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TITLE: How performances are aligned with the balance between formative and summative assessment?

Theme: Assessment and Big Data

Sub theme: Big Data and Assessment for Learning-Opportunities and Tension

Abstract

The advent of competency-based curriculum has declared less of summative and more of formative assessment. This has come with challenges and opportunities; challenges on the competencies a teacher needs to perform authentic assessments, expected balance between formative and summative assessment and opportunities such as evaluating learners continuously as well as offering information on the learning outcome. This paper explores the balance between formative assessment and summative assessment, evaluating the issues emerging, rebalancing and the role of the assessor's competency and its effect on the balancing vs. emerging issues. It analyses the established balance and how it authentically evaluates the performance. Data was collected from 470 schools across 47 counties in Kenya and analyzed to test the weighting between formative and summative and its effect on the final performance. The outcome of the data indicated that there were deviations across the submitted scores based on the mode of assessment. The deviations in outcomes were well pronounced across the learning areas as well as across different teachers. However, across board there was a positive deviation above the average in favor of formative assessment. Challenges were also noted on; the timing of assessment, consistency of assessment across learning areas and choice of assessment modes. This leads to conclusion that as much as we are transiting to formative assessment there is need to prepare the teachers on formative assessment as this will have implication on the quality at which it measures learning outcomes. The balance between formative-summative assessment and the timing of the assessment needs to be mapped onto the learning areas, teacher's qualification and length of practice to authentically measure the learning outcomes and establish the alignment between formative assessment performance and summative assessment performance.

Key words: Assessor's competency, summative assessment, formative assessment, authentic assessments, consistency of assessment.

Introduction

This study intended to evaluate the extent through which the teachers have implemented Competency-Based Assessment (CBA) within the competences-based curriculum (CBC) that is currently being rolled out in Kenya. The research also delved into the development, online sharing and utilization of formative and summative assessment tools for use in the classroom process. The study also established the suitability of a National Assessment Cloud (NAC) to drive CBA to achieving fair evaluation of learning outcomes; establish the appropriateness of different assessment methodology through database analytics based on utilization and success rates; establish the balance of the various test approaches through collaboration. Identification of suitable test approaches is critical so that we have clarity on the curricular orientations and the definitions of the competences in the national educational system, Muñoz, Daniel Ríos, & Araya, David Herrera. 2017. The study also established the role of teacher's competencies in use of suggested test approaches to achieve expected learning outcomes.

1. Background

The Kenya Institute of Curriculum Development (KICD) initiated a pilot for the CBC in the year 2017 as part of the educational reforms that are ongoing in Kenya. The pilot targeted 470 schools identified across the 47 counties in Kenya. The pilot findings indicated that implementers appreciate the ability of CBC to promote expected learning outcomes. One area where teachers felt a big deficiency is the need to further capacity build them on how to carry out assessment in a CBC context. (KICD, 2017). CBA is a strong competent of CBC hence a critical point for teachers to embrace given that CBC leans more on formative assessment than summative assessment. CBA enables the students to be assessed using teacher designed *rubrics* whose contents may or may not be found in their classroom textbooks as opposed to the content-based assessment system that allows items that are only found in the textbooks (Goutam 2016). Textbook teaching has been a big problem in most schools (Yves & Marcelino, 2005) and CBA brings about a reprieve that will focus more on the holistic abilities of the learners as clearly outlined by Goutam. The Kenya National Examination Council (KNEC) alongside KICD developed rubrics and suggested test items that were used in the pilot. Rubrics are not directions nor should they become task definers but a point of reference from which the teachers can get direction on how to go about developing their own tools. Rubrics, when well designed and aligned with standards, can assist teachers in accurately placing a student's progress on a continuum and provide valuable information regarding instructional gaps and weaknesses Caroline (2014). To further enhance

standardization of assessment across Kenyan schools, the concept of NAC was developed to support online collaboration of the 43,000 educational institutions under basic education in Kenya. Big data is an evolving term that describes any voluminous amount of structured, semi structured and unstructured data that has the potential to be mined for information, Bigelow (2018). The NAC concept involves online sharing of thousands of test tools that are mapped on specific learning areas, tracking the best of the tools through reported success rates from teachers, moderation of these tools by national assessment bodies into approved assessment items and uploading them onto an online digital library within NAC for access by teachers across the country.

1.1. Problem statement

The implementation of CBA requires proper National frameworks to support the gigantic task of creating assessment standards across Kenya as well as timely collection, analysis and sharing of important data in a timely and usable manner. The massive data shared through these platforms requires use of reliable data processing systems where teachers upload assessment items, the items are then rated through automated analytics and the most effective adopted, moderated and recommended by the National assessment body as standardized test items for specific learning areas. The use of big data in assessment resonates with Zeide (2017) who reiterated that algorithmic profiles embed assessment seamlessly into pedagogy instead of depending on the summative high stakes assessment. This study explored the emerging issues accruing out of the implementation of CBA, specifically in the use of technology in CBA, establishing the emerging issues when formative assessment is used and how the present level of teacher's qualifications affects the effective use of assessment tools. It also compared the balance between formative and summative assessment systems to establish the impact of this weighting on the final evaluation on the performance of the learner.

