

# The influence of formative assessment practices in promoting 21st Century skills development among secondary school students in Tanzania

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## Abstract

The development of 21st Century skills among students depends much on formative assessment practices employed by classroom teachers. This study explicitly assessed how formative assessment practices develop creativity, critical thinking, communication, and collaboration (4Cs) among students and, how management and administration of formative assessment tools promote the development of 4Cs amongst secondary school students. Interviews and classroom observations were done on 32 geography subject teachers from 10 secondary schools in Morogoro Municipal in Tanzania. The study found that the formative assessment practices in secondary schools do not promote the development of 21st Century skills because the formative assessment tools employed do not facilitate the development of 21st Century skills in students. Moreover, such tools are not well administered and managed in schools. Based on the study observation, the study concludes that the formative assessment practices employed in secondary schools do not influence the development of 21st Century skills in students. The study, therefore, recommends curriculum review and in-service training to secondary school teachers on competence-based assessment tools preparation, management, and administration. Moreover, the secondary education curriculum should be reviewed to give more weight to formative assessment rather than summative.

**Keywords:** 21st century skills, formative assessment, secondary school, teacher, Tanzania

## **The influence of formative assessment practices in promoting 21st Century skills development among secondary school students in Tanzania**

### **1. Introduction**

This paper evaluates how formative assessment techniques used by secondary school teachers in Tanzania promote the development of 21st Century skills in students. The 21st Century skills imply knowledge, skills and dispositions that citizens need to be able to contribute to the knowledge of the society (Voogt & Roblin, 2010). These skills are the ones applied in solving the challenges of a volatile, uncertain, complex and ambiguous world (OECD, 2018). They are also useful in harnessing digital tools and artificial intelligence (Ibid) and are the key abilities in addressing emerging political, economic, social and technological challenges threatening human lives and their development (Ananiadou & Claro, 2009). Likewise, Partnership for 21st Century skills (P21) highlights Creativity, Critical thinking, Communication, and Collaboration (4Cs) as the skills that need to be developed during teaching and learning in the context of core subjects (González-Salamanca et al, 2020). The 21st Century skills are therefore the key skills and useful in addressing social, economic, technological and many more challenges in the ever-changing world.

The paper assesses how the formative assessment process in secondary schools in Tanzania promotes the development of 4Cs to learners. The study explicitly assessed how formative assessment practices develop 4Cs among students and, how management and administration of formative assessment tools promote the development of 4Cs amongst secondary school students. The development of 4Cs among students is influenced by formative assessment practices (Singh et al, 2020) and types of tools employed by teachers (OECD, 2018).

As the world's labour market requires innovative, creative, communicative, collaborative, critical thinkers and digital literate personnel, the acquisition of such skills requires new assessment techniques that could influence learning instead of being judgmental and obstacle towards skills acquisition (Suto & Eccles, 2014; González-Salamanca et al, 2020). This argues education curriculum to prepare students with the knowledge and skills needed in 21st Century (Levy & Murnane, 2004) that could be achieved by using instructional strategies and assessment techniques that involve students rather than lecturing and memorizing (Snyder & Snyder 2008).

To align with the demands of the labour market that needs competent graduates, Tanzania shifted from content to competence-based education (Kopwel, 2014). This paradigm shift intends to make graduates demonstrate practical competencies in the real-world and address challenges through innovation, critical thinking, collaboration and communication instead of just memorizing the facts (Mkimbili & Kitta, 2019; Lupeja & Komba, 2021). The shift necessitated changes not only in the teaching processes but also in the purpose and techniques of assessment. The changes are oriented towards building a strong linkage between formative assessment and teaching/learning processes (Black & William, 1998).

The primary goal of formative assessment is to improve the learning outcomes (Care, et al 2018) and provide feedback information to teachers and students (Black & William, 1998). Formative assessments have a positive contribution because they help teachers to adjust instruction when students are not performing well, and redesign strategies of teaching and learning (Black & William, 2009). Formative assessments are catalysts for improving the teaching and learning processes. The feedback from formative assessment provides an opportunity for teachers to plan and attain the desired goals (Sardareh & Saad, 2012; Lupeja & Komba, 2021). It also informs students on the application of the knowledge acquired in addressing real-world problems (Webber & Tschepikow, 2013). In this view, new and innovative assessment techniques and instruments are required to be in place for the development of the 21st Century skills among students.

