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# Teacher Preparedness, Availability of Teaching Materials, and the Implementation of Competence-based Curriculum

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## ABSTRACT

The competence-based curriculum aims to develop the skills, abilities, and competencies of students from their previous experiences. A particular interest in this curriculum sprouted from its potential to ensure that students acquire enhanced employability skills. The recognition of the need to understand the implementation of the competence-based curriculum policy in Rwanda rendered this research relevant. Therefore, the study endeavored to test the influence of teacher preparedness and the availability of teaching materials on the implementation of a competence-based curriculum. This study employed quantitative methods, wherein a sample (n = 207) of teachers was selected through the random sampling method. In alignment with the quantitative approach, a survey composed of standardized instruments was distributed to the study participants to collect data that was subsequently analyzed by statistical procedures. Descriptive analysis, Pearson correlation, and multiple regression tests were carried out to achieve the objective of the study. The results indicated that teacher preparedness and the availability of teaching materials had a positive and significant influence on the implementation of a competence-based curriculum and explained a 37% variance, which implies that well-prepared teachers and easy accessibility of teaching materials stand for a 37% chance of successful implementation of a competence-based curriculum. Further, it was also noted that teacher preparedness ($\beta$=0.517, p <0.005) had a greater influence on competence-based curriculum than the availability of teaching materials. Relevant implications were drawn from these findings, and recommendations were made accordingly.

*Keywords:* Competence-based curriculum, curriculum reform, educational policy, policy implementation, Rwanda

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## INTRODUCTION

Competence-Based Curriculum (CBC) appeared in the United States in the 1950s and early 1960s and garnered attention towards using behaviorally observed attributes that could contribute to curriculum development. In the 1970s and 1980s, CBC focused on using fragmented behavioral elements in the curriculum, which led to its decreased popularity. After some improvement, CBC approaches became popular and practical in developed countries in Europe, such as France, the Netherlands, the United Kingdom, and Germany, followed by developing countries in Africa like South Africa, Ethiopia, Tanzania, Mozambique, and later Rwanda (Paulo & Tilya, 2014; Tilya & Mafumiko, 2010).

The CBC adopted in Rwanda by the Ministry of Education emphasizes discrete skill-based learning over traditional knowledge (Ministry of Education, 2015). According to the CBC, the objective is to encourage skill learning that enables higher-order thinking skills, resulting in effective learning. Consequently, such a learning environment allows students to tackle real-life problems using practical ideas rather than depending heavily on age-old memorization and recall (V. Nsengimana, 2020). The key features of CBC include inclusiveness, flexibility, transparency, and accountability; integration with ICT as a tool; interconnection with cross-cutting issues like comprehensive sexuality education, environment, and sustainability; financial education; gender; genocide studies; peace and values education; standardization culture; and inclusive education (Ministry of Education, 2015). The curriculum emphasizes practical skills like using science and technology for seeking resolution to everyday issues and fast work completion. The curriculum also seeks to cultivate interest, inquisitiveness, and research skills among the students to elucidate ideas, hypotheses, and scientific occurrences. The curriculum framework emphasizes the need to evaluate students' accuracy of responses, coherence of concepts, logical deduction, precision, use of suitable methodologies, quality of outcomes, swiftness and effectiveness, and consistent performances on aptitude and practical examinations.

Many Asian countries have adopted CBC, including but not limited to China, Singapore, Hong Kong, Malaysia, and the Philippines. Most of these countries quickly adjusted their education policies to meet the requirements of the CBC (Cator et al., 2014). For instance, the Singaporean authorities adopted a new policy regarding the educational system in their medical schools. This adjustment required students of internship programs to be assessed on six core competencies (Khoo et al., 2014). Shortly, many countries in Africa, such as South Africa, Ethiopia, Tanzania, Mozambique, and Ghana, followed the example of developed countries by implementing the CBC (Makunja, 2015; Paulo & Tilya, 2014). The common problems encountered in African countries while implementing CBC were (a) the development of educational policies, (b) the creation of the profile of

school administrators, and (c) the creation of the profile of students. Additionally, the teachers grappled with insufficient training, along with a lack of teaching and learning materials. In 2015, the Rwandan government decided to change the curriculum at all levels of elementary and secondary schools from KBC to CBC (Mbarushimana & Kuboja, 2016).

The Rwandan educational leaders wanted to design an elaborative curriculum emphasizing transferable skills that are expected by employers and the global labor market (Mbarushimana & Kuboja, 2016; Ngendahayo & Askell-Williams, 2016). It was hoped that this change of curriculum would equip the students with the requisite knowledge and skills, for instance, critical thinking, productive employment, and problem-solving, that would be relevant in the 21st century. Rwandan citizens were enthusiastic about seeing the potential outcomes of this innovation for the Rwandan community (Karanja, 2016). The CBC was expected to equip students with adequate skills to solve problems that may be encountered on the job. It was also expected to provide the competencies required for the young people in Rwanda to become self-employed after finishing their secondary school education (Kafyulilo et al., 2013) and bridge the gap between secondary school and the workplace (Johnstone & Soares, 2014). Understanding the implementation of CBC is valuable to practitioners and to the larger body of research in the curriculum. As much as research exists, none of the research endeavors have discussed the implementation of CBC in the bordering districts of Rwanda, particularly in the western district of Rubavu. Hence, the current study was carried out to test the influence of teacher preparedness and the availability of teaching materials on the implementation of CBC in the selected region.