1.2. **Research questions**

This research was aimed at analyzing the extent of CBA roll out in the pilot schools with a focus on the teacher's capacity to; use technology effectively, balance formative and summative assessment and the emerging issues that come with this new shift.

In order to achieve this, the following questions were addressed:

Question 1: How does the balance between formative and summative assessment formulate authentic assessment of the learners?

Question 2: Does the level of assessor's qualifications affect the use of CBA in pedagogy?

Question 3: What are the emerging issues of implementing formative assessment in the contemporary Kenyan classroom?

2. **Theoretical Framework**

The advent of CBC has declared less of summative and more of formative assessment. This has come with challenges and opportunities; challenges on what qualification the teacher needs to perform authentic assessment, the frequency and placement of the assessment, what should be the balance between formative and summative assessment and opportunities such as facilitating learners continuously as well as offering information on the learning outcome. As reiterated by Longcroft 2017, the balance between the number, kinds and purposes of formative and summative assessment in your teaching should be focused on building learning rather than measuring it. Whereas it can be argued that all assessment is formative, BirBack (2015), The Kenyan educational scene has been heavy on summative assessment mostly to give ranks and grades. Will the radical transition affect quality? Balance between the different assessment approaches is a critical factor in the obtaining consistent assessment of learner's outcomes. As correctly shared by OECD/CERI (2017) there are handicaps in the classroom on the issue of balancing assessment approaches. OECD et al reiterated that there are tensions between classroom-based formative assessments and summative and a lack of connection between systemic, school and classroom approaches to assessment and evaluation. Other scholars such as Marilyn Higgins, Fiona Grant & Pauline Thompson (2010) who shared that; methods that work well for one learning area may not work well for the other supported these disparities. This ideally means that the NAC must have proper data analytics that will be able to filter through the massive data shared through it in order to come up with a best fit selection for standardization and sharing. The national

wide technology-based collaboration will incorporate and analyze the wealth of information across Kenyan classrooms to inform institutional decision-making and provide a more precise diagnosis of learning outcomes as supported by Zeide (2017).

3. Methodology

This section provides the procedures that were used to carry out this study. The procedures are presented under the sub-headings; Hypotheses, study population, research design, sampling procedure, the sample size, the data collection instruments and the data collection procedures.

3.1. Hypotheses

3.1.1. Experience and academic level of assessor is indicative of the competency in assessment.

3.1.2. An assessment approach that is not balanced is bound to lead to biased outcomes.

3.2. Study population

In Kenya, some schools are categorized as public while others are categorized as private. 64 % of the respondent's schools were from urban areas and 36% came from rural schools. Work experience was considered, the segmentation of subject specialization also taken into consideration so as to have a representative sample. These respondents were involved directly in the piloting and implementation of CBC and CBA thus providing crucial information relevant to the success of CBA across the Kenya.

3.3. Research design

This research used a cross-sectional design approach to investigate how performances are aligned with the balance between formative and summative assessment in the Kenyan schools and how this has influenced authentic evaluation of learning outcomes.

3.4. Sampling procedure

A representative sample was drawn from 47 counties selected from across the country. The study was conducted on a study population with the following characteristics. The CBC pilot schools are 470 schools across the 47 counties in Kenya. The study sample composed of 174 schools forming 37% of the study population. The counties are divided into sub counties; the target schools came from different

sub counties. Nairobi County was used to pilot the tools. A list of schools participating in the CBC/CBA pilot and in the different sub counties was run and schools picked at random. Interventions were put in place to ensure the different categories of schools are well represented i.e. Rural, Urban, public and private. Stratified sampling was applied so that all the subjects were well represented i.e. sciences, mathematics, languages and social studies as per the Kenyan curriculum design. This was used to eliminate bias in the subjects; Gender disparity was controlled through use of dedicated quotas.

3.5. Data collection instruments

The study used a composite questionnaire that was administered to targeted teachers. The questionnaire had four sections each targeting a different parameter. The survey tool was piloted in Nairobi County, which is populous and highly cosmopolitan. The tools were analyzed, corrections made, redesigned, and retested for effectiveness. It was tested for reliability using Cronbach alpha and scored a reliability index of $\alpha = 0.895$ (Cronbach alpha) against a threshold of 7.0. The use of multiple Likert questions in the questionnaire necessitated the use of Cronbach Alpha to determine the reliability of the scale.

3.6. Data collection procedure

The questionnaire was available in soft versions through social media, chat groups and online communities of practice that comprise of teachers from the target schools. The open-ended questions were coded and qualitatively analyzed for consistency, readability and reliability.

