The Competency-Based Curriculum Journey in Kenya: Teachers' Voices

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Abstract

Sentiment analysis is a resourceful technique in making sense of teachers' perceptions toward curriculum process. The study used Aspect Based Sentiment Analysis (ABSA) to make sense of teachers' perceptions toward Competency-Based Curriculum (CBC) implementation in Kenya. ABSA is a fine-grained natural language processing method used to analyse sentiments from unstructured data (text) at the aspect level. The researchers used text data from local daily newspapers on teachers' opinions on CBC implementation in Kenya. Using ABSA, the researchers explored how teachers perceive CBC implementation in Kenya, what they consider as emerging issues in CBC implementation, and what they consider as best practices to address the issues. It was established that teachers consider training, teacher shortage, unconducive working environment, and lack of parental support as some of the emerging issues in CBC implementation. Teachers' perceptions toward CBC implementation vary but the teachers are optimistic that if the government offers more training, create more awareness on the role of parents in the CBC implementation, and employ more teachers, CBC implementation would be successful in Kenya.

Keywords: Aspect Based Sentiment Analysis, Competency-Based Curriculum, Implementation, Kenya, Teachers' Voices

Introduction

The constant global changes call for innovation in the education sector so as to provide learners with the right knowledge, skills, and values necessary to succeed in the dynamic life. Thus, the quality of education learners receive not only determines their quality of life but also their economic growth (Goczek, Witkowska, & Witkowski 2021). One way to prepare learners for the competitive global market and the changing society is through curriculum innovations. These innovations aim at introducing new techniques, new value-enhancing education, improved practices, and teaching methods (Bunyi, 2013). For example, international competition in the space race led to the introduction of Competency-Based Education (CBE) in the USA in the 1960s (Curry, 2017). In recent years, due to advances in online learning, analytical learning, and adaptive learning technology, CBE has caused an evolutionary change in education. The increasing demand for efficiency, effectiveness and verifiable outcomes in education has resulted in a growing global interest in CBE (Curry, 2017; Ford, 2014). To implement CBE, many countries like the USA, Finland, Germany, South Africa, the Netherlands, and Norway introduced the Competency-Based Curriculum (CBC). Recently, the Kenyan government introduced CBC to transform the ailing 8-4-4 curriculum that was considered less innovative and examination-based (Akala, 2021). Nonetheless, the introduction of CBC in Kenya was received with mixed reactions. A section of education stakeholders felt that their opinions were not sought while others cited a lack of proper planning and exclusion (Akala, 2021). Teachers are among the stakeholders who expressed their dissatisfaction with the CBC (Koskei and Kipchumba, 2020; Momanyi&Rop, 2019). This study focuses on the CBC journey in Kenyawith specific reference to the teachers' voices.

The following research questions guided our research:

- a) How do teachers perceive their involvement in CBC implementation in Kenya?
- b) What do teachers consider as emerging issues affecting CBC implementation in Kenva?
- c) What best practices do teachers offer to overcome challenges facing CBC implementation in Kenya?

Literature Review

Teachers' Role in the Curriculum Process

Teachers are integral in a country's education reforms (Koskei & Chepchumba, 2020; Njeru and Itegi, 2018). Gupta (2023) and Giroux (2005) observed that teachers form part of the curriculum team and contribute immensely to the programme creation and implementation. They gather data and make contact with the parents, obtain feedback from learners and evaluate the programmes. Consequently, teachers' capacity to implement curricular and pedagogical actions with discretion, judgment, and proficiency is key to a successful curriculum (Campbell, 2006). Further, Sherin and Drake (2009) observed that teachers' knowledge, experiences and dispositions are critical in modifying a curriculum to fit its intended implementation. According to Ornstein et al. (2011), teaching emerges from within and holds the mirror to one's soul and good teachers weave the fabric that joins them with the students and subjects. Teachers translate the curriculum into meaningful learning experiences, foster a positive and supportive learning environment that accommodates learners' needs and supports their overall learning and development (Gupta, 2023). Therefore, it is necessary to view teachers as full participants in curriculum implementation

and not as passive recipients of the curriculum. Nonetheless, teachers are ill-prepared for any curriculum reforms in Africa (Chere-Masopha et al., 2021). In Kenya, teacher training on CBC was partial and insufficient to adequately prepare them for the implementation of CBC concepts (Amunga et al., 2020; Kenya Institute of Curriculum Development, 2017; Muinde &Mbataru, 2019; Ngeno et al., 2020). Isaboke, Mweru, and Wambiri's (2021) study concluded that the few teachers who had been trained lacked the knowledge and skills necessary to implement CBC in Kenya. Therefore to overcome the current dilemma facing CBC in Kenya, teachers should have proper training (Koskei & Chepchumba, 2020).

