

CRITICAL REFLECTION ON RESOURCE REQUIREMENT, PEDAGOGY AND ENTREPRENEURSHIP SKILLS TRAINING FOR COMPETENCY BASED CURRICULUM IMPLEMENTATION IN KENYAN UNIVERSITIES

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ABSTRACT

The introduction of the competency based curriculum in Kenya has attracted praise and criticism in equal measure. Positive attributes include customization that enables learners to develop competencies faster than through traditional training methods. There is however controversy on the adequacy of resources and pedagogical approach to optimize positive learning outcomes. The specific objectives of this study therefore were to examine quality and relevance, resource requirement, pedagogical approaches, University preparedness, entrepreneurship skill training, challenges and recommendations. The study adopted descriptive research design. The unit of analysis was Kenyatta University being the only university in Kenya that has realigned its programmes to competency based curriculum. The unit of observation was 210 administrative staff and lecturers in STEM and Entrepreneurship fields at the University. Likert type scale was used to collect data for each of the tested items before eventually utilizing descriptive statistics. The response rate was 63.33%, with the results indicating that 58.65% of the respondents agree while 24.81% strongly agree that competency based curriculum is relevant to Kenya's current needs. About 80% of the respondents also elucidated that there is inadequate resources to support curriculum implementation. Other findings show that entrepreneurship skills were critical in the

development of the country. However, those skills should be specified and made more relevant to the dictates of the market. A partly 43% of the respondents indicated that they were prepared to implement the curriculum since they had been sensitized on its requirements and expectations. The greatest challenge in the implementation of the new curriculum was some lecturers' negative perception and rigidity in changing their pedagogies. The findings have implications towards achievement of Kenya's vision 2030, Africa Union's agenda 2063 and the global sustainability agenda. The study recommends proper training and sensitization to teaching staff, entrepreneurship skills be identified and emphasised, more teachers be availed and pedagogical skills training for STEM fields be carried out, before full implementation of the curriculum.

Key Words: STEM, Competency Based Curriculum Challenges, Entrepreneurship Skills, Pedagogy Training.

INTRODUCTION

Background Information

Education has been acknowledged globally as a critical ingredient towards the achievement of better levels of social welfare and economic growth, by improving and strengthening skills, communication, values and mobility related to opportunities (UNESCO, 2015). This is in tandem with the sustainability agenda at the global level which recognizes the centrality of education in facilitating the realization of all the seventeen (17) Sustainable Development Goals (SDGs) as reported by Vladimirovaa and David (2015). This conclusion is supported by empirical findings that have established a link between education in general and the various dimensions of the sustainability agenda (Mutisya, 2019; Ganira & Odundo, 2018; Pradhan, *et. al.* 2017; UN, 2015). United Nation's flagship reports have also augmented these findings by documenting a correlation between education and other SDG areas and vice-versa (UN, 2015). Hence the need for SDG 4 on education which is designed in such a way that it cuts across the entire sustainability agenda by reinforcing the need for inclusive, equitable, quality education and lifelong learning (UN, 2015; Vladimirovaa & David, 2015). Numerous studies around the world have also reported that even though subjects in humanities are necessary in enabling students to reason about being human, a strong identity in Science, Technology, Engineering and Mathematics (STEM) subjects has a lot of positive impact on improved social and economic performance (Burnett & Jayaram, 2012; DeCoito, 2016; Ganira & Odundo, 2018). Many governments around the world have therefore taken STEM fields as a critical part of skills development process that is essential in inducing responsiveness to fluctuations in economic conditions (Gomez & Albrecht, 2013; Burnett & Jayaram, 2012). The argument being that STEM subjects enables learners gain skills including the ability to think critically, solve complex problems, and drive advancements in science and technology in the work place, community and the global arena (Hooker, 2017; Margot & Kettler, 2019). For these reasons, and in order to enhance positive outcomes in STEM fields, some studies have suggested that the teaching of science, technology, engineering and mathematics should be integrated into one subject at the secondary school level as a response to vocational needs and economic aspirations (Hooker, 2017; Bagiati & Evangelou, 2015). This proposition has however been criticized by other scholars who have pointed out that individual STEM disciplines vary in terms of epistemological underpinning, and these differences including diverse pedagogical approaches should be maintained (Ganira & Odundo, 2018; DeCoito, 2016; Hooker, 2017).