4. Findings and Discussions

4.1. The respondents were given a Likert scale measuring various parameters as outlined in the analysis that follows.

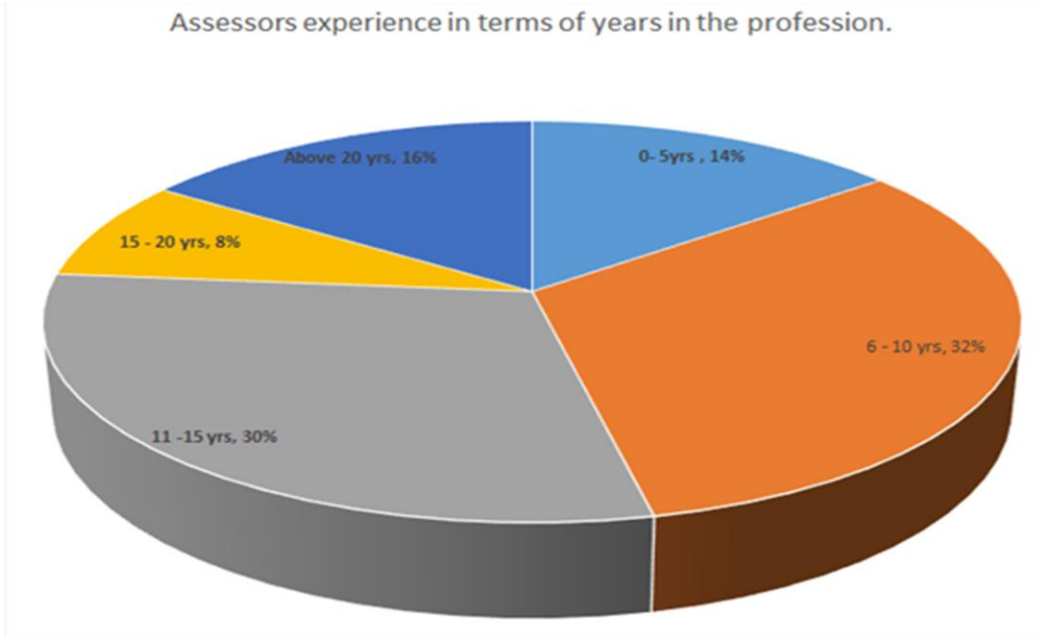


Figure 1: 14 % of the respondents had worked for 5 years or less, 32 % 6 to 10yrs, 30% having worked 11 to 15 years, 8% having worked 15 to 20 years as 16 % having worked for more than 20yrs. The respondents were well spread across all bands of work experience.

School Description

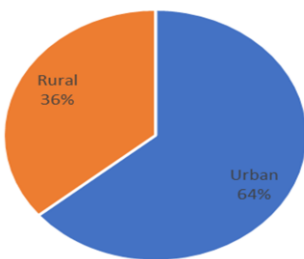


Figure 2: 64 % respondents from public schools and 36 % came from private schools.

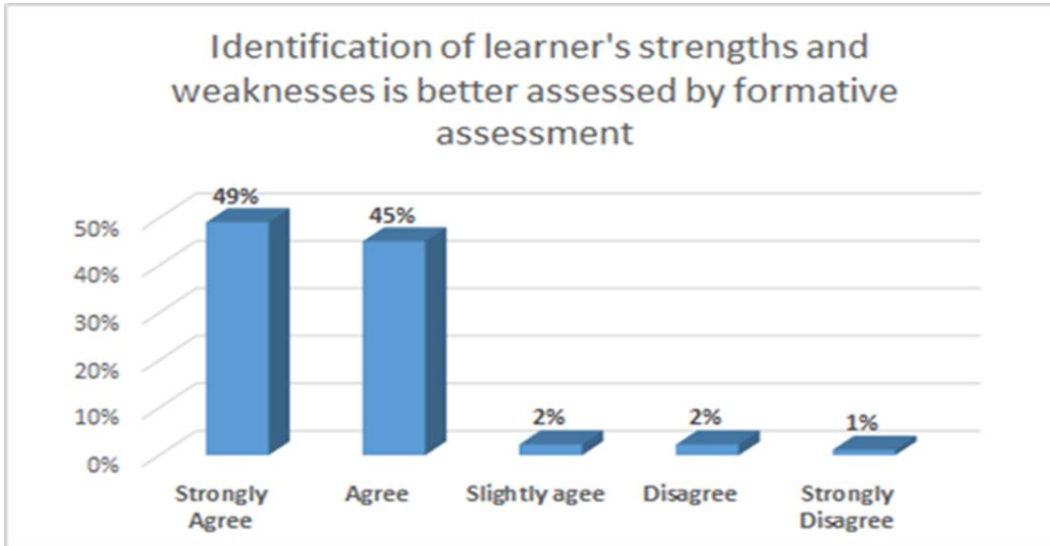


Figure 3: Majority of the respondents 94% agreed that formative assessment identified the learner's competencies better than summative assessment.

