

# TWENTY-FIRST CENTURY EDUCATION: IS KENYA HEADING TOWARDS THE RIGHT DIRECTION OF IMPROVING TEACHING AND LEARNING AS PRESCRIBED BY EDUCATIONAL TRANSFORMATION PROGRAMME?

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## Abstract

The past two decades have seen the emergence of a global movement that calls for a new model of teaching and learning for the twenty-first century. There is now a significant body of literature focusing mainly on three topics – motivations for a new model of teaching and learning, the specific competencies and skills needed to function effectively in the twenty-first century, and the pedagogy required to stimulate those capabilities. As the government of Kenya strives to transform her education system, one of the key questions that should be lingering in the minds of educators and policy makers and thus guide the process is: “Is twenty-first century education part of the overall educational transformation envisioned by Kenyan government?” If it is, this paper, based on literature review, looks at some of the developments that influence twenty-first century education in schools and discusses whether we are going into the right direction. Some of the issues discussed are the concept and framework of twenty-first century learning; instructional and learning theories; paradigm shift in the roles of teachers, learners and technology; twenty-first century skills; and a brief look at some of the pedagogies for twenty-first century teaching and learning which inform educational transformation programme.

**Keywords:** Twenty-first century education, teaching and learning, educational transformation programme, twenty-first century skills, pedagogy

## Introduction

Students in the twenty-first century are technology savvy. They have grown up in a fast-paced digital world, and easily tune out of the traditional lecture based classroom. Researching, communicating and even online job application across the world via computer or cell phone is a snap for them.

Liu (2010) mentioned that Web 2.0 technologies are emerging every day in spite the fact that there are already more than enough applications for people to use. YouTube, iTunes, Facebook, Myspace, Instagram, blogging, wikis, Tumbler, and twittering are some Web 2.0 social media technologies emerged in the market. The twenty-first century students are using these social media technologies in communication, recreation and education. These applications were not developed for learning purposes (Liu, 2010). Most people use them for recreational purposes such as gaming, communication, and shaping online spaces for expression of personal identity (Crook, 2008). Twenty-first century teaching

and learning involves a balance of the objectives of the teacher with the needs and input of the students as disclosed by McCoog (2008). The Facebook users (students) participate widely in the fields that allow them to present themselves to other users.

To effectively engage and teach twenty-first century students, the school systems must be outfitted with a prerequisite of ICT resources, and curricula must be designed to promote a collaborative learner-centered environment to which students will relate and respond.

As the vision of the new 2.6.3.3.3 curriculum framework in Kenya states in part:

.... enable every Kenyan to become an engaged, empowered and ethical citizen. This will be achieved by providing every Kenyan learner with world class standards in the skills and knowledge that they deserve, and which they need in order to thrive in the twenty-first century, (Benta, 2017), this paper discusses about the transformation programme in the Kenyan education system and whether Kenya is go-



ing into the right direction of providing every Kenyan learner with the skills and knowledge they deserve and need to thrive in the twenty-first century.

### Key Questions Discussed

The content of this paper is guided by the following key questions:

1. What is educational transformation programme?
2. What are the learning theories in the twenty-first century?
3. What are the paradigm shifts in the roles of the teacher, learner and technology in twenty-first century learning?
4. What are twenty-first century skills?
5. What is the twenty-first century learning framework?
6. What are the instructional pedagogies of the twenty-first century teaching and learning?

### Educational Transformation Programme

Generally, educational transformation means a systemic move from traditional educational system to a more modern and dynamic system in line with the social, cultural, economic, educational and technological needs of a particular time. Reigeluth and Carr-Chellman (2009) considered this move or change as a systemic or paradigm change from industrial-age education to post-industrial education. To transform education or do a paradigm shift from existing situation needs change in the mindset involving all stakeholders; community, teachers and students. The transformation programme discussed includes teaching and learning, school management and administration and educational technologies that influence twenty-first century education. This will be done in the context of definition of educational or instructional technology which was experienced from the time of audio-visual period in the 1920s to the ICT period of the 2000s

The 1994 definition states that educational technology is the theory and practice of designing, developing, utilizing, managing and evaluation of processes and resources (Seels & Richey, 1994). The 2004 definition states that “educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources” (Januszewski & Molenda, 2008, p. 1).

