

Prospects of the 21st Century Skills in Education: An implication for Competency Based Curriculum in Kenya

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ABSTRACT

Education in the 21st-Century seems to have surpassed mere learning of the stipulated curriculum areas. In the information technology era, young people are already faced with the challenges of social media interactions as well as other networks that call for certain mannerisms for acceptability. Settling well on the job as well as exhibiting certain competencies are some of the demands from the job market. It is, therefore, not a matter of just knowing what the work demands but building synergies from diverse team work is imperative. Developments in society and economy in this century, therefore, call for education systems that may equip young people with new skills and competencies, which allow them to benefit from the emerging forms of socialisation and to contribute actively to economic development under a system where the main asset is knowledge. This paradigm shift in the need for skills and competencies for young people to effectively respond to the demands of the emerging models of economic and social development unlike those in the past century which were suited to an industrial mode of production is imperative. This paper therefore reviewed literature in order to come up with novel ideas which may include the 21st-century competencies such as creativity, critical thinking, problem solving, ability to articulate, interpret and share thoughts and ideas.

Key Words: Skills; Competencies; Education

INTRODUCTION

The paradigm shift on the teaching and assessment of 21st century skills has arisen from a shared belief by several interested groups (teachers, education researchers, policy makers, politicians, employers among others) that the current century demands for a very different set of skills and competencies from people in order for them to function effectively at work, as citizens and in their leisure time (Dede, 2007; Kalantzis & Cope, 2008). Supporters of the 21st-century skills movement advocate for the need for reforms in schools and education to respond to the social and economic needs of students and society.

Global networks via social media are already exerting pressure on young people to experience a new dimension of socialisation and social capital acquisition. Their education therefore needs to provide them with the social values and attitude together with constructive experiences that will allow them to benefit from these opportunities and contribute actively to these novel spaces of social life. Besides, today's labour force has to be equipped with sets of skills and competencies which are suited to the knowledge economies

as well as capacity to work with teams. Most of these competencies are related to knowledge management, which include processes related to; information selection, acquisition, integration, analysis and sharing in socially networked environments. Not surprisingly, most, if not all, of these competencies, are either supported or enhanced by Information and Communication Technology (ICT). For many young people, schools are the only place where such competencies and skills can be learned (OECD, 2008).

The forgoing seems to suggest that, governments are expected to make an effort to properly identify and conceptualise the set of skills and competencies required so as to incorporate them into the educational standards that every student should be able to reach by the end of compulsory schooling. For Governments to succeed in this process, there are two requirements they need to meet: participation of both economic and social institutions, ranging from companies to higher education institutions. However, all these processes risk being irrelevant to schools unless the set of skills and competencies become the very core of what teachers and schools should care about. This can only be done by incorporating them into the national education standards that are enforced and assessed by governments. From this discourse, assessment of such skills and competences is key across the learning areas.

There seems to exist different points of view on how competencies and skills should be imparted from the education curriculum. Some critical voices, such as that of the Common Core group (Njeng'ere & Lili, 2017), advocate for more emphasis on content and a broad liberal arts curriculum rather than the teaching of skills such as critical thinking or learning how to learn. The main argument from this point of view is that, although such skills are very important, they cannot be taught independently, they can only be learnt within a particular knowledge domain designated in the curriculum learning areas. This will enable learners to apply such skills based on the appropriate factual knowledge in that domain. However, from another perspective, some claim that although the concept of competency is extremely valuable for guiding how teaching and learning should unfold in the classroom; it usually represents the voices of businesses and firms.

In many ways, the rhetoric of 21st-century competencies is seen as yet another facet of an economist approach to education according to which its main goal is to prepare workers for knowledge-intensive economies or even in some cases for particular firms. Based on Organization for Economic Cooperation and Development (OECD, 2009) findings, most countries cover the skills and competencies in their regulations and guidelines for compulsory education. However, there are few specific definitions of these skills and competencies at the national or regional level with no clear formative or summative assessment policies for them. The only evaluation regarding their teaching is often left to external inspectors as part of their whole school audits. Similarly teacher training programmes seemingly do not fully target the development of 21st-century skills apart from developing teachers' ICT pedagogical skills which in most of them are optional. The OECD (2009) therefore, observes that these skills and competencies have been conceptualised in three dimensions: information, communication and ethics and their social impact.

