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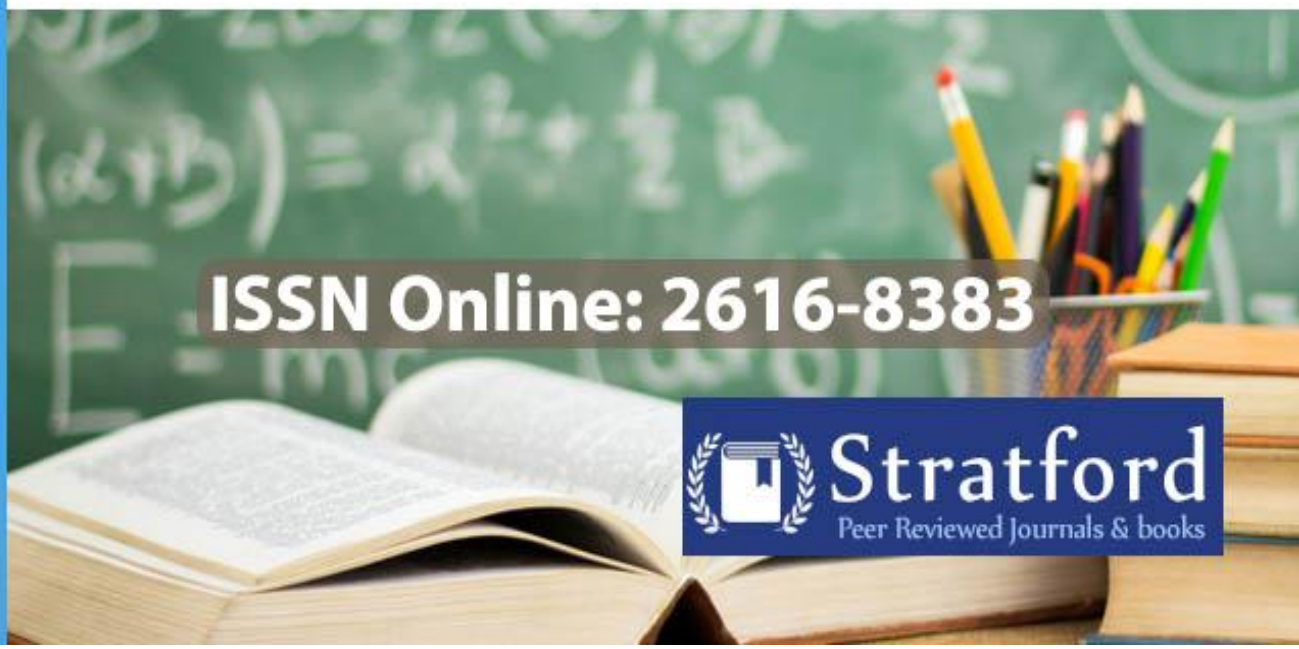

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Relationship Between Secondary School Teaching Factors and Academic Performance of Students in Science Subjects in Lower Public Secondary Schools in Rwanda

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Abstract

The performance of students in various school activities get affected by various factors including factors associated with teaching. These can include teachers' attitude, schools' facilities usage, curriculum implementation and community involvement. Therefore, the purpose of the research was to assess the relationship between secondary school teaching factors and academic performance of students in science subjects in lower public secondary schools in Rwanda, particularly in Rusizi district. The target population was 185 respondents. From this population, simple random sampling and convenient sampling techniques were used to get 126 respondents. Questionnaire and interview guide were used as data collection instruments. IBM SPSS version 23 was used in the management of quantitative data. Likewise, thematic analysis was used to analyze the qualitative findings. The findings revealed there is a statistically significant low positive relationship between school installations usage and students results where r= 0.390 and p-value of 0.001, less than 0.01 was found. This shows school facilities are more important in making students more performing in different domains. The study also revealed there is a statistically significant low positive relationship between teachers' attitudes and academic achievements where r= 0.458 and p-value is 0.000 less than 0.01. This means that teachers' attitudes are more important in making students more performing in different domains. It was noted there is a statistically significant low positive relationship between curriculum implementation and the school achievements where r= 0.291 and p-value 0.019 is less than 0.05. This means that at certain extent curriculum implementation contribute to the academic performance. The findings also indicated there is a statistically significant low degree of positive relationship between community involvement and students' achievements where r= 0.245 and p-value = 0.049, less than 0.05. This means that at certain extent community involvement contribute to the academic performance. This research recommends that the government should allocate enough funds to schools for improving school buildings. School authorities and parents should construct ways of controlling students' personal issues. Besides, there should be establishment of the departments guiding and counseling students at the educational institution like schools to resolve learners' problems like teenage challenges, panic of exams, and subject choices among others.

