



## 21ST CENTURY SKILL SET DEFICIENCY IN GHANAIAN BASIC EDUCATION: A REVIEW OF BASIC DESIGN AND TECHNOLOGY, AND INFORMATION AND COMMUNICATIONS TECHNOLOGY SYLLABI

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**ABSTRACT** 21st century skills are known among all educational stakeholder as relevant skill for success in modern Global and technological age. There have been extensive studies regarding these skills and their role in effective articulation in this age. Education, the channel of transfer of knowledge and skills must be able to serve the purpose of imbibing the 21st century skill set in addition to specific knowledge in various fields of study. However, this integration is intrinsically missing in the Ghanaian educational system. For this Qualitative enquiry, ten experts in Education (3 Curriculum Developer, 1 Educational Technologist and 6 ICT Teachers were purposively sampled) for this study. Analysis of results reveals the absence of 21st century skills integration activities in the Ghanaian Basic Education system. This paper presents findings of the investigation into content and teaching of Information Communication and Technology (ICT) and Basic Design and Technology (BDT), in Ghanaian basic schools.

**KEYWORDS :** 21st Century Skills, Information Communication and Technology, Basic Design and Technology, Ghana Basic Schools

### 1. Introduction

Humans are engulfed with evolving band of needs necessitating evolving and updated skill set and knowledge to tackle. Education in every society seeks to address this concern by equipping generations with the relevant knowledge, skills and attitude needed to face the changing problems. Characterized by globalization and industrialization, the 21st century, requires some relevant skillset that cut across all fields of study. This skill set, although not strictly defined, is known among educators and other stakeholders in education as “21st century skillsets”

The term “21st century skills”, refers to an expansive set of knowledge, skills, work habits, and character traits that are held by educators, school reformers, college professors, employers, and others to be essential for success in today's world [1]. These include, Creativity, innovation skills, Digital literacy and fluency, Collaboration, communication skills, Exploration skills, problem solving skills, Critical thinking and Analysis skills, Leadership skills, motivation to learn. All these forms the skill set required to ensure effective articulation

This skillset is however missing in Graduates from Ghanaian school, even up to the tertiary level. Djangmah [2], argues that Ghana's educational system is not consistently “adding the value and teaching the skills that matter most in the marketplace.” Despite the numerous advocacy by proponents, majority of Graduates churned out each year evidently lacks essential skills for this modern age [7] [11]. Having gone through several educational reforms after independence, this deficiency stigmatizes itself in our educational sphere. Although Ghana as a nation has attracted investors, like Microsoft, into areas of ICT education, the nation still suffers digital divide [17]. As vehemently argued, Ghana needs to integrate the International ICT Literacy Panel's scope and definitions into the Ghanaian ICT curriculum or else teaching and learning will just focus on computers with the problem of digital divide [12]. Thus evidently, Ghana as a nation is investing a lot into ICT education but failing to reap the numerous benefits as enumerated by scholars [19] [20] [21] [22].

Art education as studied in Ghanaian basic schools as creative arts is identified to be a domain for numerous skill development [12] [13] [14]. In addition to the practical skills, research has also indicated enhancement in essential cognitive skills through the study of art [15]. Despite the chunk of accompanying benefits of art in education, Ghanaian education system has failed tremendously to impart these benefits to learner due to militating factors like negative perception of the programme and poor teaching methodology [16].

This paper, therefore presents findings and analysis of investigation into content and teaching of Information Communication and Technology (ICT) and Basic Design and Technology (BDT), as taught in Ghanaian basic schools. These two courses out of the many courses taught at the Basic school level were preferred because of their expanse over all the listed 21st century skillset.

### 2. Methodology

#### 2.1 Design

The study at this phase adopted a qualitative approach [23] [24]. This was preferred because the study involved analyzing the content of syllabuses and teaching modalities for ICT lessons in basic schools. Since the research requires study of an existing system alongside systematic data collection [4], action research method was adopted. The Target population span over ICT and BDT teacher, Curriculum developer and educational technologist. The study purposively sampled a total of 10 experts from all these groups from consultation. The sample constituted, three (3) curriculum developers, one (1) educational technologist and six (6) ICT teachers from selected basic schools in the Kumasi Metro, of the Ashanti Region of Ghana. This sampling method is backed by the submission of [5][26] that, purposive sampling enables researchers to intentionally select specific individuals whose experiences are central to understanding a phenomenon under study [3].

