Evaluation of Secondary Schools' Preparedness of the Implementation of 2023 Competence Based Curriculum in Relation to Current Technological Advancement a Case Study in Rufunsa District

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ABSTRACT

The research indicates that the ICT gadgets are available but not adequate in most secondary schools to facilitate effective student and teacher engagement, while there is no availability and reliable internet access and connectivity in most secondary schools to support research and the integration of emerging technological advancements. There are no available and poor condition of laboratory and workshop equipment necessary to support the emerging technological advancements to introduce 2023 curriculum. The ICT gadgets are available but not adequate to facilitate effective student and teacher engagement, while there is no available and reliable internet access and connectivity in most secondary schools to support research and the integration of emerging technological advancements as well as to support 2023 curriculum.

Based on the study, it was recommended to the Ministry of Education to monitor the parameters that support the success of a curriculum to be introduced, were there is need for funding for these parameters or for such projects, such resources must be available. Internet access is the backbone of technological advancement if 2023 curriculum is to be as planned.

Keywords: Evaluation, Competence based curriculum, gadgets, internet, laboratory/workshop, technology

INTRODUCTION

Zambia is scheduled to make a significant change from the Outcome-Based Curriculum (OBC), which has been in use since 2013, to a Competency-Based Curriculum (CBC) in 2025. This shift involves more than just updating the curriculum; it involves a revolution in the way that education is provided, assessed, and experienced. Educators can use it as a chance to help learners develop practical skills and get ready for problems in the real world. Here, we examine the main distinctions between these two curricular approaches and provide advice on how to facilitate a seamless transition for educators, (Emmanuel Mambwe)

In 2013, the Ministry of General Education in Zambia adopted a Outcomes-Based Education (OBE) approach to learning. The adoption meant a move from the Content-Based education which the country had been using since its political independence in 1964. Hence in 2013, the development of a competency based curriculum was initiated and was finalized in 2017 together with its implementation. A competency-based curriculum seeks to link education to the real life experiences as it helps learners acquire knowledge, skills, values and attitudes to access, criticize, analyse and practically apply them to reality. In this regard, learners are provided with practical experiences during the teaching and learning processes that are likely to help them gain life skills. In fact, Mulenga and Kabombwe (2019) rightly observed as they reviewed the competency-based curriculum developments in some parts of the world that: There seemed to be a very common element among all the countries that adopted the competency based curriculum that the education system was not responding to the developmental needs of the countries since learners lacked appropriate skills and applicable knowledge.

The two terms, Competency-based education and Outcome-based education are synonymous. In other words, they mean one and the same thing as it will be seen in their historical background. A competency - based curriculum (CBC) is a complex and multilayered phenomenon and thus it requires educationists, teachers and society to be aware and knowledgeable of its principles so that they can understand and appreciate it if it is to be effectively implemented.

The United Nations Education, Science and Cultural Organisation (UNESCO), describes a CBC as one that focuses on what students should be able to do instead of what they should know. Learners should get and use the knowledge, values, skills and attitudes to solve problems that they will face every day, Hodge (2007).

Traditional intelligence tests have been validated almost entirely against school performance, the evidence that they measure abilities which are essential to performing well in various life outcomes is weak. Most of the validity studies are correlational in nature and fail to control for the fact that social class might be a 3rd variable accounting for positive correlations between test scores and occupational success, and between level of schooling achieved and occupational success. It is suggested that better measures of competence might be derived by analysis of successful life outcomes and the competencies involved in them, criterion sampling, and assessment of communication skills, McClelland, D. C. (1973).

The growth for the need of quality and relevant education is getting popular worldwide. The establishment of Science, Technology, Engineering and Mathematics (STEM) Education in Zambia is a response to this call and in line with the Zambia Educational Curriculum Framework of 2013 to produce learners who are self-motivated, creative, confident and productive individuals, who are holistic, independent learners with values, skills and knowledge to enable them to succeed in life. However, it appears the implementation of the programme has hit a snug and its implementation has been halted. Therefore, this study sought to establish the challenges in the implementation of STEM programme in selected secondary schools in Zambia. The study adopted a qualitative approach. A descriptive survey was used as a research design. Purposive sampling technique was used to sample teachers at STEM schools. The instrument used to generate data was an interview guide. The key findings were that STEM education teachers welcomed this programme but had the following challenges: lack of teaching and learning materials, improper training on STEM curriculum, poor internet connectivity for research and poorly stocked laboratories. Based on the findings, this study recommends to the Ministry of General Education (MoGE) to be making wider consultations with key stakeholders before a programme is rolled out for implementation, magasu. O (2022). Therefore, as stipulated by magasu, the launch of the STEM curriculum was a failed project. The curriculum development centre (CDC) has revealed the 2023 curriculum framework, hence the need to put in place the parameters that will drive the success of the project.