Keywords: *Teaching factors, Academic performance, Lower Public Secondary Schools, Rwanda*

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1.0 Introduction

The education system is the backbone of any nation that can be viewed within the concept of a factory that need the combination of monetary, human, and material resources to complete the production process. All the existing factories have unique operating environments that define the nature and type of production in process. Within the school sector, the plant refers to the physical infrastructure available, which can include buildings, electricity, water supply, furniture, and machinery just to mention but a few. All these items are important in ensuring that the system is efficient and effective. Torupere (2016) linked the school environment, more so the physical environment with enhanced learning process. Globally, Cross, Baker and Stiles (2006) defined the school learning as characterized by many interactions. The absence of such environments has the potential of hampering the learning process. The nature of facilities present in schools is essential in defining the anticipated education for learners by attracting them to different programs offered. Unfavorable and deteriorating conditions are associated with constant complaints from learners. Empirical studies by Ajayi (2002) established positive connections between school offices and adequacy of learning activities in schools. Similarly, Hallack (1990) cited physical facilities as major performance indicators in the schooling system. The availability, adequacy and supply of physical facilities have been overemphasized as important in contributing towards the success of students. Conversely, un-conducive environments characterized by crowded classrooms, missing doors, windows, and old dilapidated buildings can lead to declined performance among learners.

According to Ahunanya and Ubabudu (2006) availability of accurate infrastructure and equipment in schools is essential. These facilities would include quiet, clean, and beautiful physical conditions that make the teachers and students motivated hence leading to high levels of performance and productivity (Adams, 2004). Meager physical working conditions are associated with discomfort, mental fatigue, poor health and destruction, which significantly impact the performance of learners (Wilson, 2003; Okunuga, 2005; Ijaduola, 2008c). Physical infrastructure is defined by tangible things that should be made available in order to facilitate activities in the working place. Within the setting of the educational system, physical exercises are characterized by things that empower the educator undertake their teaching roles effectively while at the same time the learner gains adequate knowledge from the process. Thus, the ability of the learners to acquire knowledge from the teachers is highly dependable on the physical facilities present in the school (Ijaduola, 2007). Felix (2004) believes that good school organizations must be defined by appropriate physical conditions which support learning.

Denga's (1993) empirical studies reported lack of conducive physical environments in most secondary school settings. Improved performance among students is associated with conducive physical environment. However, most of the urban and rural schools still suffer inadequate infrastructure. Even to the extent that children are forced to undertake their studies under tree shades. In other instances, schools have roofs that are blown off or broken windows and missing doors. To make matters worse, lack of desks force students to sit and write on bare floor or improvised seats supported by stones. Such learning environments cannot promote learning, and subsequently impacting the learning and academic performance of learners negatively. The scholar along these lines suggested there would be prerequisite requesting all efforts to be mobilized to guarantee that squares were ousted with the objective like a nice beginning would base on who and what is to come. It is against this background, this work means to research the elements that

impact students' scholarly performance in science subjects by taking the case of Rusizi district where the consideration will be for school facilities, teachers and learners attitude, efficiency in curriculum, and school communication with the community since empirical studies have shown that are the most factors that may produce important impact on the learners' presentation in scientific courses.

1.1 Problem Statement

Science subjects are considered important to individuals and nations around the globe for survival and achievement of global economic requirements (Kibet *et al*, 2012). The implication is that science subjects are characterized as the most important subject in the contemporary environment characterized by economic development and wealth creation that is highly depended on scientific works (Muzah, 2011, Kibet *et al*, 2012). However, in developing countries like Rwanda schools face inadequate educational infrastructures helping in providing quality education in science subjects and this might be the reason for poor performance in sciences. Nowadays different initiatives are being taken by the government of Rwanda so as to help the education standards for all by providing schools facilities including ICT materials, renovating the curriculum from Knowledge based curriculum to competence-based curriculum, providing training to teachers. Even if all of the above efforts made; students continued to fail in science subjects at various levels in public secondary schools particularly at ordinary level in national exams (Rusizi District Report, 2018). This research therefore, thought to assess the relationship between secondary school teaching factors and academic performance of students in science subjects in lower public secondary schools in Rusizi district in Rwanda.

1.2 Objective of the Research

The objective of this research was to assess the relationship between secondary school teaching factors and academic performance of students in science subjects in lower public secondary schools in Rusizi District in Rwanda.