Teachers' Perceptions of Curriculum Change

Teachers perceive curriculum changes differently (Abidin et al., 2018; Aboagye&Yawson, 2020; Patekur et al., 2022). For example, in a study conducted in Turkey, Alper (2023) observed that a section of teachers were reluctant to implement curriculum changes since they felt that the changes did not affect the teaching environment. Other teachers resisted the changes since they felt that although their opinions were sought, there was no evidence that their opinions were reflected in the curriculum changes. Another study conducted in Indonesia by Juliantara (2016) found that teachers' training influenced their perceptions of curriculum change. He further established that a lack of knowledge on the implementation of a new curriculum influenced the teachers' perceptions. In Ghana, although teachers embraced the new curriculum, they sought inclusion in future curriculum planning and adequate teacher training before any implementation is attempted (Aboagye&Yawson, 2020). According to Juliantara (2016, pg.12), 'The openness to embracing the changes is considered important whatever the contexts are, including the curriculum changes'. Studies show that some teachers reject curriculum change despite being aware that it is beneficial to the learners (Efferi, 2017). Teachers' perceptions of curriculum change affect directly or indirectly the attitude and readiness to implement new curriculum ((Prabowo, 2016). For example, Wambiri and Ndani (2016) found that teachers' perceptions of the use of technology in implementing CBC in Kenya affected their acceptance and application in their activities. Murithi and Yoo (2021) noted that teachers' perceptions are integral in invoking learners' innovation and creativity. Therefore, there is a need for teachers' change of mindset (perceptions) and behavior (attitudes) to effectively achieve curriculum targets.

Sentiment Analysis in Education

Sentiment analysis (also known as opinion mining) is a natural language processing (NLP) technique that helps qualitative researchers explore the emotional tone in participants' texts (Bansal, et al. 2022). It is a multidisciplinary field that helps in detecting customer or user feedback to formulate strategies to gain insights on quality products or service delivery. In education, students' feedback is crucial in evaluating programme performance, pedagogical procedures and courses (Elfeky et al., 2020). Using qualitative data analysis, the learners' intent can be determined. Similarly, teachers' feedback on curriculum change can be analysed qualitatively to inform the government and curriculum specialists on how to improve the curriculum process. Sentiment analysis of teachers' opinions can occur at document, sentence, entity, and aspect levels (Ligthart et al., 2021; Zhao et al., 2021) depending on the nature of the decision being sought. In education, aspect-based sentiment analysis is the most sought since it is fine-grained. It helps to extract opinions or emotions at key aspects like students' or teachers' satisfaction with a programme, course, or curriculum. Sentiment analysis involves labeling documents, sentences, phrases or words with semantic emotions that could be positive, negative or neutral. Using the teachers' feedback, the government can

be in a position to predict teachers' needs, streamline the curriculum process and initiate training to enhance the quality curriculum process. Due to the number of teachers involved, sentiment analysis is conducted using artificial intelligence and NLP methodologies and tools (Yeruva et al., 2020).

Aspect-Based Sentiment Analysis (ABSA)

Opinion extraction and sentiment analysis are significant since they inform stakeholders how consumers perceive their services and products (Ahmad, Shaikh, Tanwani, 2023). The process of sentient analysis begins with preparing the opinion/aspect database and then using the pipeline to process the text. The output is a document (Doc), a sequence of tokens, used to create a document with linguistic annotations and properties. This is followed by the extraction of aspects/opinion words and identification of word polarity. Finally, the polarity of the sentence is aggregated making the complete sense of sentiment. Aspect-based sentiment analysis (ABSA) is a sentiment-based approach that describes people's opinions from text (Feldman, 2013). ABSA can extract the aspects people are talking about, their opinions and the reason behind their opinions. The aim is to categorise text into negative, positive, or neutral polarities. Unlike traditional sentiment analysis, ABSA not only assigns overall sentiment to a text but also assigns sentiment to every aspect of a sentence (text). ABSA allows a researcher to explore every aspect of a corpus.

