

Towards Articulating Meaning and Provisions for 21st Century Skills in Nigerian Secondary Schools- A Secondary Study

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Abstract-- 21st century skills are critical competencies and attitudes that individuals must have to be productive citizens in the 21st century knowledge economy. It is therefore critical to ensure that these skills are being taught and learnt in schools to prepare young people for life and work as successful citizens. Three research questions are posed and a desktop study is conducted to articulate a contextual meaning for 21st century skills, analyse the policy provisions and required supported needed to ensure teaching and learning of 21st century skills in Nigerian secondary schools. An extensive literature review is conducted to draw comparison and synthesize meaning and articulate the state of practice in 21st century teaching a learning standards. In answering the research questions, clear requirements for ensuring that teaching and learning of 21st century skills is happening in schools have been documented with reference to important literature. The conclusion is that the Nigerian education policy and curriculum falls short of global and regional standards of provisions in response to the needs of 21st century workforce and the recommendation is an urgent revision of the current curriculum to make explicit recognition of and provisions for teaching and learning of 21st century skills in Nigerian secondary schools. Particularly, it is recommended that the curriculum developers create a 'learner exit profile' to serve as the vision of graduates that should be produced by a 21st century skills sensitive curriculum.

Keywords— 21st Century skills, P21, Nigeria Education Policy, Secondary School Education, Secondary school curriculum

I. INTRODUCTION

Previous research has highlighted that the teaching of 21st century employability skills in Nigerian tertiary institutions is "low" [1], [2]. [3] also reported that secondary school teachers' level of awareness of 21st century skills was "just moderate" inferring that they could not transfer such skills to their students. The importance and impact of possessing the 21st century skills create a need to research the requirements for ensuring that it becomes integrated into the education system at all levels of learning.

21st century skills are difficult to define [4]. As such, there is currently no unified definition of 21st century skills. We know that 21st century skills are essential skills needed, in today's world, to harness the opportunities available to lead a successful life as valuable members of society [5], [6]. There are numerous reports and studies attempting to articulate a

definition of 21st century skills. These form the background for harmonising a definition in this dissertation.

Among Nigerian secondary school teachers, [7] and [8] reported that the awareness of 21st century skills is also low stating that there were deficiencies in promoting the teaching of 21st century skills as teachers do not possess these skills themselves. [1], [3] also investigated aspects of 21st century skills among tertiary education students in Nigeria concluding that the level of 21st century skills was 'low'. The works did not reference any existing framework for the definition of 21st century skills which will allow replicability across different contexts. Other researchers have investigated the teaching and learning of 21st century skills in different contexts reporting varying levels of segments of 21st century skills. [9], [10] and [11] assessed 21st century skills in primary school secondary schools respectively. These are important research, however, none of these considers explicitly what it takes to teach and learn the skills in the first place. So far, there has not been any investigation of 21st century skills in Nigerian secondary schools discovered in the literature.

The most recent National Policy on Education document does not use the term 21st century skills [12]. Studies available have also not situated the definition of 21st century skills in the Nigerian Education context. Furthermore, there is a wide spectrum of definitions for 21st century skills and it seems there is no consensus. It is therefore important to harmonise and synthesize a definition 21st century skills and situate it in the context of the provisions of the Nigerian Education Policy.

A. Research Questions

Following from the above stated aims and objectives, the **research questions** to be investigated are:

- Q1. How do we define 21st century skills for Nigerian Secondary schools?
- Q2. How are 21st century skills provided for in the Nigerian Secondary school curriculum and policy?
- Q3. How do we ensure teaching and learning of 21st Century skills in Nigerian Secondary school?

B. Significance of research

79.3 million individuals in Nigeria are currently within the basic education school age bracket (0-14 years) representing 41% of Nigeria's population, according to [13, p. 8,12]. Also, 10.3 million of individuals were enrolled in secondary school during the 2015/2016 session across the country [14]. This represents a huge proportion of the Nigerian population that can benefit from teaching 21st century schools in Secondary schools.