2.0 Literature Review

2.1 Factors Influencing Academic Performance in Science Subjects

To any nation, the scientific curriculum is crucial (Omosewo, 2013). The extent of any development is widely depending on the size of its people are equipped with scientific enquiry. This is why different countries particularly the Rwanda put emphasis on science and technology through many measures made to refine science teaching, because of its distinct results on nation's economy. Science subjects attract more infrastructural investments compared to other disciplines at all grades of the instructional system. This is because of the practical sessions defined by carrying our experiments in the laboratory in the classroom as well as during examinations. Most of the countries in Africa have adopted a system that encourages students to undertake practical scientific lessons. Malawi is among the countries that have many district day and boarding secondary schools that have fully equipped laboratory structures with the aim of offering lessons to students without expecting any challenges. However, despite the importance of these facilities to student's education, a number of approved and unapproved educational institutions lack appropriate infrastructure in place, or do not have required textbooks and competent personnel to offer lessons and supervise students during practical sessions. Empirical studies have linked poor

performance in practical science examination with poor provision of learning resources during practical sessions (Myers, 2000).

2.1.1 School Facilities

i. Libraries and academic performance

The academic library performs a crucial role in the educational process. Chamani (2010) in his study, the student usage of an academic library; founds that the undergraduates are overall satisfied with available library resources, services and facilities. But it further found that library resources and services are not being fully utilized by undergraduates. He suggested that the information literacy program should be conducted to promote awareness and use of electronic information resources. He also recommends that the library should increase its usage. Providing access to information about the resources available in academic libraries plays a significant role in helping the students discover the facilities available in the library. Many factors of library usage play an imperative part in determining students' performance such as individual behaviour, Library staff co-operation, library services, and proper guidance to use the resources, better communication and learning facilities and atmosphere and harmonious relationship between librarian and students. A library is considered as a heart of any educational institute. The main motive and objective of any academic library is to impart knowledge and skills to its students in higher education. Library plays an essential and indispensable role in teaching and learning which directly supports the library usage which contributes to student's achievement. Basil (2012) in his study and reveals that the facilities, services, information resources are the major facets which make more impact on the satisfaction of the users of the library.

ii. Textbooks and academic performance

In a study to establish what teachers and students consider as the strengths and negatives using textbooks and alternative materials in upper secondary schools in Sweden, Nilsson, (2006) found that teachers and students had common views on about textbook and alternative materials. The study found that using textbooks saves time as teachers no longer spend long honours to prepare alternative materials for the lesson. Learners were happy in using textbooks because they know what to do at each point in time and may choose to learn in advance if they wished. Furthermore, teachers indicated that textbooks are of significant benefit in supporting classroom work due to weak students as they feel more secure working with textbooks because of the guide books give them. By having all the material in one book, students feel that they are in control of their learning (Woodward, 2001). Harmer (2001) indicated that "many good textbooks are attractively presented and they are prepared with a good structure that offers a coherent syllabus, satisfactory language control and motivating texts and tapes" (Harmer, 2001).

iii. School building and academic performance

The school physical infrastructures like classrooms, libraries laboratories and staff houses enhance physical learning environment that leads to the provision of technical skills and to develop qualitative and adequacy aspects that are needed in the school setting (Maron and Brooth, 2007). Housing teachers and students according to the school environment, improve student's performance where teachers can get opportunity of providing special courses to those teachers that teach practical subjects through school laboratories (Watson, 2013). Sanitation facilities which comprise waste disposal, drainage and adequate water for personal hygiene, cleaned toilets and

other materials used while making school infrastructures modify the level of cleanliness which attract and motivate students get improved academic performance (Kinder, 2013). According to Sidhul (2012), the school infrastructures promote the performance of curricular and co-curricular activities provided by school. The nature and size of school infrastructures presents the shape and size of classrooms. The shape and size of classrooms and availability of educational materials, change the way through which students participate in school instruction. Practical courses could not be maintained for science students in school setting without science laboratories (Sidhu, 2012). Therefore, the availability of school infrastructures should be supported by parents and educational stakeholders that provide their financial capacities (Mgbodile, 2010). The extent to which school administrators perform the organizational goals depends on the combination of various variables which lead to the effective management of school infrastructures (Obi, 2011).

