



Influence of Teaching and Learning Resources on Students' Academic Performance in Public Secondary Schools in Arusha District Council, Tanzania

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Abstract: This study determined the availability of Teaching and Learning Resources (TLR) in public secondary schools and assessed the adequacy of TLR and its influence on students' performance in public secondary schools in Arusha District Council. The study adopted a convergent parallel research design and mixed methods research approach to gather data. The sample size included 1 District Educational Officer, 7 Ward Educational Coordinators, 7 Heads of the schools, 28 teachers and 100 form four students from public secondary schools in Arusha District Council. Questionnaires and interview guide were used for data collection. The University experts evaluated the instruments to determine content validity. Reliability of the questionnaires were tested in pilot study and Cronbach Alpha Coefficient was found to correlate at $r = 0.85$ for QHS, QT and QS. Quantitative data was analysed using descriptive statistics in the SPSS and results were presented in tables of frequencies and percentages. Qualitative data was analyzed thematically with respect to research questions. The study finding reveals adequate teachers, classrooms, textbooks, libraries, laboratories, classrooms and desks as teaching and learning resources that influence students' academic performance in examinations. Furthermore, on adequacy of teaching and learning resources, the study found that, most schools are faced with challenges such as inadequate human, financial as well as time resources. Similarly, inadequate material resources such as classrooms and books due to over enrolment which can be solved by support from Government of Tanzania and educational stakeholders in order to improve academic performance of students. The study recommends that Government, NGOs and educational stakeholders should support the provision of teaching and learning facilities to improve academic performance of students. Teachers are encouraged to implement curriculum using available teaching and learning resources in order to improve performance in national examinations.

Keywords: Performance, Teaching and Learning Resources, Academic, Public Secondary Schools, Arusha District and Tanzania

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1. Introduction

According to Kapur (2019), teaching and learning resources (TLR) are the tools that are used by teachers and instructors within schools to facilitate learning and understanding of concepts among students. These are the educational materials that are used within the classroom setting to support the learning objectives as set-out within the lesson plan. United Nations identified

these as adequate teachers, classrooms, textbooks, libraries, laboratories, computers, classrooms, Sport kits, chairs and desks as teaching and learning resources that influence students' academic performance in examinations (UN, 2015). In the views of Subedi (2013), influence refers to the power to affect or have an effect on education performance.

Within the education system, these TLR have been used since ancient times within the classroom setting. The

major role that has been rendered by the TLR is to make learning real, practical and pleasurable for the students to achieve good academic performance. Academic performance has always been associated with the evaluation of learners' tests and examinations results which are those corresponding to learner's intellectual quotient (IQ) and leaving aside other personal characteristics (Patricia, 2017).

Most European countries have made great stride in technological advancement. Availability of instructional resources such Information and Communication Technology (ICT) has contributed towards quality education and better students' academic performance. Taylor et al. (2019) observed that many people are in the education system for a longer period of their lives, thereby increasing demand of facilities on education. As enrolment increases in higher education, technology becomes cheaper and widely accessible while professional manpower becomes scarcer and costlier, in both social and economic sense. The indicator on numbers of computers per pupil is already visible as schools experience rapid growth and increase in provision of instructional resources. The real challenge lies in the most intelligent and cost-effective use and deployment of new technologies (European Commission, 2018).

Additionally, it is often said that a good teacher can achieve good results even if he or she has to teach under a tree because what is most important is willingness of the instructor then other supporting factors such as teaching and learning resources will properly be managed if inadequate. However, study done in America Washington D.C indicates that the quality of the school resources was a factor for students' academic performance and better academic outcomes were associated with schools that had better physical environments (Stevenson, 2016).

According to Taylor and Robinson (2019) in the Sub Saharan Africa, education sector faces the problem of shortage of teachers. The United Nation Education Science and Cultural Organization (UNESCO) under Institute for Statistics (IS) notes that nearly 7 out of 10 African countries face shortage of teachers and other instructional resources as governments struggle to cope with the rising demand from growing school age populations in order to meet Education for All (EFA) targets.

Also, Chepkonga (2017) noted that Africa classes have inadequate desks and chairs. Lack of adequate classrooms, desks, chairs and tables affected students' academic performance as overcrowding negatively affected learners' acquisition of competency skills. Student grasping of particular subject depend on the type of infrastructures they are using during learning process. Students who are studying under the tree have lesser grasping ability as compared to those who use well furnished classrooms. Likewise, Sattar (2013), as cited by Chepkonga (2017) viewed quality environment for education as appropriateness of resources available to education and the baseline standard in education that can be measured on a scale of reference.

