



# Teachers' Use of Instructional Materials in the Teaching and Learning of Mathematics in private Secondary Schools of Gasabo District, Rwanda

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**Abstract:** *The use of instructional materials makes the teaching and learning of mathematics simpler, more engaging, more enjoyable, and more closely connected to real-world applications. This study explored the teachers' use of instructional materials in the teaching and learning of mathematics in private secondary schools in the Gasabo district, Rwanda. A case study research design under the qualitative method was employed. The convenience sampling technique was used to select five private secondary schools while the purposive sampling technique was adopted to select two teachers from the five private secondary schools in the Gasabo district, Rwanda. Self-administered questionnaires and classroom observations of ten mathematics teachers from the five schools were used for data collection. The collected data was read and reread, edited, and coded for easy interpretation and understanding in assessing its qualitative accuracy. The findings indicated that most instructional materials are available. However, the most ones used are textbooks and writing materials. The analysis of the classroom observations in relation to the sociocultural theory and Gagnes' theory of instructional design revealed that most mathematics teachers used instructional materials as a way of presenting new content more memorable and meaningful to the learners. However, some teachers did not allow students to actively interact with the materials, and thus, students were not given the opportunity to enhance their active learning and participate in constructing their knowledge of the mathematics content. Based on the conclusion of this study, it is recommended that teachers should be creative enough to improvise simple instructional materials to spice up their teaching and not to prove unconcerned on the premise of unavailable or inadequate instructional materials. In-service training programs on instructional material utilization should be organized by school leaders to enable teachers to gain more knowledge on the use of instructional materials in the teaching and learning process.*

**Keywords:** *Instructional materials, Teachers, Teaching and learning, Knowledge, Private secondary schools*

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## 1. Introduction

Historically, instructional materials came into existence long ago when the slate was first introduced as a supplement to textbooks and teaching (Azi & Dajan, 2022). This gradually gave birth to the chalkboard and other thousands of instructional materials that are widely used in

the teaching and learning process. Adesola et al. (2022) define instructional materials as any animate materials or inanimate objects as well as human and non-human resources that a teacher may use in the teaching and learning process. Olatunde-Aiyedun (2021, as cited in Ajemba et al., 2021) considers that instructional materials include modern textbooks, rulers, charts, computers, shapes, projectors, graph sheets, and local materials among

others. Similarly, Matazu (2022) identified prints, textbooks, magazines, newspapers, slides, photos audio-visual equipment also as examples of instructional materials. Furthermore, instructional materials comprised of locally made tools (such as improvised materials like stones, and sticks among others) also help in the facilitation of the teaching and learning process (Chukwunazo et al., 2022; Effiong & Igiri, 2015). Bella (2021) urges that the use of instructional materials by teachers helps in exploring the full potential of the students in terms of learning, thereby easing the transfer of knowledge from the teachers to the learners. Similarly, Oppong (2021) also suggests that the use of instructional materials helps in facilitating and enhancing effective teaching.

Since no country can afford to disregard science at any level of education due to its impact on national development (Isma'il & Lukman, 2022), at the senior secondary level, mathematics is one of the key science subjects required in any education curriculum (Alshatri et al., 2019). Adeyemo (2000) asserts that mathematics as a subject is a requirement for higher learning in several science-related professional courses like accounting, medicine, and agriculture just to mention a few. It is a prerequisite subject for many fields of learning that contribute immensely to the technological growth of the nation (Kalyan, 2020). However, teachers have not bothered to integrate the use of instructional materials in the teaching and learning of mathematics as required by the competence-based curriculum (Nsengimana, 2021) and this, in turn, has indeed made learners have difficulties in understanding the subject because of its abstract nature (Mabagala, 2019). Teaching without instructional materials as cited by Olayinka (2016), is impossible to attain the teaching and learning goals and competency. This is because, the use of these materials makes learning more useful and meaningful to the students as they are presented with real-life experiences and materials for learning (Azi & Dajan, 2022).

