The role of teaching methodologies on learning achievements in Kagarama secondary school

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Abstract

The study regarding the role of teaching methodologies on learning achievements in Kagarama secondary school. In choosing the best practice that should be used in implementing CBC in secondary schools and stakeholders. This study was conducted using descriptive research design and both quantitative and qualitative approaches. The target population was S.1 to S. 6, CBC Kagarama secondary teachers' trainers and 87 respondents were sampled total from different categories including students, teachers, school administrators and SEI from Kicukiro District in Kagarama secondary school. Multistage sampling was used to select students from S.1 to S. 6 obeying the proportion of each class. Purposive technique has been used to select teachers who participated in CBC formulation and SEI were selected using purposive sampling. Structured questionnaire and interview guide were used as tools of data collection. Data collected were analyzed using Statistical Package for the Social Sciences (SPSS) software version 21. Both descriptive and inferential statistics were used and results were presented in Tables and figure for easy interpretations. Findings of research project indicated that competence based teaching methodology impacts learning achievements (44.8%) in secondary schools in Rwanda. Group work discussion, student feedback on the teaching process and direct appraisal of the classroom teaching affects the learning achievements (44.8%). Competence based teaching methodology and attitude change of learners towards subject matter/creativity had a high positive correlation of 0.850±0.000, Therefore this showed that competence based teaching methodology affects learning achievements in one way or other as showed by the correlation coefficients.

1. Introduction

Arrangement of value training has been a significant aspiration of numerous teachers in both created and creating nations. Subsequently, in the twentieth century more training accentuation was set on course content (Li & Zhu, (2019). In the 21st century, training has been logically extending its accentuation in growing ability based instruction past subject substance. This is because of the way that the residents of the 21st century are defied with complex social, social, monetary, innovative and worldwide difficulties, henceforth quality instruction is needed to create basic aptitudes and capacities (Lewin, 2009). As per Klees & Qargha, (2014); quality instruction is characterized by five components which incorporate students' solid and backing by their families and networks, a favorable learning condition, significant substance of the educational plan, dynamic learning cycles and fulfillment of planned training results.

To quantify the nature of education results, two key variables (factors) are thought of, one of the elements (factors) is the accomplishment of and the extent to which the accomplishment coordinates students' age and grade level. The second factor is the extent to which the scholarly quality fulfills public guidelines as per labor prerequisites. Li & Zhu, (2019), brings

up that; "mind boggling issues should be tended to by people who have modern, enhanced and reciprocal capabilities" Li & Zhu, (2019) pp12. As per Bristow & Patrick, (2014) capability or competence refers to the yields, or results of educational training. While Monkman & Hoffman, (2013) contends that ability alludes to the inputs or basic credits expected of an individual to accomplish handy equipped execution. As per the Greenwood Word Dictionary of education, Competence based education is the training where the curriculum (educational plan) is gotten from investigation of alluring useful aptitudes, roles, or capabilities, and that guarantees understudy progress based on showed performance of those skills, roles, or competence. Collins and O'Brien (2011) noticed that alluring abilities (information, expertise, qualities, (mentalities and ethnics notwithstanding). inevitably structure the reason for the improvement of educational program which is named skill based educational plan. Having examined and integrated the academic suggestions and my own involvement with instruction, in this exploration CBC is considered as a reason for long lasting learning.

A report by the Republic of Rwanda (2015), reveals that in their new educational plan, Rwanda has moved from educator centered learning which was vigorously dependent on teachers' adapting notes from the writing board. The new educational program is focused on building up learners' abilities and furnishing them with basic aptitudes to improve their seriousness in the work market. Skill based training programs are presently well known in both created nations (Joined Realm, US of America, France, Germany and Netherland) and creating more nations (South Africa, Rwanda, Mozambique, Ethiopia) (Tilya & Mafumiko, 2010).

