursuit as it presents a difficult challenge to many students to fulfill their dream of successful postsecondary education and professional career in their future life. Many studies employing various approaches and different methods have emerged in recent years to explore factors affecting the academic achievement of students at diverse educational levels. In this context, this

study has attempted to investigate factors affecting the academic achievement of foreign undergraduate students in Sudanese universities. Participants of the study were students from Somalia who are studying at Africa International University and Ahfad University for Women.

Findings of the study revealed the insignificance of the demographic variables such as; gender and residence concerning academic achievement for Somali undergraduate students. However, the study concluded the significance of the age and year of study to the academic achievement of the student. The study further discovered the insignificance of the institutional factors with the academic achievement of the student. Nevertheless, the study found a great majority of the participants agreed on the benefits of institutional integration such as orientation programs and language courses which helped their academic integration and adjustment. Conversely, students expressed dissatisfaction with hostel services and facilities as well as interaction with academic staff. Moreover, despite the high percentage of agreement with items related to study habits such as; attendance, note-taking, daily study schedule, etc., the study found insignificance of study habits about academic achievement.

In a nutshell, this study does not claim conclusive findings on factors affecting academic achievement but presents results of analysis of some variables selected as determining factors that influence the academic success of a student in the context of foreign students. Therefore, it is part of ongoing educational researches on the course of investigating underlying causes of academic success or failure.

Recommendations

Based on the findings of this study, the researcher would like to put forward the following recommendations;

1. Higher education institutions in Sudan should maintain a robust policy of social and academic integration of foreign students that are specifically developed for a better learning environment for foreign students to keep the reputation of Sudanese universities as emerging destinations of study for many foreign students.
2. Mature students at age of 22 and above should be a criterion for admission and if younger students are admitted they should be assessed to test their competency and if they show their capability they move on to join the regular program otherwise they should take prerequisite courses and get duly prepared.
3. Improving the level of interaction between students and faculty members including academic and non-academic staff by creating more space for academic advice, educational counseling, and close follow-up of student's progress.
4. Hostel facilities and accommodation services should be improved to relieve students of homesick stress and other related feelings of foreignness.
5. Induction programs targeting foreign students should be maintained on a regular basis which increases student adaptability to the institution's environment in terms of policy and practice.

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