Curriculum is the instructional and the educative program by following which the pupils achieve their goals, ideals and aspirations of life.

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Kenya has embarked on curriculum reform to improve the quality of education. This is a crucial step in the direction of Kenya's ambition to "develop a knowledge based society" and the growth of regional and global competition in the job market. An important shift has been to move away from knowledge and skills acquisition to knowledge creation and application. The purpose of the study was to investigate influence of teacher preparedness on implementation of competency based curriculum in primary schools. Four objectives guided the study: To determine influence of teacher competence, availability of instructional materials, teachers' mode of assessment and teachers' lesson planning on implementation of competency based curriculum in primary schools. The research employed descriptive survey research design where the researcher

used questionnaires, interview guides and checklists to collect data which was then used to describe why and how teacher preparedness influence competency based curriculum implementation. The target population included 336 teachers, 84 head teachers and 4 curriculum support officers making a target population of 424 respondents. Out of the 336 teachers handling the grades under competency based curriculum, 100 were purposively chosen representing a sample of 30.0 %. Out of the 84 head teachers, 17 were randomly selected representing 25.0% and 2 out of 4 curriculum officers were randomly selected representing a sample size of 50.0%. Data analysis was done using the statistical Package for Social Sciences (SPSS) programme and the results presented in form of frequencies and percentages. The theory of constructivism by Vygotsky guided the research based on the proponent that humans construct knowledge from their experiences. As learners in pairs or in groups interact with materials, they come up with creative solutions to tasks thereby building on their competencies. 50.6 per cent of the teachers needed support especially on infusing creativity and imagination and 69.2 per cent expressed having challenges infusing critical thinking and problem solving. 80 teachers representing 98.8 per cent of the sample size indicated they were not prepared to implement the competency based curriculum especially in the new subjects which were not equipped with instructional materials as opposed to the old subjects, mathematics and languages which had adequate materials. Majority of the teachers (53.1 per cent), confessed needing a lot of support in designing assessment rubrics, which are tasks tailored towards discerning learners' abilities in performing specific tasks. Teachers were not prepared in implementing the competency base curriculum since 95.0 per cent were concerned that preparing lesson plans for all lessons was impossible owing to the much time writing a single lesson plan was taking. The researcher recommended that a framework of a training programme be enacted by the Ministry of Education on infusion, assessment and lesson planning. Competency based instructional materials should also be delivered to schools to facilitate instruction. Further research was proposed for the study: To investigate influence of school factors on implementation of competency based curriculum in primary schools, j. w. waweru (2018).

General Objective

1. Evaluate the preparedness of government secondary schools to implement the 2023 Competence-Based Curriculum (CBC) in the context of emerging technological advancements.

Specific Objectives

1. Assess the availability and adequacy of ICT gadgets (computers, tablets, etc.) in secondary schools to facilitate effective student and teacher engagement.
2. Evaluate the availability and reliability of internet connectivity in secondary schools to support research and the integration of emerging technological advancements.
3. Examine the availability and condition of laboratory and workshop equipment necessary to support the emerging technological advancements in the curriculum.

Hypothesis

H_0: There is no significant difference in the availability and reliability of ICT gadgets (computers, tablets etc.) for effective students and teacher engagement, internet connectivity for effective research and laboratory and workshop equipment for emerging technological advancement across secondary schools in Rufunsa.

H_1: There is a significant difference in the availability and reliability of ICT gadgets (computers, tablets) for effective students and teacher engagement, internet connectivity for effective research and laboratory and workshop equipment for emerging technological advancement across secondary schools in Rufunsa.