## Theoretical Foundation

Rogan and Grayson (2003) suggested a theory for curriculum implementation based on three constructs—profile of implementation, outsider influence, and capacity to innovate. According to them, the subconstructs of the capacity to innovate include physical resources, learner factors, teacher factors, and the school ecology and management. Elaborating on the construct's capacity to innovate, Rogan and Aldous (2005) described the best-case scenario for curriculum implementation as the presence of adequate teaching resources and teacher willingness to change, improvise, and collaborate, among other critical factors. However, teachers' inability to understand or resistance to accept changes in curriculum results in ineffective implementation (Pintó, 2005). The social cognitive theory also posits that individuals learn from their environment while participating in its creation (Bandura, 1986). Extending this idea to curricular reform, the school environment, resulting from teachers' active participation, directly influences their efficacy and instrumentality toward reform (Min, 2019).

Implementation fidelity, which is the degree to which the implemented

intervention meets its intended standard, is a vital concept in improving change outcomes (Clayback et al., 2023). Adequate resources and support must be provided to improve fidelity in implementing curriculum change (Clayback et al., 2023; Forman et al., 2009). Clearing these impeding factors appears promising in adopting and implementing a curriculum.

**Teacher Preparedness**

Teacher preparedness is a prime factor in implementing a new curriculum. There is a need to develop new teacher training methods to implement CBC successfully. These methods ought to take into consideration the rapid and constant innovations in the information and communication technology field. According to Cator et al. (2014), teacher training programs should incorporate the core principles of CBC. In other words, in-service teachers should be given some level of autonomy when it comes to place, time, and the pace at which they implement the ideas of CBC. In addition, in-service teachers should be allowed ample liberty to align their personal teaching goals with those assigned by the government and the institution they serve.

CBC is defined by Baker (2015) as a curriculum that assesses the learning of the students based on their abilities as opposed to the theoretical knowledge they possess. Gruppen (2015) explains that the students in CBC should be able to apply the skills acquired practically. In addition to that, the practical skills and the ability of the students should match the specific job market requirements. In this learner-centered curriculum, one of the roles of the teachers is to implement the curriculum in the classroom. It has been seen that the process of implementing a new curriculum sometimes passes through various steps. This was the case in Germany, where the implementation of a new CBC for general practice was done by following five steps (Steinhaeuser et al., 2013). The idea of implementing the curriculum by following different phases is also true in Rwanda, where CBC has been implemented progressively until 2018 (Ministry of Education, 2015).

The implementation of any curriculum should follow the education mission statement released by the government and the school calendar provided. It is then the responsibility of the teachers to develop a yearly plan, semester plan, monthly plan, and daily lesson plan that respect the syllabus (Arafah & Sihes, 2015). The reason for such clearly defined hierarchical planning lies in the fact that students graduating from a particular curriculum will face the challenges of job market requirements (Backes et al., 2015). Hence, the efficacy of the implementation will have a direct bearing on the graduating students' success in the job market. However, the preparedness of the teachers can impact its receptibility and consequent implementation (Momanyi & Rop, 2020).

The preparation of the teachers to embrace their careers is the key to success in teaching. Student achievement is related to the preparation of teachers to start

teaching. Teacher preparedness reflects an internal feeling of teachers showcasing how prepared they are to teach a new skill (Murphy-Pope, 2013). Thus, in this study, teachers' preparedness ought to be measured by classroom management, use of diverse instructional strategies, knowledge of the subject matter, use of computers in classroom instruction, and assessment of students (Arafah & Sihes, 2015; Murphy-Pope, 2013).

**Availability of Teaching Materials**

CBC is a curriculum that requires many teaching and learning resources. Among several others, teaching materials are a notable factor contributing to successful learner performance (Sephania et al., 2017). In classrooms, learning activities and resources are vital for teaching and learning to yield an adequate educational response (Carrete-Marín & Domingo-Peñafiel, 2022). In the countries where CBC was developed and implemented, a lack of textbook teaching guides is one of the major problems that was encountered. In Indonesia, according to the study conducted by Suyanto (2017), CBC started at a time when the schools were not yet ready to implement it. The lack of readiness was characterized by the absence of school policies that could have helped school leaders in managing the implementation, the lack of preparation of teachers, and the unavailability of textbooks for teachers and students at all schools.