How do these definitions explain the school transformation programme? Does the new definition fit the twenty-first century learning? Let us analyze this definition and justify whether our new curriculum framework is heading the right direction to prepare our teachers, students, and administrators for the twenty-first century learning.

The key words in the previous and present definitions are: to facilitate and improve instruction and learning. But the new definition emphasized the study and ethical practice of facilitating and improving learning and performance. Both definitions are quite similar that involve the study or theory and practice of facilitating and improving teaching and learning. The only difference is that the new definition emphasizes on ethical practices of creating, using and gathering of information beyond the traditional conceptions of research. There is abundance of online information that can facilitate research and this ethical practice is reflected in the twenty-first century learning framework which will be discussed later in this paper. So coming back to the notion of facilitating and improving teaching and learning, does educational technology as a product and process help teachers to teach, students to learn, administrators to manage instruction and curriculum relevant with present learning? We will look into some of the instructional and learning theories and the new developments in teaching and learning strategies and the role of technology and media in twenty-first century education.

### Learning Theories in Twenty-first Century

Understanding the various learning theories and how these theories evolved from behaviorism to cognitivism, constructivism and now connectivism help teachers to meet the challenges of twenty-first century learning. Teachers need to analyze all the learning theories and how each theory contributes and facilitates teaching and learning. Each of these theories emerged according to time, situation and the technology used at that time. Behaviorism was popular in 1950's where learning happens when there is a change in behavior using Skinner's programmed instruction machine; cognitivism in 1960's where learning is caused by mental structure as in information processing theory and the influence of computer; constructivism in 1980's an extension of cognitivism where learning happens when a learner is able to construct new knowledge with the help of ICT and finally

connectivism in twenty-first century where learning happens when learners are connected using web-based or online materials using mobile technologies and social media.

Twenty first century teachers must be smart when and where to apply these theories. Most educators believed using a combination of these theories (eclectic approach) will help solve teaching and learning problems. In twenty-first century learning, as mentioned earlier teacher plays the role of a facilitator making learning more learner-centred, autonomous and self-directed. There is abundance of online materials to choose and learners need to have the digital skills to use ICT to access the materials and use them just in time. They need to be connected with the technology and peer group to form global classroom to construct and create new knowledge and skills.

### **Paradigm Shift and New Roles in 21st Century Learning**

#### **New Roles for Teachers**

Learning in twenty-first century calls for new roles for teachers, students and technology. Teachers do not take the role of the "sage on the stage." Instead, teachers act as a "guide on the side," providing students with opportunities to test the adequacy of their current understandings.

#### **New Roles for Students**

The expectation within the new roles in the twenty-first century learning environment is that the students play a more active role in, and accept more responsibility for their own self-directed learning.

#### **New Roles for Technology**

New roles of technology in the new paradigm is to be a tool for learners to be self-directed learners, for life-long learning and at the same time to fulfill 4 major functions for the teachers: a) Keeping track of students' progress, b) plan student project in project-based learning, c) facilitate instruction to provide immersed learning as in simulation and virtual leaning environment and d) provide personalized learning (Reigeluth & Carr-Chellman, 2009).

At this point there is need for reflection about the new 2.6.3.3.3 curriculum framework for Kenya:

Does the framework project these paradigm shifts in the new roles of the teacher, learner and technology in twenty-first century learning? There is need for critical scrutiny whether Kenya is going into the right direction.