Description and Location of the Study

The research was undertaken in Rufunsa district, Lusaka province of Zambia. A predominantly rural district, Rufunsa is located 150km east of Lusaka. According to Central Statistical Office Zambia 2022 census, Rufunsa has a population of 81733, 41478 males and 40255 females with a population density of 8.653 per square kilometer with an area of 9,446 square kilometer. It has 12 secondary schools

Source: Samuel Hall (2019).

METHODOLOGY

The research design used was mixed methods where Quantitative Data was collected. This allowed quantifying aspects of preparedness like the availability of ICT gadgets, internet connectivity, and equipment for technological advancement. Qualitative Data was also collected, this provided an in-depth insights into challenges faced by schools, and how technology is being integrated into teaching and learning. Google forms was used to create questionnaires which were open and closed ended.

Sampling Technique: **Purposive Sampling** was used where, not all staff were accessible, purposively select a sample of teachers and administrators. Bhattacharjee, Anol, (2012).

LITERATURE REVIEW

Competence based curriculum is a part of STEM curriculum. STEM Education is increasingly becoming one of the global demands of education delivery and Africa is no exception. The role mathematics plays in life is of paramount importance. Despite this, most African Mathematics classroom practices do not equip learners with appropriate competencies as demanded by STEM education dynamics in this 21st - Century. This study is aimed at diagnosing and testing the Basic School Mathematics Curricula from among African Countries in line with STEM learning outcomes. The target was twelve country syllabi and trial of lessons that were developed. Data was collected from the documentation submitted by participants in groups as responses to the tasks and lessons delivered during the continental Knowledge Co-Creation Program (KCCP), a four weeks training conducted in Zambia for twelve countries from within Africa in May 2019. Data analysis was done by coding the thematic areas in relation to Mathematics Curriculum intentions. Further analysis was from the implementation of STEM Lessons derived from such Curricula. The major findings were that there were disconnections among the country visions and aspirations through Mathematics Curriculum organization as well as lessons developed from such. Secondly the Curricula compositions had weaknesses as they mostly were content biased and at variance with the constructivist view point that aspires to boost critical, creative and analytical thinking. Additionally, attempts to develop lessons from such Curricula produced failed STEM lessons as they, to a large extent, ended up being traditional with the teacher dominating the process. The implication of these research findings was that such disconnected STEM Curriculum breeds disjointed STEM learning outcomes among learners. Further, limited pedagogical content knowledge among teachers worsens such a situation. The research therefore, recommends a critical look at STEM Curriculum organization on one hand and effective teacher professional development on the other hand if sustainable STEM learning outcomes are to be achieved in Africa (2017, New York Academy of Sciences).

During the past four decades, there have been major efforts to reform basic education system in Zambia. In teacher education, these efforts have been occasioned by a growing dissatisfaction with the way primary school teachers are trained and the quality of learning in schools. Proposals to reform primary teacher education in Zambia have become popular because primary teacher education programmes are generally held in low esteem and students preparing for primary teaching are perceived as weak academically (Musonda 2005).

Curriculum designing approach of competency-based education that the Zambian education has embraced as a way of providing quality education to its nationals. A competency-based curriculum is designed with a view to help learners acquire knowledge, skills, values and attitudes that are likely to equip them with competencies that they can effectively use to serve society. In this paper the authors have analysed the Zambian education system adoption of the competency-based curriculum whose review started in 2013 and then gradually implemented until 2017. Examples have been given of some countries that have in the past adopted and implemented a competency-based curriculum. An explanation of the historical and theoretical perspective of a competency-based curriculum has been given too. In the conclusion, a brief analysis of the implications of Zambia's adoption of the competency-based curriculum has been done, Mulenga. I (2019).

The study investigated teachers of History's implementation of the competency-based teaching approaches in the teaching and learning of History in Lusaka district, Zambia. A mixed-methods approach particularly the explanatory sequential design was used in this study. The study focused on schools in Lusaka from the ten zones. The total sample size of this study was 99. A total of 80 teachers participated in this study and 10 of them were interviewed. The participants were randomly and purposively selected. A questionnaire was used to gather information from the teachers. Interview guides were also used to collect data from one Chief Curriculum Specialist, one Subject Curriculum Specialist, 2 Standard Officers, 5 Head-Teachers, 10 Heads of Sections and 20 Teachers. Classroom lesson observations and document analysis were also done. Quantitative data was analysed using the statistical package for social sciences (SPSS) and qualitative data was analysed thematically. The findings of the study revealed that 67% of the teachers of History did not understand the concept of the competency-based curriculum or outcome-based curriculum. It was also revealed that teachers of History were not using the competency-based or outcomes-based approaches to a large extent in the teaching and learning of History in the selected secondary schools because they did not have the knowledge and skills of the competency-based approaches. Thus, it was recommended that the Ministry of General Education (MoGE) should strengthen the in-service training and continuous professional development meetings in schools and zones for the competency-based curriculum to be successfully understood and implemented effectively in schools.