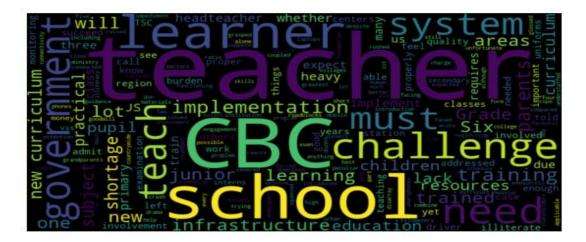
Methodology

Preparing the Database

Teachers' opinions on Competency-Based Curriculum in Kenya were manually extracted from local daily newspapers. After extracting data from different newspapers between 2023 and 2024, it was typed, cleaned (edited it for typos and grammaticality), and saved as a Word document. Through this process, a clean text was generated and then processed using Spacy pipelines. The cleaned data was visualised by generating a Word cloud image, using natural language processing (NLP) software as shown in Image 1. The cleaned data had 86 sentences, 1332 words, and 488 unique words.

Image 1

A word cloud showing the most frequently used words in our raw document.



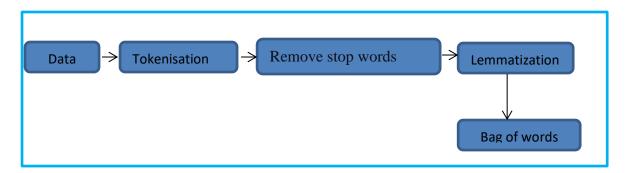
Data Analysis

This section outlines the process of sentiment analysis using Spacy pipelines. This process aimed to identify, extract, estimate the aspect term sentiment, and aggregate the aspects (Pavlopoulos & Androutsopoulos, 2014). The first step involved the installation of various modules related to text extraction and processing. The second step was the identification of different aspects from the clean text before determining the polarity and the intensity associated with the aspects. Finally, the extracted aspects were grouped. The processing stages have explained below followed by a diagrammatic representation of the pre-processing pipeline in Figure 1.

Data Pre-Processing

The first step in sentiment analysis involved importing data and then text pre-processing where raw text was transformed into an analysable state. The techniques involved were tokenisation, removing stop words, and lemmatization as shown in Figure 1.

Figure 1Sentiment analysis pre-processing stage



Tokenisation

Tokenisation is the process of breaking down the text into individual words or tokens. Researchers used the natural language tool kit (NLTK) built-in `words tokenise` function, to split the text into individual words and punctuation marks. For example:

Lines [4]: 'The greatest impediment is that teachers are not properly trained.'

Out[4]: ['The', 'greatest', 'impediment', 'is', 'that', 'teachers', 'are', 'not', 'properly', 'trained']

Removing Stop Words

Removing stop words involved dropping irrelevant words that do not carry significant meaning. For example, after dropping stop words from the above sentence, the following words emerged:

Out [27]: ['greatest', 'impediment', 'teachers', 'properly', 'trained']

Lemmatisation

Lemmatisation uses a vocabulary list and the morphological analysis, parts of speech (POS) to get the root word as shown in Table 1. For example:

Table 1

Lemmatisation

Form	Stem
Bedevilling (Verb)	Bedevil
Training(Noun)	Training
Training(Verb)	Train

Note: The table was generated by the authors from the sample data

Parts of Speech Tagging (POS)

Tagging of the tokens was conducted to understand the word patterns based on parts of speech. This was to inform the researchers of the tone and weight of the choice of words to communicate teachers' opinions and sentiments as shown in Table 2.