In Africa, AU (2021) reiterates the importance of education towards the realization of Aspiration 1 of Africa Union's agenda 2063 on social and economic transformation of the continent, by calling for significant investments in education with a view to have in place the required policy framework, human and material resources such as adequate number of trained teachers, classrooms, text books and relevant instruction materials to facilitate a prosperous Africa based on inclusive growth and sustainable development (Akala, 2020; Koskei & Chepchumba, 2020; Amutabi, 2019; Maina & Rosemary, 2019; Mutisya, 2019). Though many studies have concurred on the centrality of education in the achievement of sustainable development, countries around the world have been left to conceptualize, review and further

develop their national curricula and ensure that education is fundamental to any strategy to create a resilient generation that advocates for action in a holistic and integrated manner (Kaijage, Wheeler & Newbery, 2013). However, because countries have been left on their own to design the curricula, not much has been done globally in for instance integrating entrepreneurship skill straining in the curriculum outside of university lecture halls, despite its potential in supporting the sustainability agenda (Urbano, Aparicio & Audretsch, 2018; Rahdari, Sepasi & Moradi, 2016). This state of affairs suggests among others that the positive contribution that competencies in entrepreneurship might have towards the realization of sustainable development at the macro and micro levels may be constrained (Rahdari, Sepasi & Moradi, 2016; Bizri, 2017; Seelos & Mair, 2017). This need to enable sustainable development forms part of the reasons for carrying out educational reforms in Kenya (RoK, 2017). The series of reforms in the education sector in Kenya commenced with the push to entrench national goals and Africanization in the curriculum (GoK, 1964); medication of national objectives and education policies (GoK, 1976); formationa of the second University (GoK, 1981); variation of the education curriculum in 1985; training for the next decade and beyond; instituting working party on education (RoK, 1988); the Koech report (RoK, 1999); operationalization of the Totally Integrated Quality Education and Training (TIQET) (Muricho & Chang'ach, 2013); to the current process of implementing the 2-6-3-3 CBC cycle to replace the 8-4-4 system impelled by deficiencies identified within the educational system in Kenya (Mwarari, Githui & Mwenje, 2020; RoK, 2017; Akala, 2020; Koskei & Chepchumba, 2020; Amutabi, 2019; Maina & Rosemary, 2019). These educational reforms in Kenya are in line with UNESCO (2019) stipulation that all learners should acquire the knowledge and skills needed to promote sustainable development by the year 2030.

Research Issue

Access to quality education has been acknowledged as the engine that drives the level of development of a given country, being the factor that accelerates knowledge acquisition, scientific and technological innovations (Kondur et al., 2020; Mohamed & Karuku, 2017; UN, 2015). This conclusion is in line with Kelchen (2015) and Krause, Portolese and Schedler (2015) observations that points out the importance of education towards improved functioning that buttress a peoples' well-being and freedoms. This is the premise upon which many counties such as the Netherlands, Canada, Finland, United States, Australia, Indonesia, South Africa, Norway, New Zealand and Sweden have implemented Competency Based Curriculum (CBC) in some form (Amutabi, 2019; Krause, Portolese & Schedler, 2015; Strugies, 2015). In Kenya, the introduction of the 2-6-3-3 competency based education cycle in year 2017 to replace the 8-4-4 system was impelled by deficiencies identified within the latter educational system (Mwarari, Githui & Mwenje, 2020; RoK, 2017). The 8-4-4 system was reported to be flawed and burdensome to the learners and teachers on several fronts (Akala, 2020; Koskei & Chepchumba, 2020). The 8-4-4 system was reported to have many uncoordinated learning areas (Sifuna & Obonyo, 2019), it was judged to be dense on content (Amutabi, 2019; Maina & Rosemary, 2019), was examination oriented (Ntwiga & Mwangi, 2018; Ambaa, 2015), resources were misallocated (Mutisya, 2019); there were high teacher learner ratios (Strugies, 2015), scarcity of teaching and learning resources (Wanzala, 2018; Koskei & Chepchumba,

2020), challenges of socio-economic factors and under preparedness of teachers due to poor training (Ondimu, 2018; Waweru, 2018). Hasty implementation coupled with limited in-service training for teachers, inadequate ongoing professional support for teachers, were notable obstacles to the success of the 8-4-4 system of education in Kenya (Akala, 2020; Koskei & Chepchumba, 2020). These challenges resulted in learners and teachers being overworked, hence suffered psychologically and physiologically (Strugies, 2015; Koskei & Chepchumba, 2020; Ntwiga & Mwangi, 2018). This is the argument behind the need for CBC that is expected to foster acquisition of core competencies like creativity, problem-solving and self-efficacy (Mwarari, Githui & Mwenje, 2020; Akala, 2020; Koskei & Chepchumba, 2020; Mutisya, 2019; Strugies, 2015).