According to UNESCO (2017), a competency-based curriculum is a curriculum that emphasizes what learners are expected to do rather than mainly focusing on what they are expected to know. It implies that learners should acquire and apply the knowledge, skills, values, and attitudes to solve situations they encounter in everyday life and across the globe. Mosha (2012) also pointed out that a competency-based curriculum contains the specific outcome of statements that show the competencies to be attained. Furthermore, Fitzpatrick (1991:18) elaborated that an outcomes-based education type focuses on "what learners should know at the end of their schooling career, what learners must be able to do, and what do learners need to feel or believe?" Consequently, a competency-based curriculum capitalizes on competency-based learning which focuses on understanding the concepts, skills and attitudes which in turn calls for changes in teaching, learning and assessment approaches (Woods, 2008; World Bank, 2011; Wangeleja, (2010).

Current approaches to teaching and learning of History include historical thinking (Wineburg, 2001) and historical inquiry (Barton & Levstik, 2004). Both approaches emphasize the role of the learner in constructing historical knowledge. This clearly shows that there are some competences that learners can acquire as they study History. It is for that reason that Yilmaz (2008a) argued that the nature of History is characterized as interpretive, tentative, subjective, empirical, and literary-based and embedded in a socio-cultural context. These characteristics are consistent with competency-based approaches of teaching and learning which fall under constructivist perspectives of knowledge. The discourses about universal primary education and learner-centred approaches have become popular in Sub-Saharan Africa and have received support from the donor community (Schweisfurth, 2011; O'Sullivan, 2004). While learner-centred approaches are seriously encouraged by its proponents, Schweisfurth (2011) warned that implementing the approaches has mostly failed.

Whelan (2007:645) attacked competency-based models of vocational education as being "unproblematic 'descriptions' of the skills needed by employers", and argued that people need to see content as a product of disciplinary thinking. Similarly, McPhail and Rata (2016) critiqued the genericism for focusing on perceived relevance to the "real world" as an organising principle for a curriculum rather than disciplinary concerns.

(Betram, 2009) argued the implication is that learners may be assessed on generic comprehension skills rather than on the substantive and procedural knowledge that makes History a specialised discipline. The inherent danger of using an outcomes-based system in the study of History is that the focus on procedural knowledge might overshadow substantive knowledge (Betram, 2009).

Mwanza (2017) observed that teachers are central to achieving universal access to high quality and equitable education for all learners because teachers have first-hand knowledge of the learning environment, the learners and how the two relate. The competency-based curriculum may appear uncomplicated in design but it is not as easy as it appears, in theory, it requires teachers to be knowledgeable of the key principles of the curriculum and equipped with skills and desirable attitudes to teach using competency-based approaches appropriately Mulenga & Kabombwe (2019).

Therefore, it is important for teachers of History to know and understand the kind of curriculum a nation is using in order to interpret it correctly and avoid wastage of educational resources and ensure that necessary skills are attained. Thus, it is important for curriculum designers to provide proper guidelines to teachers so that the curriculum is implemented effectively. Teachers are familiar with the classroom situations therefore might discover the gaps and bring about change and improvements that can help learners achieve the specified outcomes (Mulenga & Mwanza, 2019).

