



Effective Use of Instructional Materials and Student Academic Performance In Selected Nine-Year Basic Education Schools A Case of Gasabo District, Rwanda

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Abstract:

Background: The purpose of this research project was to examine the extent to which the selected secondary schools in Gasabo district effectively use instructional materials in the classrooms and how this has promoted students' academic performance. This research project is based on three specific objectives as follows: To identify the instructional materials being used for teaching in order to achieve students' academic performance; To examine the extent to which students in nine-years basic education perform with the effective use of instructional materials; To analyze effects of instructional materials usage on student academic performance in Gasabo District. The study adopted a cross-sectional survey timeline. The study population involved all secondary schools in Gasabo district. Out of 61 secondary schools in Gasabo district, 3 schools were randomly selected for data collection. The schools were: G.S. Remera Catholique, G.S. Kimironko I, and G.S Ndera. The head teacher and teachers were got using purposive sampling, and the students using random sampling. 1 head teacher was interviewed, 2 teachers in two schools, and 3 in the third school; plus 107 students from 2 of the 3 selected schools and 108 from the third school. Therefore, the researcher considered 330 respondents that were selected from three schools of Gasabo district using purposive sampling and simple random sampling. Hence, the research being composed of 1885 people as the study population and 330 as sample size, whereby sample size was found by using the Slovin's formula.

Materials and Methods: Structured questionnaire and interview guide were used to collect the data. Both qualitative and quantitative research approaches were used. The Statistical Package for Social Sciences (IBM/SPSS) version 21 was used for data analysis. Descriptive data analysis, frequency distribution tables, inferential statistics involving percentages, correlation and frequencies were used in data presentation.

Results: On the instructional materials being used for teaching in order to achieve students' academic performance, the 71.4% agreed that they access on audio-visual resources, 57.2% responded yes that they use the audio resources, 85.7% agreed that they use the graphic resources and exercises books. On the extent to which students in nine-year basic education perform with the effective use of instructional materials, 85.7% of teachers agreed that the use of posters, charts and diagrams in teaching were very important for students learning. On the ways how instructional materials can be effectively used for student better academic performance, 87.5% of students' respondents pointed out that the materials help them in improving knowledge and skills. The results indicated that correlation between the use of instructional materials and students' academic performance was .959** that was a highly positive correlation and presented that there was a significant relationship between two variables. The results directed that the R Square = 0.919 which means it was clear that 91.9% of all variables of students' academic performance can be deliberated by one's of all variables of the use of instructional materials.

Conclusion: It concluded that there was the significant effective use of instructional materials on student academic performance in Gasabo District, Rwanda, and recommended that the government should strive and set aside a reasonable amount of education budget which will be directed to improve and construct libraries and laboratories in schools.

Keywords: *Instructional Materials, Student Academic Performance, Nine-Year Basic Education Schools, Gasabo District, Rwanda.*

i. Introduction

The attention to the use of instructional materials for student better academic performance has been observed in all industrialized countries but our focus here is on the current picture of effective use of instructional materials for better student academic performance in developed countries, and the developing countries and most especially in Sub-Saharan Africa, Rwanda. This dimension of educational agencies (Babayomi., 2014), according to global monitoring, all other things being equal, the quality of teaching and learning is heavily determined by the resources available and how they are managed. If secondary schools use teaching materials, it will help to improve teaching and learning and, as a result, students' academic achievement. School finance trends in Tanzania have shown a notable decrease in funding for educational facilities (VISION 2050, 2015). However, studies are needed to draw a clear comparison between the quality of instructional materials in community secondary schools and academic outcomes.

Since the 1994 Genocide against Tutsi, the GoR has made remarkable progress in rebuilding the country's social and economic fabric. Over the last decade, Rwandan ESSPs have been connected with the National Macroeconomic Development Program, the Economic Development and Poverty Reduction Strategy, and the National Poverty Reduction Strategy. (EDPRS, 2018) EDPRS-1 and EDPRS-2 aimed to accomplish long-term economic growth and social development. According to the Rwandan government, Vision 2050 (2015) is implemented over a five or seven-year period using a medium-term planning framework. This ESSP relates to the Republic of Rwanda's National Strategy for Transformation (NST-1) for the period 2017-2024. It is also aligned with Agenda 2063 (African Union, 2015), a strategic framework for Africa's socioeconomic transformation over the next 50 years through existing programs for growth and sustainable development on the continent.

One of the national priorities in the education system in Rwanda is to ensure that education quality continues to improve through closer integration of curriculum development, quality assurance and assessment, improved supply of learning materials, particularly text books, and improved teaching and learning strategies (Summary of CBC Curriculum Framework pre-primary to Upper Secondary, 2015). Unfortunately, some teachers often avoid using course materials in most of their teaching themes while attempting to accomplish everything possible during their college practical sessions; not neglecting the idea that some of these materials are not normally available in some schools for teachers and in the Senior Secondary Certificate Examination as well, regardless of the fact that one of the most crucial components of a successful lesson provided to the student depends on the effective use of the instructional materials.

Whether employed effectively or not, they have real indicators that learning has either occurred or not occurred at all. The similar interest on CBC exploration has been conveyed in Rwandan education during 2015; "Students have more options for active learning and individual engagement in their own learning in today's education system, where both students and teachers are surrounded by different technology".

