

## Competency-Based Education in Africa: Exploring Teachers' Perceptions, Understanding, and Practices

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### Abstract

This study explored teachers' knowledge and integration of competency-based practices in schools. One hundred and fifty in-service secondary school teachers were sampled across three African countries using a survey research design. A combination of both closed and open-ended questions was used to elicit responses from respondents via an online system. Responses from the open-ended questions were analysed using thematic analysis, and data received from the structured questions were analysed using percentage distribution. The theoretical lens through which this study was viewed was the Human capital theory and social constructivism theory. Findings revealed that teachers across the three countries have a positive perception of the usage of competency-based approaches but lack professional training and support, which in turn affects the quality of their teaching and assessment practices in classrooms. The implications and recommendations from this study offer teachers as well as education stakeholders in Africa valuable consideration to move beyond the traditional level of assessment and integrate good proxies of academic skills that support learners' acquisition of 21<sup>st</sup> century skills such as problem-solving, creativity and critical thinking in assessing learners' competencies.

**Keywords:** competencies, competency-based education, competency-based strategies, competency-based assessment, 21<sup>st</sup> century skills

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## Introduction

There is a compelling shift in the skills and competencies learners need to flourish globally in the present job market. This shift can be attributed to the rapid technological revolution and increased globalisation which highlight the need to develop key competencies that learners require to adapt to the changing world of work (Penprase, 2018). In this regard, research specifies that the content of every curriculum should include cross-cutting ideas, processes, and practical skills aimed at providing learners with real-life experiences that prepare them for the workforce (Roegiers, 2016). Thus, learners acquire and demonstrate essential skills that are increasingly in demand in the labour market by engaging in competency-based learning activities. Studies have described competency-based strategies in education as an innovative approach to the design of educational programs with a focus on learner's mastery of knowledge, skills, and values; as well as a convincing change towards the concept of learning in which milestones are less time-based than learning-oriented (Day & Berkeley, 2018; Rainwater, 2016). Thus, it can be argued that in preparing learners for a digital economy and the future of work in Africa, teachers and other educational stakeholders need to embrace the implementation of competency-based teaching and assessments in secondary school education across Africa.

The education landscape is globally shifting due to technological innovation, causing learning to become more measurable and personalised (Penprase, 2018; Rainwater, 2016). As such, there is increased debate about the evolving demographics of today's learners which is attributed to the widespread use of technology, thus increasing the demand for knowledge and skills necessary to address the needs of the rising fourth industrial revolution era. However, research claims that many high school learners after graduation appear not to be adequately prepared for university education or the workplace (National Conference of State Legislatures, 2020). In light of this, there is a growing recognition, reorientation, inclination, and integration of competency-based education in the education system of some countries around the world, including Europe, America, Canada, and Australia. In Africa, countries such as Zambia, Rwanda, Kenya, Tanzania, Nigeria and South Africa, among others, have adopted Competency-Based Education (CBE) into their education system (Kabombwe & Mulenga, 2019; Muneja, 2015; Muraraneza, Mtshali & Mukamana, 2017; Ruth & Ramadas, 2019). In Africa, CBE was first adopted in South Africa in 1998 (Komba & Mwandanji, 2015). This adoption aimed for the country to produce skilled and employable graduates who could meet the 21<sup>st</sup> century challenges. In 2004, Nigeria introduced universal basic education and changed its curriculum from content to competency-based learning, which brought about compulsory training for teachers (Osarenren-Osaghae & Irabor, 2018). Adequate provisions have therefore been made in the country's National Policy of Education documents on the training and retraining of teachers on the competencies needed for the effective building of 21<sup>st</sup> century skills. Of such provision is the enactment of three different national teacher

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education standards that include professional knowledge, pedagogical competence and professional engagement which was set to guide teacher education programmes (Federal Ministry of Education, 2007).

Several studies have shown how factors such as a high school dropout rate, poor education funding, shortage of skilled STEM graduates, inefficiency and poor quality of teachers amongst others are causing the deterioration of the education system in many African countries (Mtantato, 2018; Omebe & Omebe, 2015; Taylor & Robinson, 2019). As technological innovation continues to rise, it gives rise to the driving process of learning becoming a personalised approach driven towards the workforce. Therefore, learning must become an experiential approach that can accurately fulfil the needs of the economy. This can be done by mandating learners' comprehensive mastery of skills, subject matter knowledge, and attitudes needed to develop the African continent, as well as thriving in the global economy, instead of assessing learning outcomes by how much training a learner has undergone. Several studies have focused on the adoption of a competency-based curriculum in preparing learners for the changing world of work (Day & Berkeley, 2018; Kabombwe, & Mulenga, 2019; Muneja, 2015; Muraraneza, Mtshali & Mukamana, 2017; Rainwater, 2016; Ruth & Ramadas, 2019). Correspondingly, factors that mitigate against the effective implementation of the adoption competency-based curriculum appears to be more pronounced in most African countries. A particular focus of this research was, therefore, on teachers' perceptions, understanding and practices of CBE in selected African countries. Thus, the study is guided by the following research questions:

- What are teachers' self-perceived competency-based teaching and assessment methods used across African secondary schools?
- What are the inhibiting factors to the development of a competency-based approach to education in Africa?