The rapid and intricate changes in society in the last decades have brought about significant challenges and novel responsibilities especially to the field of curriculum development and education. The past education traditionally thinking of acquiring as much knowledge as possible has hence been overtaken by the new task of modern society which is exposed to an immense amount of knowledge and information. The new challenge in education is therefore to select the highest quality of knowledge and make effective use of it. Thus, a curriculum being a means through which education systems help its citizens acquire desirable knowledge, skills, values and attitudes, must seek to overcome the narrow-minded past of traditional syllabi or written plans and to focus on providing learners with the ability to acquire, develop and apply knowledge, values and attitudes which should lead to the utilization of skills. In order to meet these concerns, a number of countries in Africa, such as South Africa, Tanzania, Rwanda, Kenya, Mozambique Zimbabwe and Zambia have since the year 2000 moved away from a content based curriculum to competency or outcomes-based curriculum in their education systems. However, the majority of ideas and arguments regarding a competency-based curriculum still remain as mere discourse and have yet to demonstrate how key competencies can be developed by learners through a school curriculum. Such a situation has partly been propelled by the lack of understanding of what a competency-based curriculum is all about. Using some examples, from the Zambian experience of curriculum review which commenced in 2013 and concluded in 2017, scholars in this paper explain the key principles that constitute a competency-based curriculum, using examples from the 2013 Zambian Curriculum Framework Policy (ZCFP) and the Teacher's Curriculum Implementation Guide (TCIG). After making a distinction between competence and competency, the authors provide a historical and fundamental premise of a competency-based education. The measurements of intent in a competency-based curriculum have been explained too, while a detailed description of the components of a competency curriculum has been given to shade more light on the concept and how the curricular in question can be assessed.

Data Collection and Parameter Measurement

Data was collected using online google forms where questionnaires were sent to respondents to examine the availability and adequacy of ICT resources, internet connectivity, and laboratory/workshop equipment in 12 secondary schools in Rufunsa District efficiently. This assessed the current situation, identify challenges, and gain insights into how these resources impact student and teacher engagement with emerging technological advancements.

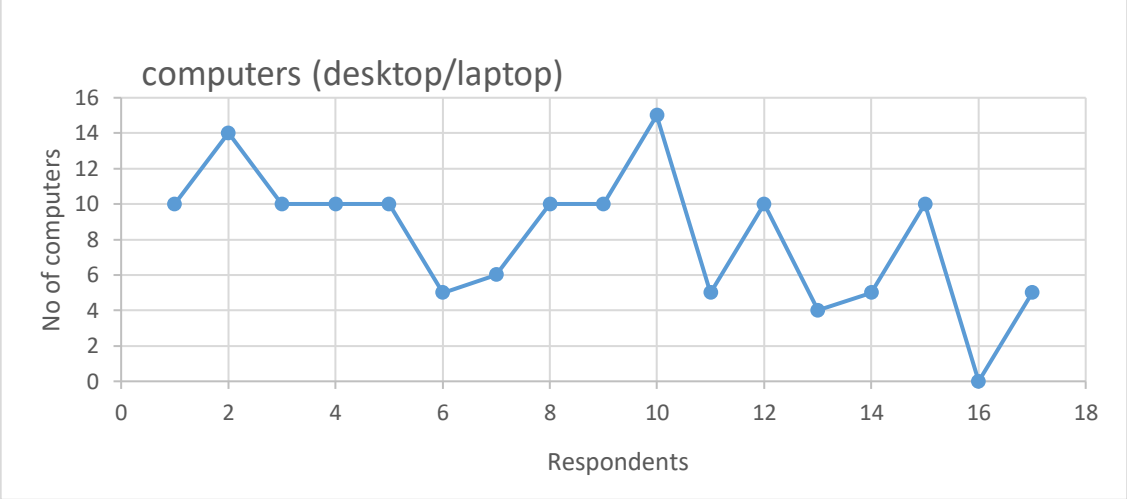
Data analysis

Data analysis is the process of putting together and making sense of all the information that has been gathered. This is done to make the information as simple and clear as possible so that it can be understood and used.

RESULTS

Rufunsa district has 12 secondary schools, from this number only 10 secondary schools were presented indicating 83% presentation. A total of 13 teachers, 4 administrators responded, in which 13 where male, 2 where female and 2 preferred not to say. This represents 71% population size. This response was a good representation of a population according to A.W. Kuria (2018), and excellent response is 70% or more.

The availability and adequacy of ICT gadgets (computers, tablets, etc.)



Source: Researcher

The graph shows that most secondary schools have computers, to facilitate effective student and teacher engagement. While a few do not have.