Effective collaboration between the school and other stakeholders significantly contribute towards the development of solid learning infrastructure, so as to create conducive working environment for a sustainable high-quality education practices in secondary schools. The financial resources needed to ensure adequate provision of infrastructural facilities and grant- in-aids for proper maintenance of the facilities should be provided through increase in government's budgetary allocation, school internally generated revenue and community support, so as to create good and sustainable working climate for effective teaching and learning processes in secondary schools hence quality performance (Ayeni and Adelabu, 2012).

The study was guided by the following research questions:

- i. What are the available resources used in teaching and learning in public secondary school in Arusha District Council (ADC)?
- ii. To what extent does the TLR influence students' performance in Public Secondary School in ADC?

2. Literature Review

The study reviewed both theoretical and empirical literatures. This study was anchored on instructional design theory by An (2021).

2.1 Instructional Design Theory

Instructional Design Theory by An (2021) offers explicit guidance on how to better help people learn and develop. The kind of learning and development may include cognitive, emotional, physical and spiritual. The theory assumed that learning is most effective when students are actively engaged in the construction of concrete and meaningful artifacts. Also, it agreed that knowledge is actively constructed by learners rather than transmitted by a teacher.

Moreover, it emphasized that the focus of an instructional design theory was on methods of facilitating learning rather than on processes of learning within a person's head. Therefore, instructional materials must be developed properly so that those materials can motivate learning and teaching process. Thus, it implies that the instructional materials are not only beneficial for learners but also for teachers.

The theory has a direct link with the current study because it explains the relationship between the TLR that the teachers use during teaching and learning process that brings positive students' learning outcomes. These learning processes include higher abilities to learn, quality strategies to learn, perform classroom activities and positive attitude towards learning. All these will enhance good students' academic performance.

The theory is relevant to the current study because it argues that the use of teaching and learning resources helps students to learn better without losing the focus. Therefore, it strives to give explanation on the

influences of TLR to students' academic performance in public secondary schools.

The Empirical literature was reviewed with reference to research objectives:

2.2 The Availability of Teaching Learning Resources used in Teaching and Learning

A research study conducted in Florida, found that the more resources the students were provided with in the classroom the better they improved in their achievement (U.S. Department of Education, 2019). In addition, a research by Subedi (2013) on the factors influencing student achievement in Nepal: An influential factor on student achievement, reported the availability and the use of resources by teachers in teaching and learning activities. Availability of resources and use of resources by teachers in high schools was found to have a positive effect on student achievement. Simplicio (2000) as cited by Subedi (2013) suggests that teachers must be willing to utilize different methods, strategies, and approaches to instruction, and they must also be willing to change their assessment tools and evaluation criteria. Positive effect on student's achievement is seen when they provide teachers with a wider variety of computer-based resources to integrate with instructional activities. According to Dangara (2016), education as an investment constitutes the largest enterprise in Nigeria. Educational institutions, including schools, are established and managed essentially to achieve certain stated goals and objectives. The goals and objectives can be achieved through ensuring adequate provision of resources. Education resources based on their nature are basically classified into material/physical, financial, time and human resources. The findings indicated that maximum utilization and appropriate management of education resources should be done so as to avoid wastages and improve the quality of the teaching-learning process in the academic environment.

Wambua, Murungi, and Mutwiri (2018) on the study of physical resources and strategies used by teachers to improve pupils' performance in social studies in Makueni County in Kenya, noted that the availability of physical resources, library, playground and classroom environment contributed positively to pupil's performance. The study also confirmed a strong and positive relationship between quality of school facilities and strategies that encourage pupils to work collaboratively in class hence creating a shared goal. Varieties of teaching resources allow students to move from teacher-centered to student-centered in classrooms. Thus, it revealed that performance was better in schools with resources than those without.

According to Kapinga (2017), the study on assessment of school resources in the context of free basic education in Tanzania reveals that the government of the URT is committed in the provision of free education. The provision of free basic education responds to

international and local policy obligation. It seems that the main determinants of quality education include provision of adequate textbooks and teaching staff, a conducive learning environment (including water and sanitation resources and classrooms), as well as a broad-based curriculum that is implemented through child-centered interactive teaching methodologies. School resources are one of the basic educational requirements that must be maintained in terms of safety and quality. Furthermore, Ida (2016), on influence of library services on students' academic performance in an ordinary certificate of secondary education examination; the study revealed that the availability of library has a role to enhance learner's study habit through support from well staffed and well stocked school libraries. Also, student reading skills can be improved if there are a lot of books and ICT materials. Students need to feel comfortable around TLR and allow them to interact positively with the resources. Not only that, students also needs the support of librarians who could deliver and guide them to access both manual and electronic materials. The study concludes that the availability of well equipped libraries encourage learning habits and strengthened students study skills.