As a result of universal secondary education, there are huge disparities in facilities and learning resources between Rwandan schools, with public schools being more populated, making it difficult to support all students, and private schools managed by for-profit businessmen who are only concerned with how much(what) is achieved rather than making the schools academically appropriate. Consequently, according to (Benell, 2015); Education quality that focuses on the significance of characteristics such as class size, expenditure per student, and the number of available textbooks is vital to the learning process. The main objective of this research was to examine the effective use of instructional materials on student academic performance in selected nine-year basic education schools in Gasabo District, Rwanda. It was guided by the following objectives:

- i. To identify the instructional materials being used for teaching in order to achieve students' academic performance in Gasabo District.
- ii. To examine the extent to which students in nine-year basic education perform with the effective use of instructional materials.
- iii. To analyze effects of instructional materials usage on student academic performance in Gasabo District.

ii. Theoretical Literature

Constructivist learning theory positions students as active agents in the construction of knowledge from meaningful interpretations of real-life experiences (Maundu, 2019); three strands of constructivism—cognitive, radical, and social, have influenced the consequent constructivist pedagogies. What makes a pedagogy constructivist is the assembly and rationale for the inclusion of particular principles that have been proposed by theorists over time (Young E. G.-P., 2017). Essential to constructivist pedagogy (Willms, 2018), learning

transpires in authentic and real-life settings; learning involves social negotiation and mediation; content and skills are made suitable to the learner; content and skills are understood within the framework of the learner's prior knowledge; students are encouraged to become self-regulated, self-mediated, and self-aware and teachers act as a guide and facilitator of learning. Principles of constructivist pedagogy have been adopted in numerous educational innovations, including problem-based learning, project-based learning, inquiry-based approach, and design thinking. Problem-based learning has a significant and positive effect on students' academic performance, achieving higher marks on all assessments than students who experience traditional approach, according to a meta-analysis of studies, mostly from Asia, conducted from 2016 to 2020 (Funa & Prudente, in press). Furthermore, (Willms, 2018) analysis of studies from 2003 to 2014 suggest the effectiveness of constructivist learning approaches. These results are congruent to other meta-analyses of constructivist approaches in science education that showed increases in student academic achievement (Vygotsky, 2017). Therefore, in line with the constructivism theory, educationists should see to it that they let learners explore their environment with a conducive environment of instructional materials that allow them to construct their own knowledge through teacher's effective facilitation and guidance. This indicates that instructional materials are very essential in the thirst to make an effective constructivism-learning environment, which leads to better student academic performance.

Instructional Materials theories

This study was conducted within the context of cognitive (Eshiet, 2013) and social (Farrant, 2014). Constructivism Theory was used to better understand the teacher and learning aspects that contribute to the academic accomplishment of learners in Gasabo District's nine-year basic education. A constructivist theory involves the child in the process. Teachers are the excellent providers of knowledge and skills in the teaching and learning profession of the twenty-first century (Farombi, 2015).

Teachers utilize instructional materials to improve classroom education, capture students' attention, and motivate them to learn. These instructional materials are devices (computer, DVD), teaching aids (book, blackboard, picture), or things (pattern, map, globe) that assist the teacher in effortlessly carrying out the teaching-learning process. Much is dependent on the teacher's creative ability. Using educational tools can make the learning process more enjoyable and less time-consuming. The usage of teaching tools helps students to apply their visual, audiovisual, kinesthetic, and hands-on talents while learning (Haki, 2017).

Regular instructional supervision has a significant bearing on students' academic performance. He ((Haki, 2017)) also, affirmed that adequate supply of instructional resources has significant effect on students' academic performance. This could be related to the teacher's teaching approaches utilized during the teaching and learning process in the classroom. Teachers are urged to employ graphics, short video clips, and social media technologies to enhance teaching and learning activities and avoid pupils becoming bored during lectures." Teaching tools are used by teachers to improve their instruction, engage students, and motivate them to learn (Onche, 2013).

Instructional Materials (IMs) defined

The term "instructional materials" refers to resources that organize and support instruction, such as textbooks, assignments, and supplements (Gogo, 2016). It refers to the human and non-human materials and facilities that can be used to facilitate, encourage, improve, and enhance teaching and learning activities. They are all materials used in the teaching process (Haki, 2017). The Great Soviet Encyclopedia defines iMs as educational materials used to improve students' knowledge, skills, and talents, monitor their information intake, and contribute to their general growth and education.

Learning Aids (TAs) are materials (such as a book, image, or map) or equipment (such as a DVD or computer) that a teacher uses to supplement or improve classroom instruction (Fuller, 2018). Learning Aids (TAs) are materials (such as a book, image, or map) or equipment (such as a DVD or computer) that a teacher uses to supplement or improve classroom instruction (Hallack, 2019). Visual aids (illustrations, textbooks, magazines), auditory aids (sound recordings from CDs), and audiovisual aids are examples of instructional aids (combination of audio and video material, DVDs).

Categories of Instructional Materials

In a learning setting, instructional materials are tools, devices, equipment, and/or things that make the learning process delightful, fascinating, fun, and meaningful. The student can absorb what has been studied with ease, simplicity, and motivation with the use of teaching materials (Higgins, 2020). The following categories of educational resources are classified: Pictures, Diagram Buildings, Projectors, Teachers, charts, Real Objects, Books, Newspapers, Magazines, Brochures, Handouts, Clock Faces, Simple Abacus, Colored Objects, Puppets, Models, and Blackboard are examples of visual resources. Cassette, radio, CD, and dramatization are all available as audio resources. Television, video records, motion pictures with soundtracks, slides, films and multimedia, computers and DVDs are all examples of audiovisual resources. Charts, picture boards, number cards, tracing paper, jigsaw puzzles, matching cards, picture books, reading boards, cartoon books, and stacking toys are examples of graphic resources. Real objects such as posters, flags, publications, plants, water, photographs, graphics, animals, sand, coins, and seeds are examples of Realia Resources. (Hoyle, 2021) Claims that students

learn Mathematics by actively constructing the meaning of concepts through individual rearrangement, representation, and reconstruction, as well as social negotiation with peers, elders, and teachers. (Ibe-Bassey, 2011). This indicates that the activity and method of teaching and learning includes input components such as teachers, facilities, instructional materials, students, and curriculum. These input components are merged during the teaching, administration, research, quality assurance, and social impact processes. As a result, qualified and marketable graduates, newly developed knowledge, responsible citizens, and economic growth can be seen.

The teaching and learning activity are reflected in the students' skills, attitudes, and research orientation. Learners will build technical skills, instill professional awareness for the job market, develop an intelligent understanding of technology, and inspire creative thinking by establishing the most effective manner to distribute knowledge content (Kerr, 2000). Such instructional materials (computer, DVD), Teaching aids (book, blackboard, picture) or items (pattern, map, globe) assist the teacher in effortlessly carrying out the teaching-learning process. Much is dependent on the teacher's creative ability. Using educational tools can make the learning process more enjoyable and less time-consuming. The usage of teaching aids allows students to make use of their hearing and visual talents while learning (Onche, 2013).