One of the goals of the National Policy on Education is the "Development of the individual into a morally sound, patriotic and effective citizen" [15, p. 2]. 21st century skills have been described as skills that provide individuals with the ability to be valuable members of society [6]. With the enormous school age population and the government's compulsory basic education policy, articulating a definition and contextualizing 21st century skills to enable integration into the Nigerian education curriculum is critical to achieving the goals articulated in the national policy on education.

II. LITERATURE REVIEW

The 21st century is associated with the rapid development of technology and the emergence of the knowledge economy. Success in previous times depended on learning hard-fast rules and techniques and repeating them consistently to create required products. In the 21st century and knowledge economy however, success factors have shifted especially because the rate of change is significantly substantial. People can now expect to experience several dramatic changes in just a life time of a few decades. The implication of this is that individuals are rewarded for their ability to 'figure things out' for themselves and others rather than for know a lot of facts. Brain power is rewarded over muscle power [16, p. 13].

This work therefore studies the literature on so-called "21st century skills" with the aim of articulating a working definition that can support teaching and learning them in a school environment. The work will go further to review how the formal curriculum in different countries makes the right provisions to ensure that students are empowered with the right skills for the 21st century. This work focuses on making recommendations for Nigerian secondary schools. However, it will draw on knowledge from broad selection of literature in developing its conclusions.

A. Emergence of 21st century skills concept

The term '21st century skills' (21CS) originated from the United States of America (USA) when in 1983, a report titled "A Nation at Risk" was published at the instance of the then US Secretary of Education who created the National Commission on Excellence in Education to enquire and make recommendations on the quality of education in the US. This was supposed to be to enable a proactive response to the perceived threat of other emerging economies to the hitherto superior American workforce. The commission noted:

"The time is long past when American's destiny was assured simply by an abundance of natural resources and inexhaustible human enthusiasm, and by our relative isolation from the malignant problems of older civilizations. The world is indeed one global village. We live among determined, well-educated, and strongly motivated competitors...Knowledge, learning, information, and skilled intelligence are the new raw materials of international commerce and are today spreading throughout the world as vigorously as miracle drugs, synthetic fertilizers, and blue jeans did earlier." [17]

The commission made recommendations under five headings-content, standards and expectations, time, teaching and Leadership and fiscal support. Under content, the mention the "New Basics" that must be taught to all students – English, Maths, Science, social studies and computer science. On top of these, foreign languages and rigorous extra-curricular activities [18]. It is important to highlight that in defining the benchmark for the "New Basics", there is an emphasis on application to everyday life thus indicating a definite move from simply acquiring knowledge. It was on the backdrop of this report that efforts to develop curriculum that support the recommendations sprang up across the USA and spread across the world.

B. Review of Different Frameworks of 21st Century skills

Today, there are still multiple views on the definition of 21CS [4]. This is a testament to the very nature of the set of skills which are not concrete like the skills needed in the 20th century industrial age but rather more fluid and amenable to context and widely transferable [19]. From the literature, it is agreed that 21CS frameworks consist of a set of core skills in addition to critical soft and social skills. Below a number of core 21CS frameworks are outlined.

1) *Partnership for 21st Century skills (P21) Framework*: The Partnership for 21st century skills (P21) consortium, which was created in 2002 is responsible for coining and popularising the term. P21 outlined the 'four Cs of 21st century learning' (4Cs) of Communication, Collaboration, Critical thinking and Creativity in addition to core subjects that students must learn and support systems that make learning and teaching effective [20], [21]. The P21 framework consists of ten core subjects, five 21st century cross-cutting themes and three skills.

P21 emphasises three important things: one, mastery of the core subjects, two, ability to think critically around these subjects i.e. high-order thinking and three, the cross-cutting nature of the 21st century learning themes. Also noteworthy is that "world languages" features as a core subject as one of the defining features of the 21st century is internationalisation. The framework also highlights the need for supporting systems around assessment and teacher professional development.