2.3 The Adequacy of Teaching and Learning Resources (TLR) and its Influence on Students' Performance

According to study by Costa, Lourenco and Simoes (2018) on teachers' education policy and practice in Europe; the study revealed that the complexity of today's world, characterized by unprecedented technological revolution, increased mobility and migration, and as rapid and profound societal change, presents new challenges to teaching and teacher education. In the past, teachers were simply mediators of knowledge, the students were taught in similar ways, and the goal was standardization and conformity. Today, teachers are being asked to keep pace with rapidly developing knowledge areas and approaches to students' learning and assessment, to use new technologies, to personalize learning experiences to ensure that every learner has the chance to succeed, to embrace diversity with differentiated pedagogies, and to promote students' creativity.

Isawasan, Lee, Lim, Lim, and Yiung (2018) conducted a study on factors influencing teachers' intention to adopt ICT into teaching secondary schools in Sibiu (China). Research has shown that the rapid development of computer and communication technology have an impact on teachers' use of ICT in teaching classroom. These technological tools help them to deliver their lessons successfully. They also believed that engaging with ICT in their teaching gave them a sense of achievement in their teaching, and their teaching would be more effective. Therefore, it is found that the use of ICT in classroom teaching managed to boost up teachers' self-esteem and the feeling of control in their teaching. Also, it is recommended that a good school resource supports the educational institutional like

having clean air, good light, and safe learning environment are important for academic achievement. Also, Ramli and Zain (2018) conducted a study on the impact of resources on student's academic achievement in university of Malaysia Kelantan. The study has revealed important insights into the resources that influence the students' academic achievement. This study described three factors that can impact student's academic achievement, which is system management (e-learning, management information system); learning environment (classrooms, teaching aid, library) and infrastructure (hostels, sports resources, parking and transportation). The results of the study show that e-learning of system management; teaching aids and library of learning environment; hostels, sports resources, parking and transportation of infrastructure were all significant to impact students' academic achievement. All the factors contributed about 51.5% towards the students' achievement.

Dangara (2016) investigated an integral component for effective school administration in Nigeria and discovered that the democratization of education has led to remarkable increase in the number of schools such as; primary, secondary schools and tertiary institutions. There is no way the goal and objectives of an educational institution can be achieved without putting in place certain mechanisms towards ensuring the success of such institutions. The teacher is a crucial component of any educational system because no organized education can take place without the teachers. All materials and non-material factors are necessary and contributive to the attainment of goals in any institution. Also, the same study done by Dangara (2016) proved that it is not the availability of these resources alone that guarantees effective performance of school, but their adequacy and effective utilization. However, no matter how well packaged a school administration or a school system is at any level of education, without adequate and efficient utilization of the available resources, the system may fail to achieve its desired results. Accessibility of education resources makes school management effective and efficient thereby enhancing the output of the education system.

In addition, a study done by Atieno (2014) on influence of teaching and learning resources on students' performance in Kenya indicates that TLR are not always available in schools. This inadequacy of TLR has been of serious concern to educators. According to Lyons (2012) as cited by Atieno (2014) availability of TLR enhances the effectiveness of schools as they are the basic resources that bring about good academic performance in students. The necessary resources that should be available for teaching and learning include material resources, human resource such as teachers and support staff as well as physical facilities such as laboratories, libraries and classrooms. When TLR are inadequate, education is compromised and this inevitably is reflected in low academic achievement, high dropout rates, problem behaviors, poor teacher motivation and unmet educational goals. The author noted that institutions with adequate facilities such as textbooks stand a better chance of performing well in

examination than poorly equipped ones. Therefore, poor performance could be attributed to inadequate teaching and learning materials and equipment.

According to Lyimo, Too and Kipng'etich (2017) on perception of teachers' on availability of instructional materials and physical resources in secondary schools in Arusha District, Tanzania, the study acknowledges that; the quality of secondary school education cannot be separated from the context and circumstances that are found in schools. A number of secondary schools in Tanzania considered to have shortage of instructional materials are understaffed, and some teachers are under qualified and de-motivated, classrooms are also overcrowded which affects teaching negatively.

Moreover, according to UNDESA (2014) on electricity and education: The benefits, barriers, and recommendations for achieving the electrification of primary and secondary schools; reported that despite the progress, efforts to electrify schools many left students in the dark. According to the study results, only 27% of village schools in India had electricity compared to 76% of schools in towns and cities. Also, the study revealed that with so many benefits to the electrification of schools encompassing like extended studying, access to computers and mass media, better staff retention and school performance, and community co-benefits such as health and gender empowerment. The following are challenges that schools face which cause lack or inadequacy of electricity; schools may not be able to afford high initial connection fees, there can be long waiting times for connections and some rural schools may never be cost-effective to connect, technical problems, theft or destruction of equipment as well as vandalism of electricity supply equipment.