Essence and development of Instructional Materials in teaching

Fostering global literacy needs the development of effective classroom environments in which students are allowed to express themselves respectfully to their teachers or classmates, to choose what media they access, what technologies they use, and how, when, and where they use them to enhance learning (Kothari C. R., 2010). Although, when compared to traditional resources, digital learning tools are now being used to support student learning, few teachers have utilized these technologies in their lessons. Learning is not driven by technology unless learning tasks are explicitly specified. Despite a math curriculum that promotes student-centered and enjoyable learning, teachers in Nepalese schools continue to use the conventional chalk-and-talk method (Makombe, 2013).

Some argue that using physical things and visual aids such as drawings and illustrations is essential for teaching children at this phase. (Blair, 2015). Reported likewise: "Babies retain visual images long before they learn to connect effectively with others (Blair, 2015). For example, they recall the faces of individuals important to them, such as parents and siblings, and associate certain things, such as fire, with suffering. As a result, as children age cognitively, visual features become increasingly more significant. According to Jean Piaget's cognitive development theory, the years between the ages of 2 and 7 are classified as preoperative phase 3, during which the child learns to use and represent objects through pictures, words, and drawings. (Bloom, 2010)

Rather, the benefits stem from the collaboration, innovation, and communication enabled by technology. In the future, digital tools will have an impact on what and how pupils learn (Maundu, 2019). To completely explain the significance of instructional materials when used correctly, consider the following Chinese proverb "When we hear, we forget; when we see we remember and when we do we understand" (Mbelle, 2011). Therefore, teaching materials not only aid the learner in understanding, but also leave a lasting picture and impression in the learner's memory (Msabila, 2012); He further asserts that: Visual aids are any visible object or device used in the classroom to support learning.

Academic performance defined

Academic performance: The academic performance of students is the central characteristic (Rono, 2014) and one of the most important goals (Abdullah, 2016) of education, which can be defined as the knowledge of students evaluated by grades by a teacher and/ or educational goals set by students and teachers to be achieved over a period of time. (Yusuf, 2016) assert that academic achievement can be understood as a student's quantifiable and apparent behavior within a given period of time and is a sum of scores that a student has in various assessments through class tests during the middle and end of the semester scores exams, etc.

Poor learner performance in mathematics has been a global concern that has prompted developing countries to participate in initiatives to bring positive change in their communities (Sinyosi, 2015). Mathematics excellence can bring positive change in developing countries to develop their education systems for shaping the future and prospects of young people; to develop infrastructure; and to improve economic knowledge, culture and morality, as well as the living standards of their people (Roohi, 2012). However, mathematics underperformance has become a perennial concern which can prevent these developing countries from achieving their developmental goals. The reports of various national and international bodies such as the International Mathematics Union (IMU) indicate that "primary and secondary level mathematics education is weak in most African countries, reducing the potential population of talented students who choose mathematics majors at university level" (IMU, 2020). International studies by Asikhia (2010) found that, in Britain, the reasons for poor performance in mathematics are a lack of learning support; principal teachers' dissatisfaction with the in-career training of teachers in mathematics; and learners taught by teachers who have not participated in career professional development. It is therefore clear from the existing research that educators have an impact on the deficient performance in mathematics because if the teacher does not have a good subject knowledge and pedagogical content knowledge s/he might deliver incorrect content or even skip content, which could also lead to poor performance (Asikhia,

2010). Another factor is the language of teaching and learning. Educators tend to use learners' home language during teaching and learning so that learners often fail to understand the language used in the official examination papers and consequently fail to answer correctly (Asikhia, 2010).

In the South African context, research by Khatoon and Mahmoud (2010) indicated that learners' inferior performance in mathematics is influenced by their negative attitudes towards the subject that emanate from societal views that it is a difficult subject (Khatoon & Mahmood, 2010; Makhubele & Luneta, 2014). While another research in South Africa by Cascio (2013, p. 152) found that educators play a significant role in learners' school performance; for example, if the educator lacks experience or passion about teaching, the learners might not be able to develop comprehensive understanding of the subject material. It is further assumed that, if the educator does not have effective classroom management skills and applies extreme authoritarianism, the classroom environment might hinder fruitful class discussions and collaborative learning from learners. It can also deter learners from applying themselves to the best of their abilities

According to Chen, et al. (2017) strong evidence exists showing that teacher diligence, dedication, and adherence to basic educational policies and processes can lead to good teaching and learning. Chen, et al. (2017) further assert that issues around the maximization of contact time with learners in class, and the presence of both learners and teachers at school and in class, have a positive impact on performance. In South Africa, the instructional time in the senior phase for mathematics is four to five hours (270 minutes) a week.

Academic performance with the integration of real-life context

International studies by Attwood (2014 cited in Sa'ad, et al., 2014) attribute poor performance in mathematics to parental attitude and interrupted teaching. Karue and Amukowa (2013) found that home environmental factors and family backgrounds as well as little participation of parents in the education of their children were the main causes of poor performance in mathematics in Kenya. In South Africa (Cascio, 2013), family-related factors also play a critical role in learners' performance. Parents who are too occupied to care about their children's performance contribute to children losing their academic focus. Poverty-stricken families were found to negatively affect their children's academic performance. Some parents were found to be abusive, which caused learners' school performance to decline dramatically. Learners who come from abusive families tend to perform badly at school (Cascio, 2013).

From the local context (Rwandan Journal of Education, Vol.6, No 1(2022); applied knowledge of the topic instead of concentrating all efforts on its theoretical parts (Seel, 2012). In these innovative teaching and learning strategies, the students gain not only the opportunity to critically analyze the phenomena which they face in their way of life but also develop further awareness of linking physics knowledge and their real-world situations.

Context-based learning as an approach to teaching and learning inspires educators to confidently have innovative and creative thoughts in their instruction activities to respond to the current needs in teaching contexts. Fundamentally, "authentic learning is a multi-disciplinary, skills-based learning in a real-life context, demonstrating to students that their learning is connected, relevant, and can have an impact upon the world around them, as well as their future personalities" (Mackinnon, 2010). In addition, it can be explained as an instruction structure that allows the teachers to contextualize what they teach by emphasizing the learning circumstances of all students to improve attitudes towards learning and enhance academic achievement (Podschuweit & Bernholt, 2018).