#### **Twenty-first Century Skills**

According to the Glossary of Education Reform (2016), the term **twenty-first century skills** refers to a broad set of knowledge, skills, work habits, and character traits that are believed—by educators, school reformers, college professors, employers, and others—to be critically important to success in today's world, particularly in collegiate programs and contemporary careers and workplaces.

While the specific skills deemed to be "twenty-first century skills" may be defined, categorized, and determined differently from person to person, place to place, or school to school, there is a general consensus that the term includes but not limited to the following list of knowledge, skills, work habits, and character traits commonly associated with twenty-first century skills:

- Critical thinking, problem solving, reasoning, analysis, interpretation, synthesizing information
- Research skills and practices, interrogative questioning
- Creativity, artistry, curiosity, imagination, innovation, personal expression
- Perseverance, self-direction, planning, self-discipline, adaptability, initiative
- Oral and written communication, public speaking and presenting, listening
- Leadership, teamwork, collaboration, cooperation, facility in using virtual workspaces
- Information and communication technology (ICT) literacy, media and internet literacy, data interpretation and analysis, computer programming
- Civic, ethical, and social-justice literacy
- Economic and financial literacy, entrepreneurialism
- Global awareness, multicultural literacy, humanitarianism
- Scientific literacy and reasoning, the scientific method
- Environmental and conservation literacy, eco



systems understanding

- Health and wellness literacy, including nutrition, diet, exercise, and public health and safety

systems necessary for twenty-first century learning outcomes (Kay, 2008). It has been used by thousands of educators and hundreds of schools in the U.S. and abroad to put twenty-first century skills at the center of learning.

**The Twenty-first Century Learning Framework**

The Framework for Twenty-first Century Learning was developed with input from teachers, education experts, and business leaders to define and illustrate the skills, knowledge and expertise students need to succeed in work, life and citizenship, as well as the support

The Framework represents both twenty-first century student outcomes (as represented by the arches of the rainbow) and support systems (as represented by the pools at the bottom). Figure 1 is a graphic representation of twenty-first learning framework.