Rwanda's shift from a knowledge-based curriculum to a competency-based curriculum and from knowledge and skills acquisition to knowledge creation and application (Ngendahayo & Askill-Williams, 2016), teachers need to shift from traditional methods of teaching and adopt interactive methods that involve the use of instructional materials to engage students in the learning process (Ministry of Education [MINIEDUC], 2015) and as well in its aspiration in achieving the targets of Sustainable Development Goal four (SDG4) of quality education by 2030.

Secondary education in Rwanda lasts for a total of six years (MINEDUC, 2015). It consists of three years of lower secondary education and three years of upper secondary education in which students are meant to take on national examinations at the end of the three years. The use of

instructional materials in the curriculum is a key strategy for improving teaching and learning at the secondary level. Umuhoza and Uworwabayeho (2021) consider that students learn better by seeing and doing.

However, Umugiraneza et al. (2018) noticed that teachers have abandoned the usage of instructional materials in helping students to visualize and increase their skills towards what they are learning easily. This has indeed hindered the quality of basic education in Rwanda (Nizeyimana & Nkiliye, 2021) and most of the teachers have continued to teach the way they were taught without the use of instructional materials to ensure a better education system (Nyirantambineza, 2022). This has greatly caused students' unskillfulness in competing globally in this 21<sup>st</sup> century driven by technologies (Bethell, 2016), especially in Sub – Saharan countries including Rwanda.

Indeed, when a curriculum is developed without the integration of instructional materials and with competent teachers, there is a waste of its implementation. It is in this regard, the study seeks to explore the teachers' use of instructional materials in the teaching and learning of mathematics in private secondary schools of Gasabo District, Rwanda. Thus, the present study sought to answer the following research question: How do teachers utilize the available instructional materials in the effective teaching and learning of mathematics in private secondary schools? To support the implementation of a competence-based curriculum (CBC) and enhance learning outcomes, the study highlights the available instructional materials for secondary mathematics teaching and learning.

## 2. Literature Review

### 2.1 The Instructional materials available for Teaching and Learning Mathematics

In his study, Omariba (2012) found out that the available instructional materials in the teaching and learning of mathematics included charts, shapes, textbooks, graph sheets, and mathematical sets. Nonetheless, audio-visual equipment like televisions, computers, and projectors were not readily available to the teachers. However, Nyemaekile and Polycarp (2022), clearly found out that, the common instructional materials in the teaching and learning of mathematics included textbooks, chalkboards/marker boards, graphs, tape recorders, pictures/charts, and calculators.

Umuhoza and Uworwabayeho (2021) in their study on teachers' use of instructional materials in teaching and learning mathematics in Rwandan primary schools, revealed that the available instructional materials to

teachers include textbooks, meter rulers, manila papers, cards, and local materials. They reported that textbooks were the most available instructional materials though, they were not sufficient for all the learners for self-study purposes.

Similarly, Olubunmi and Modupe (2019) in their study on the use of instructional materials for teaching mathematics in six junior secondary schools in Nigeria, noticed that the available instructional materials in the effective teaching of mathematics include textbooks, writing materials, chalkboards, and mathematical sets and all these were available in the schools that participated in the study. However, instructional materials such as mathematics aquariums, computers, graph sheets, and projectors, were not readily available in the schools.

## **2.2 Teachers' Use of Instructional Materials in the Teaching and Learning of Mathematics**

Due to the widespread adoption of education, oral instruction cannot be the basis of effective pedagogy today. As a result, teachers need to use instructional materials as a way of ensuring a concrete basis for conceptual thinking and reducing meaningless word responses from students (Kaufman et al., 2020). In their study on the effective utilization of instructional materials in teaching History, Asamoah and Amo (2021) found that teachers used the available instructional materials in line with students' characteristics, topics, and objectives of the lesson to be learned.

Fiorella and Kuhlmann (2020) found out that when instructional materials are used well by instructors, they support learning through visual elaboration. Instructional materials stimulate and excite learners when the teacher fully utilizes them in the teaching and learning process. Similarly, Hilda and Bernard (2015) in their study on the availability and use of Instructional Materials in the teaching of conflict and conflict resolution in Nandi North District, Kenya found out that the use of instructional materials in teaching any subject has the potential of helping the teacher in explaining new concepts. Surprisingly, instructional materials are still not adequate in many schools in Rwanda and this indeed has resulted in poor quality education (Nizeyimana & Nkiliye, 2021).