However, there has been controversy following the introduction of CBC in Kenya, including reports of inadequacy in human and material resources to support effective curriculum implementation (Ondimu, 2018; Mwarari, Githui & Mwenje, 2020). For instance there have been reports of inadequate quality textbooks due to gaps during the preparations of books and also delays in the publication of books, ending up frustrating parents and teachers who need these materials for their children and learners respectively (Akala, 2021; Amunga et al., 2020). Large class sizes catering for learners above the recommended numbers due to the government policies of provision of access to education at primary and secondary levels, making it very difficult to have individualized attention to the learners (Amunga et al., 2020). In addition, even though several studies are in agreement on the need for effective pedagogy, there is however no unanimity on the best approach to be adopted to overcome existing challenges so as to optimize positive learning outcomes in CBC (Ganira & Odundo, 2018; Margot & Kettler, 2019; Mwasiaji, Kombo & Gravenir, 2022). The challenge is in deciding which teaching methodology to adopt to deliver content in such a way as to meet the diverse needs of all learners with various cognitive abilities (Koskei & Chepchumba, 2020; Ondimu, 2018). Some studies have specifically suggested that pedagogy needs to move from teacher-led instruction method to student centered-approach also referred to as constructivist, participatory or active learning (Lesseig *et al.*, 2016; McLeod, 2019; Elliott, *et al.*, 2000). However, research supporting constructivist approach to teaching and learning has been mixed, with some studies supporting these techniques and others contradicting those results (Bada, 2015; Driscoll, 2000). For instance, other studies have argued that though constructivist approach is very effective in classrooms with fewer students, it can also be difficult to measure consistently (McLeod, 2019; Elliott, *et al.*, 2000) and difficult to implement in classes with large number of learners (McMullin & Reeve, 2014). In view of the centrality of education as an enabler for the current and future generations to contribute positively to the social, environmental and economic development of communities (Mutisya, 2019; UN, 2015; Nasibi, 2015), and considering obstacles identified in the previous education systems in Kenya, this study sought therefore to examine resource requirements, pedagogical approaches and training on entrepreneurial skills for teachers to support effective implementation of the competency based curriculum.

Research Objectives

The broad objective of this study was to examine the adequacy of material and human resources, pedagogical approaches and entrepreneurship skills training for teachers in the implementation of competency based curriculum in Kenyan Universities.

The following specific objectives had been formulated to guide the study:

- (i) To assess the quality and relevance of competency based curriculum in Kenya.
- (ii) To assess the adequacy of resources for competency based curriculum in Kenya.
- (iii) To examine pedagogical approaches for the competency based curriculum in Kenya.
- (iv) To establish the level of entrepreneurship skill training for teachers in the competency based curriculum in Kenya.
- (v) To evaluate University preparedness for competency based curriculum in Kenya.
- (vi) To identify challenges in the implementation process of the competency based curriculum in Kenya.
- (vii) To give recommendations for addressing the identified challenges in the implementation process of the competency based curriculum in Kenya.

The research questions for this study were:

- (i) What is the quality and relevance of competency based curriculum in Kenya?
- (ii) What is the adequacy of resources for competency based curriculum in Kenya?
- (iii) What are the pedagogical approaches for the competency based curriculum in Kenya?
- (iv) What is the level of entrepreneurship skill training for teachers in the competency based curriculum in Kenya?
- (v) What is the level of University preparedness for competency based curriculum in Kenya?
- (vi) What are the challenges in the implementation process of the competency based curriculum in Kenya?
- (vii) What are some recommendations for addressing the identified challenges in the implementation process of the competency based curriculum in Kenya?