Table 1: Shows the ANOVA for secondary schools have computers, to facilitate effective student and teacher engagement

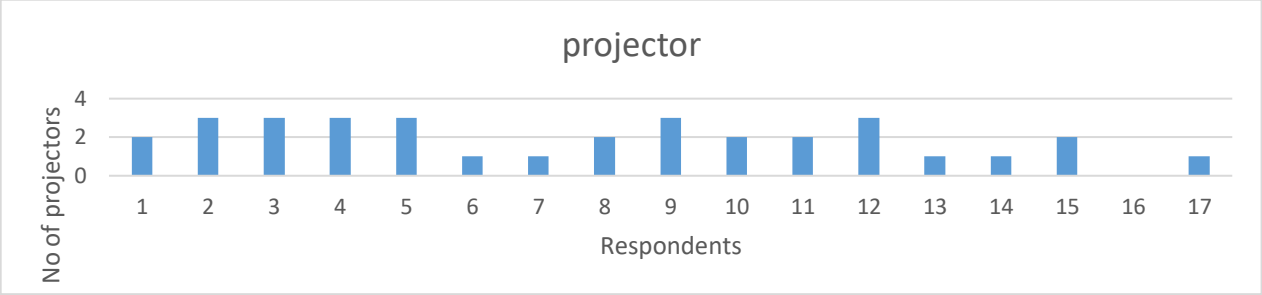
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	159.661	2	79.8308	1.18698	0.31783	3.28491
Within Groups	2219.418	33	67.2551			
Total	2379.08	35				

Source: Author

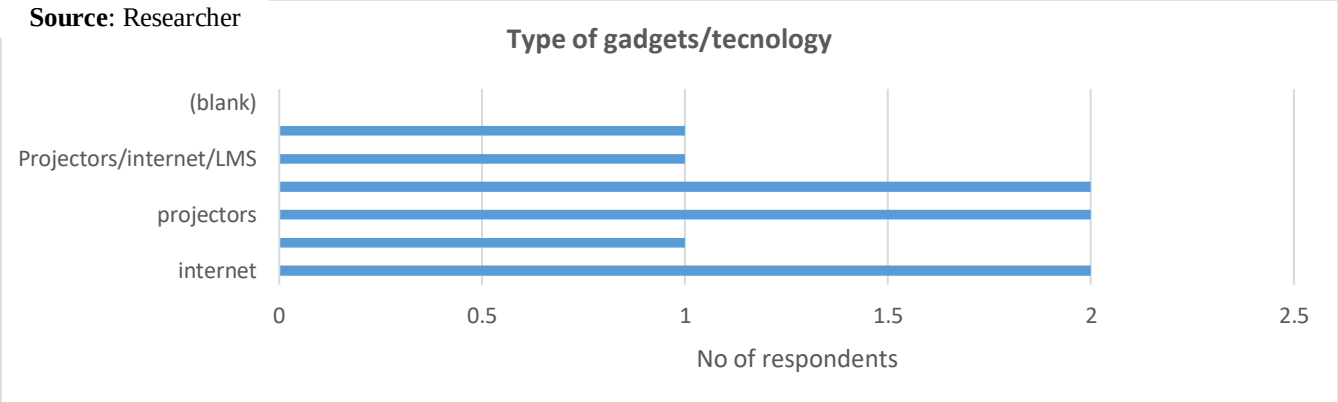
Levels not connected by the same letter are significantly different at α=0.05.

The above table shows the results generated from Excel (2016) on ANOVA. After conducting the ANOVA test, the results shows that there is enough evidence to accept the H1 since F = 1.18698 is less than F critical = 3.28491. It can also be noticed that, the P-value = 0.31783 is greater than the significant level α = 0.05. This concludes that the results above prove that there is a significant difference on in the availability and reliability of ICT gadgets (computers, tablets) for effective students and teacher engagement, internet connectivity for effective research and laboratory and workshop equipment for emerging technological advancement across secondary schools in Rufunsa.

The availability and adequacy of ICT gadgets (Projectors.)