iv. Laboratory and academic performance

The teaching and learning experience is centered on the extent of adequacy of laboratory facilities in secondary schools and teachers effectiveness in the use of the laboratory facilities with the aim of facilitating and providing meaningful learning experiences in the learners. Although some facilities may be available and adequate but may not be put into use by the science teachers. Umeh (2006) is of the view that audio-visual aids such as computers and projectors are not utilized in schools due to lack of knowledge on proper use of such resources for teaching. Achimagu (2006) classified resource materials (facilities) into classrooms, laboratory equipment/chemicals and textual/audio-visual materials. Resources or facilities according to Umeh (2006) refers to facilities that can be used to enhance or improve educational programs and promote teaching and learning. Science laboratory facilities can be human or material. The human resources have to do with personnel such as science teachers and laboratory technologists or assistant. He added that science laboratory facilities are those materials available to the science teachers for teaching and learning and these may include text books, computer, thermometers, fire extinguishers, chalk boards, first aid kits, ovens, incubators, models, chemicals, television and other electronic devices. According to Yadar (2007), the completeness of science and mathematics courses must be achieved through practical work, which is carried out by students under the guidance of teachers in laboratories or classroom settings. Practical work at the school level is very important due to the fact that people learn from what they do practically. Scientific applications and practices are meaningful in establishing how objects are seen through illustrations, and hence, they are important features in mathematics and science subjects (UNESCO, 2008).

v. Information Technology and performance of students

The advancement in technology has enabled school administrations to adopt systems that offer parents with the opportunity to follow up their children's academic progress, monitor their homework, and alert them should there arise issues or in case of emergencies. Scholars have linked the application of modern technology with effective communication among parents in the US by encouraging their involvement in their youngsters' investigations, inspiring them to get their work done, and communicating with teachers directly regarding matters to do with their progress. Tobolka (2006) emphasized the importance of communication in enhancing the interest of learners in their investigations and offering guardians with more learning in regards to day by day tutoring exercises. Thus, the concept of student self-learning was encouraging in ideal schools as learners are provided with opportunities to connect to diverse global and local learning sources and access

information either in visual or audio forms for use in the laboratories. Though the traditional use of whiteboards by teachers as a teaching aid is widely used and acceptable, researchers emphasize on the importance of allowing learners to experiment with the available technologies, among them calculators and computers that offer practical opportunities that can be discussed within the classroom setting (Goulding & Kyriacou, 2008).

Fakhruddin et al (2006) examined the adequacy of distance education innovation in assisting the delivery of academic subject matter by teachers. Findings from the study indicated an interest in the educational process and high retention of information compared to traditional methods. In addition, teachers recorded an increase in the number of students using logical deduction thinking process. Similar findings by Mahmoud and Abdul Rashid (2009) emphasized on the significant role of technology in enhancing learning capabilities among students, and supporting the entire educational process. Most significantly, e-learning factor in individual student differences through the provision of various sources and assistance services, and hence encouraging understudies to learn at their own pace depending on their particular attributes and potential. As such, students with special needs and learning difficulties gain significantly from the utilization of innovation in the learning procedure (Mahmoud and Abdul Rashid, 2009). Robert (2005) linked e-learning with a successful learning condition and arrangement of chances for understudies to impart learning encounters through communication to their associates and educators, and through the process enhancing communication and cognitive skills). Collaborative e-learning is also associated with alleviation of psychological problems associated with anxiety. Empirical evidence by Qadir (2008) documented the ability of e-learners in enabling learners to be more active and establishing global communities, hence expanding learner's understanding and acceptance of diverse religions, customs, and cultures.

More studies by Fakhruddin *et al* (2006) linked e-learning with enhanced teaching and learning, and hence saving time and efforts in comparison to the traditional system. Time saving was in the form of facilitating communication between home and the school, offering parents the ability to monitor the progress of their children, and enhancing the relationships between parents, learners, and teachers, which consequently boosted the learning experience. Kosakowski (1998) emphasized on the importance of all stakeholders embracing technology with the aim of enhancing involvement in schools while businesses had the potential of using emails and other communication tools to offer mentorship services to learners as a means of preparing them for the workplace. All said and done, e-learning has been associated with negative impacts emanating from the adverse effects that the computer poses to students, among them weakened social relationships resulting from addicted use. The computer culture that is characterized by the increase in the number of hours spend by learners on computers separate them from this present reality and avoid the improvement of regular kinships. Empirical evidence by Al-Mousa (2003) linked continuous use of computers among learners to weakened social skills, loneliness, and lack of humor and conversational skills. In addition, there was overreliance among teachers and students on technological sources as opposed to the traditional print books and resources due to the misconception that technology eased the teaching process and allowed students to store huge amounts of data.