Research Methodology

The study adopted descriptive research design. The choice of this study design in line with the general objective of the study was influenced not only by the need to observe and describe the phenomenon in a natural setting, but also the opportunity it offers to integrate qualitative and quantitative data (Creswell, 2012; Friese, 2012). The unit of analysis for this study was Kenyatta University being one of the chartered public universities in Kenya (CUE, 2022). Kenyatta University was purposively selected because it is the only institution of higher learning in Kenya that has realigned its academic programmes in the School of Education to

fit the requirements of the competency based curriculum (CBC). Kenyatta University was also selected because having realigned its academic programmes in line with CBC, teaching and administrative staff in the institution were therefore judged to be in a better position to respond to items on CBC implementation challenges and mitigation measures. The unit of observation for this study was twenty eight (28) administrative staff (such as Deans and Chairpersons of Departments) and four hundred and twenty five (425) purposively identified teaching (lecturers) from the Schools of Education, Business, Engineering, Pure and Applied Sciences. Additional administrative staff were purposively identified from the Office of Registrar Academic and Finance Department. The target population of four hundred and fifty three (453) was purposively identified because the unit of observation was judged to be in a better position to respond to items touching on competency based curriculum implementation, STEM subjects, pedagogical approaches and entrepreneurship skill training in line with the main objective of the study. Using Krejcie and Morgan (1970) table of determining sample size, 210 is the actual number of respondents that is required to form a representative statistical sample, out of a population of four hundred and fifty three (453). Since twenty eight (28) administrative staff were judged not to be many, it was found prudent to use census and therefore included all of them in the study. Using a sampling fraction, a total of one hundred and eighty two (182) teaching staff were sampled for this study. This was also done to ensure that the whole population was evenly covered to avoid biased representation (Saldana, 2011; Boeije, 2010; *Kombo & Tromp, 2006*).

The unit of observation was categorised in two broad clusters. The first comprised four hundred and twenty five (425) teaching (lecturers) staff from the Schools responsible for Education, Business, Engineering, Pure and Applied Sciences. The second cluster had twenty eight (28) administrative staff from the Office of the Registrar Academic, Finance Department, relevant Deans of Schools and Chairperson of Departments. This subdivision of the unit of observation into two clusters was judged to be useful because it was going to make it possible to study the characteristics of the sub-groups (Mwasijaji, Mambo, Mse & Okumu, 2021; Krejcie & Morgan, 1970). Relevant qualitative and quantitative data for this data was collected using a combination of structured interviews, observation and questionnaire with a Likert type scale of 1 – 5 for each of the tested items. The interviews were necessary for purposes of first-hand information, follow up and observation of selected respondents while teaching in lecture halls. The use of the interview tool was useful in gathering in-depth information from the unit of observation especially on the challenges of CBC implementation. Before the actual field work, the data collection tools were validated through expert review to inform any amendments so as to assure the reliability of the instrument. The collected data was then checked for accuracy and completeness, before being coded and analyzed using simple statistics (*Kombo & Tromp, 2006*).

Theoretical Foundation

This study considered the postulates and contributions of relevant theories with implications on change management, teaching methods and learning in the context of effective implementation of the competency based curriculum in Kenya. The theory of change is one

such proposition that seek to explain how a given intervention, or set of interventions, is expected to lead to specified positive outcomes, drawing on a causal analysis based on available evidence (Stein & Valters, 2012). The theory of change was found useful in anchoring this study because educational reforms and CBC implementation in Kenya aims to achieve better outcomes for all students, including those impacted by opportunity gaps (Muricho & Chang'ach, 2013). The theory of change in this context of CBC implementation supports the need for changes to be driven by sound analyses, consultation with key stakeholders and learning on what works and what does not in diverse contexts drawn from best practices around the world (Amunga, Were & Ashioya, 2020). The theory of change further implies that there is need to identify solutions to effectively address the causes of challenges that may hinder progress and guide decisions on which approach should be taken during CBC implementation in Kenya.

Constructivism is another proposition that was judged useful in anchoring the study. Constructivism is a learning theory found in psychology and which proposes that learners construct knowledge rather than just passively taking in information (Bada, 2015). Constructivism approach to teaching and learning is based on the premise that cognition (learning) is the result of "mental construction" by learners from their experiences (Driscoll, 2000). This means that as learners experience the world and reflect upon their experiences, they construct their own representations and incorporate new information into their pre-existing knowledge (Bada, 2015). The relevance of constructionist learning theory to the current study is that it not only seeks to explain how people might acquire knowledge and learns, but also the focus on student-centered approach which is an underlying theme of Competency Based Curriculum educational reforms in Kenya (RoK, 2017). Another relevant proposition that was used in informing this study is the Social learning theory by Bandura (1977) which postulates that people can learn from each other through observation, imitation and modeling, hence useful in encouraging and teaching desirable behaviors through the use of positive reinforcement and rewards. The relevance of the social learning theory to this study is the idea that students can learn from observing others in their environment, hence the need for role modeling and active participation by parents or guardians as is the case in competency based education in Kenya (Mwarari, Githui & Mwenje, 2020; Akala, 2020).