2) *OECD Framework*: The 2005 Organisation for Economic Co-operation and Development (OECD) framework has three themes, each having a set out outcomes describing its goal. This framework was to support the programme for

international students' assessment (PISA). First is "interacting in heterogeneous groups" having: relate well to others; cooperate, work in teams; manage and resolve conflicts as outcomes. Second is "using tools interactively" with outcomes including use language, symbols and text interactively; use knowledge and information interactively; and use technology interactively. The third theme is "acting autonomously" and the outcomes here are: act within the big picture; form and conduct life plans and personal projects; defend and assert rights, interests and needs [23].

Table I: P21 Framework [22]

Core Subjects	English, reading, or language arts, World languages, Arts, Mathematics, Economics, Science, Geography, History, Government and Civics
21 st Century themes	global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy; health literacy; environmental literacy;
Skills	Learning and innovation skills (Creativity and Innovation, Critical Thinking and Problem Solving, Communication and Collaboration); Information, Media, and Technology Skills (information literacy, media literacy, technology literacy); and Life and Career Skills (Flexibility and Adaptability, Initiative and Self-Direction, Social and Cross-Cultural Skills, Productivity and Accountability, Leadership and responsibility)

It is easy to draw parallels between the OECD and the P21 framework. The need for internationalisation for example, is captured in the first theme. However, the framework does not discuss teacher professional development or how these relate to core subjects.

3) *The enGauge Framework*: The enGauge framework presents four themes around which the 21st century skills are woven in triplets: First, *inventive thinking* which includes Adaptability, managing complexity and self-direction; Curiosity, creativity and risk taking; Higher order thinking and sound reasoning. Second, *Effective communication* comprising Teaming, collaboration and interpersonal skills; Personal, social and civic responsibility; Interactive communication. Third is *Digital-age literacy* comprising Basic, scientific, economic and technology literacies; Visual and information literacies; and Multicultural literacy and global awareness. And Fourth, *High productivity* including Prioritising, planning and managing for results; Effective use of real-world tools; and Ability to produce relevant, high quality products [24]. Again, parallels are easy to draw. Similar themes include internationalisation, Effective communication, digital literacy, interactivity and productivity.

All frameworks and definitions of 21st century skills recognise the need for excellence in a set of core subjects which still remain the foundation of all work and society but also put an emphasis at the same level of rigor on other skills that have now become critical to survival in the 21st century [16], [24]–[26]. These other skills generally focus on developing the

ability to apply knowledge from core subjects to everyday life situations which are now more diverse, as well as being able work I teams and apply modern tools to produce and present solutions to problems including to an international audience.

C. Defining 21st Century Skills

Binkley *et al.* (2012) conducted work around defining 21CS and they developed the KSAVE (Knowledge, Skills and Attitudes, Values & Ethics) model which helped summarise the various models defining the 21CS. The KSAVE model enabled the extraction of ten concrete skills under four groups. The first, **Ways of Thinking**, consisting of Creativity and innovation, Critical thinking, problem solving, decision making and Learning to learn, metacognition. The second, **Ways of Working**, consisting of Communication and Collaboration (teamwork). The third, **Tools for Working**, consisting of Information literacy (includes research on sources, evidence, biases, etc.), ICT literacy and the fourth, **Living in the World**, consisting Citizenship – local and global, Life and career and Personal and social responsibility – including cultural awareness and competence. The four groups identified can provide a general framework for identifying concrete skills that should be included in the 21CS box. As [4] observe, the term, 21CS, is usually used to encompass a variety of competencies that the society now demands of the workforce. The output of their systematic review produced five skills that featured across the literature namely: Communication skills, Collaborative skills, Individual learning approaches, Individual autonomy, ICT and digital literacy. In addition to these are three knowledge areas of Literacy, Numeracy and STEM knowledge. These areas overlap significantly with the skills mentioned by [19]

These more recent attempts to harmonise a definition along with the historical 21CS frameworks provide a veritable platform for articulating a contextualised definition for the Nigerian context.