To be well organized, teachers need some written textbooks that aid in classroom activities and are sometimes prepared and distributed by curriculum managers. In Rwanda, the Ministry of Education, which governs the Rwanda Education Board, prepares and distributes the national curriculum syllabuses to all schools in Rwanda. The implementation of CBC is measured by the authentic assessment of teaching methods, teachers, and students (Kouwenhoven, 2010; Murararaneza & Mtshali, 2018; Murararaneza et al., 2017). Teaching materials expected to be used in schools to better implement CBC include books, teaching aids, computers, libraries, and CD ROMs. Yet, a study has shown that in Tanzania, the lack of teaching materials, such as history textbooks, is a hindrance to the implementation of CBC (Namamba & Rao, 2017). The result of this study corroborates the initial challenges in the implementation of CBC due to the lack of teaching materials (Mbarushimana & Kuboja, 2016).

**Teacher Preparedness and Implementation of Competence-based Curriculum**

Every teacher needs to be prepared to embrace the challenges innate to the teaching profession. The preparation of teachers starts during their training (pre-service training) programs and continues while they are teaching (in-service training). Many studies link teacher preparedness to curriculum implementation (Achimugu, 2016; Alı & Zahadi, 2014; Simiyu, 2019), demonstrating that the preparation of teachers is a crucial factor in implementing

a curriculum such as CBC. Implementing CBC requires teachers to be aware of the core principles of CBC, which are mostly emphasized in in-service training.

Every teacher needs consistent training and orientation when implementing a new curriculum or teaching new subject content (Papay & Kraft, 2015). Students' achievement depends highly on the teachers' actual preparedness and perceived preparedness to deliver the instruction (Murphy-Pope, 2013). However, teachers who implement CBC in the classroom may face problems that compromise implementation. For instance, in Kenya, while studying the determinants of implementing a chemistry curriculum, Muse et al. (2019) demonstrated that the heavy workload of teachers hinders the perfect implementation of CBC in chemistry subjects. Further, it was found that preparing teachers through frequent and timely training could yield better results in the implementation of CBC (Mogere & Mbataru, 2023). Hence, it may be deducted that the preparedness of teachers can enhance the quality of their working environment as well as other logistic factors. Bandura (1986), in his social cognitive theory, posited that individuals learn not only through their own experiences but also through their interaction with their environment. More recently, it was found that nurturing a climate of trust among teachers was vital for schools' success (García-Martínez et al., 2021).

Moreover, there were perceived benefits of not imposing these collaborations but rather leaving them to teachers' autonomy (Muckenthaler et al., 2020). For instance, it is possible that when teachers feel confident about the implementation of CBC and readily implement it, they create an environment that embraces the implementation of CBC. On the contrary, when teachers are not ready to implement CBC, they potentially create an environment that is negative toward the implementation of the curriculum. Applying the social cognitive theory to teacher preparedness, we may note that teachers are not only motivated to take action by their own experiences but are also shaped by the nature of their environment. Consequent to these ideas, the following hypothesis was formulated:

> H1: There is a positive relationship between teacher preparedness and the implementation of a competence-based curriculum.

## Availability of Teaching Materials and Implementation of Competence-based Curriculum

In Africa, CBC first started in South Africa, one of the most developed countries on the continent, before extending to Tanzania, Ethiopia, Mozambique, and later Rwanda (Paulo & Tilya, 2014; Tilya & Mafumiko, 2010; Victorini & Wambiya, 2016). One of these countries' biggest challenges in the implementation process was the lack of teaching materials. A study conducted in Tanzania and South Africa (Victorini & Wambiya, 2016) showed that most of the secondary schools do not have sufficient teaching materials to implement CBC. In recent years, teaching materials have been

largely available in digitized forms. Kihoza et al. (2016) demonstrated the challenges related to the use and integration of information, communication, and technology in schools in Tanzania. The challenges that compromise the implementation of CBC are mostly related to the lack of infrastructure that can accommodate the CBC teaching model.

The self-determination theory (Ryan & Deci, 2000) highlights competence, relatedness, and autonomy as essential elements for an individual's well-being. Moreover, the feeling of competence in teachers could entail their ability to access and use essential teaching materials, which consequently shapes their intrinsic motivation. Additionally, when individuals lack a sense of relatedness to their peers and work environment, they may experience low levels of motivation to engage, accompanied by potential burnout (Buonomo, 2022). Further, in terms of autonomy, teachers may be more likely to successfully implement CBC through meaningful collaborations if it were not imposed on them but rather introduced as a system that they would understand and accept to be valuable (Muckenthaler et al., 2020). On the contrary, it is also likely that the successful implementation of CBC can occur when supervisors provide the needed resources and constantly monitor the process of curriculum implementation (Benson & Njuguna, 2023).