The need for new skills for accessing, evaluating and organising information in digital environments together with the ability to model and transform information to create new knowledge is also imperative. The skills in this dimension may include research and problem- solving since they both involve; defining, searching for, evaluating, selecting, organising, analysing and interpreting information. Studies suggest that ICT applications make up a particularly appropriate environment for higher-order abilities like management, organization, critical analysis, problem resolution and the creation of information (Balanksat *et.al.*, 2006; Kirriemur & McFarlane, 2004; Sefton Green, 2002; Rosas *et.al.*2002; Cox, 1997; Bonnet *et.al.*, 1999).As also observed by Flynn(2007), changes that are the product of modernity such as activities with greater intellectual demand, greater use of technology and smaller families show that people today are much more used to thinking in terms of abstract concepts, like hypothesis and categories, than they were a century ago. This is exhibited by the progressive increase in new generation's performance in intelligence tests, creating

a phenomenon of ‘demystification’ of intellectual abilities that were previously limited to the top section of the population. This dimension may be associated with two sub-dimensions: *Information as a source* which includes; searching, selecting, evaluating and organising information. Anderson (2008) was quick to note that the great bulk of available information on the internet, as well as the proliferation of databases, make the ability to find and organize information quickly and efficiently as a critical skill. The presumption here is that the student first identifies and then clearly defines the information needed; knows how to identify digital information sources and; knows how to select the information required effectively and efficiently considering the problem to be solved. The students must be capable of evaluating how valuable and useful the source and its contents are for the task at hand, together with being able to store and organize the data. Skills and competencies belonging to this sub-dimension therefore may include: digital literacy, research and inquiry as well as the restructuring and modelling of information and the development of own ideas (knowledge). The students are therefore expected to show the ability to transform and develop information in a variety of ways to understand it better, communicate it more effectively to others and develop interpretations or one’s ideas based on a question, issue or task to be solved. Individual idea development is key, as it encourages students to generate their thinking. Skills that belong mostly to this sub-dimension are creativity and innovation, problem-solving and decision-making.

The communication dimension is imperative in preparation for students to be lifelong learners as well as members of a larger community with a voice and a sense of responsibility to others. Young people should be able to communicate, exchange experiences, criticise and present information aided by ICT applications to participate in and make positive contributions to the digital culture. Research suggests that ICT applications strengthen and increase the possibilities of communication and reinforce the development of skills of coordination and collaboration among peers. As supported by Dede (2009), videogames encourage young people to interact strongly with their peers, create meeting spaces, exchange experiences and reinforce skills of communication and collaboration. This provides an opportunity for “meta-understanding”; the process of reflecting on one’s learning (Squire & Jenkins, 2003). This dimension also has two sub-dimensions: *Effective communication* in which practical skills are needed to communicate effectively; these are linked to the use of the adequate available tools, the use of correct language and all other aspects that take the context into account to achieve effective communication. This sub-dimension therefore include skills such as; Information and media literacy, critical thinking and communication. It creates a platform where Collaboration and virtual interaction ICT supplies tools to support collaborative work among peers inside and outside school. This thereby provides constructive feedback through critical reflection on other’s work or through a spontaneous learning community where some take the role of students and others of teachers. Collaboration or teamwork, flexibility and adaptability are examples of skills that belong to this sub-dimension.

Globalisation, multiculturalism and the rise in the use of ICT also bring ethical challenges, so skills and competencies related to ethics and social impact are also important for the workers and citizens of the 21st century. As with the previous dimensions, there are two ethical sub-dimensions: Social responsibility implies that individuals’ actions may have an impact on society at large, both in a positive and negative sense. In terms of ICT for example, this refers to the ability to apply criteria for its responsible use at personal and social levels, acknowledging potential risks as well as the use of rules of behaviour that promote an adequate social exchange on the web. Critical thinking, responsibility and decision making are skills that are related to this sub-dimension. This dimension refers to the development of a consciousness about the challenges in the new digital age. For instance, there is consensus that the huge impact of ICT on social life is a matter that young people should reflect upon, considering the social, economic and cultural implications for the individual and the society. These skills and competencies are often referred to as digital citizenship. The impact of young people’s actions on the environment is another area that requires reflection and skills and competencies related to this also belong to this sub-dimension. From the discourses, it has been observed that such skills and competencies are imperative in the 21st-century learners, however, they

need to be domiciled in the education curriculum with clear guidelines on how they are learnt as well as their effective assessment approaches. To address the gist of this argument this paper attempts to answer the following questions:

1. How can the 21st-century Skills be mainstreamed in the Education Curriculum?
2. How best can the 21st-century skills be assessed in the Competency-Based Curriculum (CBC)?

Research Method

This is a paper review that intends respond to the question regarding mainstreaming of the 21st-century skills in the education curriculum and how best assessment of the curriculum may done. Various empirical studies have been reviewed to achieve this. Details of the materials reviewed are listed under reference section in this paper.

RESULT AND DISCUSSION

21st– Century Skills mainstreamed in the Education curriculum

The 21st-century skills are abilities and attributes that can be learned to enhance ways of thinking, learning, working and living in the world. The skills include: creativity and innovation; critical thinking; problem-solving; decision-making, learning to learn; metacognition, communication, collaboration (teamwork), information literacy, ICT literacy, citizenship both local and global, life and career skills, personal and social responsibility.

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In Competency-Based Education (CBE) several competencies like effective communication, critical thinking and lifelong learning are key to unlocking the limited abilities of labour in the 21st-century. Teaching is therefore characterized with practical activities that oscillate around real-life situations and simulations. The basis is the measure of what a student can perform either individually or in a group after completing a learning session. It is there for ean inter twined knowledge and skill-based approach that concentrates on measuring what a person can do as a result of learning (Umbleja, Kukk, & Jaanus, 2013). Hernández and Morales (2016) observe that strategic knowledge and skill CBE are integrated such that the fundamentals of the competency-concept, the competencies of students at different levels and areas must acquire to succeed are embedded in the occupational trends with related skill demands.

A study in the Netherlands by Volman *et al.* (2020) investigated how self-regulation, collaboration and creativity were embedded in the curriculum. In schools that had just implemented 2st-century skills in the curriculum, the skills were integrated into the traditional curriculum. However, in schools that had mainstreamed the 2st-century skills for quite some time, learner-centered approaches like project-based and inquiry learning were emphasized across curriculum. The study indicated that teaching 21st-century skills in the curriculum positively correlated with students' perception. Another study of innovative pedagogical practices using technology in 28 countries, (Voogt & Pelgrum, 2005) found an emphasis on fostering 21st-century skills through the use of technology. The study observed three foci in the way technology was used: single-subject, thematic and school-wide. In all three foci 21st- century skills were addressed, but in a different manner. In all three foci students and teachers were positive about the innovative practices. In the Single-Subject Curricular Focus technology was used to teach traditional content at a deeper level, emphasizing problem solving and critical thinking skills. The innovative technology-based practices in the Thematic Curricular Focus explicitly aimed at developing 21st-century skills, such as problem-solving, digital literacy and collaboration. This was accomplished through cross-curricular project-based or thematic learning activities that were organized in addition to a subject based curriculum.

The foregoing suggests that if the traditional curriculum is impregnated with learning activities such as internet search, group experiments, class presentations, group projects and creative tasks like designing and developing frameworks for problem resolutions among others then we may attain mainstreaming of the 21st-century skills in the curriculum. Change in the learning environment and the role of the teacher in the learning progress is therefore key in this curricular paradigm shift. The teacher in this case facilitates the learning process by supervising learning teams through the process. Learners are therefore tasked with the responsibility of full participation and taking charge of their learning process. This point is supported by Saavedra and Opfer (2012) who observed that the skills needed for the 2st-century are complex, cross-disciplinary and important for many different aspects of school and life and are much more demanding to teach and learn than rote memorization-based skills. That human nature shows us that we are intuitively curious and social. People want to understand how and why things happen, and want to engage in fulfilling relationships. This is why traditional curriculum cannot meet the expectations of the 21st-century workforce where teamwork, collaboration and group synergy building are the chief cornerstones to the success of organizations. Aligning the learning process to real-life situation is therefore imperative. This education shift allows learners to follow their natural curiosity and their engagement with others. The skills shift in education now provides students with the opportunity to develop cognitively and socially within the formal