Entrepreneurial Competence is another relevant theory to this study in that it anchors the argument about acquisition of entrepreneurship education including entrepreneurial mind set and skill set as a core competence necessary to live productive lives even if one does not start a business (Neck & Corbett, 2018; Mwasiaji, Mambo, Mse & Okumu, 2021; Urbano, Aparicio & Audretsch, 2018). Entrepreneurship education and skill training is therefore important in developing the required competencies to enable individuals bring creativity into the marketplace, create businesses with the potential to hire millions of people and bring new products to the market place to meet customer requirements (Neck & Corbett, 2018; Saebi, Foss & Linder, 2018; Neck & Corbett, 2018). The Resource Based View (RBV) theory as proposed by Barney (1991) is another theoretical proposition used in this study. Organizational resources may be termed as "assets, capacity, processes, features, information and knowledge that supports the execution of a give strategy for the purpose of enhanced operational efficiency

and effectiveness (Barney 1991). The RBV is supported by Grant (1991) who argues that an organization’s resources and capabilities are the key considerations in formulating its strategy because they are the primary constants on which a company can establish its identity and frame its strategy. The relevance of this theory to the study is that it lays a theoretical foundation in seeking to explain the need for adequate human and material resources to facilitate effective CBC implementation in Kenya. The implications of RBV proposition is that managers in the education sector in Kenya should pay attention to the availed internal resources in order to ascertain the adequacy of those capabilities and competencies for the purpose of attaining excellent outcomes in CBC implementation.

STUDY RESULTS AND DISCUSSION

Characterization of Respondents

The study recorded an overall response rate at 63.33% as presented in Table 6.1.1. This means that one hundred and thirty three (133) respondents from the Registrar (Academics) Office, Finance Department, the Schools of Education, Business, Engineering, Pure and Applied Sciences, participated in the study, out of a sample size of two hundred and ten (210). The non-response by seventy seven (77) persons in the unit of observation may have been due to a combination of factors such as unwillingness to participate in the study or time constraint on the part of some participants included in the sample. The response rate from the two clusters is presented in table 6.1.1

Table 6.1.1: Response Rate

S/NO.	STRATUM	TARGET	SAMPLE	FREQUENCY	%
1	Teaching staff (lecturers)	425	182	111	60.99
2	Administrative staff	28	28	22	78.57
Total		453	210	133	63.33

As shown in Table 6.1.1, the distribution of respondents from Kenyatta University were teaching staff (lecturers) at 60.99%, while administrative staff from the Registrar (Academics) Office, Finance Department, the Schools of Education, Business, Engineering, Pure and Applied Sciences, were at 78.57%. The distribution of respondents assures a well-spread sample to avoid biased representation. The respondents were then asked to consider statements related to Quality and Relevance of competency based curriculum and indicate the extent to which they agree or disagree. This was in line with specific objective one that had been formulated to guide this study. Table 6.1.2 presents mean responses received using a Likert scale of 1 – 5 for each of the tested items, calculated by summing up the codes from all the one hundred and thirty three (133) respondents.

Table 6.1.2: Items on Quality and Relevance of CBC

Item description Quality and Relevance	Response Frequency					Mean Response
	SD %	D %	NS %	A %	SA %	
Competency Based curriculum is relevant to Kenya's current and near future human resource needs	0.75	3.76	12.03	58.65	24.81	4.0
Competency Based Curriculum in Kenya compares well with other education systems in similar contexts globally	0.76	16.54	54.89	25.56	2.26	3.1
CBC is flexible, self-paced and engaging because content is tailored to each student	9.77	22.56	54.14	12.03	1.50	2.7
CBC is skills based and avoids unhealthy competition amongst students and schools	9.02	31.58	28.57	29.32	1.50	2.8
CBC does not allow very rigid schedule in teaching and instruction	1.50	16.54	17.29	39.10	25.56	3.7