2.1.2 The Attitudes of science teachers

Abudu and Gbadamosi (2014) defined mentality as a thought or suspected dependent on specific circumstances which define the ability of an individual to like or aversion a thing. Frame of mind is categorized into three poles; positive, neutral, and negative. Empirical studies by Abudu and Gbadamosi (2014) regarding the attitudes adopted towards the science subject significantly affects the performance of students and how the subject is conceived. Positive attitudes are associated with better grades in the science subject due to increased enthusiasm for the subject and responsibility, which is associated with the desire for scholarly accomplishment (Osborne, Simon & Collins, 2003). Osborne *et* al (2003) divided attitude towards the science subject into three classes; endeavor of science, school science, and the impact of science on the general public of researchers. Attitude is associated with how the teachers perceive the subject, anxiety levels, value, self-esteem, enjoyment, mentalities of companions and companions, inspirations towards the subject, parent dispositions, the nature of homeroom condition, accomplish, and dread of disappointment in the subject (Osborne, *et al.,* 2003; Abudu & Gbadamosi, 2014). Individual attitudes towards the science subject are defined by the above constructs. In most cases, learners enrolling for school have positive attitudes towards the subject, nonetheless, the de-contextualized nature of the school educational program changes their attitudes negatively (Osborne et al, 2003).

Biology has been identified by scholars as the only section of life science subject that is seen important by students due to its ability to relate with life and how daily life is viewed (Osborne et al, 2003). Physics is looked as irrelevant due to the domination of equations and chemicals that do not relate with daily lives (Osborne, *et al.*, 2003). The change of such attitudes involves the use of teachers with positive attitudes and commitments in changing learner's attitudes (Mart, 2013). The process would not involve any teacher, but rather those that are qualified and specialized to teach the science subject, understand the subject beyond the provided curriculum, use diverse ways to teach the subject, are confident about the subject, and exceed time beyond the requirements to ensure that their learners grasp important concepts (Tsanwani *et al*., 2014; Osborne *et al*., 2003). Scholarly evidence has suggested that teachers who are not able to adopt corrective approaches and attitudes when delivering the subject result into adoption of negative frames of mind by students, and subsequently meaning poor scholarly execution in science subjects (Abudu and Gbadamosi, 2014).

2.1.3 The Science Curriculum

Curriculum is a term that pulls in various implications. The current study utilizes the definition of the concept as syllabus, document, or process involving planning and executing a system and structure that offer guidelines on the content and teaching methodologies to be adopted for a specific field of study (Moore, 2015). The current study examines the elements related to the lackluster showing of students in the science language in Rwanda, and cannot be achieved without a critical analysis of the curriculum being used, based on the fact that the curriculum sets the goals, or acts as a guidance for teachers who deliver the subject by defining what to educate and how to instruct. The perception of this document and implementation of it may have impact on scholastic performance.

2.1.4 Involvement of the community around the school

Scholars have continuously underlined on the significance of including guardians in the learning of their children as a determinant in their scholastic execution (Dhurumraj, 2013; Makgato and Mji, 2006; Lemmer, 2007). The attainment of academic performance is more effective at the point when there is sufficient correspondence between guardians at home, the learner, and the teachers at school.

2.2 Academic Performance

This is an outcome associated with the degree to which students, teachers, or educational institutions achieve their academic goals. Performance in this aspect is determined using examinations or continuous assessment tests. However, no general agreement exists regarding the appropriate measures to determine performance, or which skills are better placed between procedural knowledge (skills) or declarative knowledge (facts) (VonStumm, 2011). In the current examination, scholarly execution is estimated by school assessment results which are exams prepared on school level for permitting students to pass from one class to another, secondly it was measured by mock examination which their marks may or may not count, which indicated an existing practice for upcoming examinations or provided teachers with the platform to set grades before the completion of the term. Bloom *et al* (1971) opined that examinations were essential in determining the degree of student learning, motivating them, identifying difficulty areas of study, and providing feedback to teachers and students. Thirdly, the academic performance was measured using national examination, an assessment aimed at determining the ability of students to pass and join higher education or pass from primary education to secondary education.

3.0 Methodology

This research employed correlation research design in order to assess the relationship between secondary school teaching factors and academic performance of students in science subjects. The sample size was 126 respondents got using Yamane formula from the target population of 185 respondents. The study used stratified sampling technique, simple random sampling technique and purposive sampling technique. The data were collected using questionnaire and interview guide. The validity of the research instrument was maintained by distributing the research instruments to the expert respondents in the area of the study while reliability was maintained by making pilot study that was conducted to 20respondnets that were not sampled and got 89.5% using Cronbach's Alpha and considered to be reliable as it was greater than 70% as recommended. The data management of this study was maintained by using SPSS software version 23.

4.0 Research Findings

This research was to assess the relationship between secondary school teaching factors and academic performance of students in science subjects in Rusizi District in Rwanda.

4.1 School facilities and academic performance in Rusizi District

School facilities are composed materials and techniques that can help schools in providing quality education. Below table shows the perceptions of respondents on school facilities. And using data for academic performance in the appendix the relationship was established using the correlation as the statistical technique.