D. Review of Policy and Curriculum Support for teaching and learning 21st Century skills

This section surveys curriculum and policy around the world describing the provisions available for 21CS acquisition in schools. A brief review of current provisions in some selected countries is provided.

1) *Wales: Successful futures* [6]: The 2015 review of the Welsh curriculum uses the term "twenty-first century" five times. The aim of the curriculum review was to ensure learners' current needs are met and provision is made for their future lives. The document highlights a move from an inputs focused curriculum to an outcomes focused one, framed around skills, competencies and capacities rather than raw subject facts. In the spirit the 21st century movement, the document states that the current curriculum no longer meets the needs of children and young people in Wales! The review recognised that ICT is as important as Literacy and Numeracy in the 21st century, needs international perspective. The

curriculum recommends six areas of learning namely: Expressive arts; Health and well-being; Humanities; Languages, literacy and communication; Mathematics and numeracy; and Science and technology. Literacy, numeracy and digital competency are considered as cross cutting learning areas. This recommendation is in line with established frameworks for 21st century learning. Four 'wider skills' are also recommended as part of the curriculum: critical thinking and problem solving, planning and organising, creativity and innovation, personal effectiveness. It is clear that these align with the current thinking around a 21st century curriculum which is responsive to the needed skills.

The curriculum further highlights the critical importance of teaching to effective learning. Good teaching is defined to encompass subject knowledge expertise, classroom craftsmanship, understanding psychological factors affecting learning and charisma that excite learners to embrace independent learning. It further advocates using a blend of approaches including those that promote critical thinking, collaboration and problem solving, challenging learners to high achievement and applying cross and interdisciplinary approaches that help to connect learning areas. In this way the curriculum clearly portrays what teaching should look like in a 21st century school. Teachers must go beyond impacting rote knowledge to understanding their students and supporting them to develop their individual learning styles and capacity.

The curriculum review recommends prioritization of the formative role of assessment. This is essential for the 21st century because the essential skills cannot be effectively tested by one-off written exams.

2) *Kenya Basic Education Curriculum [27]*: The 2017 Kenyan Basic Schools curriculum, the term "21st century" appears 13 times while "21st century skills" appears two times. The curriculum adopts the 'visible learning' theory which encourages problem solving, communication and reflection - the idea of teachers knowing when learning is occurring and students knowing what to do and how, learning goals are explicit and encourages the practice of all components of formative assessment. The explicit goal of the curriculum is stated as achieving 21st century skills and competencies [27, p. 19]. This clear focus gives a reassurance of the quality of provisions to be expected. The curriculum further advocates a competency-based system which focused on application of knowledge rather than mere acquisition. Seven core competencies are listed by the curriculum which are essential for all learners to thrive in the 21st century - Communication and Collaboration, Self-efficacy, Critical Thinking and Problem Solving, Creativity and Imagination, Citizenship, Digital Literacy and Learning to Learn [27, p. 21]. Foreign languages are also provided for in the curriculum with recommendation for French, Arabic, German and Mandarin from the upper primary school level. The learning outcomes at each of the four levels of school in Kenya are embedded with 21st century skills such as to apply logical and critical thinking skills for problem solving, demonstrate ethical local and global

citizenship and communicate effectively and utilise information and communication technology for communication, learning and enjoyment. It is very clear that the Kenyan curriculum is squarely focused on achieving the 21st century skills.

The Kenyan curriculum also makes a laudable provision for careers and technology studies as one of the four pathways at the senior secondary level to provide practical career training for students who 'may not excel in pure academics'. It provides ample opportunity for critical thinking, problem solving and learning and applying new technologies and students are able to proceed to work or further tertiary education in their chosen craft thereafter. This is a bold shift from traditional academic practices to practical vocational learning within schools.