Challenges leading to poor student academic performance

From what research has already established as factors contributing to poor learner performance, there is strong evidence to suggest that these factors vary from context to context. The recommendations offered to each context also differ (Sinyosi, 2015). The factors might have a different effect on learner performance in mathematics. The school environment must facilitate the implementation of that strategy in one way or another. In different situations, teachers face challenges while integrating real-life context in teaching such as the lack of the environment that is conducive for this instructional strategy.

For this reason, the real-life context for teaching physics like examples, applications, and other phenomena comes before teaching a concept and helps in stimulating students' interest and motivation in learning physics and facilitates them to construct meaningful knowledge of the concept to be taught. While contextualizing the subject, introducing an example of an application of any physics law or concept after teaching the theory may not be the active approach aimed at all students. In some classes, teachers show the problem of insufficient time for preparation, where the total volume of physics content to cover, and then to satisfy individual student's learning difference as the challenges that anticipate the efficacy of the integration of real-life context in teaching and learning physics. The integration of real-life context in teaching physics focuses on higher reasoning and critical analysis that reduces the Rwandan Journal of Education, Vol.6, No 1(2022).

There is tension in guaranteeing the symmetry between the results expected after teaching and the procedure, the time constraint, learned material and outcomes, then what has to be essential to enhance instructive evolutions and attain successfully academic outcomes (Gutulo & Tekello, (2015); Wulandari, (2015); and Sassi & Michellini, (2014)). Thus, it appears that the current physics syllabus for senior secondary in Rwanda contains the overloaded

content to be covered in only one year. Therefore, there are few studies on poor learner performance in 9YBE in Gasabo district, Rwanda, hence little is known about the contributing factors affecting performance. It was therefore imperative to examine the effective use of instructional materials on student academic performance in selected nine-year basic education schools in Gasabo District, Rwanda to make recommendations that will enhance performance.

Real- life situation teaching and student academic performance

Teaching using a real-life context (Development & Panek, (2012); Ültay, N. & Çalıka, (2012); and Ulusoy & Onen, (2014)) is of the view that it has the potential to increase students' interest and self-engagement, when the context used, is conveniently selected. In the everyday life of people, there are some phenomena and problems that are built upon the laws and principles of physics. Teaching physics using a factual or actual framework help student (people) to explain those laws, principles, and phenomena and to solve those problems scientifically based on formal knowledge (Monica, 2013). Moreover, integrating an everyday or familiar context in teaching and learning physics helps to fill the gap between physics theory and the applications of physics.

Apart from that, some teachers face several other constraints like students' attitudes towards learning physics, lack of instructional materials, and students' poor background in science subjects when they want to apply physics in a real-life context in their classrooms. To appropriately teach the entire physics syllabus, teachers and students require sufficient time to apply physics knowledge in their real-life situations.

Linking the lessons to real-life examples and applications reduce classroom management challenges because students' self-engagement increase (Sunar, 2013). Besides, students' interest and motivation towards learning a subject reduce descriptive behaviors of students, and the improvement in students' attitudes towards learning affect academic achievement in terms of knowledge and skills attainment.

iii. Theoretical Framework

Education is one of the most important tools in developing psychological, social, intellectual, emotional, physical, political, economic and developmental aspects of life to shape capable and accountable leaders for the future. A study conducted by a psychologist and educator Jerome Bruner, cited by (Oni, 2014), People recall only 10% of what they hear, 30% of what they read, and approximately 80% of what they see and do.

According to Gould and Roffey-Barentsen (2018), sight (visual aids) accounts for 83% of human learning. 11% is derived via hearing, 3.5% from smell, 1.5% from touch, and 1% from taste. (Owoeye, 2011), recommend that most learners need visual content to learn. The Chinese proverb "one sight is worth a hundred words" also demonstrates the value of visual aids in learning. Similarly, (Pachai, 2010) asserts that "The total success of every classroom session is dependent on the teachers' use of visual aids to enrich and supplement the subject being taught". For every hour that a teacher speaks, only about 8-10 minutes of the given information stays in the students' minds. The rest of the information is lost as learners tend to lose interest and attention to the content being presented, especially when the lessons are dull and somber (Earthman G. I., 2012).

Visual aids are useful for behavior and classroom management as well (brief, 2013). Teachers who use visual aids improve class discipline by increasing learner motivation, attention, and interest (Karnerman, 2014). In addition, classes that are not paying attention are unable to receive lessons adequately. This can lead to poor comprehension and performance. Visual aids boost attention for most students, allowing them to readily learn new abilities. According to (Sumra. S. and Rajani, 2015), The use of visual aids improves students' attitude and interest in the subject, which increases their drive to study the content being taught. According to similar research conducted in Nigeria, Okendu (2012) asserted that regular instructional supervision has a significant bearing on students' academic performance. He also, affirmed that adequate supply of instructional resources has significant effect on students' academic performance. Onasanya & Omosewo (2011) confirmed that both standard and improvised instructional materials have the same positive effects on students' academic performance. The use of regular practice or repetition serves to keep the learner responsive (Department of education, 2011).

According to (Department of education, 2011) It serves as a basis for saying that instructional materials are not the only factors that determine learners' academic performance, but other factors such as regular practice, review, parental involvement, home background, types of reinforcement, as well as learners' interest in the what they learn. However, there is general agreement that behavioral principles cannot adequately explain the acquisition of higher-level skills or skills that require greater processing depth (e.g., language development, problem-solving, reasoning, critical thinking) (Schunk, 1991). This implies that there is a need to combine the three theories of learning (behaviorism, cognitivism and constructivism) for better and more effective knowledge transfer, thus aiding in the effective use of the instructional materials that enhance better academic performance.

According to behaviorist theories, the task of the teacher/designer is to (1) determine which cues can evoke the desired responses; (2) arrange practice situations in which prompts are paired with the target stimuli that initially

have no eliciting power but are expected to evoke the responses in the natural (performance) environment; and (3) design the environmental conditions so that, in the presence of these target stimuli, students can make the correct responses and receive reinforcement for those responses (Employment, 2012). This implies that not only the use or non-use of instructional materials affects students' academic performance, but also motivating factors such as how practices are arranged to elicit the desired achievement in the student and the way instructional materials should be organized or arranged to attract the desired achievement in the individual students.