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Table 1: Perceptions of respondents on school facilities in Rusizi District

School facilities	SD	D	NS	A	SA	Mean	Std. D
The library of this school has sufficient books and updated ones	3(2.4%)	21(16.7%)	61(48.4%)	36(28.6%)	5(4.0%)	3.15	.880
The classroom are built in the way providing sufficient light to student	0(0.0)	11 (8.7%)	71 (56.3%)	35 (50.0%)	9(7.1%)	3.33	.882
The schools has enough computers with updated software	26 20.6%)	45 (35.7%)	28 (22.2%)	22 (17.5%)	5(4.0%)	2.48	.705
The laboratory contained all materials for each practical science	34(27.0)	26 (20.6%)	38 (30.2%)	22 (17.5%)	6(11.1%)	2.52	.795
Training are provided to teachers who show low skills in using lab materials	0(0.0)	14(11.1%)	49 (38.9%)	52 (41.3%)	118.7%)	3.48	.829
Average mean						**3.1905**	**.42637**

This Table I represents research participants' perceptions to the school facilities. It was revealed that the facilities that are mostly provided to teachers are trainings for teachers who show low skills in using lab materials regarding an average of 3.48 that is explained by the high average. Other facilities were revealed to stand on moderate level including having sufficient books and updated ones taking into consideration the mean of 3.15 that is a moderate mean, and classroom built in the way that provide sufficient light to students considering the mean of 3.33 interpreted as a moderate mean. Lastly it was revealed that there are no enough computers with updated software consider the mean 2.48 interpreted as low mean and no teaching materials within libraries for each practical science consider the mean of 2.52 explained as a low mean. As partial conclusion, it is said that lower secondary schools in Rusizi district provide facilities on moderate level based on the mean of 3.1905 explained as a moderate mean.

Table 2: Correlations between school facilities and academic performance

		School facilities	Academic performance
School facilities usage	Pearson correlation	1.000	
	sig. (2-tailed)		
	N	126	
Academic performance	Pearson correlation	.390**	1.000
	sig. (2-tailed)	.001	
	N	126	126

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

Table 2 indicates the correlation between school facilities usage to the scholastic results in second level of education in Rusizi district for the sake of responding first specific objective of this study.

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The correlation results show that a clear relation between school installations usage and students results is shown considering the correlation or r of 0.390 and is remarkable where the p-value of 0.001 is less than 0.01. This shows school facilities are more important in making students more performing in different domains. Those results are almost in the line with those from the study that was conducted by Usen (2017) where he found that different school facilities contribute to acceding performance where there is significant positive correlation between teachers use of school facilities (library, laboratory, ICT room and exercise room) and scholastic achievement of learners in human Biology. Given the study findings, recommendations have given that teachers should exercise good effort to incorporate the available school facilities in their pedagogical practices to improve themselves and to promote the academic growth of learners.

4.2 Teachers' attitudes and academic performance

The second research objective was about examining the influence of teachers' attitudes on academic performance of students. The perceptions of the respondents on teacher's attitudes towards sciences were shown in this table.

Table 3: Teachers and learners' attitudes on academic performance in Rusizi District

Teachers and learners' attitude	SD	D	NS	A	SA	Mean	Std. D
The teachers master the subject they teach	0(0.0)	3(2.4%)	48(38.1%)	57(45.2%)	1814.3%)	3.71	.850
Teachers use to motivate students in various ways	2(1.6%)	8(6.3%)	24(19.0%)	65(51.6%)	2721.4%)	3.85	.820
Teachers are used to provide more explanations on subjects	0(0.0)	4(3.2%)	50(39.7%)	60(47.6%)	12(9.5%)	3.63	.802
Teachers feel motivated while teaching sciences	0(0.0)	8(6.3%)	50(39.7%)	43(34.1%)	2519.8%)	3.67	.745
Average mean						3.7183	.3940

This Table 3 presents participants' perceptions on teachers' attitudes. It was revealed that teachers' attitudes is effective on the following: Teachers are used to provide more explanations on subjects given an average of 3.63 given as a high mean, teachers feel motivated when teaching sciences consider the average of 3.67 explained as a high mean, mastering the teaching subjects for teachers regarding the mean of 3.71 interpreted as a high mean and to motivating students in various ways basing on the mean of 3.85 explained as a high mean. It is to say that the behaviors of teachers to science subjects is positively appreciated by respondents since the Average mean was revealed being 3.71 and interpreted as high mean. Below table shows the relationship between learners and teachers' behavior and academic performance.