The Kenyan curriculum favours formative assessment which is enshrined in the competency-based system. Projects in partnership with relevant organisations are provided for as well as a summative assessment regimen that allows learners demonstrate their skills and ability to apply knowledge across a broad scope of the subject or interrelated subjects. Summative assessment occurs only three times in the entire basic education cycle – at the end of upper primary, lower secondary and upper secondary respectively. It is worthy of note that the curriculum also prescribes 135 hours of community service learning (CSL) for students in upper secondary as a means for students to interact, experience, relate and apply classroom learning to their community. These records form part of the summative assessment at the end of upper secondary school.

The curriculum depicts 21st century teachers as well grounded in specific subject knowledge and having additional skills in modern pedagogy such as facilitation, coaching and mentoring. The curriculum makes a clear provision for developing teachers' capacity to implement the competency-based curriculum by outlining learning outcomes and capacities needed to be demonstrated by teachers [27, p. 129].

The Kenyan basic education curriculum leaves no doubt about the desire to ensure students acquire 21st century skills by making provision across all the three key facets: content, assessment and teacher development.

3) *Ghana: National Pre-Tertiary Education Curriculum*: In Ghana the new curriculum explicitly states a need to change from the 'objectives based curriculum' predominant in the 20th century to a curriculum which focused on "processes of learning which involve higher cognitive competences such as applying, thinking critically, creatively and practically; and the personal qualities and social skills necessary to become competent, engaging and contributing citizens" [28, pp. 16–17] – a standards-based curriculum. The curriculum is clearly focused on ensuring that learners succeed in the 21st century. The term '21st century' appears five times in the curriculum document and each time it is directly associated with the education needs. The curriculum highlight Reading, Writing,

Arithmetic and Creativity as 4Rs which every learner should be fluent in alongside digital fluency. The curriculum also emphasizes the aim of Education in preparing learners for work and responsible citizenship [28, p. 1]. These are all 21st century skills themes which are woven into the curriculum conceptual framework consisting three concepts – the learning areas, core/global competencies, contemporary issues and pedagogical approaches.

The 4Rs fall under the learning areas are a crossing cutting throughout the span of the curriculum (primary to senior secondary). There is an explicit provision under the ‘core/global competencies’ for all the well know 21st century skills such as critical thinking, global citizenship and digital literacy. Alongside these, are modern teaching techniques such as constructivism, learner-centeredness, use of ICT, inclusion and differentiation. The curriculum also emphasizes the need to develop students capacity for lifelong learning and global citizenship since the 21st century is characterised by rapid changes and globalisation [28, p. 18].

21st century skills can only be taught by 21st century skilled teachers. The curriculum makes a provision for imbining 21st century teaching practices in pre-service teachers as well as making explicit provisions such as teacher-centred schools, which make provision for continuous teacher professional development, effective appraisals and use of assessment data, use of formative assessment, deep curriculum knowledge, use of appropriate pedagogy and the use of dialogic teaching and learning approaches. All these are clearly listed as the objectives of the curriculum as well as in the curriculum implementation principles [28, pp. 20-21,23-25].

Further, the curriculum recognised assessment as tools for communication of achievement and progression in learning. The curriculum expatiates extensively of assessment principles, types devoting a total of 20 pages to the subject. Formative and summative assessment are well linked in the curriculum with formative assessment expected to provide input into summative assessment. The curriculum describes formative assessment as ‘Assessment for learning’ (AfL) and prescribes activities such as observations, homework, journals and characteristics such as feedback, variety, no grades, and teacher reflection that can help teachers develop and use formative assessment effectively. Summative assessment is expected to take the form of examinations as well as projects and portfolios which could be assessed formatively before final submission.

From the forgoing, it is clear that the Ghanaian curriculum drives towards supporting teaching and learning of 21st century skills in schools.