On the other extreme, Ordu (2021), in his study on the role of teaching and learning materials in the changing world, revealed that teachers should use instructional materials adequately to have a full understanding of the subject to pass on the right knowledge to students and arouse their attention in the teaching and learning process. His results showed that the use of charts, shapes, and audio-visual

equipment helps learners to have a real-life image of the context of what is being taught. Furthermore, Enikanolaye (2021), noticed that when teachers use instructional materials, they improve and stimulate students' retention level thus helping them concretize the learning of mathematics more easily. In other words, the use of these materials allows teachers to present new content more memorable and meaningful to the learners (Okolooba, 2021).

Additionally, Elaine Lin Wang (2020), in her study on teachers' perceptions of what makes instructional materials engaging, appropriately challenging, and usable, reveals that the majority of teachers apply instructional materials as a way to pose questions to the learners in getting them involved in answering them. However, according to Gagne et al. (2005), the use of instructional materials by teachers should aim at helping learners to be more engaging, providing them with constructive feedback related to the exercises given in guided or self-paced learning. Similarly, Onweazu and Olubayo (2021) in their study about the assessment of availability and utilization of instructional materials for teaching primary school pupils mathematics in Nigeria, which involved 150 teachers from both public and private schools, indicates that teachers use instructional materials as a way to pose assessment questions for the students to answer. It was shown that all teachers in this study search for the necessary instructional materials that can appeal to posing questions to the learners, arouse their interests, makes learning more meaningful, and promote the academic standard. Adebule and Ayoola (2016) also consider that, when instructional materials are effectively used, they guide learners in the learning process and allow the teachers in simplifying complex concepts simpler. This is in line with Umhoza and Uworwabayeho (2021) who also assert that effective utilization of instructional materials in teaching and learning makes learning easier, more interesting, concrete, enjoyable, and clear in real-life situations. In other words, they inculcate students with new skills, understanding, and creativity.

Also, teachers use instructional materials as a way of scaffolding (Aslam et al., 2017). Teachers use them to help learners recall what was learned in the previous lessons so that the new content can be attached to and built upon it. Kadzera (2006) claims that the use of instructional materials is not the end in itself but they are means to an end.

## **3. Methodology**

### **3.1 Research design**

Thakur (2021) defines a research design as the detailed blueprint used to guide a research study toward the

achievement of its objectives. This study took on a case study research design (Samuel, 2020) that explored teachers' use of instructional materials in the teaching and learning of mathematics in private secondary schools. Crowe et al. (2011) consider that case study design is "particularistic" because it is used to develop an in-depth, holistic understanding of a specific phenomenon within a specified context.

### **3.2 Population and Sampling Procedures**

The population of the study consisted of all mathematics teachers in all private secondary schools in Gasabo District, Rwanda. The researcher conducted the study in five private secondary schools in the Gasabo district, Rwanda. This population was considered appropriate and accessible to the researcher because this district is in the capital of the country where most of the teachers are highly educated and have experience in teaching the subject and in using instructional materials in the teaching and learning of mathematics. Hence, the researcher considered their competencies desirable for the study.

Two non-probability sampling strategies were used. The convenience sampling strategy was to select five private secondary schools among fifty private secondary schools in Gasabo District, Rwanda. This strategy was used to select schools that were willing to give the researcher the mandate to solicit data from the key informants. Further, a purposive sampling strategy was used to select key informants for the study. Thus, two mathematics teachers were purposively selected from each of the five selected private secondary schools of Gasabo District, Rwanda who knew the use of instructional materials in the teaching and learning of mathematics. The sampled ten mathematics teachers also had teaching experience ranging from four to ten years.

### **3.3 Research Instruments**

The study used two self-constructed types of research instruments namely an observation checklist and a survey questionnaire. The researcher designed survey questionnaires explicitly and questions were sequenced in a logical order to allow a smooth transition from one question to another. The development of the observation checklist was guided by the sociocultural theory since it focuses on teachers being responsible for guiding students' collaboration and using instructional materials necessary for them to teach (Dawson, 2013). Furthermore, the development of the statements in the checklist was guided by Gagnes' theory of instructional design. The observation checklist consisted of ten statements where the researcher had to record the "Yes" or "No" options for each statement as the mathematics teacher was being observed using

instructional materials in the teaching and learning of mathematics.