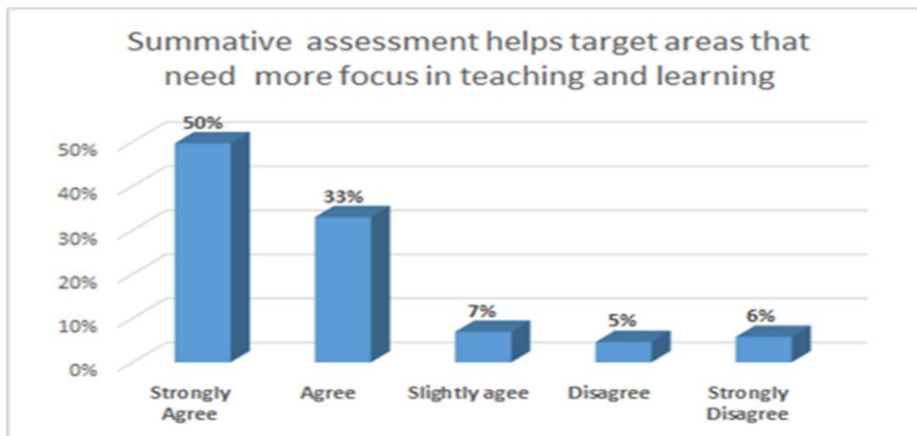


Figure 4: depicts 83% of the respondents shared that formative assessment helped to diagnose learners needs so to inform teaching and learning.

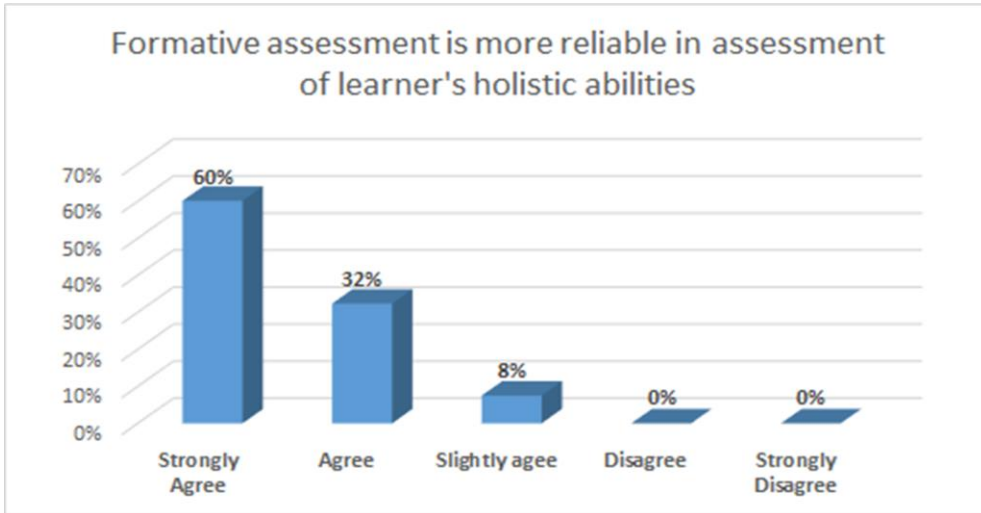


Figure 5: 92% of respondents agreed that formative assessment is more reliable

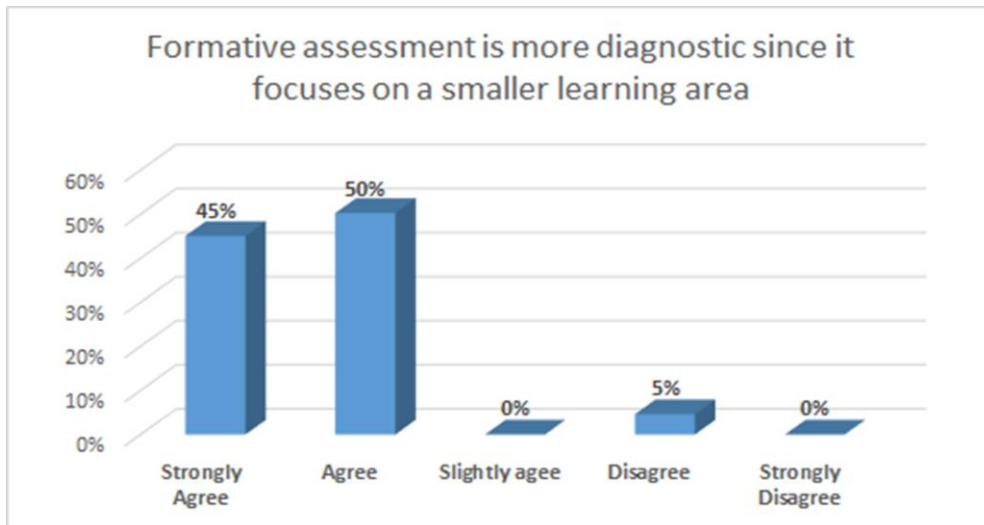


Figure 6: 95% of the respondents shared that formative assessment is more responsive to learner's needs.