learning environment, and within the curricular studies that each country believes are important for their citizens' futures. In the classroom, students can reflect on what is expected of them and explicitly acquire behaviours that demonstrate varying levels of proficiency in the skills. In particular, having students engage in meta-cognitive behaviours, in reflecting their learning, empowers them in the education process. It can enable them to monitor their progress.

The 21st-century skills classroom focuses on asking questions to encourage critical thinking, inquiry and reasoning. Learners are allowed to evaluate, synthesize and translate ideas to solve problems and complete projects. Teachers also encourage them to refine their reasoning and inquiry skills (The Hun School of Princeton, 2019). Learning environment organization is quite important in achieving 21st-century skills in today's classrooms. A positive learning environment begins with clear expectations and a sense of order. If learners know what is expected of them, they are more likely to meet those expectations. Creating a set of procedures for various classroom activities will also help keep things running smoothly. Make sure there is enough space for students to move around and that the furniture is arranged in a way that promotes collaboration. Encouraging students to take responsibility for their learning is another way to create a positive learning environment (BSD Education, 2023).

The learning process varies from one person to another; addressing differentiated learning is therefore key to the success of acquiring the 21st century skills. As guided by Tomlinson and Javious (2012), in developing differentiated or responsive instruction, teachers begin by planning with a specific group of students in mind. They may also choose to plan from the academic standards using grade-level expectations and differentiate "up" or "down" from that point. Classrooms at present therefore need to reflect the diverse cultures that exist to provide a range of perspectives and experiences that can help shape the minds of all the students in mainstream classes (Tomlinson, 2015). This suggests that the selection of a variety of instructional resources to address different learning styles in classrooms is key to the effective mainstreaming of the 21st-century skills in schools.

Management of learner participation in a 21st-century skills classroom is vital for an inclusive learning environment. Today's world requires a multi-dimensional approach to the learning experience. A 21st-century skills-based curriculum moves away from content acquisition and rote memorization and focuses on the skills and abilities that may best serve our generation of young minds. Learner engagement and hands-on, interdisciplinary learning are championed over conferring information (The Hun School of Princeton, 2019). This allows for creativity and imagination that may result in generation of novel knowledge and/or new frontiers for solving emerging 21st-century challenges.

In the 21st-century classroom, teachers are therefore facilitators of student learning and creators of productive classroom environments, in which students can develop the skills they need at present or in the future. As a 21st-century educator, it's important to be flexible and adaptable to teaching methodology and technology changes. With new technological advances, there are always new ways to teach the material. Likewise, new research on how students learn can impact how you teach. By being open to change, you can ensure that your students are getting the best education possible. The teacher is therefore: the controller; the prompter; the resource; the assessor; the organizer; the participant and the tutor (Neerukonda, V.R, 2020). This suggests that a teacher in this era should be a researcher, a learning designer of instructional resources that respond to differentiated learning as well as a learning event organizer for an effective learning experience provision.

21st-Century Competencies and Skills Assessed in the Competency-Based Curriculum (CBC)

Competency-based assessment is an approach to evaluating an individual's knowledge, skills and abilities based on specific competencies or task requirements. The focus is on measuring an individual's ability to perform a task or function and their potential for success in a particular role. The assessment typically

involves identifying the key competencies required for a particular task or role and designing assessments or evaluations that measure an individual's proficiency in these areas. This can involve a variety of methods, such as performance-based assessments, simulations and observations of task-related tasks.