3. Methodology

The current study adopted a convergent parallel research design and mixed methods research approach which entails that the researcher concurrently employs the quantitative and qualitative research paradigm, weighs the methods equally, analyses the two components independently and interprets the results together (Creswell and Clark, 2011). Purposive sampling technique was employed to select 1 District educational Officer, 7 Ward Educational Officer and 7 Heads of schools. The study employed stratified random sampling procedure to select 7 public secondary schools found in Arusha District. Three boarding boys, three boarding girls and one mixed day school were selected for the study. Then both stratified and simple random sampling procedure was employed to select 28 teachers who teach in form four class and 100 form four students by considering gender as the strata. In this regard, 14 male and 14 female (2 male and 2 female from each school) were selected. The study selected 50 boys and 50 girls that is, 15 students from each boarding school and 10 students from mixed day school.

The study employed open and closed ended questionnaire to collect both qualitative and quantitative

data from Heads of schools, teachers and students in public secondary schools while interview guide was used to collect data from District educational Officer and Ward Educational Officers. The research experts validated face and content validity of the instruments and their recommendations that were taken into consideration by the researcher in order to collect relevant information. The reliability of the instrument for collecting quantitative data was tested and found to correlate at Cronbach Coefficient Alpha ($\alpha=0.85$) for Questionnaire for Heads of schools (QHS), Questionnaire for Teachers (QT) and Questionnaire for Students (QS). Quantitative data from closed-ended questionnaires were analyzed by using descriptive statistics technique on computer software; the statistical package for social sciences (SPSS) version 23 and the results were presented in tables of frequencies and percentages. On the other hand, qualitative data were

thematically coded into themes with respect to research questions for easy narration.

4. Results and Discussion

The findings were discussed with regard to research objectives.

4.1 The Availability of Teaching and Learning Resources Used in Public Secondary Schools

The first objective of the current study was to determine the availability of resources used in teaching and learning in public secondary schools. Table 1 summarizes the findings.

Table 1: The Findings on the Availability of Teaching and Learning Resources Used in Teaching and Learning in Public Secondary Schools in Arusha District Council (n = 134)

Facilities	Students (n = 100) f(%)	Teachers (n = 28) f(%)	School Heads (n = 6) f(%)	Total (n = 134) f(%)
Teachers	83(83)	17(61)	5(83)	105(78)
Desks	75(75)	19(68)	6(100)	100(75)
Textbooks	77(77)	16(57)	3(50)	96(72)
Reference books	67(67)	16(57)	4(67)	87(65)
Classrooms	72(72)	19(68)	6(100)	95(71)
Playground	64(64)	15(53)	3(50)	82(61)
Sport kits	72(72)	18(64)	3(54)	93(69)
Library	52(52)	19(68)	3(50)	74(55)
Equipment in your laboratories	70(70)	20(71)	4(67)	94(70)
Reagents	68(68)	21(75)	3(50)	92(69)
Electricity	70(70)	19(68)	3(50)	92(69)
Clean water supply	65(65)	18(64)	3(50)	86(64)

f = frequency, % = percentages and n = number of respondents. Values in brackets are percentage of students, teachers and Heads of schools who agreed with the statement. Hence, those with contrary opinion to the statement are implied.

Table 1 shows various responses from the students, teachers and Heads of schools on the availability of facilities used in teaching and learning in public secondary schools. The finding shows students (83%), teachers (61%) and Heads of schools (83%) that is, majority 105(78%) of the respondents agreed that the availability of teachers in schools community is a necessity in order to effectively use resources in teaching and learning activities. However, 29(22%) of the respondents disagreed on the availability of teachers especially Science and Mathematics teachers. The finding shows that the availability of teachers who use resources in teaching has a positive effect on students'

achievement. This finding is related to study done by Simplicio (2000) as cited by Subedi (2013). The study reported that availability of teachers in learning institution is an important requirement on education performance of Students. Teachers should be willing to utilize different methods, strategies, and approaches to instruct learners. Similarly, they should also be willing to change their assessment tools and evaluation criteria so as to enhance students' performance.

Also, on availability of textbooks in public secondary schools, those who agreed were students (77%), teachers (57%) and Heads of schools (50%). Therefore,

a total 96(72%) of the respondents agreed with the sub-item on textbooks while a total of 38(28%) disagreed. With respect to the availability of reference books, a total of 86(65%) were in agreement in which students (67%), teachers (57%) and Heads of schools (67%) agreed that availability of reference books plays a significant role in teaching and learning while a total of 48(35%) advanced contrary opinion on the availability of reference books due to the reality that books are not adequate for all students to have his or her own copy.

Consequently, the availability of textbooks and reference books were found to be important resources necessary for teaching and learning process. The finding is related to those in the study done by Kapinga (2017), on the study on assessment of school resources in the context of free basic education in Tanzania which reveals that the main determinants of quality education include provision of adequate textbooks, teaching staff and a conducive learning environment with good sitting arrangement. This is supported by the study done by The Ministry of Education Science and Technology, MoEST (2010) as cited by Mogaka, Kariuki and Ogeta (2019), on availability and utilization of textbooks on students' academic achievement in public day secondary schools. The study explained the importance of ensuring availability of books in teaching and learning so that educational program could be implemented effectively.