Out [19]: [('the', 'DT'), ('greatest', 'JJS'), ('impediment', 'NN'), ('is', 'VBZ'), ('that', 'IN'), ('teachers', 'NNS'), ('are', 'VBP'), ('not', 'RB'), ('properly', 'RB'), ('trained', 'VBN')

Table 2

Parts of speech tags and their descriptions

POS Tag	Description
DT	Determiner
IN	Preposition or subordinating conjunction
JJS	Adjective, superlative
NO	Noun, singular, or mass
NNS	Noun, plural
RB	Adverb
VB	Verb, base form
VBN	Verb, past participle
VBP	Verb, noun 3rd person singular present
VBZ	Verb, 3rd person singular present

Note: The Table 2 shows the set of tags and their descriptions. The set of tags used for a particular task is known as tag set. It is very useful in text realization, helps in distinguishing the sense of a word and indicates how a word functions in meaning as well as grammatically within the sentence. From 'Aspect Based Sentiment Analysis and Opinion

Mining on Twitter Data Set Using Linguistic Rules' by Ahmad et al. (2023). *Indian Journal of Science and Technology16* (10), p. 767.

Bag of Words

The clean text derived from the pre-processing stage forms a document referred to as a 'bag of words' that was subjected to the Natural Language Process (NLP) for sentiment analysis. For example:

['teacher',' already', 'encounter', 'serious', 'challenge', 'parent' 'involve', 'learn', 'child', 'busy', 'involve', 'others', 'illiterate', 'bother', 'all'],['government', 'must', 'invest', 'heavily', 'infrastructure', 'teacher', 'provide', 'quality', 'education'],

Results

The data for this study was generated from local daily newspapers between 2023 and 2024. After data cleaning a total of 86 sentences, 1332 words, and 488 unique words were generated. In this stage, Python's Spacy package was used to remove stop words, lemmatise,

and normalise the text. This was followed by the fine-grain process of aspect-based sentiment analysis (ABSA) to identify teachers' opinions and sentiments regarding Competency-Based Curriculum implementation in Kenya. The results are organised based on each of the research questions.

Teachers' perceptions of their Involvement in CBC Implementation in Kenya

From the analysis, it was established that despite numerous challenges and negative opinions, teachers had positive attitudes toward CBC implementation. Using Spacy text blob modules to generate sentiment polarity for each aspect of a sentence. There were a total of 86 sentences with 33 returning positive, 27 negative and 25 neutral. However, it was noted that the software erroneously placed 23 sentences with the wrong sentiments. The researchers went through each sentence and identified key features and word patterns (n-grams) that guided us in reconstructing the correct sentiments. The corrected sentiment analysis was used to make sense of the data (sentiment analysis) of how teachers perceived their involvement in CBC implementation.

It emerged that teachers had mixed reactions and opinions regarding their role in CBC implementation. The teachers' neutral opinions expressed their understanding, knowledge, and objective perceptions regarding the process of curriculum implementation. To make sense of the teachers' sentiments, the positive and negative opinions were treated as teachers' subjectivity in their involvement in the implementation of the new CBC curriculum.

It was observed that teachers were aware of the importance of involving them and all other shareholders in the process of curriculum implementation. Further, they were aware of the peculiar challenges that 'must be addressed for the proper functioning of the curriculum'. Based on this understanding, teachers expressed their dissatisfaction with the rush to implement the new curriculum without preparing them adequately. For example, they felt isolated since "The government forced the CBC implementation yet teachers had not been trained properly". Most of them felt that CBC was rushed and it does not exist in schools. Some teachers said, "CBC is not there...it is only drama in class. CBC has a problem, it was rushed". Teachers noted that lack of proper training was the major impediment to CBC implementation. They argued that "Before CBC was introduced, teachers needed to have undergone quality training which not the case was."

Another teacher's concern was the government's attention to expanding infrastructure at the expense of training them and yet lack of adequate trained teachers results in an unmanageable teaching load. The teachers were concerned about the lack of involvement in providing quality education to the learners as demanded by the new curriculum. A teacher reported that "In CBC, there are a lot of practicals that need the teacher's guidance but in our case, that is not possible as we are understaffed." Similarly, teachers complained of having few teachers at their institutions, thus ending up 'teaching six classes...We combine Grade Two and Three in one class and Grade Four, Five, and Six in the other'. It emerged that teachers were uncomfortable dealing with large classes and subjects making them compromise the quality of teaching and learning.