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Table 4: Correlation between teachers' behavior and academic performance

		Teachers' attitude	Academic performance
Teachers' attitude	Pearson Correlation	1.000	
	Sig. (2-tailed)		
	N	126	
Academic performance	Pearson Correlation	.458**	1.000
	Sig. (2-tailed)	.000	
	N	126	126

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

Table 4 indicates the correlation between teachers' attitude and academic results in secondary school of Rusizi district in order to respond the second specific objective of this research. Correlation results presented a positive relationship between teachers' attitudes and academic achievements considering the correlation or r of 0.458 while it is significant for the p-value is 0.000 what is under 0.01. This means that teachers' attitudes are more important in making students more performing in different domains. Hence those results are in relation to those that were found by David (2016) where he found upper elementary teachers get a large effect on a number of students' attitudes and behaviours in addition to their scholastic achievements. He continues saying that these teachers' effect estimates become moderate to strong predictive validity and further, teaching practices predict students' outcomes most proximal to these measures (e.g: between teachers' math errors and learners' math achievements, and between teachers' classroom organization and learners' behaviour in class). Another study conducted by (Syed, 2009) found the same results where teachers' behaviour corresponds with academic results (marks) showed a highly positive significant correlation.

4.3 Efficiency of the science curriculum implementation and academic performance

Nowadays the government is focusing in preparing curriculums that may bring changes on academic performance. Previous researchers have revealed that curriculum is one of the key to performance of students and below table shows the perceptions of respondents on how curriculums implementation is effective.

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Table 5: Curriculum implementation in Rusizi District

Efficiency of the curriculum	SD	D	NS	A	SA	Mean	Std. D
The curriculum for sciences is understandable and facilitate teachers	2(1.6%)	9(7.1%)	28(22.2%)	56(44.4%)	31(24.6%)	3.83	.820
The curriculum for science subjects is always updated	0(0.0)	10(7.9%)	47(37.3%)	56(44.4%)	13(10.3%)	3.57	.780
The curriculum allows students to have participation in study	0(0.0)	8(6.3%)	37(29.4%)	62(49.2%)	19(15.1%)	3.73	.631
There is a way to monitor if the teachers meet the curriculum while teaching	0(0.0)	2(1.6%)	27(21.4%)	77(61.1%)	20(15.9%)	3.91	.837
Average mean						**3.7619**	**.38652**

Table 5 gives the respondents understanding on the efficient of curriculum especially in science subjects. It was shown that efficient of the curriculum implementation is explained by: the curriculum for sciences is understandable and facilitates teachers regarding that an average of 3.83 seen as a top average, the way by which curricula are designed allow students to have participation in the study this is shown by the average of 3.73 considered as a high mode, district has put in place the way to monitor if teachers meet the curriculum standards while teaching as shown by an average of 3.91 interpreted as big one and the science subjects are updated on high level considering the mean of 3.57 interpreted as a high mean. Partially the Average mean shows that the curriculum implementation is efficient and below table with the use of academic performance in appendices shows the correlation between efficient curriculum implementation and academic performance.

Table 6: Correlations between curriculum implementation and academic performance

		Efficient of the curriculum	Academic performance
Efficient of the curriculum implementation	Pearson correlation	1.000	
	Sig. (2-tailed)		
	N	126	
Academic performance	Pearson correlation	.291*	1.000
	Sig. (2-tailed)	.019	
	N	126	126

* Correlation is significant at the 0.05 level (2-tailed).

Table 6 indicates the correlation between curriculum implementation and school achievements in Rusizi District in a way of responding the third objective of the research; the correlation results gives a crucial relation between curriculum implementation and the school achievements

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considering 0.291 as correlation or r and it is significant for the p-value 0.019 is less than 0.05. This means that at certain extent curriculum implementation contribute to the academic performance. Hence Semra et al (2012) in their study which was titled "The Effect of Curriculum for Developing Efficient Studying Skills on Academic Achievements and Studying Skills of Learners" as a result, they showed that learners should earn effective studying competences by means of curriculum for expending efficient studying abilities and elevating their school achievements, appreciated studying habits. In this line, there is desire to increase the quality of education, learners who have high scale of scholastic achievements are purposeful therefore growing youth have to compete to young population of other states with the effect of globalization, what is necessary to make students to acquire efficient studying skills.

4.4 Community involvement and academic performance

The involvement that is said here is named parent- teachers' communication. This means that parents should communicate with teachers on the progress of their children and teachers provide feedback and vice versa. This table gives the respondents' perceptions on the effectiveness of communication between parents and the school especially teachers.