A study conducted in China by Chen and Wei (2015) showed that implementing CBC in the classroom is highly dependent on the teachers' interaction with the teaching materials. The developed countries invest money in the educational sector and provide the schools with teaching materials. The richer the country, the better the educational system. Additionally, educational administrators must ensure that learning resources, particularly those pertaining to practical work and other teaching aids, are prioritized (Benson & Njuguna, 2023). Another study noted the importance of access to the internet connection in the implementation of CBC among developed countries where teaching is associated with the use of a computer and internet connection, which makes the educational processes comfortable for teachers and students (Griffith & Lim, 2014). Furthermore, sometimes, the lack of adequate facilities also leads to teachers resorting to the teacher-centered approach, for instance, a teacher's responsibility to handle a large number of students in an institution that lacks proper infrastructure, like laboratories (Tabaro, 2018). In the absence of adequate teaching resources, the adoption and implementation of CBC appear improbable. Therefore, the second hypothesis for this study was formulated as below:

> H2: There is a relationship between the availability of teaching materials and the implementation of a competence-based curriculum.

The literature review revealed that teacher preparedness and the availability of teaching materials were hypothesized to influence the implementation of a

competence-based curriculum. Particularly in light of the theories discussed previously, the third hypothesis for this study was formulated.

H3: There is a significant influence of teacher preparedness and competence-based curriculum on the implementation of the competence-based curriculum.

The conceptual model for this study, developed based on the three hypotheses and illustrated in Figure 1, seeks to answer the following research questions through its findings.

1. What is the state of teacher preparedness and availability of teaching materials in the context of the study?
2. What is the statistical relationship between teacher preparedness, the availability of teaching materials, and the implementation of a competence-based curriculum?
3. What is the influence of teacher preparedness and availability of teaching materials on the implementation of a competence-based curriculum?

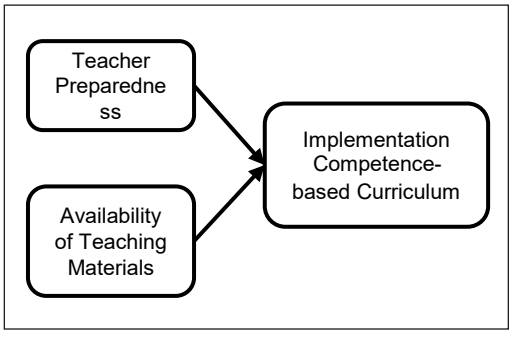


*Figure 1.* Conceptual model of the study

## METHODOLOGY

This study sought to test the relationships between the selected variables and, therefore, deemed quantitative methods to be fit for this evaluation (Creswell & Creswell, 2018). The use of numerical data collected using reliable survey instruments is typical of quantitative methods. A deductive approach was used to conduct this study. Two principal theories are generally applicable when conducting research using the deductive approach. The first is confirmatory research, in which scientists test hypotheses formulated based on prior research against empirical data. Confirmatory research validates hypotheses or disproves them. The second exploratory research is, by definition, an investigation into the data, which begins with the collection of data and proceeds with the investigation to develop hypotheses and theories grounded in the insights gained from the data. In this study, hypotheses were first formulated based on prior studies and then tested using data collected from the selected sample. Accordingly, a survey was administered to the selected sample to collect the data for this study, which was analyzed using statistical tools. Subsequently, the results interpreted are presented in adherence to quantitative methods.

### Instrumentation

The data was collected using a survey questionnaire as an instrument. The survey was comprised of two parts: the first part collected demographic information, and

the second part included items measuring the perception of teacher preparedness, availability of teaching materials, and the implementation of CBC. The scale proposed by Murphy-Pope (2013) for measuring the perception of teacher preparedness, which included a total of 15 items, was used in this study. The perception of the availability of teaching materials was measured using a scale of 15 items proposed by García-López et al. (2018). Further, García-López et al.'s (2018) scale of 14 items was used to measure the implementation of CBC. A pilot test was carried out with 20 respondents to ensure the reliability of the instruments. The reliability of the instrument was determined based on Cronbach's alpha score of 0.7 (Bolarinwa, 2015). The pilot test results suggested the instrument to be reliable, with Cronbach's alpha scores of 0.77 for teacher preparedness, 0.75 for availability of teaching materials, and 0.79 for implementation of CBC.

### Participants

Probability sampling is typically the type of sampling design selected for quantitative studies (Best & Kahn, 2006) because it allows every member of the population to have an equal chance of being part of the sample. Therefore, teachers were recruited using randomized sampling methods for this study. The sample size was determined based on Yamane's formula, which is suitable for surveys applicable to a finite population (Uakarn et al., 2021). As a result, 207 teachers from schools in the Rubavu district of Rwanda were chosen as participants in this study, according to the distribution presented in Table 1.