No matter how much effort is put in by parent communities, churches, governments, ministries of education, education-based non-governmental organizations (NGOs), and other educators to see that students' academic performance is improved nationally or globally, there still is a long way to go to see academic achievement being seen and recognized at its best. For example, if we take note of the investigation in South Africa (Grubb, 2014); they confirmed that the perceptions of Mathematics achievement shared by students in South Africa are related to their own confidence, family background, teachers' teaching/learning materials, interest in Mathematics, traditions and beliefs.

Relationship between improvisation of IM and academic performance

Jekayinfa (2012) identified the importance of improvisation of instructional materials as making learning concrete and real, substitutes one thing for another, allows the students to participate in the production of materials, economical and more teacher-student resource oriented. Likewise, Abdu-Raheem (2014) submitted that improvisation of locally made teaching aids could assist to improve quality of graduates turn out from schools and standard of education generally. Abdu-Raheem and Oluwagbohunmi (2015) also corroborated the idea that resourceful and skillful teachers should improvise necessary instructional materials to promote academic standard in Nigerian schools.

iv. Conceptual Framework

The conceptual framework below presented variables that affect academic performance. Sitko (2013), defined conceptual framework as the system of concepts, assumptions, expectations, beliefs, and theories that support and inform about the study. The study's conceptual framework is based on the model shown in Figure 2.1.

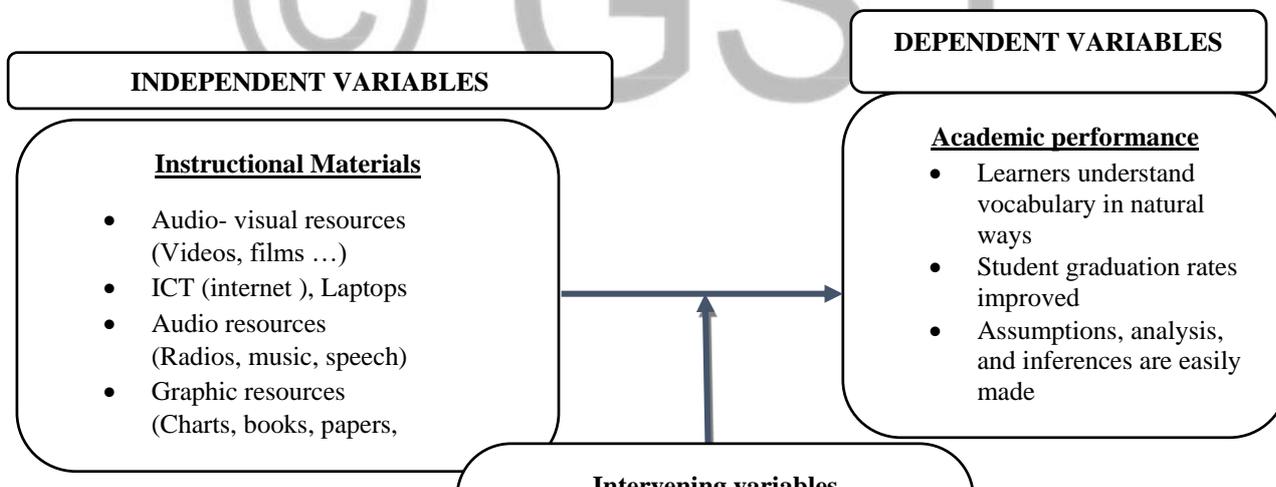


FIGURE 2.1 CONCEPTUAL FRAMEWORK

Source: Researcher, (2022)

This figure 2.1 Provides the Conceptual framework between the independent variables (Instructional Materials) and the dependent variables (Academic performance), and the intervening variable (Intervening variables). The independent variables are expected to have a positive or negative effect on the dependent variables. For example, using audio-visual resources like videos and films can help students understand complex concepts better, leading to improved academic performance. However, the intervening variables can mitigate the effect that the independent variables might have on the dependent variables. For example, involving different styles of student learning, fostering warm and welcoming relationships; where students feel safe and supported by teachers and friends, using appropriate language, embracing students' different learning styles, addressing individual needs, increasing teachers' ability to monitor and evaluate, and allowing small groups for student participation and interaction will either improve or degrade student academic performance.

school supervisions, geographic location of the school, involving and empowering parents, supporting school culture, and family background can improve or decrease students' academic performance.

v. Research Materials and Methods

This study uses a mixed methods research design; a combination of quantitative and qualitative forms of research. (Welfare., 2015) cited in (Mmbaga, 2014) assume that in mixed methods research, both approaches are used together, giving the overall strength of the study beyond that which qualitative or quantitative methods alone would impart. (Mmbaga, 2014) advocates the concept that research designs are a product of philosophy, selected investigative strategies, and specific research methods. This study is embedded in the philosophical worldview of pragmatism. According to Rossman& Wilson (2009) cited in Mmbaga (2011). The focus of this worldview is not on methods but on the research problem, and to fully understand the problem the researcher can apply pluralistic approaches.

The purpose of the study was to examine the effect of instructional materials on student academic performance. The overarching strategy of inquiry was the Concurrent Embedded Strategy, which is one of several mixed methods approaches. This strategy uses a simultaneous data collection mode during which both the quantitative and qualitative data are collected. According to (Mugenda O. M., 2011). The approach has a primary method that guides the study and a secondary method that is embedded or nested within the primary method. He adds that the secondary method may address an entirely different question than the primary method and that the blending of the data can coexist as two different images that provide a composite assessment of the problem. This study follows the above approach as the quantitative phase was designed to provide answers to research questions.

Target Population

(Nzahabimana, 2011) defines a population as the universe of the study through which the research intends to draw a multiple for the purpose of administering primary data collection tools. However, unlike quantitative studies, qualitative designs take much more of participants' time in brainstorming interviews and other data collection situations (Pernecky, 2016). As a result, members of the target population are less likely to agree to participate in a qualitative study. So, willingness to participate in a study by members of the target population is likely lower for qualitative designs. Transition from the target to accessible population in qualitative enquiry may therefore have a higher possibility of participants expressing unwillingness to participate. The target population for this study will be the educational practitioners in Gasabo district that includes Students, teachers, and head teachers in Gasabo district, which sums to a total of 330 participants.