In secondary schools, a lesson lasts for either forty or eighty minutes; however, during this study, each teacher was observed for 40 minutes, equivalent to one period. During the observations, the researcher used an observation protocol containing the list of instructional materials that the teacher had in the class and how he or she utilized these materials together with the students in ensuring the effective teaching and learning of mathematics concepts.

### **3.4 Validity & Reliability**

To establish validity, the teacher's questionnaire and an observation checklist were presented to the supervisor to assess the appropriateness of the instrument in yielding the right kind of answers deemed appropriate in responding to the research question in this study. The errors identified by the supervisor were rectified, scrutinized, and corrected accordingly. Items that showed difficulty and ambiguity, thus multiple meanings were removed before the actual data was collected from the respondents (mathematics teachers). The logic behind this was to ensure the content validity of the instruments. To establish the reliability of the research instruments used, all of them were piloted in two private secondary schools in the Gasabo district, which are not part of the sample. They were constantly tested and data was compared at all times to find out if they were able to produce expected results across schools.

### **3.5 Data Collection Procedures**

To collect data from the key informants, the mathematics teachers in the five selected private secondary schools in the Gasabo district, prior visits seeking both permission and appointment times were done in the five schools before the actual data collection process. This was so imperative to clearly explain to the participants the purpose of the study as well as to give them ample time to think through the questions, prepare for the observation schedule and have more time to feel if they need to participate. The researcher spent five consecutive working days among the five schools at different times of the day with the consent of the head teachers. Part of the purpose was to meet the participants' vis-à-vis mathematics teaching and the use of instructional materials in lesson delivery.

### **3.6 Data analysis procedures**

In the process of analysis, the researcher read and reread the raw data to code it, write up ideas, label the survey questionnaires, and categorize them based on the responses provided. This enabled the researcher to analyze the data

thematically by bringing similar ideas and information shaped by the respondents together, account for the point of divergence in opinions, and make comparisons to establish whether these views shared by the respondents could be viewed from the perspectives of prior studies.

### 3.7 Ethical Issues and Trustworthiness of the Study

To carry out this study, the researcher obtained a recommendation letter for ethical clearance in support of the request for authorization to carry out the study in the Gasabo District. Before collecting data, we wrote a letter to the Mayor of Kigali City requesting him to conduct a study in one of his three districts mainly the Gasabo district. The permission letter was obtained. The Mayor then wrote to the Education Unit of the Gasabo district, who later introduced the researchers to the five head teachers of the five selected private secondary schools. Later on, the head teachers in their respective schools granted permission for the researchers to conduct their study together with the consent forms. Participants who were teachers were given consent forms to sign, and they

were assured of trust and confidentiality of the information provided for this study. Teachers participated generously and voluntarily.

## 4. Results and Discussion

The study intended to explore teachers' use of instructional materials in the teaching and learning of mathematics effectively. To respond to this research question, the research data was collected from mathematics teachers. Participants were asked about the available instructional materials and how they utilized these materials in ensuring effective teaching and learning of mathematics.

### 4.1 Availability of instructional materials

Regarding the survey questionnaires used, all teachers revealed that indeed there are instructional materials available to them in the teaching and learning of mathematics however, on the other hand, those that use power supply, especially audio-visual ones are still inadequate in private secondary schools as shown in the figure below.

**Table 1:** Available instructional materials in the teaching and learning of mathematics

S/N	Instructional materials	Available		Not Available		Decision
		Freq	Per (%)	Freq	Per (%)	
1	Textbooks	10	100	-	-	Available
2	Writing material supply	10	100	-	-	Available
3	Measuring tape/ruler	9	90	1	10	Available
4	Charts/Diagrams	8	80	2	20	Available
5	Cardboards	6	60	4	40	Available
6	Computers	9	90	1	10	Available
7	Shapes	6	60	4	40	Available
8	Graph sheets	7	70	3	30	Available
9	Overhead projectors	4	40	6	60	Not Available
10	Chalkboard	8	80	2	20	Available
11	Mathematical sets	9	90	1	10	Available
12	Teacher guides	8	80	2	20	Available
13	Televisions	2	20	8	80	Not Available
14	Local materials (For example, stones, sticks, etc.)	9	90	1	10	Available
15	Others (not mentioned above)	6	60	4	40	Available

From above, it was visibly seen that the most available instructional materials available to teachers included

textbooks, writing materials, computers, local materials, measuring tapes, mathematical sets, charts, chalkboards,

teacher guides, cardboards, shapes, and others like student handouts. However, the least available ones included overhead projectors and televisions.