Lack of collaboration between parents and teachers was another concern aired by the teachers. Teachers felt lonely in implementing the new curriculum without the support of the parents. They noted that the government did very little or nothing to prepare the parents for

their collaborative role in the implementation of CBC. One teacher pointed out that many "parents in the region are illiterate and cannot help much in the implementation of the new curriculum". Another one noted that "other parents were too busy to help or are illiterate to assist their learners with homework."

Despite the challenges, teachers exhibited a positive attitude towards CBC implementation. They expressed their understanding that CBC aimed at providing skilled manpower to the government. Consequently, they are determined to persist with the implementation of the new curriculum. For example, one teacher pronounced, "We are trying our best to teach despite the challenges. "Moreover, they have pointed out the key areas they feel the government needs to streamline to make them feel included in the implementation of the CBC. For example, one of them noted that "There are grey areas that need to be addressed; infrastructure is inadequate, capitation, shortage of teachers, and their lack of preparedness". Parents should also be sensitised on their collaborative role through local barazas and the media.

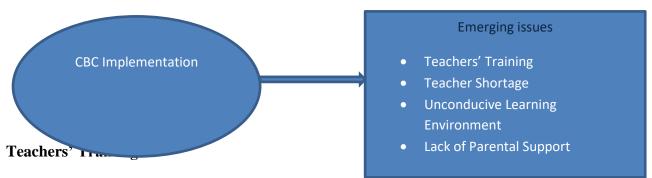
In conclusion, teachers felt left out in the implementation of CBC and were concerned about the level of the government's preparedness to train them to mitigate the implementation challenges. Nonetheless, they were willing to work with the government to offer solutions to the areas of their dissatisfaction.

What Teachers Consider as Emerging Issues Affecting CBC Implementation in Kenya

Using word cloud text analysis data was visualised to make sense of the key aspects that teachers addressed as captured in the different excerpts from the local daily newspapers. After gaining insights on the keywords that appeared most in our document, the data was subjected to further analysis to identify patterns of key aspects. Finally, the researchers used the topic modelling process to narrow down to four emerging issues (themes): teachers' training, teacher shortage, an unconducive school environment and lack of parental support.

Figure 2

Competence based curriculum emerging issues (themes)



Teachers perceived teacher training as a big impediment to successful CBC implementation. Some teachers felt that the government was in a hurry to implement the curriculum without training the teachers. One teacher said, "The government forced the CBC implementation yet teachers had not been trained properly". Other teachers felt that the training was done partially and targeted a small group of teachers, resulting in inadequate training. One teacher was quoted saying that "The greatest impediment is that teachers are not properly trained".

Several teachers wondered why the government would force teachers to teach yet they knew nothing about CBC implementation.

It emerged out that due to lack of adequate and continuous training, teachers ended up teaching subjects that they were not trained in. A teacher reported that he was "... trained to teach History and Kiswahili and didn't have an idea of how to teach other subjects but when we arrived, the head teacher told us we were to teach all the 12 subjects." Consequently, teachers expressed concern over the quality of education that the learners were receiving in CBC.

Teacher Shortage

Another emerging issue was the acute teacher shortage in the schools. Teachers expressed deep concerns regarding the implementation of the new curriculum and the dire need for resources. For example, three teachers observed that CBC was not only facing "serious issues and roadblocks, but it needs a good foundation and enough resources. It needs a lot of human resources and massive investment." The question of teacher shortage was conspicuous in our analysis. It was associated with the government's failure to employ adequate teachers to teach in all grades. Also, they noted that the government and the Teachers Service Commission (TSC) failed to train teachers before actual implementation of CBC started. One teacher said, "Before CBC was introduced, teachers needed to have undergone quality training which not the case was. Unfortunately, the Ministry has focused on expanding infrastructure but neglecting the training of teachers." It emerged that failure to have enough trained teachers led to an acute shortage, leading to poor implementation of the curriculum. It was found that teachers reported being overloaded. One teacher pointed out as follows:

The institution has only three TSC teachers who are expected to teach the six classes — from Grade One to Six. We combine Grade Two and Three in one class and Grade Four, Five, and Six in the other. The CBC requires a lot of engagement with parents and teachers, and a teacher-pupil ratio of one to 40, which is not applicable here due to the acute teacher shortage. We are three TSC teachers and we feel that, with the introduction of the new curriculum, it is difficult to teach all classes because the pupils need close attention.