E. *Understanding the context of Nigerian Secondary Schools*

The Nigerian secondary school exist with the education system across the basic and post-basic education level in two parts. The Junior secondary school encompasses the last three years

of the compulsory 10-year basic education and the senior secondary schools represents one of the pathways after completing basic education and lasts for three years, which paves the way for tertiary education

Secondary education is provided both by government and private ownership however, standards and supervision is provided by the government and all schools are supposed to comply with such standards. The secondary schools cater for children between the ages of 11-16 years. [12].

Nigeria is classified as a developing country with the largest global youth population. There are high levels of unemployment and underemployed exacerbated by COVID-19 [29].

III. RESEARCH METHODOLOGY

A. *Selection of Literature*

This research is a desktop research so no primary data was collected. Published materials both online and off-line were earmarked for review in writing this dissertation. Literature to be reviewed were selected from respected databases of peer-reviewed articles and government offices.

1) *Selection criteria:* The selected literature for this dissertation include peer reviewed articles from reputable journals, published dissertation and theses. Published reports from respected academic and research institutions and those commissioned by government departments were also selected for inclusion. No date limits are included in the selection criteria, however, most recent versions of regularly revised documents will be selected.

2) *Selection process:* Selection of relevant literature was conducted both online and offline. For online selection, searches were conducted on google scholar using appropriate keyword combination in line with the dissertation topic and research questions. All publications with relevant titles were selected for review.

Next, the reference lists of the selected literature were scanned for relevant articles to be included in the review. Reference lists have been seen as a very important tool for discovering relevant literature and the process of reading through the works listed in the literature is the easiest way to conduct an exhaustive literature research.

Physical documents were mainly government policy documents and secondary school curriculum which were generally not available online. Copies were accessed from schools and the government publisher for review.

3) *Keywords search:* In order to conduct the online search, the following keywords were used in google scholar.

“twenty first century skills”, “21st century skills”, “21st century skills teaching”, “21st century skills teaching methods”, “21st century skills learning”, “21st century skills measurement”, “Nigeria education policy”, “national education policy”, “national curriculum”.

After running the search, all articles with titles containing the keywords were selected for textual review towards inclusion.

4) *Inclusion Criteria:* Peer-reviewed articles to be included are articles that have been published in the last 15 years on the topic of 21st century skills. However, because this work covers relatively a new idea which is still getting to be established, older documents which are seminal were included to ensure foundational clarity. Finally, other documents traceable to reliable government or institutional sources were included.

B. *Analysis Methods*

The selected literature were organised according to their relevance to each of the three research questions being investigated in the work based on the abstract or executive summary. In the next phase, to answer each research question, relevant text were then studied and their proposals and conclusions noted for further analysis and synthesis of the dissertation argument.

C. *Ethical Considerations*

This research is considered low risk as it does not include access to real life participants. However, since this work relies on previous research, there are ethical considerations to be made to ensure the findings are reliable. [30]. In conducting this research, objectivity was ensured by staying true to the conclusions available in the literature and not making unfounded extrapolations. Effort was made to ensure reliability of methods as these also affect the validity of the conclusions made by the source. Effort was made to ensure all publications are from reliable sources such as reputable peer-reviewed journals. Theses, dissertations and government sponsored reports were also downloaded from verified websites of the owner institutions to ensure authenticity. Ethical standard of literature consulted was reviewed to ensure compliance with set standards of ethics. Literature violating or not reporting on ethical processes were excluded from the work.

IV. RESEARCH RESULTS AND FINDINGS

This dissertation set out to answer three questions. The following sections will present answers to each one accordingly.

A. *How Do We Define 21st Century Skills for Nigerian Secondary Schools?*

Having reviewed some of the most influential publications on the 21CS, alongside a presentation the Nigerian secondary schools' context in chapter two, a definition is now presented. 21st century skills are attitudes and competencies that create a value system or world view from which teaching and learning flows and that guides outlook to work and life in the 21st century. It has at its core an awareness of the global nature of life, work and learning, the need for effective communication and collaboration, the criticality of innovation and creativity, the influence of ICT as a fundamental resource and a sense of individual responsibility.