## 4.2 Teachers' Use of instructional materials in the Teaching and Learning of Mathematics

After identifying the available instructional materials, the observation checklist consisting of ten statements where the researcher had to record the "Yes" or "No" options for each statement as the mathematics teacher was being observed using instructional materials in the teaching and learning of mathematics was used. Each teacher was observed for 40 minutes, equivalent to one period. During the observations, the researcher used an observation protocol containing the list of instructional materials that the teacher had in the class and how he or she utilized these materials together with the students in ensuring the effective teaching and learning of mathematics concepts and findings were revealed as below:

All the mathematics teachers observed, used instructional materials as a way of presenting new content more memorable and meaningful to the learners. For instance, Teacher A was observed using a cable wire in demonstrating to students how to find the range of values of a cut piece of a longer wire given one known length of one piece while teaching the application of linear inequalities in real life. The teacher used a textbook to identify the key point on applications of linear inequalities as it was captioned and he referred to it in line with the local material [cable wire] to ensure the mastery of the concept. Learners were motivated and indeed gave a round of applause to the teacher.

Furthermore, during the classroom observations conducted, nine out of ten mathematics teachers used the instructional materials as another way to get students' attention as well as in enhancing retention and help in transferring abstract concepts into concrete easier ones to remember. For instance, Teacher I was observed using a ladder while explaining rates of change as an application of differentiation. Concerning the ladder, the teacher called two students in front to hold both ends of the ladder, teacher assisted students to identify the base of the ladder and the height of the ladder. Teacher I, then applied the knowledge of implicit differentiation to help learners describe how the top of the ladder moves when the base is pulled away at a constant rate. The teacher allowed students to explain, though the teacher dominated the teaching and learning process at some point.

However, one out of ten teachers does not use the instructional materials in getting students' attention and in

enhancing retention by transferring abstract concepts into concrete easier ones to remember. He was observed using a conventional way of chalk and talk approach with no involvement of the learners at all in the teaching and learning process.

It was also found that, in eight out of ten classroom observations done, teachers used instructional materials to help learners in recalling the prerequisites to link the previous content to the new one as well as in guiding them in the learning process. Nevertheless, in two out of those ten observations done, it was seen that teachers did not use the instructional materials to help learners recall the prerequisites and guidance in the learning process. For instance, Teacher C was observed with a textbook in a class as instructional material, however, the teacher did not open the textbook nor refer students to read something throughout the lesson. The teacher demonstrated deep content knowledge through his delivery with no reference to any instructional material. More talk and chalk approach with no involvement of learners in the whole process of learning.

Further still, it was found out that in seven out of ten observations made, mathematics teachers used instructional materials in projecting out lesson objectives as well as in posing assessment questions for the class to answer. For instance, Teacher F was observed tasking a student to open a textbook to a specified page and read the question about simple interest aloud. The teacher then explained it in bits in as much as the student read. The teacher continually repeated what the student pronounced as a way of explaining the question in the textbook about simple interest together with the use of banknotes that he had brought to supplement the textbook information. The teacher asked students questions occasionally in order for them to identify the objective required and this was actually covered throughout the lesson. However, in three out of ten observations done, none of the teachers used the instructional materials in projecting out lesson objectives and in posing assessment questions for the learners to respond to.

In addition to the above, it was further found that in six out of the ten observations made, teachers used instructional materials in providing constructive feedback relating to the class exercises given and also in eliciting student responses to get them involved in answering the questions. four out of ten observations, teachers didn't use the instructional materials in ensuring constructive feedback and eliciting student responses. For instance, Teacher D was observed using handouts in teaching integration by parts under Calculus. The teacher in as much he explained the key points, did not sporadically solicit responses from the students. He used charts also but never referred to them or

allow students to read something from them. It was purely teacher-centered.