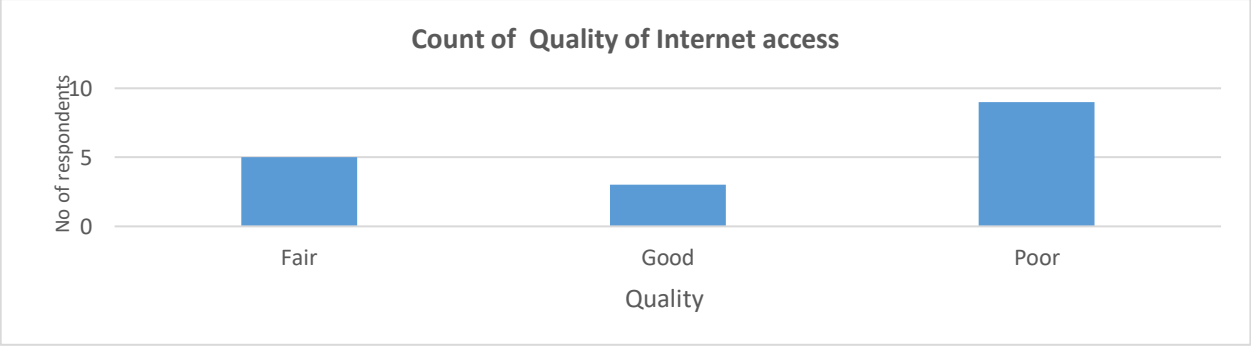
Source: Researcher



Source: Researcher

The graph indicate that most schools have at least a projector to facilitate effective student and teacher engagement.

The availability of reliable of internet



Source: Researcher

The graph indicate that most schools do not have internet access and reliable internet connectivity to support research and the integration of emerging technological advancements.

Table 2: The ANOVA for the quality of internet access and connectivity

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	33.8033	2	16.9016	8.01026	0.06263	9.55209

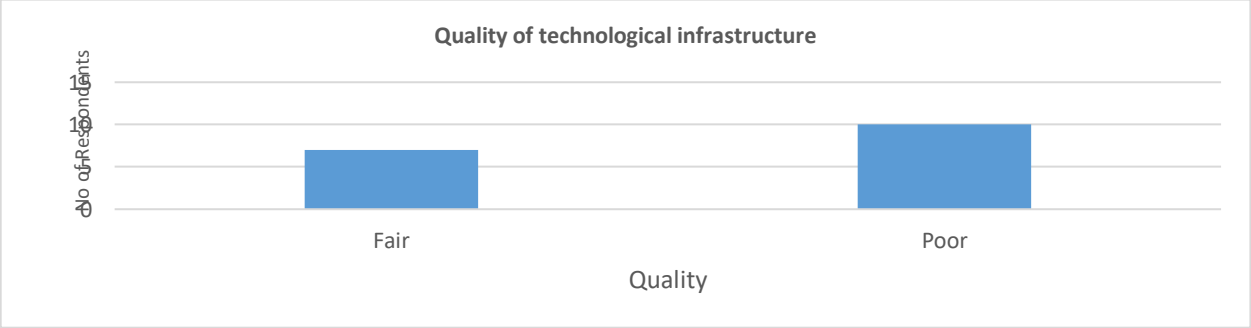
Within Groups	6.33	3	2.11			
Total	40.1333	5				

Source: Author

Levels not connected by the same letter are significantly different at α=0.05.

The table above shows the results generated from Excel (2016) on ANOVA. After conducting the ANOVA test, the results shows that there is enough evidence to accept the Hı since F = 8.01026 is less than F critical =9.55209. It can also be noticed that, the P-value =0.06263 is greater than the significant level α = 0.05. This concludes that the results above prove that there is a significant difference on the availability and reliability of internet connectivity in secondary schools to support research and the integration of emerging technological advancements.