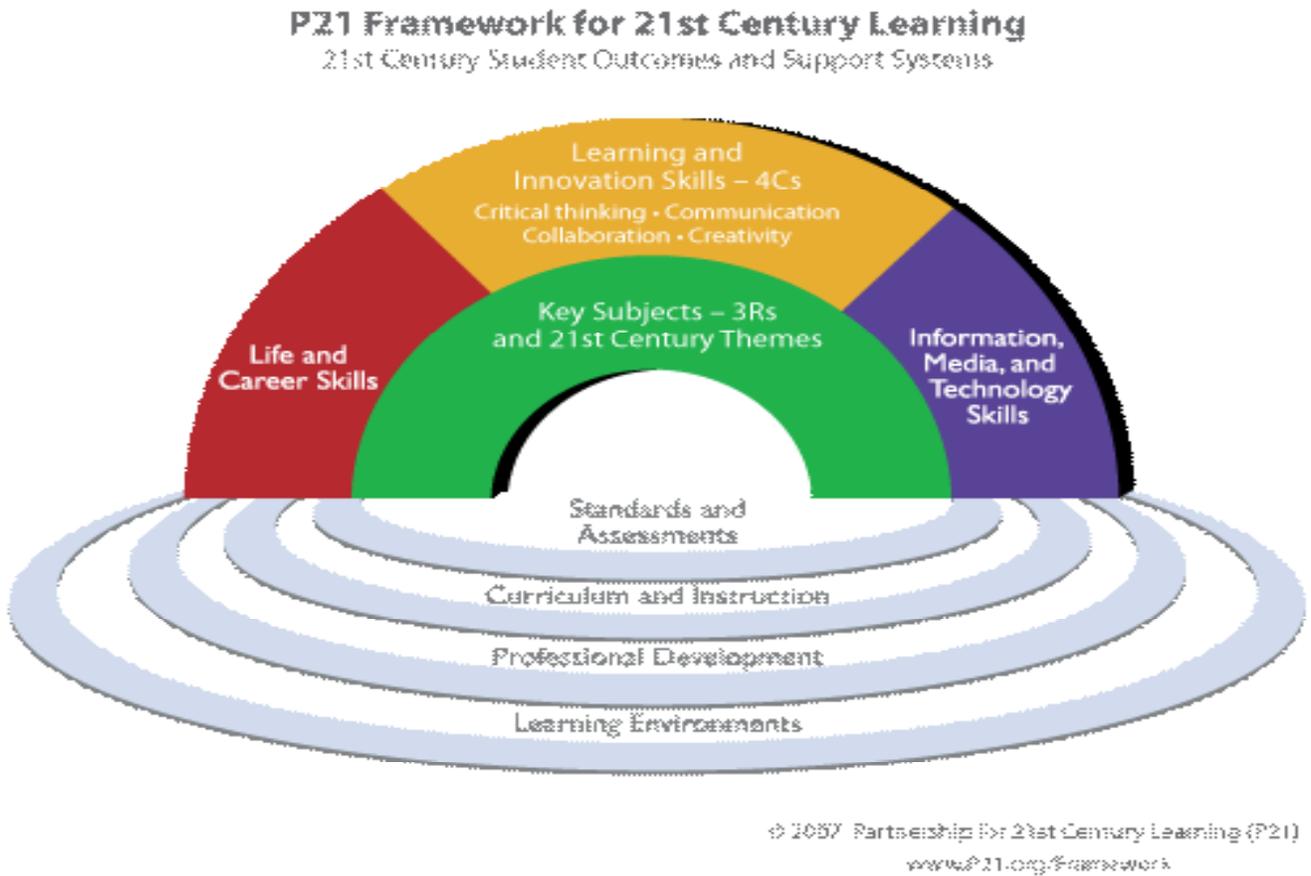


Figure 1. P21 framework for twenty-first century learning

**Twenty-first Century Student Outcomes**

The elements described in this section as “twenty-first century student outcomes” (represented by the rainbow) are the skills, knowledge and expertise students should master to succeed in work and life in the twenty-first century.

- Core subjects and twenty-first century themes**  
Mastery of fundamental subjects and twenty-first century themes is essential for students in the twenty-first century. Core subjects include:

**English, reading or language arts, World languages Arts, Mathematics, Economics, Science, Geography, History, Government and Civics**

In addition to these subjects, schools must move beyond a focus on basic competency to promoting understanding of academic content at much higher levels by weaving twenty-first century interdisciplinary themes into core subjects:

- Global Awareness; Financial, Economic, Business and Entrepreneurial Literacy; Civic Literacy; Health Literacy; and Environmental Literacy.
2. **Learning and innovation skills**  
Learning and innovation skills increasingly are being recognized as the skills that separate students who are prepared for increasingly complex life and work environments in the 21st century, and those who are not. A focus on the 4Cs: creativity, critical thinking, communication and collaboration is essential to prepare students for the future
  3. **Information, media and technology skills**  
Today we live in a technology and media-suffused environment with: 1) access to an abundance of information, 2) rapid changes in technology tools, and 3) the ability to collaborate and make individual contributions on an unprecedented scale. To be effective in the twenty-first century, citizens and workers must be able to create, evaluate, and effectively utilize information, media, and technology skills to search and select useful information in the Internet, select and use appropriate media.
    - Media literacy, Information literacy and ICT literacy.
  4. **Life and career skills**  
Today's life and work environments require far more than thinking skills and content knowledge. The ability to navigate the complex life and work environments in the globally competitive information age requires students to pay rigorous attention to developing adequate life and career skills, such as:
    - Flexibility and Adaptability. Initiative and Self-Direction, Social and Cross-Cultural Skills, Productivity and Accountability, Leadership and Responsibility

### Twenty-first Century Support Systems

The elements described below are the critical systems necessary to ensure student mastery of twenty-first century skills. Twenty-first century standards, assessments, curriculum, instruction, professional development and learning environments must be aligned to produce a support system that produces twenty-first century outcomes for today's students.