Sample Design

According to (Nwabuno, 2013), sampling refers to the selection of a subset of individuals from within a population with the aim of estimating the characteristics of whole population. Sample is therefore, a portion of population which is involved in the research work. During the sampling stage, the researcher considered: the number of schools, the number of head teachers, the number of teachers, and the number of students. Gasabo District statistics shows the following population: the district has 15 sectors, 45 public secondary schools, 26,270 students in general secondary, 857 secondary school teachers, and 45 head teachers (Education Statistical Yearbook 2020/2021, 2022). In this regard, the researcher considered 330 respondents that were selected from three schools of Gasabo district. The schools are: G.S. Remera Catholique, G.S. Kimironko I, and G.S Ndera. 1 head teacher and 7 teachers using purposive sampling, and 322 students using random sampling was considered which made a total of 330 respondents using purposive sampling and simple random sampling. Thus, the sample population 1885 selected from Gasabo District made 330 of sample size population which were selected using purposive sampling and simple random sampling. This research is composed of 1885 people as the study population whereby sample size is found by using the SLOVIN's formula (Tejada et al., 2012) where n stands for the sample size, N stands for the population size while e stands for the margin of error (0.05) as follows: $n = \frac{N}{1+N(e)^2}$

Therefore, $n = \frac{1885}{1+1885(0.05)^2} = 330$ N: Total population under the study was 1885 and n: sample size is 330.

Proportionate method was used for getting each stratum of respondents

Table 1: Target population and Sample Size

No	Participants	Target Population	Sample Size
1	Head Teachers	3	1
2	Teachers	40	7

3	Students	1842	322
	Total	1885	330

Source: G.S. Remera Catholique, G.S. Kimironko I, and G.S Ndera

Based on the aim of this research, the researcher intentionally selected the population of the research in such way that 1 Head teacher, 7 teachers and 322 students in 9YBE were grouped into strata for achieving the effective and efficient data of the study.

Sampling Technique

Sampling is the process of selecting a subset of cases in order to draw conclusions about the entire set. It is a process of selecting individuals from a population such that the sampled group contains elements representative of the characteristics found in the entire population. The researcher used simple random sampling to select the schools, head teachers, students and teachers. A census was used for 1 head teacher and a random sample for 7 teachers and 322 students since the specific information was collected from them.

Data Collection Methods

The descriptive survey was selected by the researcher because of limited time of research project to deal with a large number of schools, teachers and students from all 9YBE schools in the district under study. The respondents under investigation were geographically dispersed in the area under investigation. This is the factor that made the researcher choose the descriptive survey method. Interview was used to gather information from the head teacher because the number is limited. The other criteria to choose mixed methods was the financial means of the researcher to reach every respondent of targeted population and stay with her during investigation time. Therefore, questionnaires were administered to the sampled head teacher, teachers and students.

Data Collection Instruments

To obtain qualitative primary data structured questionnaire were developed, bearing both open and close ended questions relating to the purpose and objectives of the study. The researcher also conducted interviews in order to address the research questions. A questionnaire carefully designed together with a written interview guide were used to provide comparison between written and oral responses from key respondents who included the students, head teacher, and the teachers. Semi-structured personal interview schedules were made to enable the researcher to examine the respondents and get more information from them. Interviews were also used because they help in generating detailed qualitative data and guarantee immediate feedback from the respondents when obtaining in depth-information pertaining to the themes of the study. Besides, interviews helped in cross-checking responses given in questionnaire to ensure consistence and validity of the responses hence data triangulation.

Administration of Data Collection Instrument

After approval of the proposal, the researcher obtained a letter of transmittal to conduct research from the university, which was presented, to the Mayor of Kigali City and the DDE, seeking permission to carry out research in Gasabo District. The researcher made a careful identification and briefing of research assistants on what was expected to be done. Questionnaires were distributed to the respondents through hand delivery. They were collected as soon as they were filled to avoid loss or misplacement. In case of interviews, appointments were made with the teachers and the head teacher where they set their own convenient time of participating in the study exercise.

vi. Results

Presentation of the findings

The presentation of the research findings is based on the study's objectives, which means tables are ordered according to the specific objectives. The data was collected from 330 participants as sample size.

Instructional materials and teaching for achieving the students' academic performance

The following data were captured from the schools on the status of the Instructional Materials in schools in Gasabo district for the period 2020 – 2022. The first research objective and question sought to identify the instructional materials being used for teaching in order to achieve students' academic performance in selected nine-year basic education schools in Gasabo district, Rwanda. The collected and analyzed data revealed that secondary schools in this district were endowed differently with instructional materials. See the findings tabulated in table 2.

TABLE 2: HEAD TEACHER RESPONSES ON INSTRUCTIONAL MATERIALS

	Availability/ Accessibility			
	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Audio- Visual resources	1	100	0	0
Audio Resources	1	100	0	0
Graphic Resources	0	0	1	100
Courses and exercise books	1	100	0	0
ICT (internet)	0	0	1	100
Total	1		1	

Source: Primary data, (2022)

These data indicated that schools in Gasabo district were not well-equipped with instructional resources and facilities. Data in Table 2 was analyzed vis-à-vis with table 5 below. Most head teachers 1(100%) indicated that Audio- visual resources like videos and films were not in their schools. This was supported by 5(71.4%) of the teachers (see table 5). The other 2(28.6. %) of the teachers indicated that schools had enough videos. As regards the Audio Resources, a similar problem was seen with 1(100%) of the head teachers lamenting lack of the same. Most teachers also seemed to agree with the head teachers in that 4(57.1%) of them said that the facility and services were missing in their schools. Only 2(28.5%) of the schools had ICT (Internet / Intranet connection) and infrastructure. This meant that a majority of the schools did not have the ICT.