Finally, in five out of ten classroom observations made, it was found that teachers utilized instructional materials to support learning through examples and visual elaboration. Conversely, five out of ten observations done, showed that some of them don't utilize them in supporting learning through examples and visualization. For instance, Teacher G was observed using measuring tape/rulers, shapes, and calculators about the topic of the lesson [Inverse of a function]. The teacher asked students to mention the points outlined in the shape. He explained each point to the class in a successive manner, however, without helping students to visualize what he was teaching.

## Discussion

### Availability of instructional materials

The findings of this study revealed that most of the instructional materials are available in most private secondary schools. All the schools were found to have textbooks, writing materials, chalkboards, measuring tapes, shapes, graph sheets, local materials, and mathematical sets as part of instructional materials that are available for the teaching and learning of mathematics. This result of the study aligns with the finding of Omariba (2012) who noted that basic materials such as textbooks, chalkboards, and essential equipment like computers, projectors, televisions, and video are not readily available in many schools in Kenya. It is in line with Olubunmi and Modupe's (2019) finding in schools in Nigeria which asserted that most schools do not have audio-visual instructional materials. Still, the finding of the study supported the assertion of Oppong (2021) who asserted that instructional materials are very necessary for enhancing the effective teaching of mathematics. They claimed that when teachers use instructional material in various ways, they support students in increasing their knowledge and understanding of the subject content.

Since instructional materials are indispensable to the effective teaching and learning of mathematics by making learning easier, more interesting, concrete, enjoyable, and clear in real-life situations (Uhumoza & Uworwabayeho, 2021), teachers are highly required to make use of these materials and in impossible cases, they can improvise to ensure that learners are given a chance to interact or participate actively in the teaching and learning process (Adebule & Ayoola, 2016). This also justified the assertion of Nyemaekile and Polycarp (2022) who attested that availability of instructional materials helps students to hear, see and touch which in turn adds to the effectiveness of learning. As opposed to passive knowledge acquisition,

the use of instructional materials by teachers will encourage students to actively participate in the construction of knowledge (Aljohani, 2017) as required in the mathematics syllabus of Rwanda (REB, 2015).

### Teachers' Use of Instructional Materials in the Teaching and Learning of Mathematics

The findings indicated that all the observed mathematics teachers utilized the available instructional materials as a way to present the new content as more memorable and meaningful to the learners. In other words, they utilized these materials in order to improve student learning outcomes. This is in line with Enikanolaye (2021) who asserted that when teachers use instructional materials they improve and stimulate students' retention level thus helping them concretize the learning of mathematics content more easily. In addition, Herman V. Portana (2021) urged that teachers' use of instructional materials allows teachers to present the content more meaningfully to the learners.

Furthermore, the results revealed that nine out of ten mathematics teachers used instructional materials to get students' attention and retention as well as in helping in the transfer of abstract concepts into concrete easier to remember. The finding of the study disagreed with the finding of Ndiokubwayo et al. (2020) who noted that many teachers in secondary schools did not make use of instructional materials while teaching the subject in class. Ndiokubwayo et al. (2020), lamented that the theoretical aspect of science subjects has been given so much attention, therefore, neglecting the role of practical classes using instructional materials in imparting knowledge of mathematics. However, according to Adebule and Ayoola (2016), our findings agree with theirs in that, teachers' use of instructional materials in the teaching and learning of mathematics allows students to interact or participate actively in learning paving the way for them in transferring abstract concepts into concrete easier ones to remember. Indeed, the use of instructional materials adequately by teachers helps them to have a full understanding of the subject to pass on the right knowledge to students and arouse their attention in the teaching and learning process (Ordu, 2021).