The curriculum of Tanzania emphasizes the use of formative assessments as they provide students with an

opportunity to demonstrate their competencies in the world of work and address their own mistakes and misconceptions (Paul, 2014). This can be achieved by multiple assessment tools like field assessment tasks, role play, portfolio, oral presentation written essay, rating scale (MoEVT, 2007) and many more. Formative assessment tools that develop 4Cs probe students' understanding, reasoning and critical thinking rather than memorizing the facts. As the literature indicates, formative assessment is more effective in developing the 4Cs to students compared to summative assessment. The study conducted in Indonesia on the effect of formative assessment in developing critical thinking revealed that formative assessment through oral feedback can develop critical thinking in students (Nurhijah et al, 2020). It also engage students in higher order thinking activities and develops critical thinking, collaborative, communication and creative skills (Msoqi, 2019). In addition, the study conducted on the 21st Century assessment techniques in South Africa found that the 4Cs assessment techniques improve teaching and learning processes (Khasi, 2009). The same has been observed in Kenya where secondary school teachers are emphasized to employ formative assessment rather than summative assessment (Wafubwa & Ochieng 2020).

To gain an understanding of students' progress and abilities, management and administration of formative assessment can be done on daily bases in classroom teaching and learning. Depending on the purpose and the aim of the assessment, different formative assessment tools could be used to assess various skills. Among the formative assessment tools used are think pair share, questions, tests and quizzes (Culline, 2015). Performance-based assessments are more effective in assessing competences and skills rather than standardized test (Siarova et al, 2017).

In Tanzania, the literature indicates that education stakeholders including parents have the opinion that graduates of secondary education lack skills and competences, including the 4Cs 21st Century skills. The focus of the teaching and learning processes is on syllabus coverage instead of mastery of skills. Students are prepared to sit for examinations and not for acquiring the necessary skills which are useful and applicable in daily life (Lupeja & Komba, 2021). Despite the importance of formative assessment in developing the 4Cs 21st Century skills among students (Snyder & Snyder, 2008; Suto & Eccles, 2014; González-Salamanca et al, 2020; Singh et al, 2020), there is a literature gap on how formative assessment tools are used by teachers in assessing the 4Cs 21st Century skills in secondary schools and how such tools are managed and administered towards the development of 4Cs 21st Century skills.

The limited literature threatens the strategies for improving 4Cs 21st Century skills and the realization of the Sustainable Development Goals which requires a competent, competitive, and innovative workforce. This study, therefore, explores the practices, administration and management of formative assessment tools in secondary schools in Tanzania to be informed whether the formative assessment done in classroom teaching and learning is in a position of promoting the 21st Century skills, namely critical thinking, creativity, communication and collaboration. The findings could inform various stakeholders such as teachers, education officials, the ministry of education and other stakeholders on what is going on at the grassroots.

## **2. Theoretical Underpinnings**

The study was guided by the social constructivism theory by Lev Vygotsky. The theory believes in the learning assessment that emphasizes the interaction between teachers and students, the guidance and creation of feedback for students' improvement. Social constructivism acknowledges the social interaction of more knowledgeable peers in shaping the learners' experiences and moving from their zonal of proximal development (ZPD). Formative assessment aims to influence students' learning (Stiggins, 2007) by making them part and parcel of the teaching and learning process. The day-to-day collaborative assessment could reveal team members who would be more knowledgeable to support their ZPD and move them to the next level of learning. If the assessment techniques rely on social constructivism approach, the development of the 4Cs 21st Century skills amongst learners will likely occur.

### 3. Materials and Methods

The study adopted mixed methods in which data were collected from 32 geography subject teachers from 10 secondary schools in Morogoro Municipal in Tanzania. The study employed two data collection methods, namely interview and classroom observation. Face-to-face interview was conducted to geography subject teachers and key informants (academic teachers and head of schools). The key informants were interviewed on the modality of assessment in the schools. A total of 24 classroom observations were conducted to collect data. Assessment methods recommended by the secondary school curriculum such as projects, quizzes, field tasks, role play, oral presentations and essay writing were used as checklists in classroom observation (Moevt, 2007).