### **Competency-based education**

CBE is a learning model that embraces students' learning outcomes or competencies on a task (Thakaberry, 2017). It focuses on the learning outcome a student can demonstrate effectively after learning. In essence, it seeks to develop learners' ability to know, learn and learn how to learn, doing things individually and functioning well in teamwork (Gervais, 2016). Its recent appraisal in the education sector is owed to the pressure from the industry that most graduates lack the basic skills and competencies needed for the world of work (Henrich, 2016). In effect, countries around the world have been transforming their education sector from content to a competency-based curriculum to meet with challenges of the 21<sup>st</sup> century. This shift has

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pedagogical implications because it requires a change in teaching and assessment practices (Siarova, Sternadel, & Mašidlauskaitė, 2017). To meet up with this pressing demand of the knowledge-based economy, the teachers matter, since they are the main change agents in educational transformations (Federal Republic of Nigeria, 2013; Vandeyar, 2017). Considering that teachers are significant agents of change in the implementation of CBE (Vandeyar, 2017), it is important to assess teachers' understanding of CBE and how they facilitate competency-based approaches that allow learners to develop important skills needed for the workplace.

Gervais (2016) explains that CBE was designed to address the needs of the learners. Such needs are basic skills, their effective application and the attainment of higher skills which are expected to be infused into the curriculum and presented in different forms throughout the students' course work (Dlamini & Dlamini, 2018). However, a change in the curriculum also involves a change in teacher preparation and professional development, since teachers tend to slide back to the traditional teaching method when they are not adequately trained to adopt a revised curriculum (Govender, 2018).

### **Competency-based teaching and assessment**

McClarty and Gaertner (2015:2), stress that “competency-based approaches to education have the potential for assuring the quality and extent of learning and developing integrated skills that ease learner transitions between school and work”. In this regard, CBE allows learners to show mastery of a specific set of skills needed to progress and receive marks for graduation, rather than completing a certain number of years spent in school or taking the assessment for proxy measures to meet an awarding body requirement. While competencies vary due to job context, different frameworks have been developed to emphasise the basic 21<sup>st</sup> century competencies that learners require to thrive in the changing world of work (Sanghi, 2016). Researchers have argued that teaching and assessment practices in CBE should focus more on helping learners make links between pieces of evidence, thereby fostering their capacity to generate new knowledge (McClarty & Gaertner, 2015). In like manner, Curry and Docherty (2017) equally claimed that teaching within the context of CBE ought to engage learners in self-directed learning, provide possibilities for continuous training, be collaborative, interactive, and showcase learners' application of competencies in terms of knowledge, abilities, and attitudes. This implies that competency-based instructions could be delivered using teaching approaches that are inquiry, problem, or project-based. Furthermore, research indicates that acquisition of competencies could be stimulated through the development of attitudes and attributes such as brainstorming, presentations, debate, small groups, guided practice, simulations (e.g. role-playing), questioning, use of metacognitive tasks, laboratories, and integration of technology tools (Curry & Docherty 2017; Dilmore, Moore, & Bjork, 2011). Since CBE encourages teachers to depend strongly on open-ended questions, and encourage comprehensive learners' dialogue, assessment becomes

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very crucial in gauging the knowledge and skills that learners acquire in competency-based instruction, course or program.

In addition, studies have shown that the role of assessment in CBE is integrally connected and crucial to the teaching methods used in classrooms (Henri, Johnson & Nepal, 2017; Kabombwe, 2019). Thus, assessment practices within the CBE context are assumed to create opportunities for the integration of learners' knowledge, skills, and attitude, as they reflect on ways of addressing issues experienced in everyday life. McClarty and Gaertner (2015) indicated that methods of assessments in competency-based education should generate individual pathways for the learner. Thus, methods such as the use of digital portfolio, performance assessment, formative assessments, self-assessment, authentic assessments, creating tests, quiz or exams, summative assessments and creating scoring instruments that empower learners to evaluate, interpret, and envisage data could be used to promote competency-based assessment practices in classrooms (Curry & Docherty 2017; Dilmore et al., 2011; McClarty & Gaertner, 2015). For instance, Dilmore et al. (2011) argued that repeated formative assessments of knowledge, attitudes, and skills during training should be carried out while content is learned, regardless of whether it has been scored or not. Such formative assessment provides learners with non-threatening feedback on their performance and offers them significant possibilities to practice skills, learn the knowledge, and gain self-reflect about their learning. Dilmore et al. (2011) further argued that teachers could also utilise ready to use or modifiable rubrics such as class participation, written communication, peer evaluation, laboratory work, oral communication, written assignment, small group work, miscellaneous, and self-assessment surveys in assessing learner's competency during and/or after classroom instruction

