

Effect of Training on Chemistry Teachers' Attitude toward the Comprehensive Assessment System in Secondary Schools of Gakenke District, Rwanda

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Abstract: This study sought to establish the effect of training on chemistry teachers' attitude toward the comprehensive assessment system in secondary schools of Gkenke District in Rwanda. This study adopted the descriptive research design. Data was collected through questionnaire. Analysis of data was done through descriptive statistics. Furthermore, chi-square test was used to establish the existing relationship between the variables. The study concludes that the majority of teachers were trained on how the comprehensive assessment is implemented. Also most of respondents involved in this study showed a positive attitude towards the CAS and its implementation. Furthermore, the positive attitudes and effective use of CAS in teaching and learning chemistry were found to be associated with training received by teachers. The trained teachers in CBC implementation and its assessment strategies supported the relevance and importance of this assessment strategy compared to those who didn't receive the training. The study recommends that the districts should organize adequate trainings related to comprehensive assessment strategies to all teachers. There is a need to enhance teachers' continuous professional development (CPD) at school level to promote good understanding of CAS. There is also a need to enhance the culture of peer collaboration among teachers (learning by experience where strong teachers may help weak ones) in CAS implementation.

Keywords: Comprehensive Assessment System; Competence Based Curriculum; attitudes; General Education.

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Introduction

Comprehensive assessment entails intentional questioning strategies to find out what students know and what they have learnt (Dean, 2019a) for the purpose of improving the quality of teaching and learning (MINEDUC, 2019). To improve the

quality of education, the government of Rwanda initiated a curriculum reform, an important step in attaining the Rwanda's wish or ambition to develop the knowledge-based society (Ngendahayo & Askill-williams, 2016). Shifting from knowledge based to competence based approach determines the ability

of graduates having skills to perform different tasks instead of just knowing theories. In 2016, the structure of basic education: pre-primary, primary and secondary schools shifted from the knowledge based curriculum (KBC) to the Competence based curriculum (CBC) that seeks to develop generic competences like creativity and innovation, critical thinking, communication, research and problem solving, co-operation, interpersonal relations and life skills as well as lifelong learning (REB, 2015).

In the Rwandan national educational priorities, education quality is being focused through the improvement of a closer integration of curriculum, pedagogy and assessment. Assessment is a logical approach of gathering data about the progress of learners so as to improve teaching and learning processes and students' performance (Cartwright et al., 2009). The assessment consists of elements that indicate what students have accomplished (Phamotse, et al., 2011; Alkharusi, 2011). During assessment, teachers use different methods to determine what the students have mastered (Harlen, 2005; Timperley et al., 2007). However, the quality of assessment is influenced by different factors including trainings received by teachers, availability of teaching and learning materials as well as a continuous follow up made by educational authorities at different levels.

In Rwanda, before 2019, the curriculum evaluation was done through National examinations prepared at national level but for only the students who are leaving primary cycle and secondary cycle. In other words, those examinations aimed to promote students from primary (P6) to secondary (S1), to promote students from Ordinary level (S3) to Advanced level (S4) and to award students at the end of secondary studies with their certificates. The majority of assessment like school evaluation based continuous assessment (assessment during lesson, homework, quizzes, tests, etc.), end of terms and year examinations were conducted by teachers for promoting learners from one level to another.

However, this mode of assessment where students were evaluated by their teachers during the process of learning and during the national examinations was found to be not effective because some teachers tended to not complete teaching the entire content as planned in the national curriculum. This resulted into failure of some students at the national examinations level. In response to this challenge, the assessment system was changed into

the comprehensive assessment with its primary purpose to support full implementation of the Competence Based Curriculum.

Different sectors/levels of education are involved in the assessment process. For all grades from primary (P1-P6) to secondary (S1-S6), teachers prepare continuous assessments (during teaching and learning process). The end of 1st term examination is equally prepared at school level while the end of the 2nd term examination is prepared at the district level and the end of 3rd term examination as well as the end of primary, ordinary and advanced level of education are prepared at the national level by the National Examination and School Inspection Authority. (NESA) (MINEDUC, 2019). This helps both teachers and learners to know their position after analysis of the results from exams prepared by external authorities. In addition, it helps students to be familiar with evaluations prepared by others experts rather than their teachers who may give them the simplest questions based on how they have taught them. This study sought to establish the effect of training on chemistry teachers' attitude toward the comprehensive assessment system in secondary schools of Gakenke District in Rwanda.

Literature Review

Assessment is a process by which data related to students' academic progress is recorded in order to improve the teaching and learning process (Cartwright et al., 2009). The main purpose of assessment is to improve the teaching and learning process and students performance (Brown, 2014).

Different types of assessments are known in teaching and learning process. These include assessment for learning (formative Assessment), assessment of learning (Summative Assessment) and assessment as Learning (assessment which actively involves students in the learning process). Assessment for learning, which is formative assessment is a type of assessment used to gather information on the learning process of individual students during the teaching and learning process (Black, & Wiliam, 1998). This assessment helps students to revisit their errors and learn from their past experiences so as to improve their future performance (Boston, 2002; Duncan & Noonan, 2007). In addition, assessment for learning provides teachers with important feedback to adjust the ongoing teaching and learning practices so as to improve students' achievement as far as learning goals and objectives are concerned (Umar, 2018).