Equipment such as computers and medical/ fast aid kits were present in only 66.6% of the schools. Schools were however well- equipped with graphic and other reference books as evidenced by 1(100%) of the head teachers and 6(85.7%) of the teachers agreeing that books were available and accessible. Data was also collected from teachers on this very aspect of availability of instructional materials. The teachers’ responses on the aspect were as indicated in table 5 below. The values discussed in the preceding paragraph, as mentioned, are indicated in the table.

TABLE 3: TEACHERS’ RESPONSES ON INSTRUCTIONS MATERIALS

	Availability/ Accessibility			
	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Audio- Visual resources	5	71.4	2	28.6
Audio Resources	4	57.2	3	42.8
Equipment (computers, medical kits)	2	28.5	5	71.5
Graphic Resources and exercise books	6	85.7	1	14.3
ICT (internet)	4	57.1	3	42.9

Sources: Primary data, (2022)

Table 3 indicated the responses of teachers on instruments materials. Out of 7 teachers that participated in this study, on the audio-visual resources, 71.4% agreed and 28.6% disagreed that they access on audio-visual resources. On the audio resources, 57.2% responded “yes” and 42.8% responded “No” about their use of the audio resources. On equipment, 28.5% agreed and 71.5% disagreed that they use the computers and medical kits. On graphic resources and exercise books, 85.7% agreed and 14.3% disagreed that they use the graphic resources and exercises books. On ICT, 57.1% agreed and 42.9% disagreed that they use ICT (internet) as their instructional materials in education in Gasabo District.

TABLE 4: STUDENTS’ RESPONSES ON USE OF INSTRUCTIONAL MATERIALS

	Availability/ Accessibility			
	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Audio – visual resources	117	36.4	205	63.6
Graphic resources (Models, posters, maps)	263	81.8	59	18.18
Audio resources	302	93.9	20	6.1
Courses and exercise books	293	90.9	29	9.09
ICT (internet), Laptops	175	54.5	147	45.5

Source: Primary data, (2022)

Table 4 shows data on availability of instructional materials supplied by students’ respondents. If the data was compared to that from the head teacher and teachers as presented above, one should notice great similarities. In other words, most students generally agreed that secondary schools in Gasabo District had limited resources such as: Audio- visual t (36.4% agreed to have had them in their schools), ICT (with only 54.3% agreeing), school library and library services (90.9% of Students said these were available).

Most schools seemed to have course and Exercise books as indicated by 90.9% of the students agreeing to the availability and accessibility of the books. It should be noted (as outlined earlier) that the success of teaching and learning has been linked to availability of instructional materials and that to support poorly performing schools, educational authorities must increase student levels and competencies by use of these instructional materials for students to be ready for National Assessments (UNESCO, 2015).

It became evident that school libraries in these schools were lacking in quality, going by what Hannele et al. (2002) highlighted as the objectives of a school library in a school in an article titled A Good School Library. The objectives so mentioned are creating an aesthetically pleasing as well as a practical learning environment, providing access to sources of varied, current and useful information for both pupils and teachers and thirdly encouraging reading for pleasure.

The extent to which students in nine-year basic education perform with effective use of instructional materials.

The study's second objective was to examine the extent to which students in nine- years basic education perform with effective use of instructional materials in selected nine-year basic education schools in Gasabo District, Rwanda. First the research wanted to establish types of instructional materials normally available and used in secondary schools, and second the perception and opinions on their effectiveness on students’ performance. Questionnaire was used to collect information from 322 students. The following are the responses:

TABLE 5: STUDENTS’ ACADEMIC PERFORMANCE (STUDENTS=322)

Statement	High extent	Medium extent	Low extent	Total
The instructional materials help students understand vocabulary in natural way	291(90.4)	31(9.6)	0	322(100%)
Due to school’s use of the instructional materials, the graduation rate is improved	162(50.3)	137(42.5)	23(7.8)	322(100%)
The use of instructional materials develops the learning methods and making Inferences become easy to students	273(84.8)	49(15.2)	0	322(100%)

Source: Primary data, (2022)

Table 5 presents the results on students’ academic performance. The students responded to the questions freely basing on their feelings about the effect of using instructional materials on their academic performance. Out of 322 students, on the topic that instructional materials help them understand vocabulary in natural ways, 90.4% of respondents responded high extent, only 9.6% of respondents responded medium extent, which indicated that use of instructional materials brings high effect on students’ academic performance. On the school’s use of instructional materials to improve the graduation rates, 50.3% responded high extent, 42.5% responded medium extent, and only 7.8% responded low extent, this shows that at schools, students and school administration like to use instructional materials to improve their graduation rates.

On the use of instructional materials to develop the learning methods and making inferences becoming easy to students, 84.8% responded high extent, 15.2% responded medium extent, and no one responded on low extent.

The results indicated that the use of instructional materials help head teachers, teachers, and students to improve the students' academic performance. Using educational tools can make the learning process more enjoyable and less time-consuming. The usage of teaching tools helps students to apply their visual, audiovisual, kinesthetic, and hands-on talents while teaching and learning (Haki, 2017).

Relationship between the use of instructional materials and student academic performance

The third objective of this study was to analyze the effects of instructional materials on student academic performance in selected nine-year basic education schools in Gasabo District, Rwanda. The relationship between use of instructional materials and students' academic performance was calculated. The findings are presented in tables as follows:

TABLE 6 : RELATIONSHIP BETWEEN THE USE OF INSTRUCTIONAL MATERIALS AND STUDENTS' ACADEMIC PERFORMANCE
Correlations

		Use of Instructional Materials	Student Academic Performance
Use of Instructional Materials	Pearson Correlation	1	.959**
	Sig. (2-tailed)		.000
	N	322	322
Student Academic Performance	Pearson Correlation	.959**	1
	Sig. (2-tailed)	.000	
	N	322	322

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

Source: Primary data, (2022)

Table 6 indicates the relationship between the use of instructional materials and students' academic performance in Gasabo District, Rwanda. The statistical package for social sciences (SPSS) software was used to determine the Pearson coefficients. The Pearson coefficients correlation is between -1 and 1, -1 to 0 presents a negative correlation while from 0 to 1 presents a positive correlation. By categorizing the correlation levels, from 0 to -0.5 are the low negative relationship, from -0.5 to -1 is the high negative relationship; from 0 to 0.5 are the low positive relationship, and from 0.5 to 1 is the high positive relationship. According to the results, the correlation between the use of instructional materials and students' academic performance was .959**. The results presented that there was a highly positive correlation which means there was a significant relationship between the use of instructional materials and students' academic performance in Gasabo District, Rwanda.