In addition, students (72%), teachers (68%) and Heads of schools (100%) giving a total of 95(71%) indicated that classrooms are available and are important for teaching and learning to take place without being interrupted, while a number 39(29%) respondents disagreed. The researcher found that increasing number of schools and construction of classrooms in schools are the priority of the government of Tanzania. This is also revealed by Dangara (2016), while investigating an integral component for effective school administration in Nigeria. The study discovered that the democratization of education has led to remarkable increase in the number of schools such as primary, secondary schools and tertiary institutions. The finding is also supported by the study done by Wali, Abulfathi and Mustapha (2019), on impact of classroom environment on students' performance; and therefore, it was recommended that school management should provide all necessary facilities in the classroom in order to create enabling environment for students overall development.

Furthermore, students (64%), teachers (53%) and Heads of schools (50%) giving a total number of 82(61%) agreed on the availability of playgrounds. On the other hand, a few 47(39%) of the respondents disagreed that playgrounds are available in their schools. Playground is among the necessary item which is vital in cognitive learning, physical development and social growth but most of the public secondary school have no large area for construction of good playground. The finding in this study is supported by the study done by Wambua, Murungi, and Mutwiri (2018). On the study of physical facilities and strategies used by teachers to improve pupils' performance in Social Studies in Makueni

County, the study noted that the availability of physical resources such as playground contributed positively to pupil's cognitive ability.

The study also confirmed a strong and positive relationship between quality of school resources and strategies that encourage pupil to work collaboratively and creatively in achieving shared goals in learning activities. Therefore, each school is encouraged to make sure that they have quality playground so that they can motivate students to enroll in playing for the betterment of their health and brain which is important in learning because it helps in developing thinking ability.

Likewise, the sub-item on the availability of libraries, students (52%), teachers (68%) and Heads of schools (50%) translating to 74(55%) respondents approved the availability of libraries however, 60(45%) of the respondents expressed contrary opinion. The study revealed that library is where the books are kept and private study is conducted. The same view is supported by Ida (2016) on influence of library services on students' academic performance. The study revealed that library improves studying skills and students feel comfortable around books and allow them to interact positively with the books. Likewise, students also need the support of librarians who could deliver and guide them to access both manual and electronic materials. Library services enable people to get a lifelong education, therefore, libraries should be made accessible with books and library services made available at all places, all sections and all the time. Consequently, the study concluded that the availability of well equipped libraries encourage learning habits and strengthened students study skills.

The provision of enough teaching and learning resources is the key to the implementation of educational activities which enhances good education performance in public secondary schools. In this regard, a respondent put forth the following views:

The government and other educational stakeholders should provide teaching and learning facilities. For instance, availability of libraries in schools is essential for good study habits. This is necessary in enhancing quality education in schools.(personal interview, 4th June, 2021).

According to the respondents, the provision of teaching and learning resources in schools is a responsibility of several stakeholders in education sector namely; government, parents, community, political leaders, civil society institutions, well wishers, Faith Based Organisation (FBO) and Non Government organisations (NGOs).

The finding is in agreement with the commitment by the fifth government of Tanzania on lifting all students off floor by equipping classroom with desks, giving orders to local government leaders, Regional Commissioners and District Commissioners to make sure that all public

schools are equipped with all teaching and learning resources. This is evident by the number of desks that were provided to primary and secondary schools, construction of laboratories and repair of all old public schools. In addition, there is increased expenditure from the ministry of education and that of local government as a result of increased allocation of funds by the National Government (URT, 2018).

On the other hand, the findings from qualitative data indicate that the ratio of textbooks per student in public secondary schools in Arusha District Council is reasonably satisfactory. For instance, when a respondent was asked about the availability of TLR in public secondary schools, the following observation was made;

The ratio of text book per student in each class should be 1:3 but it differs from one school to another due to higher enrollment of students every year. However, the government has made a deliberate effort to supply course books to schools. This efforts should be encouraged and supported by other stakeholders. To this extend, the ratio of textbooks per student in public secondary schools is relatively satisfactory (personal interview. 4th June, 2021).

This finding is in agreement with the findings from quantitative data where teachers, classrooms, desks, laboratories equipments and reagents, library, textbooks and reference books, playground and sport kits were identified as TLR that the government makes effort to ensure their availability. This finding is supported by the findings in the study done by Ramli and Zain (2018) on the impact of resources on student's academic

achievement in university of Malaysia Kelantan. The study revealed important insights into the resources that influence the students' academic achievement. This study described three factors that can impact on student's academic achievement, which is system management (e-learning, management information system); learning environment (classrooms, teaching aid, library) and infrastructure (hostels, sports resources, parking and transportation). The results of the study show that e-learning of system management; teaching aids and library of learning environment; hostels, sports resources, parking and transportation of infrastructure were all significant to impact students' academic achievement. In support, Mogaka, Kariuki and Ogeta (2019) conducted a study on availability and utilization of textbooks on students' academic achievement in public day secondary schools. The study explains the importance of ensuring that there are adequate and appropriate resources for teaching and learning so that educational programmes could be implemented effectively. The availability of teaching and learning resources determines the success or failure of the education system.