Despite the affordance of CBE in preparing learners for future challenges of the 21<sup>st</sup> century, its implementation in Africa still appears to be problematic due to teachers' values, practices and beliefs about CBE (Ruth & Ramadas, 2019). The existing secondary education system in most African countries is assumed to be focused on countless standardised tests, resulting in a more general curriculum, covering more content, but at the cost of in-depth understanding and skill development (Dlamini & Dlamini, 2018; Makunja, 2016; Ruth & Ramadas, 2019). While assessment describes what learners know and how they do what they have learned; unfortunately, examinations and grading in the secondary education scheme of most African countries do not appear to reflect learners' performance correctly, especially concerning competencies of the 21<sup>st</sup> century (Atibuni & Olema, 2017). Although CBE is focused on outcomes, teaching and assessments within competency-based learning are considered as an ongoing process that constantly develops the knowledge and skills that learners are required to have mastered by the end of their secondary education program.

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### **Factors affecting the implementation of CBE in Africa**

Most African countries have recently incorporated CBE into the education system. However, it has not been widely disseminated or implemented in many classrooms due to the varied educational challenges affecting African countries (Ruth & Ramadas, 2019). The following inhibiting factors are discussed based on their applicability to developing African nations:

- ***Absence of educators on the job training about CBE***

The absence of appropriately prepared instructors was one of the significant difficulties thwarting successful execution of CBE (Tambwe, 2017). Educators are anxious to actualise CBE, yet the huge challenge which most educators face is the absence of training. The vast majority of them do not unmistakably see the skill-based methodologies since they could not get any preparation. Absence of in-training preparation for educators ruined the viable usage of a capability-based educational plan in optional schools. Accordingly, the educators are confronted with difficulties when it comes to actualising CBE since they needed current information and aptitudes to manage learning issues which, sadly, influence the nature of training (Makunja, 2016) in the most African nations. Thus, educators neglect to actualise CBE because they come up short on the required instructive and specialised abilities required to manage students' difficult learning problems which influence the nature of training in the African nations by creating graduates without the required aptitudes and capabilities in the labour market.

- ***Low teaching and learning resources/facilities***

Text and reference books are insufficient to accommodate the number of learners in schools; even the available books do not mirror the current educational plan and need clarity on the best way to instruct according to CBE necessities. On account of the state of classrooms, library space and computer laboratories, the circumstances are even more appalling. Deficient educating and learning facilities/resources inhibit the execution of CBE in Tanzania (Chisi, 2018) and students may not be able to develop necessary independent learning capabilities, problem-solving, critical thinking minds which might deprive them the chances to being equipped skilfully (Makunja, 2016). With the situation of things in schools, it is imperative to improve the quality and quantity of learning resources.

- ***Large class size***

The issue of a large class is a common phenomenon among many countries in Africa. This condition creates difficulties for both the teachers and students when engaging in teaching and learning in the classroom. Marais (2016) observed that in South Africa, some schools experience overcrowded classrooms; unfortunately, this situation may remain for a long time to come in the future. All teacher training institutions must provide appropriate teacher training programmes which can assist upcoming student teachers in handling the critical challenge of





teaching in overcrowded classrooms. Huge class sizes could be a mind-boggling environment for recently designated educators if they need to teach an overcrowded class (Marais, 2016). It can be concluded that overcrowded classrooms tend to affect classroom teacher-students and student-student interactions during group discussions. For example, teachers failed to attend to individual students with learning difficulties (Marais, 2016; Muthusamy, 2015; Tejada Reyes, 2019). Overcrowded classes also increased the workload of teachers (Muthusamy, 2015). Consequently, the teachers failed to use learner-centred interactive teaching methods as CBE demands.

- ***Low institutional support***

Lack of institutional support was one of the major demanding situations hindering effective implementation of CBE in most African schools. Tambwe (2017) documented that about 69 respondents (46%) showed that lack of institutional help limits a powerful implementation of CBE in technical establishments. Take the issue of overcrowded college students in school training. If the college students are divided into manageable smaller groups, the instructors may incur more coaching hours and will have to be paid additionally for the extra classes. The schools are too aware of possible additional fees which have jeopardised the implementation of CBE in one way or the another. Sadly, CBE on the job training has not been given serious attention (Cedefop, 2015; Tambwe, 2017; Makunja, 2016). Schools have to create conducive and pleasant coaching and learning environments for powerful CBE implementation.

Some challenges continue to impact on the introduction of CBE, particularly in African countries. It is therefore important to harness all possible remedies to salvage the debilitating condition of making the introduction of CBET a reality in the schools.