## FINDINGS

### Perceptions of Teachers

The first research question, considering the perceptions of the secondary school

Table 1
*Sample and demographic distribution*

| Type of School | No. of Schools | Estimated population | Sample |
|---|---|---|---|
| Private Schools | 15 | 162 | 86 |
| Public Schools | 11 | 187 | 121 |
| Total | 26 | 349 | 207 |
| | | **Frequency** | **Percentage (%)** |
| ***Gender*** | | | |
| Male | | 145 | 70.1 |
| Female | | 62 | 29.9 |
| ***Age*** | | | |
| 29 & below | | 51 | 24.6 |
| 30–39 | | 78 | 37.7 |
| 40–49 | | 53 | 25.6 |
| 50 & above | | 25 | 12.1 |
| ***Educational attainment*** | | | |
| High school | | 13 | 6.3 |
| Diploma | | 30 | 14.5 |
| Bachelors | | 148 | 71.5 |
| Master's & above | | 16 | 7.7 |
| ***Years of service*** | | | |
| Below 10 | | 133 | 64.3 |
| 11–20 | | 50 | 24.1 |
| Above 20 | | 24 | 11.6 |
| ***School status*** | | | |
| Public | | 38 | 18.3 |
| Semi-public | | 127 | 61.4 |
| Private | | 42 | 20.3 |

teachers in the Rubavu district regarding the study variables, is framed as follows: "What is the state of teacher preparedness and availability of teaching materials in the context of the study?" The results are presented according to the responses on each variable, reflecting their perception of each item in terms of their agreement or disagreement with the statements.

## Perception of Teachers on Teacher Preparedness

The secondary school teachers were asked to respond by encircling the relevant number in the questionnaire (Likert scale) that describes how they perceived teacher preparedness to implement the CBC in the classroom. The responses were gathered through a Likert scale ranging from 1 to 5. Each item was given one point, and the mean score was determined. Table 2 summarizes the responses.

The overall mean score was $M$ = 3.502, with $SD$ = 0.7319. This result was interpreted as a high perception of their teachers' preparation for implementing CBC in the classroom. The result suggests that the secondary school teachers in the Rubavu

Table 2
*Perception of teachers on teacher preparedness*

| Items | *M* | *SD* | *SR* |
|---|---|---|---|
| The system of competence-based learning promotes increased teamwork. | 3.84 | 1.15 | Agree |
| I use a variety of instructional methods to teach. | 3.82 | 1.03 | Agree |
| I am prepared to teach my subject matter by using a competence-based curriculum. | 3.72 | 1.12 | Agree |
| I select and adapt curriculum and instructional materials. | 3.67 | 0.97 | Agree |
| I am prepared to assess the competencies of my students. | 3.64 | 1.02 | Agree |
| The new challenge of this teaching-learning model has motivated me to investigate new technologies and methods. | 3.64 | 1.02 | Agree |
| The new learning system requires greater coordination of efforts between teachers. | 3.64 | 1.13 | Agree |
| I feel prepared to use this curriculum model successfully. | 3.58 | 1.01 | Agree |
| The new model requires a significant increase in course preparation time. | 3.57 | 1.14 | Agree |
| When I first taught using the competence-based curriculum, I was well prepared to handle a discipline situation. | 3.47 | 1.14 | Undecided |
| I attended training organized by the Rwanda Education Board before the implementation of a competence-based curriculum. | 3.32 | 1.29 | Undecided |
| When I first taught using the competence-based curriculum, I was well prepared to handle a range of classroom management issues. | 3.29 | 1.15 | Undecided |
| I learned how to teach using the competence-based model in a teacher training college. | 3.14 | 1.31 | Undecided |
| There is greater difficulty assessing students with this learning system. | 3.09 | 1.15 | Undecided |
| I use a computer in my classroom instruction. | 3.08 | 1.27 | Undecided |
| Overall mean | 3.50 | 0.73 | Agree |

*Note.* Legend*:* M= Mean, SD= Standard Deviation, SR= Scaled Response

district perceived themselves as prepared to use the competence-based learning system to promote teamwork in the classroom ($M$ = 3.84, $SD$ = 1.154). In addition, these teachers are prepared to use a variety of instructional methods ($M$ = 3.82, $SD$ = 1.027).

There is a high score of teachers' preparedness on the subject matter using CBC ($M$ = 3.72, $SD$ = 1.123). However, some teachers (16.7%) still had difficulties assessing the students with the CBC learning system ($M$ = 3.09, $SD$ = 1.15). Although teachers are well prepared to teach using the CBC model, some of them (15.2%) indicated that they do not use computers in the classroom ($M$ = 3.08, $SD$ = 1.27). In addition to a lack of computer skills, the secondary school teachers in the Rubavu district scored average on the items of learning how to teach using the CBC method in college before they started their teaching career ($M$ = 3.14, $SD$ = 1.305). This means that the teachers are undecided on whether they must or must not learn how to teach using the CBC model.