4.2 The Adequacy of Teaching and Learning Resources in Public Secondary Schools and its Influence on Students' Performance

The second objective of the current research study was to assess the adequacy of teaching and learning resources in public secondary schools. The table 2 summarizes the findings.

Table2: The Findings on the Assessment of the Adequacy of Teaching and Learning Resources in Public Secondary Schools (n = 134)

Statements	Students (n = 100) f(%)	Teachers (n = 28) f(%)	Heads Schools (n = 6) f(%)	Total (n = 134) f(%)
Adequate teachers	63(63)	20(71)	3(50)	86(64)
Adequate desks	69(69)	16(57)	6(100)	91(68)
Adequate textbooks	61(61)	15(54)	3(50)	79(59)
Adequate reference books	51(51)	14(50)	3(50)	68(51)
Adequate and specious classrooms	70(70)	16(57)	4(67)	90(67)
Standard playground	40(40)	12(43)	2(33)	54(40)
Adequate sport kits	45(45)	16(57)	3(50)	64(48)
Specious library	52(52)	14(50)	2(33)	68(51)
Adequate equipment in laboratories	50(50)	12(43)	3(50)	65(49)
Adequate reagents in laboratories	49(49)	11(39)	3(50)	63(47)
Electricity	50(50)	14(50)	2(33)	66(49)
Clean water supply	49(49)	13(46)	2(33)	64(48)

f = frequency, % = percentages and n = number of respondents. Values in brackets are percentage of students, teachers and Heads of schools who agreed with the statement. Hence, those with contrary opinion to the statement are implied.

Table 2 shows various responses from the students, teachers and Heads of schools on the assessment of the adequacy of teaching and learning resources in public secondary schools. In this regard, 63% students, 71% teachers and 50% Heads of schools giving an average total of 64% agreed that teachers are adequate in school in the study area while 48 (36%) of respondents disagreed. According to the finding there are complains on adequacy of teachers, due to the extra workload that teachers have especially in Science and Mathematics subjects. The finding is in agreement with that of Victorini and Wambiya (2016) which reported that in some schools even the number of teachers was not enough which led to overloading of the teachers. The researcher found that although there are challenges of inadequate teachers, the good news is, the Government of Tanzania is putting in place the necessary effort to employ teachers, especially in science and mathematics (URT, 2020). Also, the colleges and university are training more teachers who will be recruited into the teaching profession to address the shortage. The study established that students' academic achievement is one of the methods of determining the extent of teacher's adequacy.

On the sub item adequate textbooks, the response was as follows; students (61%), teachers (54%) and head of schools (50%) giving a total of 79(59%) who expressed their view in support of adequate textbooks. However, 55(41%) of the respondents reported that textbooks are inadequate in their schools. With respect to reference books; students (51%), teachers (50%) and Heads of schools (50%) that is, total of 68(51%) respondents agreed while 66(49%) disagreed. The findings revealed that students' text book ratio is fair however; addition of more text books should be encouraged. Also, according to the researcher some schools have adequate course books while others have inadequate reference books. The finding are related to those in the study done by Mogaka, Kariuki and Ogeta (2019) on availability and utilization of textbooks on students' academic achievement in public secondary schools; the study revealed that many public secondary schools have not attained required student - text book ratio. Isawasan, Lee, Lim, Lim, and Yiung (2018) conducted a study on factors influencing teachers' intention to adopt ICT into teaching secondary schools in Sibu (China). In support of the finding in the current study, the study reported that the rapid development of computer and communication technology have an impact on teachers' use of ICT in teaching classroom. These technological tools help them to deliver their lessons successfully. They also believed that engaging with ICT in their teaching gave them a sense of achievement in their teaching, and their teaching would be more effective. Therefore, it is found that the use of ICT in classroom teaching managed to boost up teachers' self-esteem and the feeling of control in their teaching. Also, in the same vein, Mogaka, Kariuki and Ogeta (2019) noted that one of the factors hindering successful implementation of introductory technology in Nigerian secondary schools was lack of textbooks and training manuals. The researcher established that a similar problem is in Tanzania though the Government through Ministry of education have

attempted to solve the problem through provision of enough books thus students book ratios has improved, though yet to reach the required adequate levels globally.