## **Theoretical Underpinnings**

This research study is based on the concept of Human capital theory (Becker, 1962), and social constructivism (Vygotsky, 1978). The human capital theory indicates the significance of education and training as a crucial factor to developing the knowledge, skills, competencies, attributes and/or attitudes required to thrive in a changing global economy (Becker, 1962; Gillies, 2017). The basis of the human capital theory lies in how teachers support learners to develop the academic, metacognitive, social, and emotional skills needed to increase their efficiency and productivity in the workplace, hence contributing to the economic development of African schools. The integration and implementation of competency-based strategies in Africa's secondary education create an opportunity for teachers to tailor their teaching principles to meet the unique abilities of individual learners, support the learners' growth towards becoming responsible citizens and providing them with skills and knowledge needed for the development of the country.

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The philosophical underpinning of social constructivism proposed by Vygotsky (1978) also provides a practical orientation into understanding how teachers can adopt a classroom practice that promotes competency-based learning in Africa's secondary education. The social constructivist posits that learning is achieved as a result of social interaction that occurs in the process of collaborative inquiry which enables learners to draw upon each other's experience in solving difficult tasks (Vygotsky, 1978; Amineh & Asl, 2015). Within the constructivist approach, learners play an active role in their education as they engage in real-world, engage in genuine and meaningful application of skills, while teachers act as facilitators or more knowledgeable others. In this study, the implementation of social constructivist theory is based on how teachers use different performance tasks, peer assessments and other approaches to the teaching and learning process to facilitate the development of learners' knowledge and skills in preparation for the world of work. The teaching and learning activities employed by teachers are anticipated to help improve the knowledge, skills, proficiency, self-sufficiency, and independence of subject matter for learners in providing answers to specific problems.

## **Methodology**

This study adopted a qualitative research design (Creswell & Creswell, 2017). This design provided a greater degree of understanding of the variety and complexity of teachers' use of competency-based strategies in selected African countries, summarising the qualitative variables using descriptive statistics (Pietersen & Maree, 2016). The population comprised secondary school teachers in three African countries, including Nigeria, Rwanda, and South Africa, all of which are selected from West, East and Southern Africa, respectively. One hundred and fifty in-service teachers were sampled across the three African countries using a non-proportional quota sampling method. The participants were mainly teachers who taught science subjects at the secondary level. These categories of teachers were selected because the researchers believed they would have utilised CBE practices during teaching in one way or another.

The data was collected through a combination of a closed and open-ended questionnaire jointly designed by researchers 1 and 2 above, and the face validity was confirmed by researchers 3 and 4 above. After much deliberation during which the questionnaire was satisfactorily certified, it was then sent to 10 teachers via an online system using google form for a pilot study. The questionnaire was then sent to the main participants of the study using the google form. However, for participants in Nigeria, the form had to be printed and sent to them to be filled in on paper because most of them did not have access to the internet. Responses from the open-ended questions were qualitatively analysed using thematic analysis (Clarke & Braun, 2013) and data received from the closed-end responses were quantitatively analysed using percentage

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distribution (Lavrakas, 2008, Pietersen & Maree, 2016). The percentage representation of the participants' responses is presented in a graphical form (see Section 7). For the thematic analysis aspect of the analysis, the data was read and collated by the second author and verified by the first author. Coding and categorisation were jointly done by all the researchers, while the findings are presented in themes.

## **Findings**

The following discussions provide answers to the two research questions stated above.

### ***What are teachers' self-perceived competency-based teaching and assessment methods used across African secondary schools?***

First, teachers' awareness of CBE practices in Africa was investigated. Chart 1 illustrates the difference in the percentage of teachers' understanding and awareness of CBE across the three countries. The percentage of teachers that claimed to be aware of what CBE was and who were able to describe their understanding of CBE was South Africa = 14.7%, Nigeria = 26%, Rwanda = 33.3%), which was apparently higher than the percentage of teachers who were unable to describe their understanding of CBE (South Africa = 18.7%, Nigeria = 7.3%). From Chart 1, the findings revealed that there is a great extent of CBE awareness among teachers across the three countries.

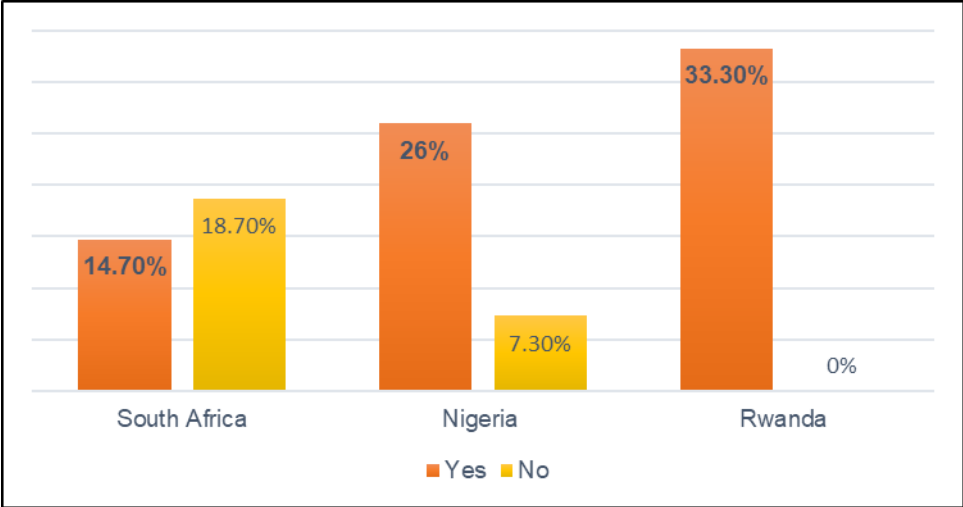
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Chart 1: CBE awareness in Africa