Table 7: Effectiveness of community involvement in Rusizi district schools

Community inv.	SD	D	NS	A	SA	Mean	Std D
There is a periodical parent-teacher meetings	0(0.0)	0(0.0)	41(32.5%)	59(46.8%)	26(20.6%)	3.88	.691
Parents can phone the school on the progress of students	0(0.0)	7(5.6%)	30(23.8%)	72(57.1%)	17(13.5%)	3.79	.830
There is a report cards for students where parents can write their views	3(2.4%)	14(11.1%)	61(48.4%)	35(27.8%)	13(10.3%)	3.33	.744
There is platform that unites parents and teachers for example social media	2(1.6%)	14(11.1%)	54(42.9%)	42(33.3%)	14(11.1%)	3.41	.543
Average mean						3.601	.42489

This table 7 represents how community involvement is perceived. The positive perceptions were revealed on the following: there is a periodical parent-teachers' meeting as we consider the mean of 3.88 explained as a high mean, Moderately, for some schools there is platform which unites parents and teachers for example social media based on the mean of 3.41 interpreted as a high mean but and parents can phone to the school for the progress of students based on the mean of 379 which is explained as high mean. But it was revealed that existence of report cards for students where parents can write their views is moderate considering the mean of 3.33 which is a high mean. In partial conclusion, the community involvement regarding the performance of students is

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on high level since the Average mean 3.60 is a high mean. Below table shows the correlation between community involvement and academic performance.

Table 8: Correlations between community and academic performance

		Community involvement	Academic performance
Community involvement	Pearson Correlation	1.000	
	Sig. (2-tailed)		
	N	126	
Academic performance	Pearson Correlation	.245*	1.000
	Sig. (2-tailed)	.049	
	N	126	126

*. Correlation is significant at the 0.05 level (2-tailed).

From this Table 8, the correlation of community and school achievements in Rusizi District in order to respond the fourth specific objective of this study show a positive relation between community involvement and students' achievements considering 0245 as correlation or r and it is significant because p-value of 0.049 is less than 0.05. This means that at certain extent community involvement contribute to the academic performance. However, those results are almost linked with the results found by Petrolina et al, (2019) on their study that was titled "Influence of Parent-teacher Communication on Academic Performance of Pupils in Public Primary Schools in Ainabkoi Sub- County, Kenya" where they found that a positive and significant relationship between parent – teacher communication (X2=10.087; p=0.039) and academic performance is highly appreciated. Parent – teacher communication becomes therefore a positive predictor to pupils' academic performance.

5.0 Summary of findings

The purpose of this research was to assess the relationship between secondary school teaching factors and academic performance of students in science subjects in lower public secondary schools in Rusizi District in Rwanda. The findings revealed that there is a statistically significant positive relationship between school installations usage and students results where r= 0.390 and p-value of 0.001 is less than 0.01. This shows school facilities are more important in making students more performing in different domains. The study also reveals there is a statistically significant low positive relationship between teachers' attitudes and academic achievements where r= 0.458 and p-value is 0.000 less than 0.01. This means that teachers' attitudes are more important in making students more performing in different domains. It was noted that there is a statistically significant low positive relationship between curriculum implementation and the school achievements where r= 0.291 and p-value 0.019 is less than 0.05. This means that at certain extent curriculum implementation contribute to the academic performance. The findings also indicated that there is also a statistically significant low degree of positive relationship between community involvement and students' achievements where r= 0.245 p-value = 0.049 is less than 0.05. This means that at certain extent community involvement contribute to the academic performance.

6.0 Conclusion

Science subjects seem to be difficult to students due to different teaching factors but due to the needs of the country for sustainable development, it is a must to focus on them and do whatever

that is possible to help students to perform. The study showed the different factors contribute to the way by which students perform in science subjects including school facilities usage, teachers' attitude towards science subjects, efficient curriculum implementation and effective communication between parents and teachers. But among those factors it was revealed that the main teaching agents that affect lower secondary students in science subjects are school facilities and learner-teachers attitudes towards science subjects.

7.0 Recommendations

The following recommendations are made based on the study findings;

i. School authorities and learners' parents should construct ways of controlling students' personal issues. Besides, there should be establishment of the departments guiding and counseling students at the educational institution like schools to resolve learners' problems like teenage challenges, panic of exams, and subject choices among others.
ii. Parents could support their children at home at home by providing basic needs.
iii. Government could allocate enough funds to schools for improving school buildings. For the school partners particularly, parents should highly innovate and participate in projects to make the school resourceful.
iv. Teachers should use of modern methods of teaching learning like ICT tools in teaching science subjects should be given emphasis for motivating and catching learners' will for science domains.

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