The finding indicated that students (70%), teachers (57%) and Heads of schools (67%), a total of 90(67%) agreed on the adequacy of classroom while 44(33%) of the respondents held contrary opinion. Most of the respondents agreed that classrooms are adequate in their schools. The researcher found that although classrooms are adequate, most of them are overcrowded as observed by 33% of respondents who disagreed. It is imperative to note that, Classroom physical environment is seen as the physical characteristics of classroom that involve size of classroom, floor, walls, desks, lighting and school structure. The finding is in agreement with the study done by Wali, Abulfathi and Mustapha (2019) on impact of classroom environment on students' performance in English Language; the study revealed that a well-designed classroom will not only help to achieve the expected learning outcomes of education but also ensures cordial student-teacher relationship. The provision of sufficient learning facilities and instructional materials within suitable classroom atmosphere are some of the factors that improve the standard of education in schools.

Also, the few who disagreed on an inadequacy of the classrooms, observed that classrooms are inadequate due to overcrowding in the classrooms as a result of large number of students enrolled in school. This is related to the study done by Chepkonga (2017) on influence of learning facilities on provision of quality education in early childhood development centers. Nonetheless, the study also noted that classes in most countries in Africa have inadequate classrooms, desks, chairs and tables which affected pupils learning as overcrowding interfere with learners' acquisition of competency skills. Furthermore, if classroom setting is not conducive, students feel uncomfortable in classroom then they tend to distract attention during the lesson. The finding reveals that classrooms are influential factor for students' academic performance. Students tend to exhibit better understanding devoid of external interference while in classrooms and therefore they perform well (Wali, Abulfathi and Mustapha, 2019).

Also, about standard playground, students (40%), teachers (43%) and Heads of schools (33%) giving the total of 54(40%) respondents agreed. A total of 80(60%) respondents disagreed on the adequacy of playground. With the respect to sport kits, students (45%), teachers (57%) and Heads of schools (50%) giving a total of 64(48%) of the respondents agreed that there are adequate sport kits. On the other hand, 70(52%) respondents disagreed on adequacy of sport kit. The finding revealed that playground and sports kits available do not satisfy the students' needs. The researcher observed that some of the schools are built on a small land where they cannot set adequate fields for sports. Since, there are no standard playgrounds in most schools, so applies to sport kits resources that are also inadequate. In addition, in most schools in their

timetable, there is no time set for sports. The finding is relevant to that in the study done by Victorini and Wambiya (2016) on assessment of the adequacy of resources and facilities to enhance Learner Centered Pedagogy in secondary schools. The study revealed that standard playgrounds was lacking in many schools both in urban and rural areas in public and private schools. Therefore, the government should make sure that all schools have standard playgrounds and adequate sports kit resources so that students can be able to interact and socialize which is important for their physical and mental growth hence their studies since it enhance student centered pedagogy.

Furthermore, on the sub item availability of specious library; students (52%), teachers (50%) and Heads of schools (33%) giving a total of 68(51%) respondents who agreed and supported that, there is library in which they get time for private studies and borrow books while 66(49%) disagreed. Those with divergent views argued that there is no clear library apart from small shelves set in teachers' offices. This findings are supported in the study conducted by Ida (2016), on influence of library services on students academic performance; the study found that in most public secondary schools there is no library, though there are small rooms where by students go and borrow books because there is no space for reading. Also, the same study found that most of schools had acute shortages of text books in the library. The researcher found that schools with good library services to students achieve significantly better academically than schools with minimal or no library services. Therefore, each public secondary school should be covered with adequate books in library so as to enhance learning habits and strengthened students study skills thus readers and writers are to be nurtured.

The effects of overcrowded classrooms are far-reaching for teachers and learners. Many parents base their decision on whether to send their child to a particular school on the prospective number of learners in the child's classroom (Petro, 2016). Many public secondary schools in Tanzania are overcrowded due to the current increase of students' enrollment because of the introduction of the free basic education program in the country since the year 2016.

In this regard, a respondent put forth the following views;

Most classrooms are overcrowded due to high population of students in the schools which causes constrain on the available TLR (personal interview, 5th June, 2021).

According to the respondents' views, overcrowded classroom is caused by free education policy where by students receive free fee basic education from primary schools to secondary schools. The finding is supported by the finding in the study done by Mashala (2019) when elaborating about the phases of education sector especially the fourth phase which covers from 2014 to date. It is within this period where the government made

significant changes to the education system by overhauling the education system and introducing free primary and secondary education. During this period, basic education now run from Standard I to Form IV and all schools shift to using a single textbook for each subject. These changes are as a result of the new Education and Training Policy (ETP) of 2014, which distinguishes itself as a vehicle for attaining Universal Primary and Secondary Education.

Regarding classroom environment, the findings in the study established a strong influence on the academic performance due to the fact that it enables both students and teachers to be motivated and inspired towards teaching and learning. Also, attendance rate was recorded to be high due to learners feeling enthusiastic to be attending and participating in learning in a well improved classroom and school environment. This enhances their performance in all academic and extra-curricular activities.