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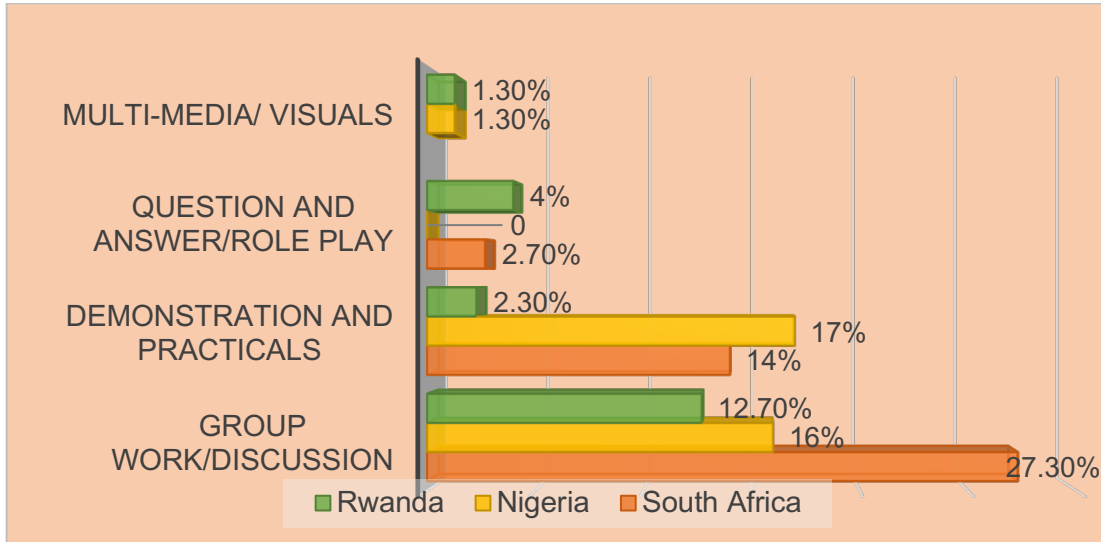
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However, the survey indicated that teachers, particularly in Nigeria and Rwanda, have an inadequate understanding of the meaning of CBE. For instance, teachers from Nigeria described CBE as the “*way instructions, assessment and grading are carried out; level of approach a teacher use in making the student understand what is being taught better*”. For Rwanda, CBE was described as “*an approach to developing critical thinking instead of memorising facts; and a way of implementing knowledge into practices*”. The findings infer that the orientation and conception of these participants towards CBE are not sufficient for their practice as compared to their counterparts in South Africa who described CBE as “*as a set of teaching skills required for the future workplace; an outcome-based learning focused on enhancing learners with the required skills and attitude for work*”.

A further analysis into their teaching approaches revealed that group work and discussion are mostly used although with low percentages (27.3%, 16% and 12.70% in South Africa, Nigeria and Rwanda respectively). In addition, the three countries claimed the use of demonstration and practical work but with very low percentages with Rwanda having the lowest percentage of 2.3%. However, question and answer/role play, and multimedia/visuals are rarely used. Chart 2 presents a graphical representation of the results.



**Chart 2: Teachers' CBE teaching approaches**



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In addition to the above, researchers asked teachers how the teaching approaches used were selected. The findings confirmed that 86.6% of teachers in the three countries chose suitable approaches for the teaching of science concepts. This finding can be related to their use of demonstration and practical sessions, and group discussion as represented in Chart 2. The selected teaching approaches also support the use of higher-order thinking (83.3%) and complex concepts (61%). In addition, 83.3% of the teachers claimed it was *very true* that they monitored their learners understanding of the scientific concepts.