For Nigeria, the following definition is proposed: *21st century skills are skills that enable you think productively, collaborate effectively, use tools efficiently while being globally self-aware.* Productive thinking means the ability to 'figure out' useful solutions in various situation and contexts. Effective collaboration means the ability to draw on team strength even across international borders, which also includes the communication and language skills that are essential for that to happen. Efficient use of tools means knowing what tool is best for achieving a particular task and knowing how to use the tool. Using ICT features here. Global self-awareness means an awareness of the individuals' position in the world and how his/her action and inactions affect events from the local to the international level.

In addition, 21st century learning in Nigeria should also include the following subjects: Numeracy/mathematics, English language, other foreign languages, Science, History/Civics, Geography and Computing. Core subjects should provide cross-cutting foundational knowledge and expose students to global issues while incorporating opportunities for demonstrating the soft skills.

This definition can be used to develop concrete curriculum content for Nigerian secondary schools.

B. *How Are 21st Century Skills Provided for in The Nigerian Secondary School Curriculum and Policy?*

The National Education Policy and curriculum for mathematics and English were reviewed to understand the provisions available for 21st century skills teaching and learning in Nigerian secondary schools.

According to the National Policy on Education (2014) document [12], "The National Policy on Education enunciates the guidelines, objectives, standards, structures, strategies, and management for achieving the national education goals in Nigeria" (p1) One of the goals of education in Nigeria is also listed as for individuals to develop of skills and competencies to contribute positively to society (p2). Furthermore, the document mentions that 'educational activities' are to be learner-centred and teaching be practical, activity-based, experiential and IT-supported. There are however, not clear guidelines as to how these will be supported with tools and teacher training. Among the goals for basic education is to 'raise individuals capable of independent thinking' which also restated under the goals of Junior Secondary Education. Independent thinking can be related to critical thinking and problem solving skills which are more frequent terms used in the 21CS literature. There is a strong theme of nationalism throughout the curriculum goals and philosophy with terms such as – patriotic young people, national consciousness, harmonious coexistence occurring severally. This important to learning skills related to citizenship and patriotism, however the 21st century also requires students to be globally aware. A provision for this is not apparent in the policy. The curriculum lists 10 subjects with information technology (IT) subsumed under Basic Science and Technology and French language as a

separate subject along with religion and national values, creative and cultural arts and Prevocational studies. Nigerian language also features as a standalone subject along with English studies and Mathematics. It is clear that the policy is still very much subject-based instead of the more forward looking competency or standard-based focus which has become the beacon of 21st century education.

For assessment, the curriculum further prescribes a ratio of 40 to 60 for continuous assessment and school examinations which are the basis of advancement from one class to another. There is a nationwide examination at the end of Junior secondary (i.e. the end of the 10year basic education) as well as at the end of Senior secondary school. This provision is clearly behind the 21st century thinking that encourages more of formative assessment and deemphasizes one-off high stakes examinations. Although the policy recognised the ‘prominent role of IT in advancing knowledge and skill’ with a commitment to provide ‘adequate infrastructure and develop capacity for the utilization of IT’ for enhanced education delivery, this recognition does not shine through the policy given its relegated listing in the subjects and no prescription of its incorporation into the schools’ systems and activities such as blended learning options or e-examinations.

At the senior secondary education level, there are four fields namely Science and mathematics, Technology, Humanities and Business studies. The compulsory cross-cutting subjects are English language, General mathematics, Trade/Entrepreneurship and civic education. Computer Studies is only an option under the Science and Mathematics field however, students may choose between 1 to 3 subjects from other fields of study different from their major. Overall, given the importance of IT knowledge in the 21st century, this provision is inadequate especially following from the similarly poor provision made in Junior secondary school for acquisition of IT skills.