The instrumentation for the study are document analysis and in-depth interviews [25]. The course syllabus was the material of discourse between researcher -curriculum developers, researcher – educational technologist. The discourse with ICT teacher encompassed the syllabus content as well as teaching modalities. Informal conversational interviews were specifically employed in order to retrieve as much expert information from respondents without limitations. This involved loosely structured enquiries rather than statistical capacities, and eventually makes interpretative, subjective, impressionistic and diagnostic analysis possible [6].

### 3. Results and Discussions

#### 3.1 Review of the syllabi

##### 3.1.1 BDT Syllabus

The BDT syllabus is undoubtedly a comprehensive and exhaustive one for pupils. The Basic Design and Technology (BDT) has been introduced at the Junior High School purposely bring to light the importance of design and technology in promoting technical education and industrialization and also equip pupils with various vocational or industrial skills for entrepreneurial development. All the three-core

area of the syllabus (Pre-technical skills, Home economics and Visual Arts) are all well addressed and distributed throughout the course structure.

The syllabus serves as a complement to all the other subject areas treated in the basic Junior High school curriculum. As postulated by [8], the BDT syllabus is extensive in imbuing essential, practical and contextual skills. In addition to these skills, the subject has entrepreneurial skills, which makes pupils business conscious and also equips them with basic entrepreneurial startup abilities.

### 3.1.2 ICT Syllabus

The aims of the syllabus although relevant, seems to only create the awareness in pupils and grant them basic skills of using a couple of office tools. The syllabus lacks lessons to imbibe majority of the skills of fluency, with the web, text, audio, animation, video, remixing, design, downloading and uploading, and fluent in critical thinking, collaboration and deciding relevancy, as identified by [10].

The syllabus is hinged entirely some selected software from the Microsoft office suit, especially Microsoft word (MS Word). MS Word is just an example of text editing tools out of many [18]. This makes ICT education seem like "MS Word tutorial". And ICT literacy and fluency is reduced to ability to use MS Word, Power point and excel. Whereas life around ICT is not only about PowerPoint and Word. There are many more fundamental knowledge and skills needed for effective engagement of ICT products.

Obviously, the ICT syllabus has so many vague topic repetitions. With some of them too concise to be main topics. They could have been covered as subtopics. First year, term two, section one has the topic, "typing keyboard symbols"; a topic too narrow to standalone. Never the less, this topic was repeated in 2nd year section three. A similar lesson is "computer viruses".

At the tail-end of the syllabus lies the topic "Integration of ICT into Education" (Section 20). This is a topic that should be treated in the early stages in order to broaden learning environment of learners as well as give them practical uses of the computer in their learning environment. Having this lesson at the early stages of the curriculum would give the opportunity to engage computers and the internet as learning tools, other than mere article of study.

With much time spent on repetitious lessons, learners are expected to undertake a project in Paint Brush, whereas there is no reflection of a lesson on it through the three years' curriculum.

### 3.2 Curriculum Developers:

The interaction with the 3 curriculum developers was tailored at soliciting for their view on the current teaching and learning of ICT in schools, and their expectation of the proposed framework.

On ICT education there was harmony of view to the fact that, the entirety of Ghanaian education needed an upgrade because the classroom to field gap is obvious. It was also agreeable that the current ICT syllabus needed an upgrade to cater for modern concept in ICT. Two out of the three categorically affirmed that, the Curriculum Research and Development Division of the Ghana Education Service (CRDD-GES), has constantly been on the lookout for content that would reflect the 21st century skills (4Cs: Creative and Innovative skills, Critical thinking and problem-solving skills, Collaborative skills and Leadership skills, Communication skills -Literacy and numeracy).

Apart from the lapses identified in the syllabus, which they unanimously agree to, the following were also identified as contributing factor to the problem at stake.

- a) uneven ICT infrastructural distribution across basic schools
- b) varying teacher competencies
- c) lousy administrative rules regarding facility usage
- d) misconceptions regarding ICT integration in education.

Notably, the implementation of the ICT4D policy and the "One Laptop per Child (OLPC)" initiative by the Government of Ghana (2007), has furnished schools (Government-owned Junior High School) with laptop(s).