### Pedagogies for the Twenty-first Century Teaching and Learning

Rethinking pedagogy for the twenty-first century is as crucial as identifying the new competencies that today's learners need to develop. Traditional approaches emphasizing memorization or the application of simple procedures will not advance learners' critical thinking skills or autonomy. To develop the higher-order skills they now need, individuals must engage in meaningful enquiry-based learning that has genuine value and relevance for them personally and their communities. Real-world experiences merged with sustained engagement and collaboration offer opportunities for learners to construct and organize knowledge; engage in detailed research, enquiry, writing and analysis; and communicate effectively to audiences (Barron & Darling-Hammond, 2008).

How can teachers and educators best support learners develop essential skills for the twenty-first century? People learn in a variety of ways, so the challenge for teachers is to discover which approaches help them learn *most effectively*. Until a teacher becomes familiar with a learner's individual strengths and needs, it is difficult to know which learning methods and pedagogy will have a positive impact on that person. Nevertheless, research suggests that some forms of pedagogy are consistently more successful than others in helping students acquire a deeper understanding of twenty-first century skills. Pedagogies that support deeper learning include personalized learning strategies, collaborative learning and informal learning (Gijsbers and van Schoonhoven, 2012; Leadbeater, 2008; Learnovation, 2009; Redecker & Punie, 2013).

Which pedagogies offer learners the best opportunities to acquire competencies and skills needed to thrive in twenty-first century learning? The following sections describe the specific pedagogies and perspectives that will promote such learning.

### Pedagogies that Foster Quality

The Sustainable Development Goal on education for 2030 aims to 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all' based on four priority areas: (i) expanded access to quality learning for all, at all levels of education; (ii) attention to the quality of education, including content and relevance, as well as learning outcomes; (iii) a greater focus on



equity; and (iv) gender equality with a renewed focus on enhanced access for girls and women to post-basic and post-secondary education in safe and supportive learning environments. Fundamentally, quality learning requires highly competent and committed teachers employing active pedagogies (UNESCO-IBE, 2013). To achieve these goals, Kenya must ‘ensure that there is an adequate supply of well-trained and motivated teachers and school leadership; improve teachers’ training, conditions of service and deployment; and offer ample professional development opportunities’

### **Pedagogies that Foster Participation**

Gone are the days when people learned and worked in isolation. Today, learners regularly take part in online communities where they share opinions, critique ideas, swap insights and comment on each other’s plans and aspirations (Davidson & Goldberg, 2009). Social media have transformed teaching and learning environments by making it convenient for learners to engage with their peers, teachers, subject-matter experts and the community-at-large.

### **Pedagogies that Personalize and Customize Learning**

With personalized and customized learning, lessons no longer have to adhere to the ‘one-size-fits-all’ approach characteristic of traditional education systems. As people learn in a variety of ways and may take multiple pathways to skills acquisition, education must be reorganized around each ‘learner’s journey’ (Leadbeater, 2008).

With personalized learning, individuals approach problems in their own way; grasp ideas at their own pace, and respond differently to multiple forms of feedback (Hampson, Patton, & Shanks, 2011).

### **Pedagogies that Emphasize Project and Problem-based Learning**

Project and problem-based learning are central to twenty-first century pedagogy. With project and problem-based learning, students learn by designing and constructing actual solutions to real-life problems (Cornell University Center for Teaching Excellence, 2014).

Project and problem-based learning are ideal instructional models for meeting the objectives of twenty-first century education, because they employ the 4Cs Principle – critical thinking, communication, collaboration and creativity – alongside ‘teaching for

transfer’ and learning structured in real world contexts. Solving real-world problems draws on multiple forms of expertise (P21, 2007).