Also; arranging, planning and actualizing ability based educational program, in a way can assist learners' with connecting effectively in the present worldwide information based society. Rwanda has introduced curriculum reform to improve the learning achievements. Therefore, there was a need of revised curriculum to move away from a knowledge-based curriculum to a competence-based curriculum and from knowledge and skills acquisition to knowledge creation and application. The aim is to develop students' independent, lifelong learning habits; appropriate skills and knowledge; and applications to real life situations (Tabaro, 2018). The competencies planned for Rwanda's educational system include, critical and problem solving skills; creativity and innovation; research; communication in official languages; cooperation, inter personal management and life skills; and lifelong learning (Tabaro, 2018).

Graduates of knowledge based curriculum failed to demonstrate the skills and competences that fully addressed local, national and global market demands now, are the graduates of CBC demonstrating the skills and competences that fully addressed local, national and global market demands? In answering this question therefore there is a need to assess impact of competence based teaching methodology on learning achievements in secondary schools in Rwanda

2. Review of Literature
CBC approaches that are carried out in secondary schools

As indicated in the report by OECD (2013). US competency education reflects a global trend. The report acknowledged the key competencies to be increased or developed among students. These comprise thinking critically and making judgments about the barrage of information that comes to ones' way every day, solving complex multidisciplinary, open- ended problems that all employees in every kind of work place come across routinely. In addition to that creativity, entrepreneurial thinking, communicating and collaborating with teams of people across culture, geography and language should be developed among student. In general, US curriculum put emphasis on the use of language, information and opportunities to create new services, processes and products and also taking charge of financial, health, civil responsibilities and making wise choice.

The authors completed that, the primary ingredient in Finland's success in implementing competence-based curriculum is its investment in teacher preparedness and professionalism. They further noted that teacher education in Finland is heavily research-based with strong emphasis on pedagogical-content knowledge.

In Africa competence based curriculum was adopted for the first time by South Africa in 1998, following the acute storage of professionals like engineers, technicians and Artisans (Komba and Mwandanji, 2015). The author further pointed out that South Africa accepted the competence based curriculum in a bid to change attitudes of all South African employable skill to manage with challenging matters. In the 21st century competence based education programs are now popular in African countries such as Mozambique, Ethiopia and Rwanda (Tilya & Mafumiko, 2010).

According to Kitta and Tillya, (2010), the revised curriculum emphasizes on teachers to assess students frequently using authentic assessment method focusing on the prescribed set of knowledge, skills and altitudes. Teachers are emphasized to use authentic assessment methods such as portfolios, classroom or field observations, projects, oral

presentation, self-assessment interviews and peer assessment. More importantly teachers are required to change from norm- referenced to criterion referenced judgment of learners' capability or competences as supported by Kouwenhoven (2013). The findings of the study about teacher and teaching effects on students' attitudes and behavior conducted by Blazar & Kraft (2017), Showed than the attitudes and behaviors are stronger predictors of some long-term achievements than test scores. The authors regularly have agreed with these findings, decades worth of theory also have described teaching as multidimensional. High-quality or competent teachers are thought and expected not only to raise quality of teaching and learning resulted by test scores but also to offer psychologically or emotionally helpful environments that contribute to students' social and emotional development, manage classroom behaviors, deliver accurate content, and support critical thinking (Blazar & Kraft, 2017).

There is limited theoretical arguments which indicate the linkage or relationship between CBC approaches and quality of teaching and learning in secondary schools. It reveals that the effect of the competence based curriculum practices on quality of teaching and learning has neither been theoretically argued nor empirically tested in Rwanda especially in secondary schools context, perhaps in the international or governmental context

3. Materials and Methods
Research Design
The study used descriptive survey with mixed approach, which its attempt covers all the more large spread of the findings research issue instead of either method alone. Creswell and Clark (2011) affirm that the crucial reason of mixed method design is that the utilization of qualitative and quantitative in compatibility would give a greater comprehension of the research problem than the utilization of possibly one method alone in research. Descriptive research was an appropriate choice when the research aimed at identify characteristics, frequencies, trends, and categories. It was useful when not much is known yet about perception and total understanding of competence based curriculum implementation in a classroom situation and its influences on students' creativity, critical thinking and ability to apply knowledge in their daily life.