### 4. Findings

The study intended to assess geography subject teachers' competence in applying formative assessment techniques that influence the development of 21st Century skills among secondary school students in Tanzania. It sought to evaluate the contribution of formative assessment practices in the development of 21st Century skills among students. The study findings are presented based on the specific objectives which were to assess how formative assessment practices develop 4Cs (Communication, Collaboration, Creativity and Critical thinking) 21st Century skills among students and how management and administration of formative assessment tools promote the development of 21st Century skills amongst secondary school students in Tanzania.

#### 4.1 The influence of formative assessment practices in promoting 21st Century skills amongst students

To evaluate the influence of formative assessment practices on the development of the 21st Century skills, classroom teaching observations were done. Eight indicators were used to show whether or not the teacher assigns students a variety of hands-on activities, provides homework or quizzes, gives students an opportunity to weigh out their understanding during the learning process (allowing questions and answers) and connect what they learn with real-world situation, and sets authentic based assessment activities such as real world (field) tasks; simulation or role play; oral presentation; written essay or report. The findings are shown in Table 1.

**Table 1**

*Formative assessment practices in teaching and learning*

Variables	Measures			
	WD	D	PD	ND
Projects and practical works.	0	8.3%	4.2	87.5%
Homework or quizzes	0	25%	37.5%	37.5%
Questions and answers	4.2%	50%	37.5%	8.3%
Connecting content and real-world situation	12.5%	20.8%	29.2%	37.5%
Field tasks	4.2%	0	12.5%	83.3%
Role play	4.2%	12.5%	4.2%	79.1%
Oral presentation	12.5%	16.7%	8.3%	62.5%
Written essay or report	0	12.5%	8.3%	79.1%

WD: Well Done, D: Done, PD: Partially Done and ND: Not Done

Table 1 shows that formative assessment practices in secondary schools do not develop the 4Cs 21st Century skills. Teachers who assign project and practical work were 8.3%. The development of 21st Century skills depends on the methods of assessment. When students are provided with hands-on activities, creativity, innovation and critical thinking are developed. According to García and Pearson (1994), projects are important since they increase students' ability to access information, organize ideas and share information with others. Projects also provide students with opportunities to read a variety of reference materials and resources and involve students in setting learning goals (Lupeja & Komba, 2021). The low rate of project and practical work implies that creativity and critical thinking are not developed in assessment practices.

When interviewing one of the teachers revealed that “*the school has no Geography room where students can be assessed on practical bases, students are, therefore, being assessed theoretically*”. Another teacher added

*“with the fee-free education, parents are not willing to contribute anything, therefore, it has become impossible to have study tours where hands-on assessment techniques could be practiced.”* In this regard, with lack of facilities and financial resources, it is hard for teachers to prepare practical work that promote the development of 21st Century skills. To address the problem of facilities and financial resources, teachers should be trained in using locally available resources instead of waiting for the Government to provide all the resources. Also, parents should cooperate with teachers in the academic life of their children despite free education.

Nevertheless, homework provided to students was rated low at 25% as the majority of teachers do not provide homework or quizzes to students. The reason given was a large number of students in the classroom. One of the teachers asserted:

*The workload of the teacher is considered by the number of periods but in actual fact a teacher has more than 45 students. In form four, I have three streams with an average of 73 students which makes 220 students, this makes it difficult to provide homework frequently and mark them.*

The above quotation suggests that homework is less provided to students due to a large number of students in classes. The findings concur with Kapinga and Kimaro (2020) and Lupeja and Komba (2021) that teachers do not use formative assessment due to the large number of students in classes and limited instructional time. The government and other stakeholders should therefore consider embarking on increasing the number of classrooms per school so as to match the standard class size which is 45 and, improve the teacher-to-student ratio.