Effective approaches to assessment used in competency-based education are both formative and summative. Formative assessment aims to provide immediate feedback to learners to improve the attainment of learning outcomes (McClarty, 2015). The CBE models can take a variety of forms, but they are mainly characterized by two common elements: a competency framework and competency assessments. The competency framework describes the "skills, abilities, and knowledge needed to perform a specific task (US Department of Education, 2014) Competencies must be clearly defined in measurable terms and must be related to the knowledge or skills needed for future endeavours, such as additional education or employment (Sally & Louis, 2014). This suggests that the CBE curriculum should clearly define their competencies and directly link them to material covered in their assessments. The feedback from such assessments should be empirically linked to external measures such as the future outcomes. This ensures the validity of the assessment tools.

Some scholars observe that assessments in a competency-based curriculum focus on the demonstration of specific skills and competencies which may include performance tasks, projects, portfolios, or real-world applications, providing a comprehensive understanding of students' abilities and progress. And that five categories of assessment may be employed: peer and self-assessment, group-based assessment, performance-based assessment, portfolio and technology-based assessment (UNESCO, 2023). A research project report to advise the UNESCO Institute for Statistics (UIS) in designing an instrument for the assessment of digital literacy skills regarding Sustainable Development Goal (SDG) Indicator 4.4.2, the following assessment approaches were suggested:

1. **Performance assessment**, where individuals are monitored by human observers or software while being engaged in solving authentic, real-life problems by using common software tools (e.g. browsers, word processors, spreadsheets) or simulations;
2. **Knowledge-based assessment**, where individuals are responding to carefully designed test items that measure both declarative and procedural knowledge and;
3. **Self-assessment**, where individuals are asked to evaluate their knowledge and skills with questionnaires that range from structured scales to free-form reflection (UNESCO, 2019).

Performance Assessments enable educators to identify students' progress and what adjustments to make to the class curriculum to ensure students are successful in their learning process. They also assist in evaluating the effectiveness of course lesson plans. A teacher may decide to use a diagnostic performance assessment before starting a new lesson to gain perspective on students' current level of knowledge of a topic and give the assessment once more at the end of the lesson to understand if the activities throughout the course were helpful to the students (Indeed-Career Guide, 2023). These assessments are often used to identify if students have gained knowledge of a learning area within a specified period of learning. They are mostly administered at the beginning and end of a learning session. In performance assessment students are often asked to use problem-solving skills or critical thinking to produce a report, experiment or give a performance that displays their ability to apply what they have learned.

The following criteria are used to administer performance assessments: use of relatable communication and situations; incorporation of multiple stages of completion of a task and problems that use creative thinking; asking learners to produce a product, report, experiment or performance; involve interaction between instructor and self; allow for self-evaluation; make testing standards and expectations obvious to the learners; administer assessments regularly in the classroom settings to monitor implementing the assessments and an

explanation of why the assessment is being used and how it will be evaluated (Indeed-Career Guide, 2023).

A knowledge-based assessment analyzes an individual's understanding of skills needed to do a task. There are five types of questions that test one's comprehension: True/False, Multiple Choice, Fill in the Blanks, Matching Items Together, and Written Expression (Report). A knowledge assessment is a final way of confirming one's understanding of a concept. The more core ideas are grasped, the better chance one has of retaining that knowledge. A good way to gauge one's current level of understanding is with a quiz or knowledge assessment. This assessment approach tests critical thinking skills for that specific idea. It is likened to running an update function and asking one's self: "Do I know what this means?" and then seeing how well one did (or not doing). And if we do not review our understanding periodically we may move to false conclusions, moving forward without realizing we need further study to solidify foundational ideas (Singapore Assignment Help, 2021). The knowledge-based assessment methods are: **Multiple choice questions (MCQ)**; **Written Answers (Short Answers)**; **Projects** (They encourage pro-activity and also need an extended duration for completion and are mostly presented in the form of reports); **Portfolio (this involves a collection of evidence that learners assemble and use as proof they have met certain performance criteria. Assists in proving that a learner has achieved the desired results)**; **Report writing** (A report is a form of extended written assignment that provides information and often includes recommendations for action); **Oral Questions**: these require learners to articulate their understanding through a verbal face-to-face question and answer (Q&A) process. It is useful when addressing a varied group of learners with varying literacy levels as the assessor can paraphrase questions to help candidates understand.