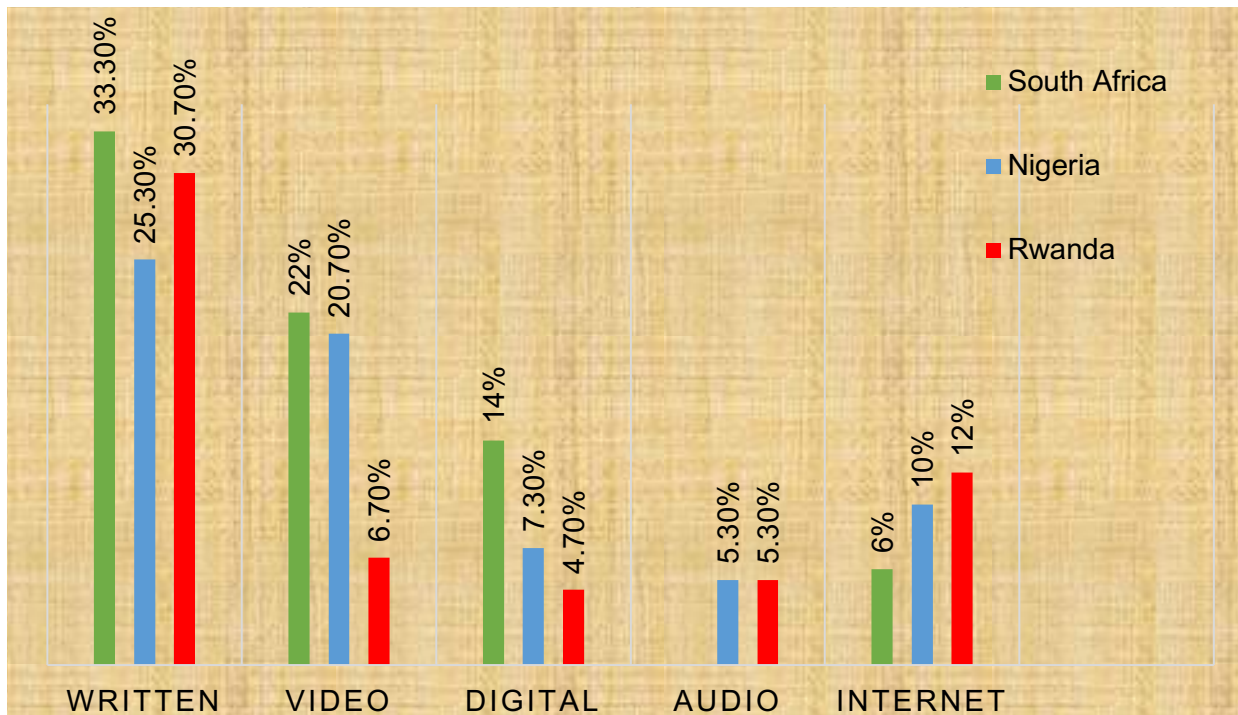
Table 1: Teacher's teaching approaches

Teaching approaches	Statements	South Africa (%)	Nigeria (%)	Rwanda (%)
Selection of suitable teaching approaches	Very True	33.3	22.7	30.6
	Somewhat True	0	10.7	2.7
Monitoring of learners understanding	Very True	33.3	26.7	32.0
	Somewhat True	0	2.7	1.3
	Not Very True	0	1.3	0
	Not True at all	0	2.7	0
Teaching approaches supporting higher-order thinking	Very True	33.3	20	30
	Somewhat True	0	11.3	3.4
	Not True at all	0	2	0
Teaching approaches supporting complex concepts	Very True	13.1	22.6	25.3
	Somewhat True	20	10.7	2.7
	Not Very True	0	0	5.3



In Chart 3, the result shows that teachers in the three countries sometimes used traditional forms such as written materials for teaching. However, other technological tools such as video, digital tools, audio and the internet were not often used. However, there seems to be a level of usage of video tools in both South Africa (22%) and Nigeria (20.70%).

Chart 3: Instructional tools for teaching



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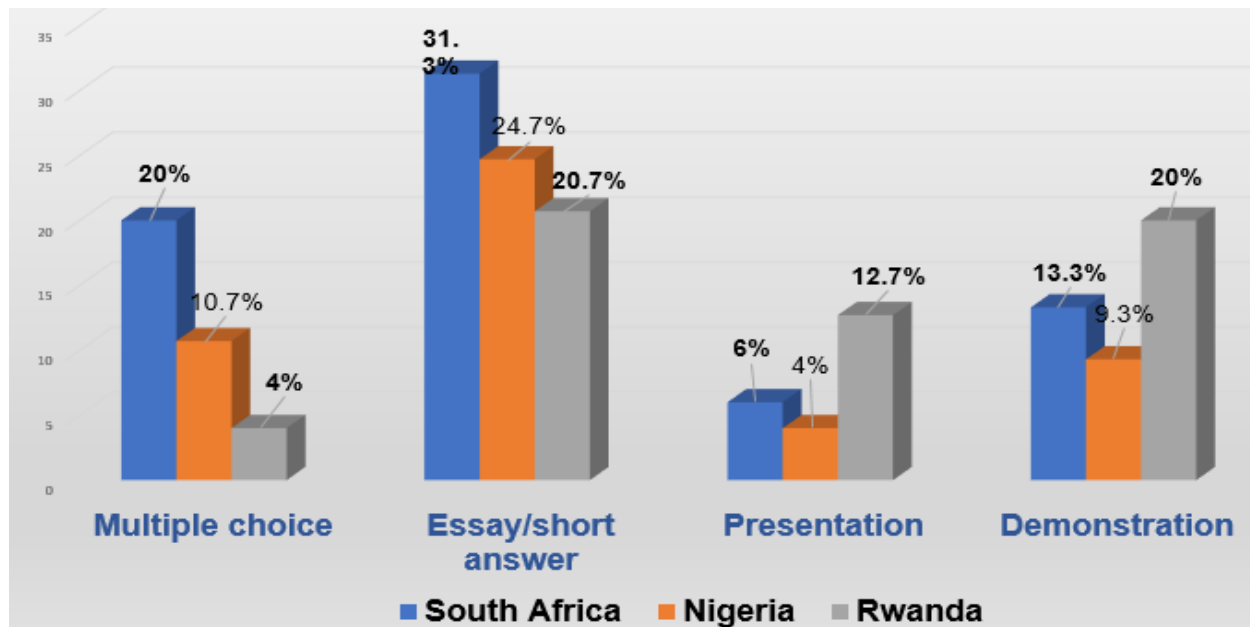