### **Pedagogies that Encourage Collaboration and Communication**

Collaboration is a twenty-first century trend that shifts learning from teacher or lecture-centred settings to collaborative ones. With the development of new ICTs innovative forms of collaboration are also emerging (Leadbeater, 2008). Collaborative learning – the intentional grouping and pairing of learners for the purpose of achieving a learning goal – has been widely researched. Smith and MacGregor (cited in Barkley, Cross, & Howell-Major, 2014) note that collaborative learning is a broad term for a ‘variety of educational approaches involving joint intellectual effort by learners, or learners and teachers together. In most collaborative learning situations, learners work in groups of two or more, mutually searching for understanding, solutions, or meanings, or creating a product’.

### **Pedagogies that Engage and Motivate the Learners**

In a twenty-first century learning environment, new and engaging ways must be developed that depart from the standard school ‘transmission model’ and increase learner-engaged learning. Given the importance of fostering motivation for independent learning, research emphasizes the importance of the teacher’s role in motivating learners and finding ways for them to build intrinsic motivation (Malone & Smith, cited in Meyer, Haywood, Sachdev, & Faraday, 2008). According to these authors, motivation is based on developing the interest of learners, maintaining their involvement and encouraging confidence in their abilities to perform a specific task. Teachers can foster learning and motivation by ensuring that success is recognized and praised.

### **Pedagogies that Cultivate Creativity and Innovation**

Innovation and creativity are very valuable competencies in knowledge societies. In today’s economy, innovations emerge from improvisational teams (Sawyer, 2006). Creativity is deeply social, with most creative insights typically emerging from collaborative and creative circles. Few schools teach students to create knowledge; instead learners are taught that knowledge is static and complete, and they become

experts at consuming knowledge rather than producing it. McLoughlin and Lee (2008) argue however that the ultimate goal of learning is to stimulate learners' capacities to create and generate ideas, concepts and knowledge. To this end, there is a need for meaningful learning experiences that tap into and expand learners' creativity, not extinguish it (Robinson, 2006).

### **Pedagogies that Employ Appropriate Learning Tools**

There are many different instructional tools available to teachers to stimulate learning and help learners create new knowledge in collaboration with their peers. These include:

- Strategic questioning
- Mobile technologies
- Social media

### **Pedagogies that Involve Relevant and Real-world Learning Activities**

To ensure effectiveness, any curriculum must be relevant to the lives of students (Mansilla & Jackson, 2011; Perkins, cited in Saavedra and Opfer, 2012). Learning activities that are designed to connect student experiences to real-world problems will transform their focus. The Partnership for 21st Century Skills (P21, 2007) echoes this point: 'when students realize the connection between what they are learning and real world issues that matter to them, their motivation soars, and so does their learning' McLoughlin and Lee (2008) stress that, above all, learning tasks should be authentic, personalized, experiential, learner-driven and designed, and enable the creation of content and innovative ideas by learners.

### **Pedagogies that Teach Metacognitive Skills.**

Put simply, metacognition is 'thinking about one's thinking'. More precisely, it refers to the processes used to plan, monitor and evaluate one's understanding and performance.

Metacognition reflects an individual's critical awareness of how they think and learn, and their assessment of themselves as a thinker and learner. Metacognition is not solely an intrinsic talent; it can be taught and cultivated. Teachers can cultivate a metacognitive culture that promotes greater learning by giving learners 'permission' to identify their confusion, asking them what they find confusing and acknowledging their difficulties.

### **Pedagogies that Build the Right Relationships for Learning**

Relationships for learning are gaining new importance in the twenty-first century. New learning experiences will be collaborative, project or problem-based, and supported by relationships that allow students to practice new competencies of collaboration and communication until they master these skills (RAND Corporation, 2012). Quality learning and teaching are grounded in powerful relationships built on mutual respect and trust. Learning often results from the way in which ideas are shared, including between the teacher and the student. Leadbeater (2008) emphasizes that learners need relationships that will motivate them to learn.