Teachers need more training to perform authentic assessment

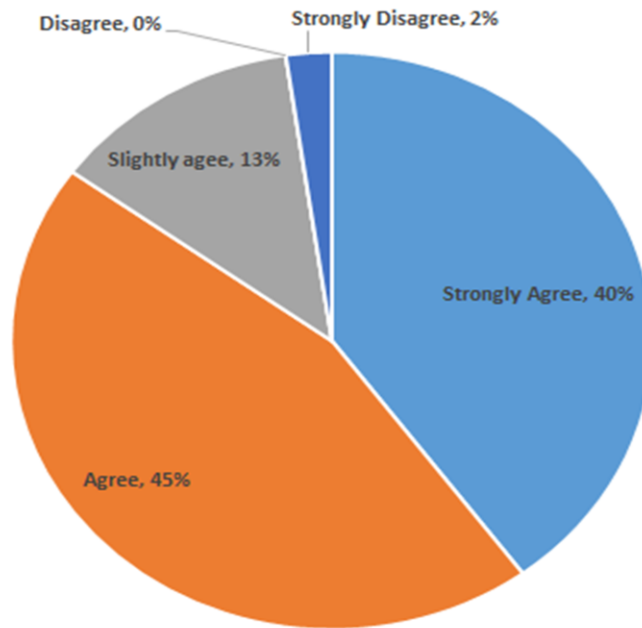


Figure 7: 85 % of respondents were of the view that teachers need more training in CBA to perform more authentic assessment.

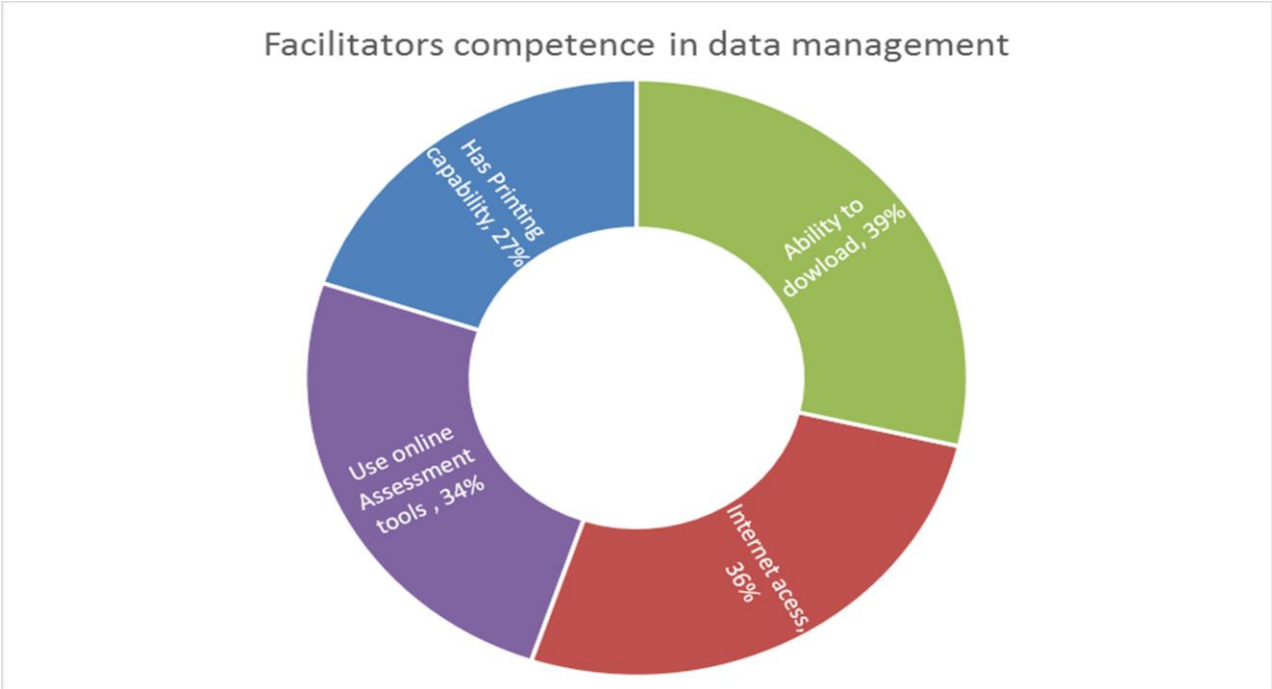


Figure 8: Only 34% of the respondents have the ability to use the online Assessment tools.

The deviations in assessment of learning outcomes are well pronounced across the learning areas

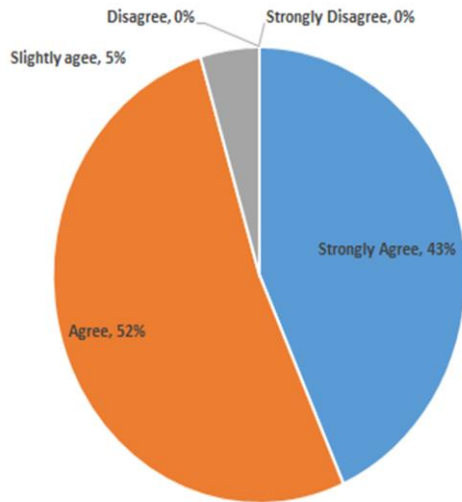


Figure 9: 95 % of respondents shared that assessment of learning outcomes varied from one topic area to the other.