TABLE 7: MODEL SUMMARY
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.959 ^a	.919	.919	.158

a. Predictors: (Constant), Use of Instructional Materials

Source: Primary data, (2022)

The model summary shows the strength of the correlation between the independent and the dependent variables. R presents the correlation coefficient, which is the linear correlation between the observed and model-predicted values of students' academic performance, its value of .959a indicates a high correlation. The results indicated that the R Square = 0.919, it was clear that 91.9% of all variables of students' academic performance can be deliberated by one's of all variables of the use of instructional materials.

TABLE 8: ANALYSIS OF VARIABLES
ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	89.935	1	89.935	3622.739	.000 ^b
	Residual	7.944	320	.025		
	Total	97.879	321			

a. Dependent Variable: Student Academic Performance

b. Predictors: (Constant), Use of Instructional Materials

Source: Primary data, (2022)

Table 8 presents the analysis of the variance of variables. The analysis of variables was used to determine differences among two groups (use of instructional materials and student academic performance), or independent variables (use of instructional materials) based on dependent variable (student academic performance). The data was analysed and the results showed that the variables (the use of instructional materials and students' academic performance) were statistically significant with the ratio of $F(89.935) = 3622.739$ with a $p\text{-value} = 0.000^b$ which indicated that there was a significant correlation between the use of instructional materials and students' academic performance in Gasabo District, Rwanda.

TABLE 9: COEFFICIENTS OF VARIABLES

Model		Coefficients ^a			t	Sig.
		Unstandardized Coefficients	Standardized Coefficients			
		B	Std. Error	Beta		
1	(Constant)	.031	.037		.823	.411
	Use of Instructional Materials	.992	.016	.959	60.189	.000

a. Dependent Variable: Student Academic Performance

Source: Primary data, (2023)

Table 9 presents the constant coefficients of independent variables of the use of instructional materials. It shows the Mathematical correlation between use of instructional materials and students' academic performance. The results indicated that the relationship was Mathematically significant with a $p\text{-value}$ equal to .000. This confirms that in Gasabo District, Rwanda, the use of instructional materials affects the students' academic performance.

Discussion

This chapter presented the data on the views of head teachers, teachers and students on “The instructional materials being used for teaching in order to achieve students' academic performance in Gasabo District; To examine the extent to which students in nine-years basic education perform with the effective use of instructional materials and to analyze effects of instructional materials usage on student academic performance in Gasabo District.”

On the first objective, key findings indicate that instructional materials are essential for good academic performance (refer to table 4.5). Schools which do not have adequate instructional materials are likely to perform poorly. On the second objective, the data show that to a higher extent e-learning helped them by 57.1 % and 28.5 % helped them at a medium level and 14.2% at a lower extent. And with the use of posters, charts and diagrams proved to be of high extent at 85.7% with a medium of 14.2% and 0% said nothing and lastly the use of instructional materials proved 57.1% to be of a great extent, 42.8 % at a medium level and 0% at a low extent. Lastly, the data for objective three shows that instructional materials can be effectively used to improve students' academic performance. And the results proved that 12.4% helped them to pass examinations and 87.5% of the students confirmed that instructional materials helped them to improve their academic knowledge and skills.

Instructional materials being used for teaching in order to achieve students' academic performance

The first objective, key findings indicate that instructional materials are essential for good academic performance, Schools which do not have adequate instructional materials are likely to perform poorly. Equipment such as computers and medical/ fast aid kits were present in only 66.6% of the schools. Schools were however well-equipped with graphic and other reference books as evidenced by 100% of the head teachers and 85.7% of the teachers agreeing that books were available and accessible. The school library and library services, 90.9% of Students said these were available. The success of teaching and learning has been linked to availability of instructional materials and to support poorly performing schools, educational authorities must increase student levels and competencies by use of these instructional materials for students to be ready for National Assessments (UNESCO, 2015).

Extent to which students in nine-year basic education perform with effective use of instructional materials

On the second objective, the data show that to a higher extent e-learning helped them by 57.1 % and 28.5 % helped them at a medium level and 14.2% at a lower extent. And with the use of posters, charts and diagrams it proved to be of high extent at 85.7%. Lastly, the use of instructional materials proved 57.1% to be of a great extent and 42.8 % at a medium level. The 85.7% of teachers agreed that use of posters, charts and diagrams in teaching were very important for students learning. Therefore, teaching materials not only aid the learner in understanding, but also leave a lasting picture and impression in the learner's memory (Msabila, 2012).

How use of instructional materials affects student academic performance

The results of this objective show that instructional materials can be effectively used to improve students' academic performance. The 87.5% of the students confirmed that instructional materials helped them to improve their academic knowledge and skills. The 87.5% of students' respondents pointed out that the materials help them

in improving knowledge and skills. Teachers who use visual aids improve class discipline by increasing learner motivation, attention, and interest (Karnerman, 2014). The 90.4% of students (of sample size) agreed that the instructional materials help them to understand vocabulary in natural ways.

Conclusion

From the study findings, it is apparent that many schools in the study area do not use appropriately instructional materials. They do not have instructional materials that the schools need to buy, nor do they improvise their own. Although all the teachers agree that instructional materials are important in contributing to students' academic performance, they do not show a need to have these materials in their classrooms. This implies that, although the teachers have the knowledge about the importance of instructional materials, they are not inclined to develop them. This may have many reasons. One could guess that teachers do not care whether the students perform or not, and this from the management point of view, may emanate from low morale and motivation towards their teaching. Another explanation may be, poor supervision from their heads of schools. Normally, heads of schools are supposed to be instructional supervisors, to ensure that instructions are going on and students are provided with quality education coupled with quality instructional materials. Lack of supervision may be the reason for the situation found by this study.

The study concluded that the correlation between the use of instructional materials and students' academic performance was .959**, which was high and concluded that there was a highly positive correlation and presented that there was a significant relationship between the use of instructional materials and students' academic performance in Gasabo District, Rwanda.

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