Self-assessment is an evaluative act carried out by a learner to monitor progress on his or her abilities, process and products out of a learning episode (Panadero et al., 2016; Brown & Harris, 2013; Epstein et al., 2008). Self-assessment should consider: strengths; skills to improve and goals to work towards. For instance strengths should include responsibilities, skills and other tasks in the role one is performing well; areas of improvement which are the tasks or skills one can improve upon and a potential plan to do so; values which refer to one's role one believes are important and any professional beliefs one is striving to uphold; goals set regarding what one would like to achieve over the next review period and; achievements one has accomplished based on previously set goals (Jennifer, 2022 as cited in Indeed-Career Guide, 2023).

Group work assessment is often based on the student's participation and contribution to the group. Thus, process skills and group work abilities, which require cooperation, constitute the most common substrate for group work assessment (Forsell *et al.*, 2021; van Aalst, 2013). However, Skills required both in the educational context and future working life can still be assessed based on group task allocation as well as an overall score for the group output. This is in the context of an individual's contribution towards general group success. A part from tasks undertaken in the group, there are normally some which are assigned to individuals to accomplish based on their abilities. The gist only lies in the ability of the assessor to develop an observation assessment tool that is both reliable and valid for this exercise. However, if group work assessment competency framework is not well designed then it may be a challenge to establish competencies of collaboration and communication from an individual learner and this is a skill key to successful team playing in the work industry for which we prepare our graduates.

What to assess in group work has been summarized by scholars (Forslund F. & Hammar C., 2011; Onyia & Allen, 2012; Orr, 2010) as the process and the intended outcome of the group's joint work; which includes: *contribution, knowledge and product*. Contribution comprises three aspects; (a) group interaction, (b) intellectual and (c) workload; *Group interaction* includes a member's ability to relate with other members during group work in terms of; (a) cooperation, (b) positive behavior and (c) communication; and the *Workload* each group member puts into group work. All these attributes of group contribution can form various items in an observation guide that may be employed for assessment.

Knowledge assessment in group work encompasses all aspects of knowledge that is generated from group work. It may be described as an outcome that can be assessed at both group or individual levels (McKechan & Ellis, 2012 and van Aalst & Chan, 2007) and may take form of both quantitative and qualitative nature concerning the group's product (McKechan & Ellis, 2012). Knowledge mastery and cooperative abilities are two aspects of knowledge pointed out by Forslund F. and Hammar C. (2011). The skills observed when students orally present group work are other examples of what is assessed (Earl, 1986; Lejk & Wyvill, 2001). All these can be included in the assessment tool for observing individual's participation in the group work.

Products, along with participation and contribution, are the typical components when grading group work (Alden, (2011). Scholars agree that both process and product always become intertwined with each other in an assessment (Kench et al., 2009; Li, 2001; Torres-Skoumal, 2001). Examples of products that may be assessed include: written reports and conference papers among others (Dingel, Wei, & Huq, 2013 and Kench et al., 2009).

CONCLUSION

This paper reached the following conclusions:

1. Creation of a classroom environment where learners freely participate in a lesson under supervisory guidance of a teacher is imperative for mainstreaming the 21st century skills in Education curriculum. This environment must cater for differentiated learning approaches with clearly defined learning outcomes well described in performance indicators for checks and balances for reporting progress in a learning process.
2. So many learning assessment strategies are available for an effective evaluation in a competency based curriculum. Knowledge, skills and values acquisition can effectively be assessed for tracking progress in learning as well as summative evaluation of learners. Self-assessment, knowledge-based assessment, performance assessment and group assessment strategies allow for both learning progress assessment as well as summative evaluation as long as they are based on a well-defined competency framework for competency assessment in any learning area or specialization.

RECOMMENDATION

This made the following recommendations:

1. Teachers in Kenya should create learning environment where learners freely participate for effective mainstreaming of the 21st century skills through adoption of differentiated learning strategies in terms of more democratic teaching methods, instructional resource rich environment and effective classroom management that brings order in a learning process.
2. Knowledge –based, Skill-based and value-based assessment strategies should be designed by teachers and educators in Competency based Curriculum to enable them keep tracking of progress in learning as well as giving summative evaluation report on learners. Teachers should therefore design a competency framework that provides performance indicators to expect during assessment.

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