SD- Strongly disagree; D-Disagree; NS-Not sure; A-Agree; SA-Strongly agree

Table 6.1.2 shows that even though majority of the respondents (58.65%) agree or strongly agree (24.81%) that CBC is relevant to Kenya's current and near future human resource needs, 54.89% of the study participants indicated that they are not sure whether CBC in Kenya compares well with other education systems in similar contexts globally. Another 54.14% of the respondents were also not sure whether CBC is flexible and engaging due to content being tailored to each student. This finding which seems to concur with Akala (2020), suggests that there is need for more sensitization in view of the large number of respondents who seems not to be sure. This finding also implies that even though countries may have different developmental priorities at a given point in time, there is need for additional comparative studies seeking to establish how CBC equate to other educational systems in African and the developed world considering the need for an education system to prepare a global citizen able to make a positive contribution in any part of the world (Amutabi, 2019; Sifuna & Obonyo 2019).

The respondents were then asked to consider statements related to adequacy of resources for competency based curriculum. The mean responses received are presented in Table 6.1.3.

Table 6.1.3: Items on Adequacy of Resources for CBC

Item description Adequacy of Resources	Response Frequency					Mean Response
	SD %	D %	NS %	A %	SA %	
Adequate number of teachers have been availed to support implement competency based curriculum	27.07	43.61	18.05	10.53	0.75	2.1
Adequate material resources such as textbooks, classrooms and relevant teaching aids have been availed in implementing competency based curriculum	36.19	44.36	10.53	6.77	2.26	1.9
Primary and Schools have adequate resource streams to supplement government financial grants	9.02	31.58	54.14	4.51	0.75	2.6
Teaching staff in primary and secondary schools have been sensitized and adequately trained for CBC	9.02	31.58	28.57	29.32	1.50	2.8
Guardians and parents are well prepared to avail required teaching and learning materials for CBC	21.05	41.35	19.55	16.54	1.50	2.3

SD- Strongly disagree; D-Disagree; NS-Not sure; A-Agree; SA-Strongly agree

As shown in Table 6.1.3, many of the respondents (43.61%) disagree or strongly disagree (27.07%) that adequate number of teachers have been availed to support effective implementation of CBC in Kenya. Only about 29.32% of the respondents agree that an adequate number of trained teachers have been availed to support implement competency based curriculum, while 80% either disagrees (44.36%) or strongly disagrees (36.19%) that adequate material resources such as textbooks, classrooms and relevant teaching aids have been availed in for CBC implementation in Kenya. These finding agrees with some previous studies on CBC implementation (Wanzala, 2018; Ondimu, 2018; Ntwiga & Mwangi, 2018). Inadequate quality teaching and learning materials suggests that there might have been gaps during the preparations of books and also delays in the publication and approval process of books required to support effective implementation of CBC (Akala, 2021). This challenge of readily availing required teaching and learning materials may not only frustrate parents, learners and teachers, but also may negatively impact on the quality of CBC graduates in the country.

The respondents were also asked to consider statements related to pedagogy approaches for competency based curriculum. The responses received are shown in Table 6.1.4.

Table 6.1.4: Items on Pedagogy Approaches for CBC

Item description Pedagogy Approaches	Response Frequency					Mean Response
	SD %	D %	NS %	A %	SA %	
Learner centered teaching methods are likely to have better learning outcomes in CBC in Kenya	4.51	6.01	21.80	53.38	14.29	3.7
Teaching staff have been adequately sensitized and trained on appropriate pedagogy approaches for CBC	29.32	50.38	10.53	8.27	1.50	2.0
All teaching staff have adapted learner centered teaching methods for CBC instruction in Kenya	11.28	38.35	45.86	3.76	0.75	2.4
There is significant difference in assessing CBC learners as compared to the 8-4-4 students in Kenya	8.27	34.59	27.07	28.57	1.50	2.8
The teaching aids used to support instruction in class are appropriate to CBC in Kenya	19.55	42.86	21.05	15.79	0.75	2.4