Assessment of learning (Summative assessments) is an assessment which provides the information about students' achievement of academic content following a longer period of instruction, such as a month (end of unit test) or full semester (end of term exam) or school year (Troy, 2011). Summative assessment identifies evidence of retained learning across lessons and achievement levels. It is most useful to teachers and parents, often used to report grades at certain points in time.

Evolution and Purposes of the Comprehensive Assessment System

In October 2015, the United States Department of Education released the Testing Action Plan (TAP) fact sheet, which was a document to guide the development, selection and use of fewer and smarter assessments. In that document there was a set of seven principles to ensure a thoughtful approach to testing by State Education Agencies (SEA) and Local Education Agencies (LEA) with clear statements of purpose and strategies to ensure that all assessments administered are rigorous, fair and yield a unique information about what learners or students know and can do according to the academic content standards. Assessment must be time limited, worth taking, high quality, fair and supportive and transparent to students and parents (Sigman & Mancuso, 2013).

Administered in good conditions and thoughtfully, assessment is a tool for learning and through it, students are empowered to make important decisions about their learning experiences (Marion et al., 2020). They provide necessary information for educators, families, the public and students to measure progress and improve outcomes for learners. To ensure that all students in America are achieving at high levels, they (Americans) introduced the Testing Action Plan to coordinate and control all assessments' quality and fairness by ensuring that every state or district administers a comprehensive assessment (Department of Education, 2015).

The Science and Design of Educational Assessment defines comprehensive assessment as comprising a range of measurement approaches used to provide a variety of evidence to support decision making (Pellegrino, 2003). Comprehensive assessment includes main three types of assessment: formative (during instruction), interim/benchmark (after instruction to evaluate midterm goal) and summative (to assess all the content at the whole

level of education) (Herman, (2016). The Colorado Assessment Literacy Initiative by Colorado Department of Education in Colorado State had three main aims: the first was to help fill assessment knowledge gaps among teachers, the second was to describe the features of a high-quality assessment system and how it can support optimal learning and the third was aimed to promote systems-level thinking during the processes of selecting and developing assessments. Teachers and administrators were provided with adequate trainings and in-person workshops with department staff designed to deepen their assessment knowledge and skills and teach how to administer alternate assessments and make use of appropriate accommodations to support students with disabilities (Department of Education, 2015).

Structure of the Comprehensive Assessment in Rwanda

The comprehensive assessment system was established in 2019 in Rwanda. It includes three levels of assessment. The first level is classroom level assessment which is prepared by teachers after lesson and at the end of units. The Competence-Based Curriculum (CBC) provides Key Unit Competences to be achieved by learners in each unit of study. As teachers use daily formative assessments to monitor and respond to learners' progress, these daily assessment activities are complimented by the end of unit assessment to measure the level of acquisition of the key unit competence. The second one is end of term assessments prepared with the support from trained staff at district level. Under the Comprehensive Assessment System, every subject/trade is assessed at the end of each term in order to provide feedback and remedial support to learners. Each end of term assessment is set by different level (Schools, districts and Central). End of term one assessment is prepared, conducted and marked at the school level. The end of term two assessments are organized and set at the district level by teams of trained teachers. Finally, at central level, the end of year assessment (Term three exams for P1-P5, S1-S2, S4-S5 and National examinations for P6, S3 and S6) is prepared at the national level by the National Examination and School Inspection Authority (NESA) and administered under the supervision of the District leadership, in the close collaboration with schools (MINEDUC, 2019).

Methodology

Research Design

This study adopted the descriptive research design. Data was collected through questionnaire. The study was conducted in the Gakenke District of the Northern Province in Rwanda. The population of the study was 76 secondary school chemistry teachers from 52 secondary schools in the district. Out of those, 55 teachers from 35 schools were randomly selected to constitute the sample. The purposive method was used to include 19 educational inspectors of 19 sectors of Gakenke District, 35 Head teachers from 35 secondary schools and 1 DDE, District Director of Education.

Validity and Reliability

For ensuring validity and reliability of data collections tools, the researchers ensured that research tools are composed with items that could bring relevant information without errors. These collection tools were given to research experts from the University College of Education in Rwanda to assess them. Their recommendations were taken into consideration before the tools were used for data collection.

Statistical treatment of Data

Analysis of data was done through descriptive statistics and then the tables were used to present the results. Furthermore, chi-square test was used to establish the existing relationship between the variables.

Ethical Consideration

Various measures were taken to ensure ethical standards throughout the study. For example, legal permission to conduct this study was sought from concerned authorities. Respondents signed the

consent form before they participated in the study. Furthermore, anonymity and confidentiality were considered in this study.

Findings and Discussion

This section presents the results of the study and was guided by three themes as follows:

Theme 1: To establish the number of trained teachers.