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A further probe into their assessment approach within the context of CBE in Chart 4 reveals that teachers rarely used the assessment methods. However, it was found that the percentage of teachers depending on traditional methods of assessment such as multiple-choice tests and essays/shorts which focus on assessing surface knowledge were respectively higher in South Africa (20%, 31.3%) and Nigeria (10.7%, 24.7%) as compared to Rwanda (4%, 20.7%).

**Chart 4: CBE assessment practices**



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In a bid to investigate more into the assessment practices used by science teachers across the three countries, 64% of the teachers claimed they designed assessments that measure learning objectives demonstrating mastery of the content. In contrast, 34% only did on a *somewhat true* basis. Discussing whether the designed objectives aligned with the learning objectives designed, 82.1% of the teachers claimed they were *very true* to the usage of this practice for designing assessments. In comparison, 16.3% said this was *somewhat true*. The teachers (58%) also claimed that they not only focused on the design aspect of the assessment but also assessed student learning by allowing them to showcase their knowledge of science concepts since the curriculum allows learners to show what they know. Therefore, the teachers (80.7%) encouraged the learners through the demonstration of their proficiencies in science subjects. This finding relates to the use of demonstration and presentation as a form of assessment in Chart 4, but only a few teachers used it often. It is interesting to see that teachers (67.9%) allowed learners to showcase their skills as a form of assessment that enables teachers to engage learners in self-reflective learning. What's more, 54.1% of teachers have also conducted assessments outside of the subject matter because the curriculum of CBE supports such assessment methods. However, 31.6% did on a *somewhat true* basis, and 13.3% did not.

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Table 2: Assessment plans and methods used by teachers

<b>Assessment methods</b>	<b>Statements</b>	<b>South Africa (%)</b>	<b>Nigeria (%)</b>	<b>Rwanda (%)</b>
Design of learning objectives demonstrating mastery of content	Very True	13.4	20	30.6
	Somewhat True	20	11.3	2.7
	Not Very True	0	2	0
Design of assessment tasks aligning with learning objectives	Very True	22	30.1	30
	Somewhat True	11.3	3.3	2
	Not Very True	0	1.3	0
Curriculum supports learners' assessments outside the subject matter.	Very True	0	20.7	33.4
	Somewhat True	21.3	11.3	0
	Not Very True	12	1.3	0
Curriculum allows learners to show what they know	Very True	2	29.3	26.7
	Somewhat True	7.3	0	2.7
	Not Very True	24	4	4
Gives opportunity for demonstration of proficiencies as an assessment	Very True	14	33.4	33.3
	Somewhat True	19.3		
Engages students in self - reflection	Very True	10.6	28.7	28.6
	Somewhat True	18.7	4.7	4.7
	Not Very True	4	0	0



*What are the inhibiting factors to the development of a competency-based approach to education in Africa?*

From the thematic analysis of data, three themes were generated. The themes are curriculum issues, learner characteristics and school-based problems; as factors inhibiting proper integration of CBE at the secondary school level. The associated categories are lack of government support, curriculum overload, limited time to teach lessons, overcrowded classrooms, inadequate teaching resources, learner characteristics and poor language proficiency. Each theme is explained below.

- Curriculum issues

Findings revealed that even though the government of the three countries advocated for CBE in schools, there is no support for smooth implementation of CBE practices from the government. Teachers in both South Africa and Rwanda claimed that because the curriculum is overloaded, they find it difficult to allow for differentiation of learning as entrenched in CBE practices in the classroom. Also, since the curriculum is too crowded, teachers mostly find it difficult to express themselves using different CBE approaches because of the limited time allocated to each subject. They believed that the only solution for curbing this problem is to get training support from the government on the way and manner in which they can effectively cope with both curriculum overload and allotted time for each subject. Teachers from Nigeria stated that they required financial incentives from the government, which will serve as a source of motivation on the job. However, they seem not to get such support at the moment. In support of the findings, 30% of the participants from the three countries said, *“the content is much compared to the available to cover it; “there is no time to execute the process, and the curriculum does not allow for differentiation of learning because the number of teachers to student ratio is too high”*; and *‘no support from government in terms of adequate time to use of this approach’*.