The timing of assessment affects the learning outcomes for both summative and formative assessments

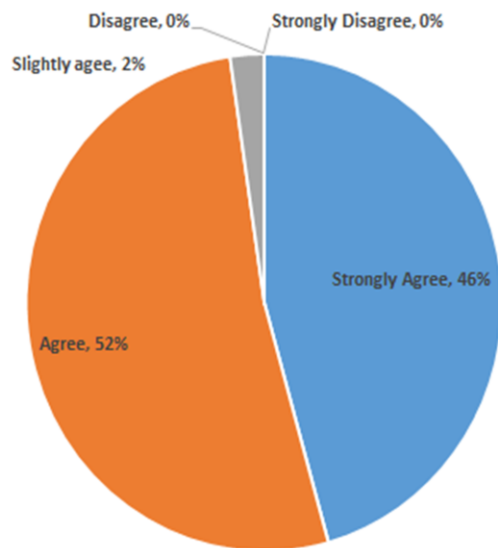


Figure 10: 98 % of respondents shared that the timing of assessment affected learning outcomes

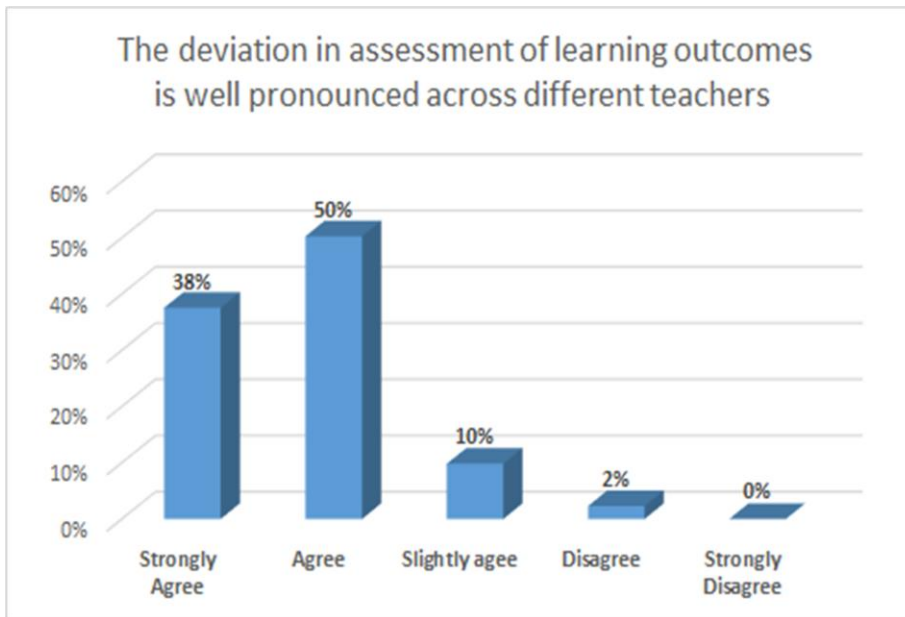


Figure 11: 88 % of respondents were of the view that formative assessment is still subjective.

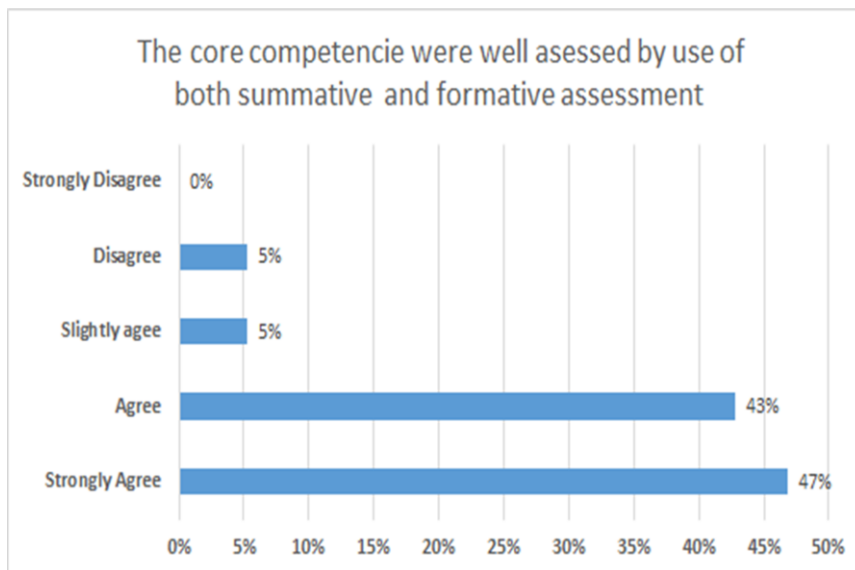


Figure 12: 90 % of respondents supported the use of both formative and summative assessment in weighted doses.