Mostly, question and answer assessment method was used by teachers to assess the achievement of the lesson objectives. According to Mulenga-Hagane (2019), question and answer assessment is used to gauge whether learning has truly occurred. Table 1 indicates that 54.2 per cent (4.2% and 50 % well done and done respectively) ask students questions in the process of learning. Although the question-and-answer assessment method was rated higher, the majority of students never tried it. This paves the way for a teacher to proceed with the lesson and consequently, the majority of students are left behind. Teachers proceeded with lesson intending to complete the syllabus and cover the contents. It is, therefore, imperative for teachers to diversify their assessment methods to promote the acquisition of 4Cs 21st Century skills.

Moreover, both lesson content and real-world connection and fieldwork were rated very low, only 33.3 per cent (12.5% and 20.8 % well done and done respectively) of teachers lead students to connect content and real-world situation while 4.2% provide fieldwork or activities to the students as the way of assessing. This shows that assessment is mainly based on the content provided to students and not intends to solve the real-world problems. According to Webber and Tschepikow (2013), assessment requires to indicate how students can use the knowledge acquired in solving real-world problems. Either, teachers showed their concern about some of Geography topics content that do not match the students' real situation. One of the teachers revealed: *“Some of the topic assessed is glacial while students have never seen an area covered with ice/snow. It is better to teach and assess contents that are linked with students' environment”*. This implies that assessment practices in secondary schools do not influence the development of 21st Century skills as what is assessed is irrelevant because teachers strive to cover the content and use assessment to prepare students for final examinations (Lupeja & Komba, 2021; Mkimbili & Kitta, 2019; Amua-Sekyi, 2016). Under such a situation, curriculum review is necessary to increase the relevance of the subject contents and streamline the delivery of skills to students.

In addition, the assessment activities such as role play were 16.7 per cent (4.2% and 12.5 % well done and done respectively). Also, Oral presentations were rated low at 29.2 per cent (12.5% and 16.7% well done and done respectively) and essay writing 12.5%. It was observed that oral presentation was hindered by students' language incompetence. The study observed students struggling to discuss in their groups and failing to present in front of their fellow students because of being incompetent in the language of instruction. The classroom group discussions were done in Swahili then changed Swahili discussion to English. This implies that communication skills and collaboration skills assessment is inefficient in secondary schools. The same has been

reported by Massay (2020) that students cannot communicate fluently in English. The English language seems to be a key cause of poor communication and delivery of materials among students. As suggested by Lupeja and Komba (2021), it is important to either switch to Swahili language or improve English learning and teaching environment from primary level which would result in improving English language mastery and communication altogether.

Generally, teachers' assessment practices do not reflect 21st Century skills, the majority still rely on traditional paper-pencil assessment methods despite changes in curriculum which demands the adoption of authentic and performance-based assessment methods (Paul, 2014). Nevertheless, methods of assessment that require extensive involvement of the students and teachers like projects and field practicals were not used. The majority of teachers were not aware of the 21st Century skills incorporated in the curriculum that need to be developed and assessed. Hence, it is obvious that teachers cannot be able to assess such skills. The same has been observed by Mpapalika (2014) that teachers lack adequate knowledge on how to develop assessment tools that assess competence development. Teachers need in-service training and seminars to improve their capacity for the promotion of 21st century skills.

#### *4.2 Management and administration of formative assessment tools and their influence in promoting the acquisition of 21st Century skills*

Interview methods were employed to examine the role of management and administration of formative assessment tools towards the development of 21st Century skills among secondary school students. Teachers were asked about how they set, supervise and mark their classroom tests and examinations. Results indicated that the majority of teachers use paper and pencil tests and examinations as the main tools for assessment. However, it was observed that the tests and examinations were poorly managed and administered.

A teacher from school A, said:

*In our school, a teacher has a mandate to decide the kind of test and thus the majority of teachers set test questions that can be easily marked. Also, we do not have examination moderation committees and therefore our examinations are not moderated. We also do not have an internal format for setting examinations.*

The statement above suggests that constructed questions were biased towards testing only "knowledge" resulting in forcing students to memorize. For example, one of the examinations had four essay questions, all required students to explain factors.