SD- Strongly disagree; D-Disagree; NS-Not sure; A-Agree; SA-Strongly agree

As presented in Table 6.1.4, the study established that most of the respondents (67.6%), agree (53.38%) or strongly agree (14.29%) that learner centered teaching methods are likely to have better learning outcomes for Competency Based Curriculum in Kenya. The study also established that in addition to most respondents (79%) indicating that teaching staff have not been adequately sensitized and trained on appropriate pedagogy approaches for CBC, another 84% were either not sure (45.86%) or disagreed (38.35%) that all teaching staff have adapted learner centered teaching methods for CBC instruction in Kenya. Direct observation of some teaching staff conducting a session in selected lecturer halls showed that most of those observed in action appeared to make use of lecturer centered, as opposed to constructivism pedagogical approach. The finding seems to suggest that even though some progress has been made since the introduction of CBC in Kenya, the teaching staff have adopted dissimilar pedagogical approaches and preferences, for instance STEM subject instructors in learning institutions in Kenya. These findings seem to agree with similar studies on CBC implementation (Amunga, Were & Ashioya, 2020; Koskei & Chepchumba, 2020; Ondimu, 2018). This state of affairs requires urgent action because pedagogical approach being the adopted content delivery method during the interaction between teachers and learners in class or lecture halls is a key

factor in determining for instance STEM education outcomes (DeCoito, 2016; Ganira & Odundo, 2018). Having a well-thought-out teaching method based on the established entry behaviour of students can enhance the quality of teaching by helping learners gain a deeper understanding of the subject area (Mwasiaji, Mambo, Mse & Okumu, 2021; Kondur, Ridei, Mykhailyshyn & Katsero, 2020).

The respondents were then asked to consider statements related to entrepreneurial skill training for competency based curriculum implementation in Kenya. The responses received are presented in Table 6.1.5.

Table 6.1.5: Items on Entrepreneurship Skill Training for CBC

Item description	Response Frequency					
	SD %	D %	NS %	A %	SA %	Mean Response
Entrepreneurship education is critical in enabling vision 2030 in Kenya	0.75	3.76	5.26	66.17	24.06	4.1
Critical aspects of entrepreneurship education have been incorporated in CBC at all levels of education	15.79	51.13	25.56	6.77	0.75	2.3
Teaching staff for CBC classes are well grounded in entrepreneurship skills	14.29	46.61	33.83	4.51	0.75	2.3
Entrepreneurship skill training should be cascaded down to lower levels of the competency based curriculum	2.26	18.05	27.07	51.13	1.50	3.3
Entrepreneurship is critical in facilitating the sustainability agenda at the regional and global level	1.75	3.01	6.01	83.46	6.77	3.8

SD- Strongly disagree; D-Disagree; NS-Not sure; A-Agree; SA-Strongly agree

Table 6.1.5 shows that majority of the respondents at 90.23% agree (83.46%) or strongly agree (6.77%) that Entrepreneurship is critical in facilitating the sustainability agenda at the regional and global level. Another 66.17% of the respondents agree that Entrepreneurship education is critical in enabling vision 2030 in Kenya. Despite this, 51.13% of the respondents disagree that critical aspects of entrepreneurship education have been incorporated in CBC at all levels of education. In addition, 60.9% of the respondents indicated that Teaching staff for Competency Based Curriculum classes are not well grounded in entrepreneurship skills, implying that there is need for more sensitization and skill training for teaching staff to facilitate effective transfer of knowledge, hence better learning outcomes for students. Table 6.1.5 also shows that about half of the respondents (51.13%) agrees that entrepreneurship skill training should be cascaded down to lower levels of the competency based curriculum in Kenya, probably because of the importance of Entrepreneurship in enabling economic and social development (Barbier & Burgess, 2017; Rahdari, Sepasi & Moradi, 2016). This finding in line with Mwasiaji, Kombo and Gravenir (2022) study, seem to suggest that through entrepreneurship skill training, learners can have the necessary competencies to take advantage of opportunities upon graduation to design their startups and position themselves in the market place for profitability in support of the sustainability agenda. It would therefore be important to establish which specific entrepreneurship skills should be cascaded to lower levels of the curriculum, outside of lecture halls in tertiary institutions.

The respondents were then asked to consider statements related to University preparedness for competency based curriculum and indicate the extent to which they agree or disagree with the

tested items. Table 6.1.6 presents mean responses received using a Likert scale of 1 – 5 for each of the tested items, calculated by summing up the codes from all the one hundred and thirty three (133) respondents.