Target Population
A population is a group of individuals, objects or items, from which samples are taken for measurement (Muhaturukundo, Shukla and Mbabazi, 2016). The target population for this study included all schools that are implementing CBC approach. And the population included subject teachers, students (from senior one to senior six), school administrators and sector education inspector. Table 3.1 presents the target population.

Table3. 1 Target population

Categories	Population
Students	917
Teachers	45
School administrators	5
SEI	1
Total	968

Source: Kagarama Secondary school (2020)

Sample size
It is not possible to use the whole population due to a number of reasons, including limited time given by the institution for completion of the research. It was therefore possible to select a group of representatives through a variety of research techniques in the study. A portion of the target population referred to as a sample (Orodho, 2013). This means a finite part of a statistical population whose properties were studied to gain information about the whole population was a representative sample.

From the secondary schools of the Kicukiro district, Kagarama secondary school was purposively selected because it is a school of excellence; therefore one secondary school participated in this study.

In order to determine the sample size of the study, formula by Alain Bouchard was used, that illustrates that for a population under between 500 and 1000 individuals, the sample can be 88 with an assumed error of 5% and 95% of precision (Muhaturukundo, Shukla and Mbabazi, 2016). This can was calculated in the following figures:

N = total population size is 962
No: Sample size when the population size goes towards infinite is 88
Nc: Corrected sample size

$$Nc = \frac{N \times No}{N + No} = \frac{962 X 88}{962 + 88} = 80.1 \cong 81$$ Thus,

the sample size was 87 individuals in total were

included 81 from students and teachers, 5 school administrators and 1 sector education inspector.

The respondents from secondary schools are clearly presented in Table3.2.

Table3. 2 Sample size of the Study

Categories	Population	Sample size	Sampling technique
Students	917	78	Proportion of the class
Teachers	45	3	Purposive
School administration staff	5	5	Census
SEI	1	1	Census
Total	968	87	

Source: Kagarama Secondary school (2020)

In this illustration, eighty seven (87) respondents among 968 were selected and studied. To collect quantitative and qualitative data, formulated questionnaires were administered to eighty seven (87) participants who were selected using different sampling techniques

Sampling Techniques

In this study, three sampling techniques were used to achieve a representative sample of the population. The multistage simple random sampling was used to get a sample of students to participate in the study from Kagarama secondary school where proportional representative was used to select students from S.1 to S.6. Where the selection of participants depended on the percentage that the class contributed to the total population of the school. School administrators were selected using simple random sampling, teachers were purposively selected because only those who participated in CBC writing were chosen, and sector education inspector was selected purposively.

Procedures of Data Collection

A well-developed questionnaire helped researcher to answer all research questions and link them with the independent variables so as to meet the research objectives. The questionnaire had one sets of questions, which targeting the assessment of the impact of competence-based curriculum approaches on learning achievements in secondary schools in

Socio - demographic characteristics of respondents

This section of socio-demographic characteristics indicated the frequencies of socio-demographic characteristics especially sex, age, staff qualification,

Rwanda. The number of questionnaires to be administered were derived using the Alain Bouchard formula. These were distributed and administered to the respondents by the researcher in person and picked later, and this was preferable because it was found to be easy to present and collect.

Data Analysis

The data was collected through the study questionnaires, and observational checklist was coded and entered into Statistical Package for Social Sciences (SPSS 21.0) and validated. According to Cresswell (2012). Data collected was cleaned, validated and transformed to ensure accuracy with which data entered. This process engaged coding, editing, classification and tabulation of collected data (Orodha, 2003). In the present research, procedures for data analysis were involve qualitative data and quantitative data analysis because, some of the data (information). For quantitative data in this study used descriptive statistics, hence the process involved cleaning of data to make sure that the data was correctly identified in order to gain knowledge about the data, lists of data was made to produce descriptive statistics. For example, means and standard deviations was used. In calculating coefficient measuring strengths and coefficient that describe percentages or variance the use of Statistical Package for Social Sciences (SPSS 21.0) was used

4. Results and Discussion

profession experience staff, types of respondents and period spent in school

Gender of Respondents

The frequencies indicating the gender of respondents are presented in the table 4.1.