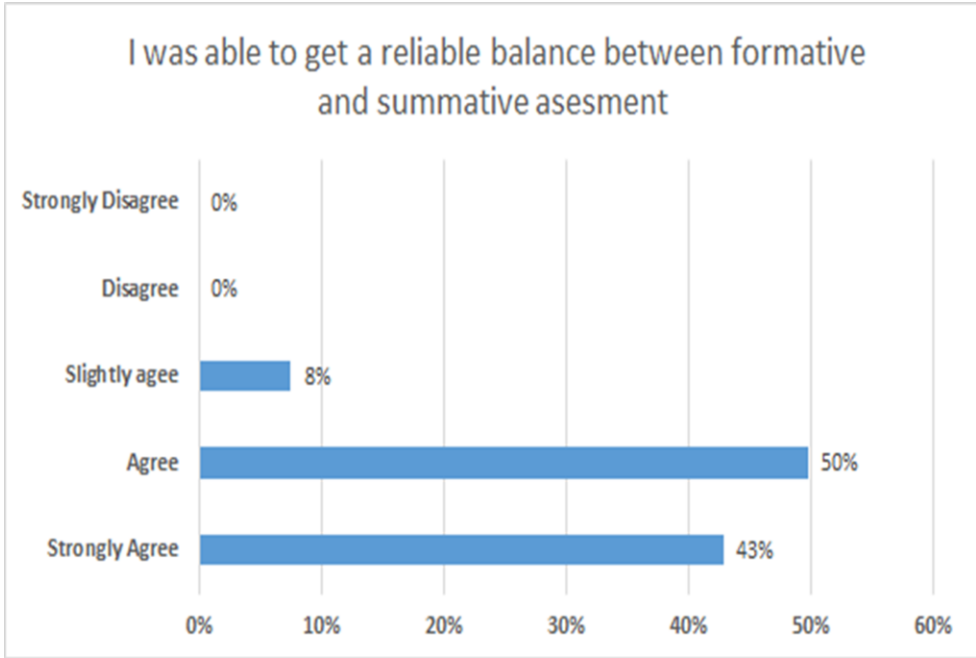


Figure 13: 93 % of respondents were able to get a working balance between use of formative and summative assessment.

Attributes of Competence Based Assessment that make it different from the what was in place before.

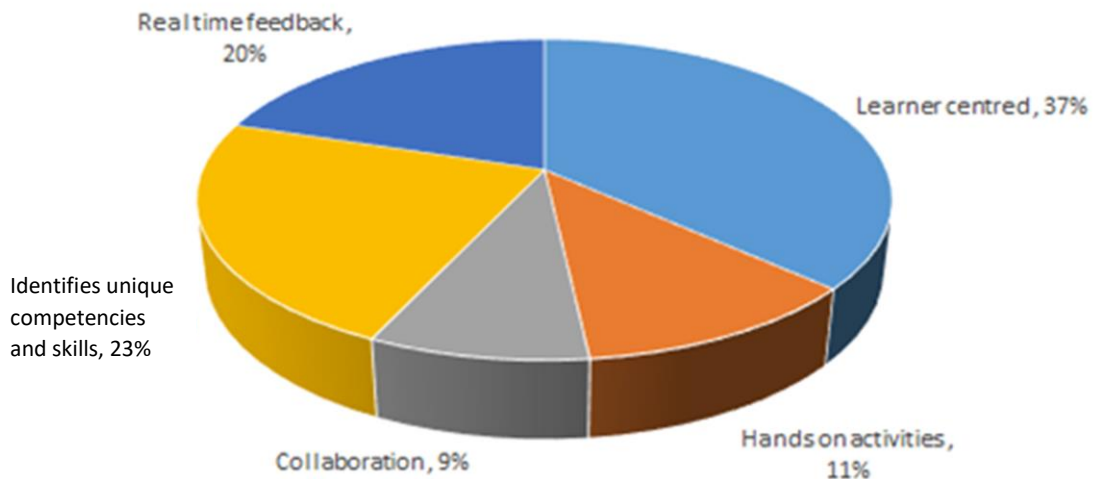


Figure 14: 23 % of respondents shared that CBA was uniquely tailored to the learners needs, 20% viewed CBA to give real time feedback as 37% shared that it is learner centered.

How would you rate the effectiveness of CBA ?

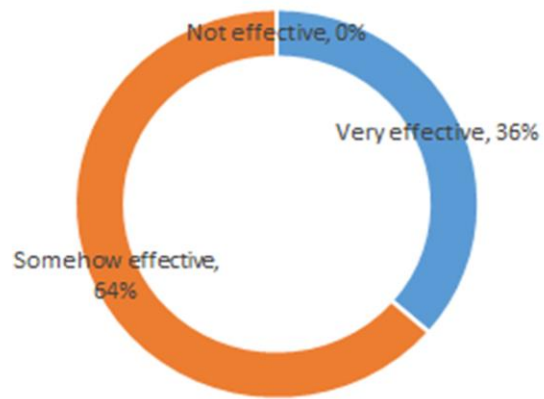


Figure 15: Majority (54%) felt that CBA is somehow effective as 36% shared that CBA is more effective.

Suggest other areas of improvement in the use of both formative and summative assessment.