- School-based problems

School-based problems relate to the lack of teaching resources and over-crowded classroom in Nigeria and Rwanda. Participants from South Africa did not state whether or not they face these problems in their classrooms. The teaching of science subjects requires the use of different *teaching resources* such as scientific and technological tools, textbooks, laboratories, electricity and internet facilities that will assist teachers in presenting the content to the learners. However, findings from this study show that most of the teachers are willing to use these tools for teaching and learning, but there was no provision for them by the school authority. In addition, the available tools for teaching do not cater for all the students in the class. Therefore, teachers are mostly left with no choice other than not to use these tools since students tend to wait for each other to use the tools with limited time available. To worsen the case is the *overcrowding of the classroom*, which

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do not allow teachers to support struggling and physically challenged learners easily. However, teachers in Rwanda said they could manage the situation. In support of the findings, some of the participants quipped, *“availability of resources and time will determine the integration of CBE in my classroom; ... “these large number of students in each class and problems of personal disabilities while we try our best to solve them by applying inclusive education”*; and *‘yes as a science teacher, there is often a scarcity of resources... to support permanent existence of electric power’*.

- **Learner characteristics**

This theme describes issues related to learners. Teachers in South Africa and Rwanda claimed that most of their learners behaved unruly in the classroom with the introduction of CBE practices and the complexities attached. They are receptive to making the approach successful in the classroom. In addition to this, teachers face issues with learner’s language proficiency because of the diversity of learners in the classroom. They often face problem explaining the content to learners who struggle with the English language.

## **Discussion**

It was found that sampled teachers in the three countries recognised the benefits of CBE in developing learners’ knowledge and skills for the competitive world of work and development of the country. Whilst teachers are aware of the importance of CBE; their understanding of CBE was to some extent related to instructional and assessment tools utilised in their classroom practice. Teachers in this study also indicated that they used learner-centred approaches like demonstration, practicals, and group discussion to promote competency-based learning in their classrooms. The findings also revealed that most of the teachers relied primarily on traditional resources like textbooks and workbooks as instructional tools to track learners’ understanding, promote higher-order thinking and complex concepts. However, these traditional resources do not allow extensive social interaction among learners.

A further concern revealed in the study is that teachers in the three countries rarely use technology in schools due to lack of infrastructure and limited teaching time. With regards to their assessment practices, teachers depended mostly on traditional methods of assessment such as multiple-choice tests’ and essays/shorts’ answers which do not prepare learners for expertise. Hence, one factor that appears to be critical to the effective implementation of CBE in Africa is teachers’ understanding in terms of their roles, ability, and use of competency approaches in classrooms. From the foregoing, the findings of this study align to some extent with human capital and social constructivism theory which was used towards understanding teachers’ implementation of CBE in Africa. Although teachers taught learners the academic content using different teaching

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approaches and assessment methods, certain skills such as social, metacognitive and technological skills needed for the 21<sup>st</sup> century workplace were rarely used by the teachers in the three African countries. The reasons for this can be understood from the challenges experienced by teachers in effectively integrating competency-based approaches in their classrooms. For instance, inadequate time for teaching was identified as a general challenge across the three countries, while challenging factors relating to learners' unruly behaviour and language barrier were unique to South Africa and Rwanda. In addition, problems related to overcrowded classrooms and unavailability of resources were mostly reported by teachers from Nigeria and Rwanda. The literature attests that teaching in an overcrowded classroom, inadequate educating and learning facilities/resources hinder a powerful execution of CBE in similar African countries; and this may affect the learner in developing the necessary independent learning (Chisi, 2018; Marais, 2016). Furthermore, curriculum overload was reported as a contextual challenge, hindering teachers' effective implementation of CBE in South Africa and Nigeria. Also, it appears that teachers from Nigeria mentioned a lack of support from government as a major problem affecting their implementation of CBE. These findings corroborate the claims of Tambwe (2017) that curriculum issues owing to overloading of the curriculum, and lack of support affect the realisation of competency-based practices in Africa.

### **Conclusion and Recommendation**

This study explored teachers' knowledge and integration of competency-based practices in three African countries. Findings from the study indicated that teachers have a positive perception using competency-based approaches but lack professional training and support, which affect the quality of their assessment practice in classrooms. These findings, therefore, call for education stakeholders in Africa to provide models illustrating key knowledge, skills, and attitudes that teachers can use to implement appropriate competency-based approaches in classrooms effectively, particularly those in a distance learning environment. The use of open educational resources, computer marked assessments and observed learners' performance should be considered by teachers and education stakeholders in Africa as valuable considerations required to prepare learners with good proxies of academic skills like problem-solving, decision-making, creativity, critical thinking and digital literacy needed in the changing world of work in Africa.

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