Table 4. 1: Sex of respondents

Variables	N(%)	MEAN	SEM	STD
Males	40(46.0)			
Females	47(54.0)	1.54	0.054	0.501
Total	87(100)			

Source: Primary data, 2022
Table 4.1, indicates that male respondents were represented by 46% of respondents while females were 54% of respondents.

Age of Respondents

Table 4. 2: Age of Respondents

Variables	N(%)	MEAN	SEM	STD
Under 15 years	6(6.9)			
15-19 years	38(43.7)	2.61	0.103	0.957
20-25 years	34(39.1)			
25-35 years	2(2.3)			
Over 35 years	7(8.0)			
Total	87(100)			

Source: Primary data, 2022
The group of age is presented in the table 4.2. The respondents under 15 years were 6.9%, the respondents with age range of 15-19 years were 43.7%, the respondents within 20-25 years were 39.1%, the respondents within 25-35 years were 2.3% and the respondents over 35 years old were 8.0% of respondents.

Qualification of staff

Table 4. 3: Qualification levels of staff

Variables	N(%)	MEAN	SEM	STD
Secondary(A2)	2 (22.2)			
University (A0)	7(77.8)	3.85	0.056	0.518
Total	9(100)			

Source: Primary data, 2022
Table 4.3 shows the qualification of staff respondents, 22.2% of staff respondents had secondary studies and 77.3% of staff respondents had finished university studies

Experience of respondents' staff

Table 4. 4: Staff experiences

Variables	N(%)	MEAN	Std Error Mean	Std
Less than 5 years	3(33.3)			
5 and above5years	6(66.7)	2.89	0.041	0.387
Total	9(100)			

Source: Primary data, 2022
Table 4.4 indicates that 33.3% of staff respondents had the experience of less than 5 years and 66.7% of staff respondents had the experience of a period between 5 and above years.

Period spent at school

Table 4. 5: Number of years spent at school

Variables	N(%)	MEAN	Std Error Mean	Std
1-3 years	17(19.5)			
2-5 years	43(49.4)	2.11	0.076	0.706
More than 5 years	27(31.0)			
Total	87(100)			

Source: Primary data, 2022
Table 4.5 indicates that 19.5% of respondents had spent one to three years at Kagarama secondary school, 49.4% of respondents had spent two to five years at Kagarama secondary school and 31.1% of respondents spent more than 5 years at Kagarama secondary school.

Impact of teaching methodology on learning achievements in secondary schools in Rwanda
Different aspects indicated impact of teaching methodology on learning achievements in secondary schools in Rwanda, a researcher made the analysis of respondents' views about teaching methodology on learning achievements in Kagarama secondary schools.

Table 4. 6: Competence-based curriculum teaching methodologies

	I do not know if it was considered	Not considered at all	Considered with low importance	Considered with moderate importance	Considered with high importance
	N(%)	N(%)	N(%)	N(%)	N(%)
Student test scores	7(8)	14(16.1)	19(21.8)	8(9.2)	39(44.8)
Group work discussion	15(17.2)	20(23.0)	37(42.5)	8(9.2)	7(8)
Student feedback on my teaching	7(8)	14(16.1)	19(21.8)	8(9.2)	39(44.8)
Direct appraisal of my classroom teaching	10(11.5)	14(16.1)	19(21.8)	28(32.2)	16(18.4)
Innovative teaching practices	14(16.1)	18(20.7)	18(20.7)	21(24.1)	16(18.4)
Learner centered method	9(10.3)	8(9.2)	12(13.8)	19(21.8)	39(44.8)

Source: Primary data, 2022
Findings shows that students test scores considered with high importance (44.8%) for impacting teaching methodology on learning achievements in secondary schools in Rwanda. Among teaching methodologies that can affect the learning achievements in secondary schools in Rwanda, group work discussion was considered with low importance (42.5%),

Student feedback on teaching was considered with high importance (44.8%), direct appraisal of classroom teaching was considered with moderate importance (32.2%), innovative teaching practices was considered with moderate importance (24.1%) and learner centered method was considered with high importance (44.8%).