Apropos the BDT syllabus, the principal challenge is with recognition

of course relevance among majority of stakeholders. The BDT course is considered almost extracurricular, and thus attracts little recognition or infrastructural input from educators as compared to subjects like Science, Mathematics and English language. This ill-attitude hinders the positive will and militates against attention given to the subject by majority of students.

### 3.3. Educational Technologist

The discourse with the educational technologist revealed relation between ICT infrastructure need for basic schools and effective deployment of ICT lesson to meet the needs of the century. It was indicated that, apart from availability of computers/labs, good Learner to computer ratio (maximum of 3:1) is another factor needed for effective delivery of ICT lessons. This would ensure sufficient learner contact with computers for hands on practice. Also focus on learner-centered classroom activities is ideal for ICT lessons instead of teacher centered activities. This would create the platform for learners to intensively engage the facilities.

### 3.4 ICT teacher

#### 3.4.1 View of the current ICT syllabus

From the discourse the following were retrieved:

5 out of the 6 (83.3%) respondents submitted that the current ICT syllabus for JHS is outdated and needed to be reviewed. The remaining respondent (16.7%) indicated that the syllabus is ideal for their level. They also noted that syllabus still runs on 2003 office suit, which is an old version of the Microsoft suit. This makes teaching and learning difficult since the computers the school has all run later version of Microsoft office and thus poses Graphical User interface inconsistencies when it comes to relating theoretical lessons to practical lessons.

All the 6 unanimously agreed that, the syllabus is filled with so much needless repetitions and topics that could be captured as subtopics. (E.g. Keyboard skills and Computer viruses). Notably, all of them stretch the repetitive lessons as brief introductions for terms, and eventually dedicating the entire 3rd year to revision.

All the 6 respondents are unanimous on the fact that, syllabus is largely centered on Microsoft word and Excel, ignoring other relevant aspects of ICT education. As expressed by one, "There are a lot of things pupils need to know which are not captured." Moreover, Microsoft word and Excel are just examples of the vast class of text editing and spreadsheet software. Hinging the entire curriculum of just these two products can pose learning problems when these products are discontinued. ICT education is not only about learning how to type and format text in Microsoft word.

#### 3.4.2 The state of ICT infrastructure in schools and their usage.

- a) Availability of Computer Functional Computer Laboratories: 2 out of the six schools (33.3%), have a fully functional computer lab with internet access. 3 out of the 6 (50%) have computer labs without internet access and 1 (16.7%) school has laptops for demonstration without a lab. In all, all the schools have at least a computer. Of these categorization, the Government-owned schools fall within schools with computer labs with internet, and schools with just functional computer labs.
- b) Learner to Computer ratio: Learner to computer ratio was variable across all six schools. The study realized the following ration: 2:1, 4:1, 5:1, 6:1, 7:1, 22:1. The school with the highest learner to Computer ratio (11:1) is a private school.
- c) Teacher competencies: 5 out of 6 schools (83.3%) of the teachers interviewed have trained teachers in ICT education. 1 out of the 6 teachers (16.7%) is not a trained ICT teacher. Notably the untrained teacher teaches in one of the private schools under study. All 6 (100%) respondents (teacher) are apt in basic ICT skills. 2 out of the 6 (33.3%) have advance skills.

#### 3.4.3 Expectations of improvement or maintenance

All 6 respondents (100%) agreed to the need for improvement and update. Regarding the kind of improvements, they all stated update of the syllabus content. They also requested for a mechanism that would ensure flexibility in updating learning content based on modern trends. 2 of the respondents (33.3%) categorically stated the need for more interesting, dynamic and innovative learning activities other than routine typing skills projects. They however could not give an example of such an activity when asked for one.

#### 4. Conclusion

The current problem of 21st century skills deficiency in Ghanaian education system is known among educators, school reformers, college professors, employers. There is a visible classroom-field gap that makes Ghanaian education seem irrelevant in the face of 21st century societal/industrial needs. The highlighted lapses unveiled in this article are issues of concern for all stakeholders. Syllabus revision and upgrade, infrastructural support for schools, revision of lesson delivery styles and conscientisation of stakeholder about the relevance of art-based lessons, are principal issues that must be addressed.

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