Table 6.1.6: Items on University Preparedness for CBC

Item description	Response Frequency					Mean Response
	SD %	D %	NS %	A %	SA %	
Academic staff in Universities in Kenya fully understand the design and philosophy of CBC	9.77	25.56	54.89	9.02	0.75	2.7
Universities in Kenya have developed new academic programmes in line with CBC requirements in Kenya	33.83	36.84	24.06	3.75	1.50	2.0
Universities in Kenya have adequate resources to supplement government capitation to facilitate CBC	24.81	36.09	33.08	5.26	0.75	2.2
Teaching staff in Universities have been sensitized and are prepared to implement CBC	3.76	23.31	29.32	39.10	4.51	3.2
Universities in Kenya are well prepared for admission and training of CBC students	6.77	23.31	18.80	44.36	6.77	2.7

SD- Strongly disagree; D-Disagree; NS-Not sure; A-Agree; SA-Strongly agree

Table 6.1.6 shows that only about 10% of academic staff fully understands the design and philosophy of Competency Based Curriculum, while another 70% of the respondents disagrees that Universities in Kenya have developed new academic programmes in line with the requirements of competency based curriculum in Kenya. Another 30% of the respondents seem to disagree that Universities in Kenya are well prepared for admission and training of CBC students, which seems to reinforce the perception by 30% of study participants that Teaching staff in Universities have been sensitized and adequately trained for CBC. This finding seems to agree with previous studies (Amutabi, 2019; Ondimu, 2018; Mohamed & Karuku, 2017). This means that unless urgent action is taken based on scientific evidence, this state of affairs is likely to have negative implications on effective curriculum implementation in Kenya in support of the country’s development agenda (Kelchen, 2015; Barman & Konwar, 2014). This is because economic development is highly dependent on the education sector to provide expertise in terms of human and mechanical resources (Akala, 2020; Amunga, Were & Ashioya, 2020).

When asked to indicate what are the challenges in the implementation process of the competency based curriculum in Kenya, the responses received are presented in Table 6.1.7.

Table 6.1.7: Challenges for CBC Implementation Process

CBC Implementation Challenges	f
Inadequate Stakeholder participation and management	34
Lack of adequately trained human and resources	32
Inability to focus on the learner due to large class sizes	12
Inadequate material resources such as books and classrooms	11
Poor attitude of CBC by teaching staff	8
Hurried implementation of CBC	7
Politicisation of education sector in the country	6
Poor policy framework in the education sector	5

Some respondents did not give their views on some aspects of CBC implementation challenges, as such; the frequencies could not be computed into percentages. When asked to suggest what needs to be done to address the identified challenges in the implementation process of the competency based curriculum in Kenya, eight proposals were put forth as presented in Table 6.1.8.

Table 6.1.8: Recommendation for CBC Implementation

Suggestion on Way forward	f	%
Adequate training and sensitization to teaching staff	42	26.75
entrepreneurship skills be identified and emphasised	38	24.20
pedagogical skills training for STEM fields	21	13.38
Government to avail resources for more teachers and classrooms	18	11.46
Avail funding for physical and human resources	14	8.92
More stakeholder engagement and participation	12	7.64
Motivate staff through enhanced remuneration	8	5.10
Government to ensure universities realign their curriculum	4	2.55

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was not only to examine the adequacy of resources and pedagogical approaches for STEM educators at the tertiary level, but also assess entrepreneurial skills training for teachers for the competency based curriculum in Kenya. The study anchored on Theory of Change, Constructivism, Social learning and Entrepreneurial Competence theories, established that in addition to inadequate in resources, there is incongruent pedagogical practices, in addition to entrepreneurship not being offered at the primary and secondary levels. The study also established that there is inadequate university preparedness, including poor understanding by many academic staff about the design and philosophy of competency based curriculum. While the study findings contribute to literature on CBC implementation in Kenya, it has also identified nascent gaps that require urgent action by all stakeholders to avoid negative implication on effective curriculum implementation in support of Kenya’s vision 2030, sustainable development Goals (SDGs) and Africa Union’s agenda 2063. The study findings may be of great importance to governments and development agencies as it presents the bases for the formulation of relevant policies and design of programs to address the identified challenges. This is because education being a means for empowerment, skill development, attitude formation and an enabler of economic development, poverty alleviation and other forms of social value, can be a transformational driver, offering the platform for delivering sustainable development. The study therefore recommends additional training and sensitization to teaching staff, entrepreneurship skills be identified and emphasised, and pedagogical skills training especially for STEM fields be carried out, and availing additional human and material resources especially teachers by the Teachers Service Commission before full implementation of the curriculum in Kenya.

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