## Perception of Teachers on Availability of Teaching Materials

The respondents answered by checking how they perceived their access to relevant teaching materials to assess the availability of teaching materials. Table 3 presents the results in the form of a Likert scale ranging from 1 to 5. The overall mean score was $M$ = 3.102 and $SD$ = 0.645, which is interpreted as the average perception of teachers on the availability of teaching materials. The secondary school teachers confirmed that they have internet connections in their respective schools ($M$ = 3.52, $SD$ = 1.272). This validation regarding the perception of access to the internet connection may be due

Table 3
*Perception of teachers on the availability of teaching materials*

| Item | *M* | *SD* | *SR* |
|---|---|---|---|
| My school has access to an internet connection. | 3.52 | 1.27 | Agree |
| The new curricular model requires the teacher to diversify the types of learning resources used. | 3.51 | 1.04 | Agree |
| The application of competence-based education has allowed me to explore beneficial internet resources. | 3.48 | 1.14 | Undecided |
| My school has a computer and projector that help me teach using a competence-based curriculum model. | 3.27 | 1.16 | Undecided |
| The lack of school guide material makes me go back to the content-based curriculum. | 3.27 | 1.12 | Undecided |
| The school has a complete mathematical set to teach geometry. | 3.26 | 1.04 | Undecided |
| My school has enough library resources. | 3.23 | 1.10 | Undecided |
| Some students do not have textbooks to use in the classroom. | 3.21 | 1.26 | Undecided |
| I have all the required textbooks I need for the subject I teach to deliver the instruction. | 3.05 | 1.17 | Undecided |
| Rwanda Education Board provides schools with teaching materials before teachers implement a competence-based curriculum. | 2.86 | 1.24 | Undecided |

Table 3 *(continue)*

| Item | *M* | *SD* | *SR* |
|---|---|---|---|
| Each classroom I teach has at least one computer. | 2.85 | 1.34 | Undecided |
| The classroom materials available are suitable for competence-based teaching. | 2.84 | 1.19 | Undecided |
| The economic resources available at my school are enough to implement a competence-based curriculum. | 2.79 | 1.15 | Undecided |
| The number of pupils per class is suitable for competence-based teaching. | 2.71 | 1.23 | Undecided |
| I allow students to submit assignments via the Internet. | 2.68 | 1.30 | Undecided |
| Overall mean | 3.10 | 0.65 | Undecided |

*Note.* Legend*:* M= Mean, SD= Standard Deviation, SR= Scaled Response

to the government of Rwanda's promotion of using technology in all areas of activities, including education (Ministry of Education, 2015).

In addition, the secondary school teachers of the Rubavu district are required to diversify the learning resource information provided to the students to vary the reference resources of learning materials ($M$ = 3.51, $SD$ = 1.042). CBC allows teachers to explore beneficial resources ($M$ = 3.48, $SD$ = 1.143). Even if most of the schools have access to an internet connection, the perception of the participants in this study was average on the item that seeks to understand if the schools have enough resources to facilitate the implementation of CBC ($M$ = 2.79, $SD$ = 1.145). Further, the participants' perceptions were average on the number of students in the classroom, which is either suitable or not suitable for the implementation of CBC ($M$ = 2.71, $SD$ = 1.226). The result shows that teachers do not generally allow the students to submit their assignments via the Internet ($M$ = 2.68, $SD$ = 1.301), which generated the interpretation of the average perception of online submission of assignments.

## Relationship Between Teacher Preparedness, Availability of Teaching Materials and the Implementation of a Competence-based Curriculum

Research question 2 stated, "How are teacher preparedness and availability of teaching materials related to the implementation of a competence-based curriculum?" The responses were analyzed after conducting a Spearman correlation test using SPSS. The results summarized in Table 4 indicate that all the independent variables are positively correlated with the dependent variable and even among each other.

There is a strong positive correlation between teacher preparedness and implementation of CBC ($r$ = 0.567$^{**}$, $n$ = 336, $p$ < 0.01). Further, the result indicates a moderately positive relationship between teaching material availability and implementation of CBC ($r$ = 0.445$^{**}$, $n$ = 336, $p$ < 0.01). Consequently, hypotheses 1 and 2 were accepted.

The positive correlation between the independent variables and the dependent variable implies that when the values of the independent variables go up, the value of

Table 4
*Relationship among the variables*

| | 1 | 2 | 3 |
|---|---|---|---|
| 1. Teacher Preparedness | 1 | | |
| 2. Availability of Teaching Materials | 0.401** | 1 | |
| 3. Implementation of CBC | 0.567** | 0.445** | 1 |

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

the dependent variable also goes up. This suggests that the greater the government of Rwanda's desire to implement CBC, the greater the need for the Rwanda Education Board to prepare teachers to teach using CBC. Additionally, more teaching materials should be available in schools to enable teachers to utilize them and contribute to the successful implementation of CBC.

## Influence of Teacher Preparedness and Availability of Teaching Materials on the Implementation of Competence-based Curriculum

A regression analysis was carried out to test the influence of the independent variables—teacher preparedness and availability of teaching materials—on the implementation of a competence-based curriculum. The results of this test are presented in Table 5.