Although the teacher shortage remains a major concern among teachers, there is a ray of hope for the successful implementation of CBC. Some teachers are optimistic that with proper training and government involvement, all will be well at the school and classroom levels.

Lack of Parental Support

It was established that teachers were conscious of the need for goodwill from all stakeholders for the success of any education system. Thus, parents are integral in the curriculum implementation process. It was noted that teachers were discontented with the level of parental engagement in the CBC implementation. Several teachers cited illiteracy, poverty

and socio-economic factors that affect the teacher-learner-parent learning relationship. For example, one teacher argued that "Parental involvement in CBC is a challenge since many children are being raised by their grandparents."

Further, teachers decried the illiteracy level of some parents. For example, a teacher argued, "Most parents in the region are illiterate and cannot help much in the implementation of the new curriculum." Besides parents' level of literacy, teachers also felt that parents were left out during training denying them a chance to support teachers with guiding their children with homework. Also, teachers feel that children from rural areas are economically disadvantaged as compared to those from urban areas. For example, a teacher from a rural school said:

Most villages have no mobile connectivity, which is needed in the implementation of CBC. How, then, will our children cope? Most of us have no phones, let alone smartphones. That, coupled with high illiteracy levels, and the government still expects our children to compete with others countrywide?

Despite poverty and illiteracy, teachers felt that some parents were indifferent. A teacher noted that "Some are too busy to be involved, while others are illiterate and while some are not bothered at all".

It emerged that failure to involve all the stakeholders in the curriculum process, socioeconomic factors, and the literacy level in Kenya might be causing inadequate parental involvement in the implementation of CBC.

Unconducive Learning Environment

An unconducive school environment is another issue that got the attention of teachers regarding CBC implementation. According to teachers, "The implementation of CBC in junior schools is bogged down by the unconducive public primary school environment". Several issues emerged namely: unhealthy teacher-head teacher relationships, dissatisfied interns, and poor and inadequate infrastructure, among others. It was established that teachers were concerned over the domiciling of junior secondary school (JSS) in the primary section. First, the JSS teachers were dissatisfied with the teacher-student ratio, and relationship with the school administration, and complained of heavy workload that was not commensurate with their pay. One teacher said the following in regard to the acute teacher shortage:

The few teachers are handed unreasonably heavy workloads and have to teach subjects they are not trained in. The gap between these teachers' remuneration vis-à-vis their work contribution is shockingly discriminatory, demotivating them. That has frustrated them, which has inevitably cascaded to their learners. The interns' frosty relations with the head teachers in the respective primary schools add insult to injury.

The interns also felt that they should not be managed by head teachers and supervisors who are non-degree holders. Teachers also felt that the primary schools lacked the necessary

infrastructure. The infrastructure at primary schools "have.... no capacity to carry the weight of a practical-heavy Competency-Based Curriculum (CBC) to achieve its envisaged outcomes".

The unhealthy and compromised school environment may affect the quality of learning. Therefore, there is a dire need to identify ways to mitigate the situation and amend the gaps in the CBC implementation.

Best Practices Teachers Offer to Overcome Challenges Facing CBC Implementation in Kenya

The researchers established that teachers were aware of the consequences of the emerging issues on CBC implementation. They noted that "there are grey areas that need to be addressed; infrastructure is inadequate, capitation, shortage of teachers, and their lack of preparedness". Consequently, they were quick to make recommendations on the best practices to mitigate the emerging issues affecting the implementation. Researchers have identified several recommendations in line with every challenge identified.

First, it was found that the majority of the teachers were positive and eager to receive more training, knowledge, and skills necessary to implement CBC at all levels. For example, teachers advocated for the involvement of all stakeholders in the implementation of CBC. They said, "We are trying our best to teach despite the challenges". They acknowledged receiving some training that has helped them grasp CBC to some extent. They argued that "... the training was some form of crash programme that squeezed too many important items into a short schedule," thus the need for better training. They also sought further training, mentorship and guidance on the implementation process of the monitoring of the learners' progress.

Teacher shortage is another emerging issue directly related to teacher training. One way to mitigate this challenge is through continuous employment. One teacher argued that for the government through TSC to say that "they have achieved the required number is not accurate. Instead, they should confirm the interns on permanent employment. The interns needed assurance from the government that they were no longer on contract.