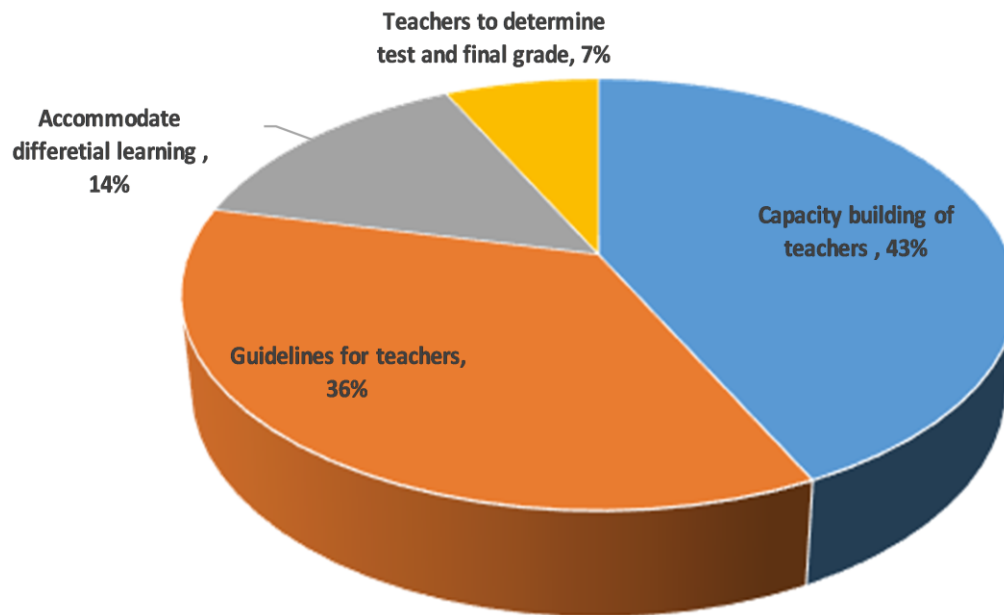


Figure 16: Majority of the respondents (43%) felt that there is need for more training in CBA as 36 % shared on the need to have guidelines from KNEC to facilitate effective assessment of learning outcomes.

5. Summary of findings

The outcome of the data analysis indicated that there were deviations across the submitted scores based on the mode of assessment. The deviations in outcomes were well pronounced across the learning areas as well as across different teachers. However, across board there was a well pronounced bias in favour of formative assessment. Challenges were also noted on; the timing of assessment, consistency of assessment across learning areas and choice of assessment modes. The respondents outlined the positive effects of formative assessment on learner outcomes.

The study also established that the balance between formative-summative assessment and the timing of the assessment needs to be mapped onto the learning areas (strands) so as to clearly measure the learning outcomes and establish the working alignment between formative assessment and summative assessment.

5.1 Limitations

The study encountered a number of challenges that called for interventions. The respondents were on holiday thus majority required more follow up. Due to the wide geographical region of the study area and number of schools involved a lot of networking was employed through used of regional social media groups and enumerators to reach out to as many respondents; this was time consuming and very hectic. However, this was made manageable by use of a cell phone friendly data capture tool.

5.2 Conclusion

The study intended to explore the emerging issues in the implementation of formative assessment, establish the challenges teachers face when using formative assessment as well as evaluate the present level of teacher's qualifications and how this affects effective use of technology and data sharing tools in the implementation of CBA in the Kenyan classroom. The study also compared the weighting between formative and summative assessment; so as to establish its impact on learner's performance. The research revealed that formative assessment enhanced understanding of concepts and also seamlessly guided the learning process. This is supported by the OECD (2017) report that reiterated that consistent use of formative assessment throughout education systems may help stakeholders address the very barriers to its wider practice in classrooms assessments.

The study established that use of digital assessment tools through NAC reduces the teacher's workload over time thus making the teaching learning experience more efficient. The challenges faced in utilization of NCA include lack of basic ICT skills, inadequate infrastructure and accesses to the internet, which essentially serves as the highway for collaboration between teachers.

6. Recommendations

From the research findings it is evident that CBA enhances the teaching and learning process and thus it's a critical component in the successful implementation of CBC. It's also clear that huge structured data repositories will form an integral part in standardization of CBA assessment tools. The research recommends that:

- 6.1. National examinations bodies such as KNEC should:
 - 6.1.1. Develop a robust data repository system (NAC) that is teacher driven to enable extensive collaboration in assessment.
 - 6.1.2. Coordinate and guide in the development of assessment tools for the various areas of the curriculum.
 - 6.1.3. Adopt the tried and tested assessment tools shared on the NAC, improve on them and establish a national library for teachers to access with a window for possible improvement from the teachers in the field.
- 6.2. Parent ministries through public private partnerships (PPP) to facilitate a National training and sensitization program to capacity build teachers on best assessment practices benchmarked on the global scale.
7. The research proposes more training of teachers in CBA, which a strong follow up in the form of nationwide monitoring and evaluation mechanisms.

8. References

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