The regression test analysis produced a model in which teacher preparedness and the availability of teaching materials had a significant influence on the implementation of a competence-based curriculum ($p$=0.000). Additionally, the results indicate that the independent variables—teacher preparedness and availability of teaching materials—explain 37% of the variance in the implementation of a competence-based curriculum ($r^2$=0.37, F(2.205=60.448, $p$=0.000).

Therefore, the third hypothesis (H3) was also accepted. The model further indicates that out of the two independent variables, teacher preparedness ($\beta$=0.517, t(207)=8.15,

Table 5
*Regression analysis test result*

| Model Summary | | | | |
|---|---|---|---|---|
| **Model** | **R** | **R Square** | **Adjusted R Square** | **Standard Error of the Estimate** |
| 1 | 0.609[a] | 0.371 | 0.365 | 0.5804 |

*Note.* a. Predictors: (Constant), Teaching Materials Availability, Teacher Preparedness

| **ANOVA** | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| 1 | Regression | 40.731 | 2 | 20.366 | 60.448 | 0.000[b] |
| | Residual | 69.067 | 205 | 0.337 | | |
| | Total | 109.798 | 207 | | | |

*Note.* a. Dependent Variable: Implementation of competence-based curriculum; b. Predictors: (Constant), Teaching Materials Availability, Teacher Preparedness

Table 5 *(continue)*

| Coefficients | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | | **Unstandardized Coefficients** | | **Standardized Coefficients** | | |
| | | **B** | **Std. Error** | **Beta** | **t** | **Sig.** |
| 1 | (Constant) | 1.202 | 0.211 | | 5.707 | 0.000 |
| | Teacher Preparedness | 0.463 | 0.057 | 0.517 | 8.153 | 0.000 |
| | Teaching Materials Availability | 0.173 | 0.070 | 0.157 | 2.476 | 0.014 |

*Note.* a. Dependent Variable: Implementation of competence-based curriculum
The findings of this study resulted in the following regression equation:
y= 1.202 (a) + 0.517 ($\beta$TP) + 0.157 ($\beta$ATM)
Where Y = Implementation of Competence Based Curriculum (dependent variable);
a = constant value or Y-intercept;
$\beta$TP= teacher preparedness (independent variable);
$\beta$ATM = availability of teaching materials (independent variable)

$p$ <0.005) had a greater influence on the implementation of a competence-based curriculum, suggesting that 67% of the unexplained variance may be attributed to other variables excluded from this study, leaving room for future investigation. These findings substantiated teacher preparedness and the availability of teaching materials as factors explaining the implementation of a competence-based curriculum in Rwanda.

## DISCUSSION

This study was carried out to understand the implementation of a competence-based curriculum in Rwanda in a selected country district, namely Rubavu. It was found that the perceived preparedness of teachers was high, while the perception of access to relevant resources was average. However, both variables contributed significantly to the implementation of the CBC. Making relevant resources available to stakeholders is central to the successful implementation of educational policy (Esongo, 2017). One of the most basic aids in curricular change is the availability of textbooks, which is often the first step in implementing the change (Gracin & Matić, 2021). However, the mere availability of textbooks for teachers does not guarantee successful teaching and learning. In fact, Carrete-Marín and Domingo-Peñafiel (2022) pointed out that the way teachers utilize the textbook and ensure its adaptation to the learning situation is of greater importance. In support of these findings, the current study found that teachers' perception was average regarding the availability of teaching materials, potentially posing challenges in implementing the CBC.

In the recent past, the greatest factor in the advancement of any sector has been the integration of technology into all operations. Technology competence is also recognized as a 21st-century skill, and schools need to help teachers nurture this skill for effective teaching-learning (Jung & Ottenbreit-Leftwich, 2020; Yılmaz, 2021).

Evidently, the educational sector has also seen tremendous leaps in the integration of technology into the curriculum. As such, teachers need access to adequate resources, including technology infrastructure, which seems vital to curriculum implementation (Ghunu, 2022). In support, this study found that teachers acknowledged the provision of an internet connection, but the adequate technology infrastructure could be improved further. The results of the studies by Mentz and Mentz (2003) and Suyanto (2017) found that internet connectivity was limited across many countries in Africa. This challenge appears to exist in rural Rwanda even to date despite its satellite launch in 2019, which was revealed during the COVID-19 pandemic (Uwizeyimana, 2022). Uwizeyimana (2022) discussed the challenge of merely 30% of schools in Rwanda being equipped with internet access.