On parental involvement and an unconducive learning environment, teachers recommended the government create awareness through local barazas and radio stations. One teacher noted that they, "....need proper participation". The teachers also advocated for government involvement in supporting the CBC curriculum through provision of infrastructure. They observed that "Kenya is not fully equipped for CBC...since we have some pupils sitting on stones" They were afraid if left to the parents it would be a burden. Another recommendation is that the government should come out and "bite the bullet and admit that domiciling JS in the primary section was a blunder that must be rectified". They argued that moving JSS to neighbouring high schools would address the issue of resources, saving the government money needed to improve CBC delivery.

Discussion

This study aimed at making sense of the teachers 'perceptions toward the CBC implementation in Kenya. Researchers used Aspect Sentiment Analysis to interrogate the data generated from local daily newspapers to describe the teachers' perceptions. From the data analysis, it was concluded that fine-grained teachers' opinions were informative. This was in line with Ligthart et al. (2021) and Zhao et al. (2021) argument that opinion mining can help in understanding teachers' satisfaction with a programme or curriculum. It emerged that there are numerous challenges facing CBC implementation in Kenya. There is a spill over effect of the government's failure to involve teachers at the initial stages of planning and implementation of CBC. Teachers identified inadequate and partial training to be an indicator of the government's motive and failure to involve teachers fully in the implementation of CBC. Lack of training has denied teachers the capacity to manage numerous subjects, making them feel inadequate in offering quality education. This observation aligns with Juliantara's (2016) findings on the influence of training on teachers' perceptions of curriculum change.

Teacher shortage is another emerging issue that was identified. It is a spill over effect from lack of training. The government has failed to embark on hiring and training more teachers, leading to overloading those already in employment. Interns were discontented with the amount of workload compared to their pay. Consequently, they are not committed to delivering CBC as expected. The continued disregard of teachers' concerns has made them believe that the government is not involving them in the implementation of CBC. Although teachers feel that the government needs to provide more infrastructures, they feel that it is doing so at the expense of solving the real problem (i.e. teacher shortage and training).

Nonetheless, teachers are committed to supporting the government in resolving the issues bedevilling CBC implementation. It was concluded that, regardless of the emerging issues, teachers identified remedies to the issues. For example, they advocated for more training and domiciling of junior schools in secondary schools to cut down on the cost of building new infrastructure (such as laboratories and libraries). Further, they advocated for the use of media and open barazas to create awareness of the parents' role in the implementation of CBC. This concurs with Aboagye and Yawson's (2020) observation of the teachers' willingness to be included in future planning and training before implementation.

Conclusion

The study aimed at conducting opinion mining by use of sentiment analysis computer software to make sense of teachers' perceptions regarding CBC implementation. The data was based on teachers' sentiments as documented in excerpts from the local daily newspapers. The study applied Aspect-Based Sentiment Analysis and Word-Cloud techniques to make sense of the data. The findings of this study have contributed to the research community on the effectiveness of opinion mining in describing and understanding teachers' perceptions toward CBC implementation. The researchers consider themselves to be among the first to use ABSA in researching teachers' roles to give it a broader perspective on the topic. The use of ABSA has proved useful for unstructured text data. It is a great source of information for qualitative analysts as it is easy to get an overview of the opinions without reading through the excerpts. The study found insights related to teacher training, teacher shortage, an unconducive working environment, lack of parental support, and ways to mitigate the challenges. Although teachers expressed mixed opinions, they offered best practices, and they were optimistic that CBC implementation will be successful if the government implements their recommendations.

Since CBC is a new curriculum and its implementation is still on-going, there is a need for the government to reach out to all stakeholders. Teachers are integral in implementing changes in a curriculum and their opinions should be taken into consideration at all times. The findings of our study can be of great value to the improvement of the CBC implementation strategies. The results, though, have some limitations. First, the data used was excerpts from print media and may have been influenced by the language of the writers. Second, the study relied only on one source of data which might have affected data triangulation. These shortcomings can be addressed by using similar research questions with other data sources like interviews and, a variety of written media. Nevertheless, these shortcomings did not affect the reliability and credibility of our findings. Teachers' perceptions are a great source of insights with regard to curriculum implementation.

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