*(i). With vivid examples explain six factors that influence the development of tourism sector in Tanzania. (ii). Explain the factors that limit the development of hydroelectric power in developing countries. (iii). Explain eight factors that lead to the population distribution in the world. (iv). Explain five factors affecting rain formation.*

The questions had the scenario of CBC but in reality, it forces the learner to memorize the points or facts. The formative assessment tools (tests and examinations) do not reflect 21st Century skills because the examinations rely on memorization and reproduction of facts. It was also observed that the majority of teachers are incompetent in constructing their question items instead they rely on past papers from either the National Examination Council of Tanzania or past papers from other schools as reported by Selemani-Mbewe (2002). In-service training is therefore imperative for capacity building to improve teachers' competence.

A large number of students in classes hinders the administration of the formative assessment tools which promote the development of 21st Century skills. A teacher from school D said "With a large number of students in class, some teachers do not mark their tests, they just guess the marks and award scores to students based on their personal views" This implies that students are given tests or examinations as formality instead of gauging

students' skills. The test results, therefore, are meaningless since they are not a true measure of skills acquired. A similar observation by Mulenga-Hagane et al, (2019) indicated that huge classes impact the frequency and administration of tests and examinations. With a large number of students, the frequency of tests is being reduced and consequently, limited aspects of skills are tested. To effectively manage and administer tests and examinations that are linked with 21st Century skills, there should be a balanced teacher students' ratio. The teaching load should not be measured by the number of periods but the number of students in classes.

A teacher from school E said *“Due to limited resources, we do not mark tests and internal examinations in panels, teachers mark tests at their own pace to meet the deadline”* Another teacher from school F added: *“Some teachers mark tests and examinations without marking schemes. This creates a variation of answers and marks among students in similar questions and examinations”* This implies that the modality of marking tests and examinations does not intend to develop 21st Century skills but rather to create scores that are needed for continuous assessment. This was also observed by Lupeja and Komba (2021) that teachers have been persuaded more towards the demand of examinations than imparting students with critical skills. This is contrary to the development of 21st Century skills which needs more practical work. Teachers, therefore, need in-service training and seminars to improve their capacity for the promotion of 21st Century skills. They should also work collaboratively with experienced ones by building working teams. This is likely to produce competent teachers who could orient their assessment practices towards building 21st Century skills for their students.

The interview with teachers from different schools indicates that, despite the use of tests and examinations as formative assessment tools in secondary schools, such tests and examinations are poorly managed and administered, hence hard to develop 21st Century skills among students. This means that even the poor tools in place for formative assessment are not adequately utilized and managed. Large class sizes, and limited resources and knowledge of preparing and setting formative assessment techniques that provide authentic assessment are the setbacks for teachers to abide on formative assessment practices that develop 21st Century skills in students. In this view, the government should allocate adequate number of teachers and provide in-service programs to teachers to equip knowledge and skills on administering formative assessment techniques that develop 21st Century skills amongst students.

## 5. Conclusion

The study concludes that the formative assessment practices in secondary schools do not influence the development of 21st Century skills in students as it is based much on assessing students' ability to memorize facts and concepts instead of skills acquisition. Secondary school teachers have limited competence in designing, managing, and administering assessment tools that promote 21st Century skills. This in turn affects their assessment practices towards the development of 21st Century skills among students. The observation is attributed to a lack of in-service training, poor reading culture, lack of facilities, a large number of students in classes, and negative attitudes towards teaching career among teachers.

The findings call for teachers to provide students with more opportunities to demonstrate their skills by using assessment tools that require critical thinking, creativity, collaboration, and communication. Teachers also need to provide students with feedback that focuses on skill development rather than just memorizing facts and concepts. They should also develop formative assessment techniques that will enable students to demonstrate critical thinking, collaboration, creativity, and communication explicitly and seek out opportunities to apply these skills in their learning activities.

Moreover, the secondary education curriculum should be reviewed to give more weight to formative assessment rather than summative. The curriculum standards and assessment frameworks should align with the development of 21st-century skills. Also, the Ministry of Education should provide resources and professional development opportunities for teachers to support the implementation of effective formative assessment practices that promote the development of 21st Century skills.

In addition, the National Examinations Council of Tanzania (NECTA) is urged to advocate examinations that assess the acquisition and development of the 21st Century skills rather than the memorization of facts. Lastly, heads of secondary schools should ensure that teachers can integrate the 21st Century skills in their lessons, from preparation, execution to assessment in order to develop such skills among students.

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