While the most effective way of getting knowledge related to a given educational policy is through training, it was necessary to start with the identification of trained teachers on the use of the Comprehensive Assessment System as reflected in table 1.

Table1: Trained teachers vs Untrained Teachers

Teachers	Frequency	Percentage
Trained	47	85.5
Not Trained	8	14.5
Total	55	100.0

Table 1 indicates the number of trained and untrained teachers on the use of the Comprehensive Assessment System. The table indicates that 47 teachers (85.5%) were trained while 8 (14.5%) teachers were not trained. Therefore, the majority of sampled teachers were trained, which is an added advantage in the process of using the Comprehensive Assessment System. Having enough trained teachers ensures effective implementation of the CAS just as Hafeez (2021) reported that training of the teachers determines effectiveness.

Theme 2: To establish the attitudes of Chemistry teachers on the Comprehensive Assessment System.

Table2: Perception of chemistry teacher on CAS

SN	Statements	Strongly disagree		Disagree		Agree		Strongly agree	
		N	%	N	%	N	%	N	%
1.	I know well what is CAS and its purposes	4	7.3	4	7.3	25	45.5	22	40
2.	CAS is well planned but its preparation to give the needed information is critical	3	5.5	7	12.7	35	63.6	10	18.2
3.	The integration of CAS in assessing CBC has a great role in quality education improvement	3	5.5	1	1.8	24	43.6	27	49.1
4.	I analyze and use CAS results to increase my teaching and learning activities	1	1.8	6	10.9	22	40	26	47.3
5.	I prefer to follow and adapt the CAS more than using the old methods of assessing	2	3.6	3	5.5	19	34.5	31	56.4
6.	Current situation on CAS indicates that its primary purpose will be achieved	5	9.1	5	9.1	30	54.5	15	27.3

Table 4: Correlation between of CBC trainings on the attitudes of teachers on CAS

s	Item	X ²	p	Difference	
1	I know well what is CAS and its purposes	10.505	.015	p<0.050	Significant
2	The integration of CAS in assessing CBC has a great role in quality education improvement	12.135	.007	p<0.050	Significant
3	Comprehensive assessment is well planned and its preparation to give the needed information is critical	13.433	.004	p<0.050	Significant
4	I analyze and use comprehensive assessment results to increase my teaching and learning activities	1.178	.758	p>0.050	Non-significant
5	I prefer to follow and adapt the CAS more than using the old methods of assessing	9.417	.024	p<0.050	Significant
6	Current situation on CAS indicates that its primary purpose will be achieved	5.388	.146	p>0.050	Non-significant

The second theme sought to establish the attitudes of teachers on the Comprehensive Assessment System as appears in table 2.

The table indicates that in all six items majority of the respondents either agreed or strongly agreed that they know well what CAS is and its purpose, that CAS is well planned and its preparation to give the needed information is critical, that the integration of CAS has a great role in quality education, that the integration of CAS has a great role in quality education, that they analyzed and used CAS results to enhance their teaching and learning activities, that they preferred to follow and adapt the CAS more than using the old methods of assessing and that current situation indicates that the primary purpose of CAS will be achieved. Therefore, the teachers under investigation had a positive attitude toward the use of CAS. Based on the findings of this study, chemistry teachers involved in the study understood the significance of the CAS and had positive attitudes towards it in the teaching and learning process. The findings of Collie and Martin (2016) stated that adaptability to change is very important to teachers because teaching work involves responding to and managing the incoming changes. It is in line with the ministerial guidelines on CAS suggesting that comprehensive assessment enables teachers to adjust their teaching and learning according to the learners' competence.

Theme 3: To establish the correlation between trainings and attitudes toward CAS.

The third theme sought to establish the relationship between trainings and attitudes toward CAS. Table 4 indicates the existing relationship between training and attitude toward the use of the CAS in the first, second, third and fifth items. The existing

relationship is shown by the p value which is lesser than the critical value (.05).

The items that yielded a significant relationship include the following ingredients: knowledge on the use of the CAS, the role of CAS toward quality education and planning and preference to use the CAS. Therefore, it is important to increase teachers' knowledge on the use of the CAS and inform teachers about the role of CAS toward quality education. Teachers also need to be enabled to do effective planning which will enhance their preference to adopt the use of the CAS.

Conclusions and Recommendations

Conclusions

The study concludes that the majority of teachers were trained on how the comprehensive assessment is implemented. Also most of respondents involved in this study showed a positive attitude towards the CAS and its implementation. Furthermore, the positive attitudes and effective use of CAS in teaching and learning chemistry were found to be associated with training received by teachers. The trained teachers in CBC implementation and its assessment strategies supported the relevance and importance of this assessment strategy compared to those who didn't receive the training.

Recommendations

The study recommends that the districts should organize adequate trainings related to comprehensive assessment strategies to all teachers. There is a need to enhance teachers' continuous professional development (CPD) at school level to promote good understanding of CAS. There is also a need to enhance the culture of peer collaboration among teachers (learning by

experience where strong teachers may help weak ones) in CAS implementation.

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