Table 4. 7: Effect of teaching methodologies on learning achievements

		Improved class participation	Attitude change of learners towards subject matter/creativity	Learners' behaviour change (critical thinking)	Improved class scores	Methodology
Improved class participation	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	87				
Attitude change of learners towards subject matter/creativity	Pearson Correlation	.792[**]	1			
	Sig. (2-tailed)	.000				
	N	87	87			

Learners' behavior change (critical thinking)	Pearson Correlation	.868[**]	.912[**]	1	
	Sig. (2-tailed)	.000	.000		
	N	87	87	87	
Improved class scores	Pearson Correlation	.793[**]	.628[**]	.688[**]	1
	Sig. (2-tailed)	.000	.000	.000	
	N	87	87	87	87
Methodology	Pearson Correlation	.771[**]	.850[**]	.829[**]	.682[**]	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	87	87	87	87	87

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Primary Data, 2022

Table4.7 indicates that there is high positive correlation between attitude change of learners towards subject matter/creativity and improved class participation with Pearson correlation of 0.792±0.000. The same way there is a positive correlation between learners' behavior change (critical thinking) and attitude change of learners towards subject matter/creativity with Pearson correlation of 0. 912±0.000.

There is a high positive correlation between improved class scores and improved class participation (0.793±0.000), attitude change of learners towards subject matter/creativity (0.628±0.000) and with learners' behavior change (critical thinking) (0.688±0.000) in the same way teaching methodology and attitude change of learners towards subject matter/creativity had a high positive correlation of 0. 850±0.000, teaching methodology and improved class participation had a high positive correlation of 0. 771±0.000, teaching methodology and learners' behaviour change (critical thinking) had a high positive correlation of 0. 829±0.000 and teaching methodology and improved class scores had a high positive correlation of 0. 682±0.000. Therefore this showed that teaching methodology affects learning achievements in one way or other as showed by the correlation coefficients

Table 4. 8: Effect of competence-based curriculum teaching methodologies on learning achievements Correlations

		Methodology	competence	Class size	Learning Achievements
Methodology	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	87			
competence	Pearson Correlation	.979[**]	1		
	Sig. (2-tailed)	.000			
	N	87	87		
Class size	Pearson Correlation	.975[**]	.986[**]	1	
	Sig. (2-tailed)	.000	.000		
	N	87	87	87	
Learning achievements	Pearson Correlation	.858[**]	.786[**]	.828[**]	1
	Sig. (2-tailed)	.000	.000	.000	
	N	87	87	87	87

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

Table 4.8 indicates that there is high positive correlation between teacher's competence and teaching methodology of 0.979±0.000, Therefore this showed that teacher's competence affects teaching methodology as showed by the correlation coefficients, the correlation between class size and teaching methodologies was found to be

0.975±0.000, the correlation between class size and teacher's competence was found to be 0.986±0.000 and the correlation between learning Achievements and teaching methodology was found to be 0.858±0.000, the correlation between learning achievements and teacher's competence was found to be 0.786±0.000, the correlation between learning achievements and class size was found to be 0.828±0.000 and all these correlation coefficient are high and positive. Therefore competence-based curriculum approaches affects learning achievements in secondary schools in Rwanda

Regression analysis

Table 4. 9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.919[a]	.844	.838	.71786

a. Predictors: (Constant), Class size, Methodology, competence

b.

In order to explain the percentage of variation in the dependent variable of learning achievements in secondary schools in Rwanda by the independent variables, the researcher used the regression model for determination of R Squared. Based on the analysis, the findings showed that the independent variables contributed to 84.4% of the variation in learning achievements as explained by R^2 of 84.4%.