Further, the finding showed that eight out of ten mathematics teachers not only used instructional materials to help learners recall the prerequisites so that the new content can be attached to and built upon it but also as a way to guide the learners in the learning process. They make learning more pleasant to the students because they offer a reality of experience, which stimulates self-activity and imagination on the part of the students. In other words, they are not ends in themselves, but they are means to an

end (Kadzera, 2006). The result is in line with Aslam et al. (2017)' findings which reported that the use of instructional materials serves as a way of scaffolding. They contended that the use of these materials helps learners to recall what was learned in the previous lessons so that the new content can be attached to and built upon it. Similarly, Hilda and Bernard's (2015) findings reported that the use of instructional materials has the potential in helping the teacher in explaining new concepts clearly, hence resulting in better student understanding of the concepts being taught.

Similarly, Kaufman et al. (2020) also agreed that instructional materials serve as a concrete basis for conceptual thinking and hence, reduce meaningless word responses from students. Indeed, a teacher needs to use instructional materials to make the teaching-learning process engaging (Nicholls, 2000 & Raw, 2003). Further, Asamoah and Amo (2021) posited that it is very important to use instructional materials for instructional delivery to make students acquire more knowledge and are in line with students' characteristics, topics, and objectives of the lesson to be learned.

Further, the findings showed that seven out of ten teachers used instructional materials both as a way to project out lesson objectives and pose assessment questions for the class to answer. These observations agree with the view of Elaine Lin Wang (2020) who firmly concurred that teachers should apply the usage of instructional materials as a way to pose questions to the learners in getting them involved in the teaching and learning process. This is also in line with Onweazu and Olubayo (2021) in their study in Nigeria who indicated that teachers use instructional materials as a way to pose assessment questions for students to respond. Azi and Dajan (2022) agreed that the use of instructional materials makes learning more meaningful as learners are aware of the purpose of the lesson to be taught. As cited by Olayinka (2016), it is impossible to attain teaching and learning goals and competency without the use of instructional materials by teachers. More so, the results indicated that six out of ten mathematics also not only use instructional materials in eliciting students' responses but also use them in providing constructive feedback relating to the class exercises given. This result is in line with Gagne et al. (2005)' finding which also urged that teachers' use of instructional materials should aim at helping learners be more engaging, providing them with constructive feedback related to the exercises given in guided or self-paced learning. These findings also agree with the sociocultural theory guiding this study (Vygotsky, 1978). Surely, the use of these materials allows the teachers to have a better understanding of their learners and see how to help them to improve in stimulating responses upon class activities given (Drew, 2023). Lastly, the finding showed that five out of ten

mathematics teachers utilized instructional materials to support learning through examples and visual elaboration. These findings agree with Ordu (2021) who urged that instructional materials stimulate and excite students while improving their visual imagery. His results showed that the use of instructional materials helps learners to have a real-life image of the context of what is being taught. Umhoza and Uworwabayeho (2021) also asserted that students successfully become more creative as they perform hands-on activities when teachers use instructional materials adequately.

## **5. Conclusion and Recommendations**

### **5.1 Conclusion**

The findings of the study have provided the basis for the researcher to conclude that it is apparent that all private secondary schools in the study area have appropriate instructional materials. Although all the mathematics teachers agree that instructional materials are important in ensuring effective teaching and learning of mathematics, they have shown little interest in using instructional materials in their mathematics lessons during the teaching and learning process. Further, some have continued not to allow students to actively use the materials; thus, denying students the opportunity to enhance their active learning and participate in constructing their knowledge of the mathematics content.

This implies that, even though the teachers know the use of instructional materials, they are not inclined to develop them or improvise where possible. Therefore, heads of schools as instructional supervisors, are supposed 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 in this study.

### **5.2 Recommendations**

Based on the findings in line with the study objective, some recommendations have been formulated and can be addressed to the Government of Rwanda, School leaders, and teachers who are the curriculum implementers:

1. The Government through the Ministry of Education should endeavor to carry out comprehensive supervision in private secondary schools to ensure that these schools utilize the available instructional materials in ensuring effective teaching and learning of mathematics as well as other subjects. Otherwise, private secondary schools will continue to repudiate the use of instructional materials in the teaching and learning process.



2. Workshops, seminars, comprehensive training, and re-training programs on instructional material utilization should be organized by school leaders to enable teachers to gain more knowledge on the use of instructional materials in the teaching and learning process.
3. Teachers should be creative enough to improvise simple instructional materials to spice up their teaching and not to prove unconcerned on the premise of unavailable or inadequate instructional materials.

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