The number of teachers for the Science and Mathematics subjects in public secondary schools is greatly insufficient due to the fact that the students training for Science and Mathematics courses in colleges and in universities is quite low. In this regard, when respondents were asked on the role and adequacy of teachers in teaching and learning process in public secondary schools in Arusha District Council, the following views was put forth;

Though the government provide employment to teachers but still the teachers are not enough especially science and mathematics teachers in public seondary schols (personal interview. 6th June, 2021).

The teacher is a crucial component of any educational system because no organized education can take place without the teachers. Teachers implement educational policies, the curriculum and play significant roles in the attainment of the objectives of any educational system (Dangara, 2016). The researcher established from respondents that due to inadequacy of science and mathematics teachers, there are some teachers who teach other subjects which they are not professionally qualified in. For instance, in school X the teacher with Bachelor of Arts with Education specifically, in Economics is forced to teach Mathematics.

This finding is in agreement with the findings in the study done by Victorini and Wambiya (2016). The study demonstrated that in some schools even the number of teachers in other subjects was not enough and that led to too much workload for the teachers. The study found that though there is inadequate number of teachers in most schools, their presence matters a lot. This view was supported by Wali, Abulfathi and Mustapha, (2019) who revealed that teaching is the science and art that are cleverly combined by teachers. When teachers use most current pedagogical and teaching methodology (student centered approach) as well as content knowledge thus, the lessons are translated with the use of artist-tic skills

so that students do not become bored and retain information longer when they are actively involved in their learning. This finding has shown that teachers are key factors for the student academic performance. Therefore, effective use of resources by teachers in schools is found to have a positive effect on students' achievement and this leads to improved student academic performance.

Based on this finding, every student should have an individual desk which makes them to be comfortable in learning process. This finding is closely related to that in the study done by Tobia, Sacchi, Cerina, Manca and Fornara (2020) on the influence of classroom seating arrangement on children's cognitive processes in primary school: the role of individual variables. The results on 77 participants showed that, when children were seated in single desks, their score in logical reasoning was globally higher. Furthermore, when seated in single desks, girls showed a better performance in the theory of mind, and lonely students performed better in theory of mind and creativity. Therefore the finding revealed that text books helps to encourage students to read and acquire essential skills for student to master knowledge, thereby influencing students' academic performance.

Furthermore, reading not only influences reading achievement but also increases general knowledge. Students who read frequently possess stronger overall literacy skills, such as vocabularies, improved writing ability, better spelling and increased knowledge of grammatical and punctuation rules. Students who read proficiently often perform well academically in all subjects. The finding is in agreement to the study done by Du Toit (2001) who found that students' academic success was associated with their reading skills. Reading not only enhances personal, spiritual and mental development but also provides entertainment, inspiration and knowledge of how we view ourselves and others. Therefore, there is a correlation between reading proficiency and academic success.

The finding revealed that clean water supply influence students' academic performance. It is proved that it is important to provide clean water for hand washing, drinking water to pupils as a way of reducing sanitation related diseases such as diarrhea and COVID-19. Hence, to improve health and school retention is very important. This finding is related to the study done by Jasper, Tam Le and Bartram (2012), on water and sanitation in Schools: a systematic review of the health and educational outcomes. The study revealed that educational outcomes included school attendance and academic performance. Therefore, availability of adequate clean water supply enhances sanitation,

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reduces absenteeism and increase access to education and hence better academic performance.

5. Conclusion and Recommendations

5.1 Conclusion

The study concluded that availability of teaching and learning resources in public secondary schools directly influence students' academic performance in public secondary schools in Arusha District Council. The findings from this study have shown that the availability of teachers, classrooms, desks, laboratories equipments and reagents, library, hall, textbooks, reference books, playground and sport kits in secondary schools make the necessary physical environment of schools and classrooms. These TLR cause students' comfort in school; hence influence their behavior, especially on teaching and learning as well as on their academic interactions with teachers and fellow students within their environment.

The second objective of the study dealt with the assessment of the adequacy of teaching and learning resources in public secondary schools where by the study found that most schools are faced with challenges such as inadequate human resources, material resources, financial resources as well as time resources that affect provision of quality education and consequently influence students' academic performance in public secondary schools. The study concludes that available teaching and learning resources should be used effectively.

5.2 Recommendations

Based on the research findings, the following recommendations are given suggested:

- i. Public secondary schools should convince education stakeholders, political leaders, and local government to provide teaching and learning resources in order to improve students' academic performance in national examinations.
- ii. Teachers in Public secondary school should be encouraged to implement curriculum using available resources in teaching and learning processes in order to improve performance in national examinations.
- iii. Teachers are encouraged to improvise teaching and learning resources where possible so as to enhance students' academic performance in public secondary schools.
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