### **Pedagogies that Emphasize Learner-centered Models**

Twenty-first century learning must be relevant, engaging, effective and learner-centric (Vockley and P21, 2007). It is therefore essential to replace out-moded 'closed classroom' models of teaching and learning, which emphasize delivery of information by an instructor and/or from a textbook, with new more learner-centric models (McLoughlin & Lee 2008). Twenty-first century pedagogy should lay greater emphasis on learners taking responsibility for their own learning and the development of education systems that nurture such responsibility (Davies, Fidler, & Gorbis, 2011; Facer, 2011).

### **Pedagogies that Promote Learning Without Borders (Anytime and Anywhere)**

The emergence of learning spaces beyond classrooms and schools, and growing recognition of the importance of learning and relearning outside the formal education and training system, offer learners many new options (Taddei, 2009). The meaningful use of new technologies in the home may also increase opportunities for learner-driven forms of learning (Furlong & Davies, 2012). People can learn anytime and anywhere. Mobile devices will also make learning possible anywhere and at any time,

### **Pedagogies that Promote Learning Through Open Education**

There is a gradual move away from classroom-based learning towards anyplace, anytime learning and open education. The Partnership for 21st Century Skills (P21, 2007) maintains that develop-



ing a robust, engaging twenty-first century curriculum and employing twenty-first century pedagogies require educators to ‘look outside schools and seek ideas, resources, and expertise where they are found – in their communities; in professional and educational groups; and in individuals, schools, and organizations around the world.

### **Accrediting and Credentialing Non-traditional Learning**

How will accreditation and credentialing of informal learning activities be addressed in the twenty-first century? While formal qualifications will most likely remain central to gaining new employment, informally acquired skills must be better acknowledged. Redecker and Punie (2013) argue that mechanisms must be established to allow learners obtain formal recognition of efforts to upgrade work skills through informal training, both inside and outside the workplace. Experts polled by Redecker et al. (2011) noted repeatedly that informally acquired skills must be better recognized and structures put in place to allow people to obtain formal recognition for their experiences and skills. UNESCO (2012) has echoed these views, stating that there is a need to assess and validate skills and competencies developed beyond formal education and training.

### **Assessment for Deeper Understanding and Competency**

Twenty-first century assessment is inextricably linked to instruction and should be used to inspire deeper learning. To evaluate deeper understanding, it is essential to assess the extent to which learners’ knowledge is integrated, coherent and contextualized (OECD, 2008). It is not possible to address the issue of transforming twenty-first century instruction without also addressing formative assessments – assessments that enable a teacher to evaluate learning while it is occurring. Formative assessment is especially beneficial for clarifying learning goals, ensuring continuous monitoring, providing feedback, responding to learners’ progress, encouraging adaptation and improvements in learning outcomes, and involving students in meaningful self and peer assessment (Facer, 2011; National Research Council, 2012). Formative assessments enable diagnosis of learning gaps, so they can be addressed before they lead to more fundamental misunderstandings of knowledge or misapplication of skills.

### **Conclusion**

The transformation in the education system in Kenya to 2.6.3.3 is a move in the right direction if this transformation is directed towards combating the challenges of the twenty-first century generation such as unemployment, digital illiteracy, lack of life and career skills, environmental degradation, etc, as highlighted in the twenty-first century learning framework.

The researchers, therefore, recommends that all stakeholders, teachers, academics, other researchers, policy makers, curriculum designers, and educationists - all those who have the means to influence the direction of education in Kenya should critically examine the new curriculum of 2.6.3.3 education system to ensure that the aims and objectives, content, methodology and evaluation systems conform to:

- the learning theory of the 21st century;
- the paradigm shift in the roles of the teacher, students and technology;
- the twenty-first century skills that the learners ought to learn;
- the twenty-first century learning framework; and
- the pedagogies and assessment strategies of the twenty-first century.

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