The document is silent on specific requirements, formats and outcomes of assessment, delegating it to national or regional awarding bodies such as West African Examination Council (WAEC), National Examination Council (NECO) as the case maybe. This is alarming since assessments give the opportunity to document student’s achievements. With the complexity of assessing 21st century skills, clear assessment guidelines are even more critical.

The role of teachers is not expounded, neither are the standards of teaching or teaching methods to be used or provisions for teacher development both pre- and in-service. There are however sweeping remarks about the minimum levels of certification required of teachers again, the focus is not on competencies. A one-year internship is prescribed for new teachers however the details as to the implementation and monitoring is not provided. This is especially worrying since Nigeria suffers a high shortage of teachers.

Generally, the Nigerian policy on education does not reflect the global pulse on the urgency of preparing students with

requisite skills to lead successful adult lives as productive citizens. A simple textual search reveals only one mention of the basic term ‘21st century’ and a shocking absence of other popular terms. Also, there are no alternative terms used in the document that could be legitimately supplemented for the popular terms and thus no concrete provision made for their teaching and learning in Nigerian secondary schools.

C. How Do We Ensure Teaching and Learning of 21st Century Skills in Nigerian Secondary School?

It is clear from the literature review that ensuring the teaching and learning of 21st century skills requires deliberate and focused action at the policy level. Four main components of teaching and learning must be engineered towards this goal of enshrining 21st century skills in schools if there will be success.

First, content. The curriculum must make a clear statement of what 21st century skills are and how they will be taught and learnt in schools. Core 21st century subjects must also be explicitly listed and made compulsory at all levels of schools with adequate vigour and quality.

Second, assessment. It is clear that formative assessment is key in developing 21st century skills. There must therefore be clear guidelines on conducting formative assessments with a clear understanding of how it feeds into the summative assessment for each student. Details of the style, content and goal for assessments must be well articulated and communicated.

Third, pedagogy. It is well documented that teacher-centred teaching no longer has a place in the 21st century school because facts are changing rapidly! Students must be groomed to synthesize knowledge for themselves. Therefore, teachers must be trained to use appropriate modern pedagogies that will aid the proper development of students as independent lifelong learners.

Fourth, teacher development. Underpinning all these hopes is the quality of teachers. Pre-service teacher training must prepare teachers to be ready for 21st century-styled teaching. In-service training must also be made available to update old teachers. All teacher training must have clear outcomes that align with the requirements of 21st century education including a deep understanding of their basic subject, a firm grasp on how to use learner-centred pedagogies, identifying learners’ learning styles and adapting to them and use of ICT for teaching and learning.

Overall, there must be strong government commitment to invest in upgrading education infrastructure support 21st century teaching and learning both in secondary schools and teacher training institutions. Government must also commit to maintaining minimum standards of teacher and student quality through clearly define teacher and learner quality profiles.

There are currently no concrete provisions for the above therefore the need is urgent.

V. CONCLUSION AND RECOMMENDATIONS

A. Summary

This work has conducted research into the teaching and learning of 21st century skills with aim of articulating meaning and policy provisions for the Nigerian secondary school context. A definition of 21st century skills as been proposed, the policy provisions have been analysed and actions needed to ensure practice in schools have been articulated in answering the three research questions underpinning the research.

B. Recommendations for Policy and Future Work

21st century skills are critical for competitive advantage in the 21st century. Therefore, Nigerian teachers and students must acquire these skills during their schooling. An urgent review of the National Curriculum and the national education policy is therefore recommended to incorporate the definition of 21st century skills provided in this work and to implement the actions outlined to ensure that Nigerian secondary schools are able to deliver 21st century skills education. Nigeria should consider following the lead of countries like Ghana and Kenya and develop learner exit profiles that explicitly define the characteristics of a 21st century graduate in Nigeria.

Further research should also be carried out to confirm the actual teaching practice in schools. Since there can be differences between the formal and implemented curriculum, a primary research will be conducted to collect raw data on the level of 21st century skills among teacher and students both in secondary schools and teacher training institutions.

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