Further, Murithi and Yoo (2021) noted that while basic technology literacy was apparent, facilities enabling the integration of technology for curriculum implementation were inadequate in Kenyan public primary schools. They further highlighted the need for sufficient pedagogical knowledge to successfully implement the curriculum. The results of this study indicate that despite being generally prepared to teach, the participants were unfamiliar with the mechanism of using the CBC. These results agree with the results of a study conducted by Kafyulilo et al. (2013), where they found that pre-service teachers had difficulties in preparing a lesson plan according to CBC, even though the pre-service teachers were in their last year of training. Likewise, the result of the present study indicates that some teachers want in-service training to increase their competence in teaching by using CBC. Hence, just as much as the infrastructure is made available, pedagogical knowledge as a resource must also be offered to aid in the implementation of a competence-based curriculum in Rwanda, as evidenced in this study.

Teachers have been identified as a vital factor in the success of any innovative educational endeavor (Al-Awidi & Aldhafeeri, 2017). A study carried out in Kenya assessing the teachers' preparedness in the implementation of CBC highlighted the need for teacher training in pedagogy and assessments (Momanyi & Rop, 2020). This need was verified by the current study, which found that the participants were relatively unfamiliar with the CBC implementation. The results of the participant's responses to the teacher preparedness items in the survey indicate that they lacked adequate training on the implementation of CBC. Additionally, the extent to which teachers are supported in terms of conducive workloads and timely training—allowing ample planning time—can also impact curriculum decisions (Fu & Sibert, 2017; Mogere & Mbataru, 2023; Muse et al., 2019). Another interesting finding in this study was that despite teachers feeling prepared to implement CBC, they were not prepared to handle in-class situations. A potential challenge in the shift towards CBC could be attributed to the teachers' convenience of practicing the

teacher-centered approach due to the dearth of knowledge of CBC implementation (Mathias et al., 2023; T. Nsengimana et al., 2017). In fact, it was noted by Otara et al. (2019) that although teachers in Rwanda adopted the constructivist approaches, teacher-centeredness was still predominant. The same was the case in its neighboring country, Burundi, where teacher-centered approaches were still in use (Niyukuri, 2020; Sibomana et al., 2021). The findings of this study, in concurrence with past research, imply that teacher training in the implementation of CBC is vital to successfully enabling the shift. Further, in-service training could induce a more willing transition towards the discovery methods of pedagogy characteristic of the CBC. In essence, equipping teachers with pedagogical capabilities and adequate resources are potential determinants of the success of CBC implementation, as confirmed in this study.

Furthermore, this study found that the availability of teaching materials was relevant to the implementation of CBC, thus supporting the findings of previous studies (Esongo, 2017; Mbarushimana & Kuboja, 2016; Namamba & Rao, 2017; V. Nsengimana, 2020; Pale & Amukowa, 2020). Teachers may still need to learn how to use certain teaching tools, such as computers and projectors, for instructional purposes. Teachers' tendency to make their tasks easy justifies in-service training in the new programs or teaching methods (Simiyu, 2019). Additionally, this study found that teacher preparedness was a factor affecting the implementation of CBC, which supports similar findings of past studies (Alkandari, 2023; Curry & Docherty, 2017; Mogere & Mbataru, 2023; Momanyi & Rop, 2020). As such, this study provided evidence for the substantial impact of teacher preparedness and the availability of teaching materials on the successful implementation of CBC.

## CONCLUSION

This study aims to investigate how the availability of teaching materials and teacher preparedness influenced the implementation of a competence-based curriculum. It was found that both independent variables influenced the dependent variable positively and significantly. From the findings, we can infer that the success of a policy greatly depends on the environment created to support its implementation. This study sought to understand the curriculum implementation policy in Rwanda by testing the influence of the selected variables on the implementation of CBC. Consequently, it provided evidence for the significance of support in the form of providing adequate teaching materials and nurturing teacher preparedness for the success of competence-based curriculum policy implementation. Failure to implement policies to improve practice is not uncommon, particularly in the absence of support systems (Hudson et al., 2019). Adequate support typically aids in narrowing the policy implementation gap (Makinde, 2005). As such, implications for theory and practice may be drawn. Theoretically, this study adds to the literature on educational policy implementation by

extending it to the context of this study. Further, practical implications suggest that a newly formulated policy can result in its successful implementation when all stakeholders are brought on board. In this study, it was noted that the teacher participants were largely undecided on their preparedness for the implementation of CBC. Therefore, one of the implications for practice implies making deliberate and mindful efforts toward providing a conducive environment that includes adequate resources and proper training for the success of educational reforms.

Just like other research studies, this study is not short of limitations. Firstly, the design employed in this study allows for the use of self-reported responses to a survey questionnaire, which is ineffective in exploring concepts in depth. As such, conducting a qualitative study in a similar context is recommended for future research to add more depth to the understanding of the implementation of CBC. Secondly, since the present study used a relatively small sample size, other studies could also consider a larger sample size to further support or refute the findings of this study. Additionally, it may be recommended to policymakers regarding competence-based curriculum implementation to ascertain teachers' preparedness through ample training and support the implementation by making relevant resources available and accessible. The various implications of CBC may be effectively disseminated to all stakeholders to ensure that they willingly embrace its implementation.

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