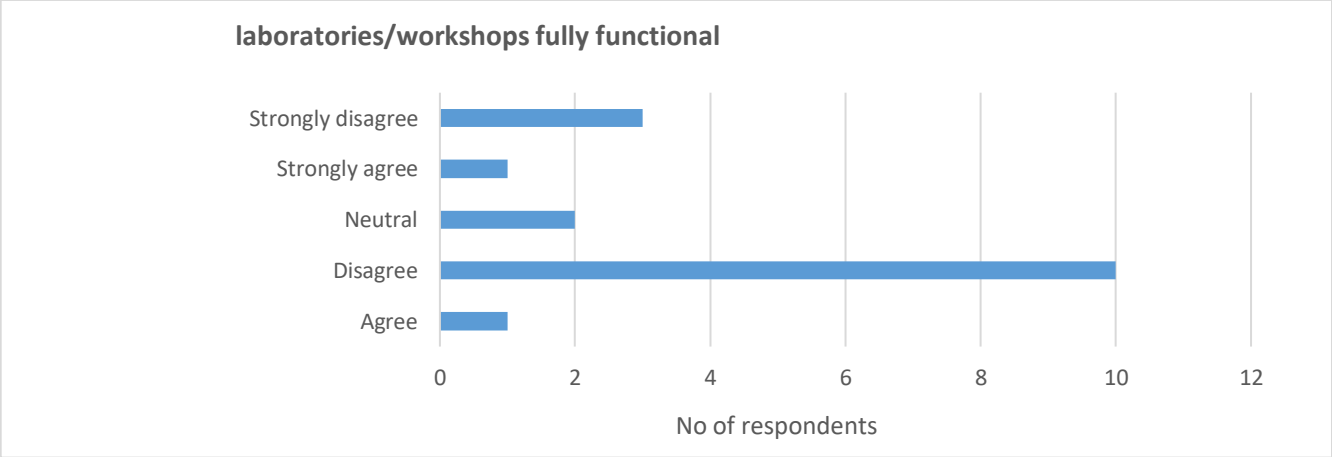
Quality of technological infrastructure



Source: Researcher

The graph indicate that most schools do not have good technological infrastructure such as computer laboratory, internet facilities to support research integration of emerging technological advancements

Laboratories/workshops fully functional



Source: Researcher

The graph indicate that 13 respondent do not have laboratory infrastructure, two agreed and 2 were neutral, this means that most schools do not have laboratory/workshop infrastructure to support emerging technological advancements

Table 3: Shows the ANOVA for the availability of laboratories/workshops infrastructure.

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	8	2	4	4.42857	0.0731	5.14325
Within Groups	1.555556	6	0.259259			
Total	9.555556	8				

Source: Author

Table 3 above shows the results generated from Excel (2016) on ANOVA. After conducting the ANOVA test, the results shows that there is enough evidence to accept the H_1 since F = 4.42857 is less than F critical =5.143253. It can also be noticed that, the P-value=0.07314 is greater than the significant level $\alpha = 0.05$. This concludes that the results above prove that there is a significant difference on the availability and condition of laboratory and workshop equipment necessary to support the emerging technological advancements in the curriculum.

DISCUSSION

The research indicates that the ICT gadgets are availability but not adequate in most secondary schools to facilitate effective student and teacher engagement, while there is no availability and reliable internet access and connectivity in most secondary schools to support research and the integration of emerging technological advancements. There also no available and poor condition of laboratory and workshop equipment necessary to support the emerging technological advancements in the curriculum.

Since the competence-based curriculum emphasizes on the development of competencies, such as critical thinking, problem-solving, and communication and it is emphasized that the Curriculum is designed to help students develop specific competencies that are relevant to real-world contexts. Students are assessed based on their ability to demonstrate competence in specific areas. Instructions are often focused on providing students with opportunities to practice and develop their competencies. For example a Physics curriculum might focus on students developing competencies in construction by applying moments to lift heavy loads.

CONCLUSION

The research concludes that there are no available and poor condition of laboratory and workshop equipment necessary to support the emerging technological advancements to introduce 2023 curriculum. The ICT gadgets are available but not adequate to facilitate effective student and teacher engagement, while there is no available and reliable internet access and connectivity in most secondary schools to support research and the integration of emerging technological advancements as well as to support 2023 curriculum.

RECOMMENDATION

Based on the study, it is recommended to the Ministry of Education to monitor the parameters that support the success of a curriculum to be introduced, were there in need funding for these parameters or for such projects must be available. The poor condition of laboratory and workshop equipment necessary to support the emerging technological advancements to introduce 2023 curriculum must be looked into. The ICT gadgets are available but not adequate to facilitate effective student and teacher engagement can also be checked since some schools do not completely have, while there is no available and reliable internet access and connectivity

in most secondary schools to support research and the integration of emerging technological advancements to support 2023 curriculum. Internet access is the backbone of technological advancement if 2023 curriculum is to be as planned.

According to magasu he indicated challenges such as lack of teaching and learning materials, improper training on STEM curriculum, poor internet connectivity for research and poorly stocked laboratories that made the STEM curriculum not to be a success and recommended that based on the findings, the study recommended to the Ministry of General Education (MoGE) to be making wider consultations with key stakeholders before a programme is rolled out for implementation.

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