Analysis of Variance

Research conducted an Analysis of Variance (ANOVA), in order to test the effect of competence-based curriculum approaches on learning achievements in secondary schools in Rwanda. The findings were as shown in the table

Table 4. 10: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	231.182	3	77.061	149.540	.000[b]
	Residual	42.772	83	.515		
	Total	273.954	86			

a. Dependent Variable: Learning Achievements
b. Predictors: (Constant), Class size, Methodology, competence

Table 4.10, F value of 149.540 is significant at 95% confidence level. This is because the P value is 0.000 (p=0.000) and less than 0.05. The result means that competence-based curriculum approaches affects learning achievements in secondary schools in Rwanda.

Test for Coefficients

This Table demonstrates the level of significance on the variables; it also provides the standardized and unstandardized coefficients.

Table 4. 8: Coefficient of the effect of competence-based curriculum approaches and learning achievements

		Coefficients[a]				
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.743	.283		9.704	.000
	Methodology	.429	.052	1.808	8.192	.000
	competence	-.290	.039	-2.190	-7.488	.000
	Class size	.442	.098	1.224	4.503	.000

a.
Dependent Variable: Learning Achievements

From Table 4.11, the researcher wanted to establish the relationships between competence-based curriculum approaches and learning achievements in secondary schools in Rwanda. The following regression equation was obtained: LO = 2.743 + 0.429X - 0.290Y + 0.442Z + Ɛ

Where LO is learning achievements, X is teaching methodology, Y is teacher's competence, Z is class size and Ɛ is error term

From the above findings, holding the various components of competence-based curriculum approaches constantly, learning achievements were measured by proficient and powerful usage of teaching methodology, teacher's competence and class size. The consequences of the various regression models showed that there is a positive relationship between competence-based curriculum approaches on learning achievements in secondary schools in Rwanda.

The findings regarding the impact of teaching methodology on learning achievements in secondary schools in Rwanda showed that students test scores considered with high importance (44.8%) for impacting of teaching methodology on learning achievements in secondary schools in Rwanda. Similarly, to the current study where the formative assessment showing student test scores had a positive effect on academic performance (Ozan and Kıncal, 2018).

One staff said that learning achievements in secondary schools in Rwandan depends on a number of factors but most of them are teacher's competence, teaching methodology and class management while a teacher is in class

Therefore, in Singapore, student tests contribute to teachers' professional development as well as to student learning achievements by transferring professional development practices to the lesson plans (Koh, Lim, & Habib, 2010). This support in the same line of the findings of current study.

Among teaching methodologies that can affect the learning achievementss in secondary schools in Rwanda: group work discussion is considered with low importance (42.5%), Student feedback on my teaching is considered with high importance (44.8%), Direct appraisal of my classroom teaching is considered with moderate importance (32.2%), Innovative teaching practices is considered with moderate importance (24.1%) and learner centered method is considered with high importance (44.8%). With supporting results of Kemboi, Jackson and Nabwire (2017) and the findings of their study revealed that a majority of teachers did not use learner centered methods for example demonstration, enquiry and discussion. Contrary, throughout the world, studies have been carried out on teacher training and the implementation of learner centered pedagogy in secondary schools (Azigwe *et al.*, 2016).

5. Conclusion

Findings showed that students test scores considered with high importance (44.8%) for impacting of teaching methodology on learning achievements in secondary schools in Rwanda. Regarding teaching methodologies, (42.5%) of respondents reported that teaching methodologies can affect the learning achievements in secondary schools in Rwanda. Group work discussion is considered with low importance. Student feedback on the teaching is considered with high importance (44.8%), direct appraisal of the classroom teaching is considered with moderated importance (32.2%), Innovative teaching practices is considered with moderated importance (24.1%) and in Rwanda secondary schools, learners centered method is considered with high importance (44.8%).

There was a high positive correlation between improved class scores and improved class participation (0.793±0.000), attitude change of learners towards subject matter/creativity (0.628±0.000) and with learners' behavior change (critical thinking) (0.688±0.000) in the same way teaching methodology and attitude change of learners towards subject matter/creativity had a high positive correlation of 0. 850±0.000, Therefore this showed that teaching methodology affects learning achievements in one way or other as showed by the correlation coefficients

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