What Makes a Curriculum Effective in Promoting Children's Learning?

A concept note for analyzing basic curriculum effectiveness in East Africa

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1. Introduction

The results of numerous studies assessing learning in children attending basic education in developing countries show that, while millions of children are able to attend school in these countries, schooling does not always lead to learning. These studies show that very few children are able to achieve the basic learning benchmarks in reading, writing and numeracy (Pritchet& Beatty, 2012; Beaty&Pritchet, 2012; Brombacher et al., 2014;Mbelle&Katabaro, 2003). In East Africa, specifically, a series of Uwezo assessment tests over the past five years show that only a small proportion of children attending schools are able to meaningfully master the basic learning milestones in literacy and numeracy. For instance, the 2013 literacy and numeracy assessment report in East Africa showed that two thirds of children enrolled in Standard 3 in East Africa did not demonstrate the basic literacy and numeracy skills (Uwezo, 2014).

Several factors determine learning outcomes or academic achievement in general. These include, for example, students' age, gender, physical health and social and emotional well-being (Lee & Kim, 2009; Rowe, 1995)), parents' education (ECCS & Davis-Kean,2005; Gratz, 2006; Farooq et al., 2011), parents' involvement in their children's learning (Department for Children, Schools and Families, 2008), family factors (Heath et.al., 2008; Farooq et al., 2011), classroom factors (Marshall & Weinstein, 1984); and school factors such as availability of teaching and learning resources and teachers (Stotsky, Bradley, & Thomas, 2005).

A careful review of the factors associated with learning outcomes shows that curricular effectiveness does not feature prominently in the list of factors associated with learning outcomes, especially in developing countries. There are, however, a few emerging studies that have recently examined the effect of curricular effectiveness on the learning outcomes. For example, recently, Pritchet and Beatty (2012), using data from three studies in South Asia and Africa, showed that there was a clear gap between curricular and actual pace of students' learning.

Though there has been no systematic analysis of the curriculum effectiveness in in East Africa, some writers have long questioned the relevance of the curriculum in preparing young people for further education and work. For example, in Tanzania, the review of the education for self-reliance philosophy by Saunders and Vulliamy (1983) and Wolhuter (2004) showed that education provided in Tanzania did not adequately meet the aspirations of the development agenda in the country. This suggests that, among other things, there could be gaps in the curriculum.

Additionally, there has always been a large public debate across East Africa about the relevance of education provided in general and curriculum in particular, regarding what should be taught, at what amount and pace and how it should be taught. Nevertheless, systematic evidence about the curricular effectiveness in the region is largely lacking. As such, we lack a basis for engaging citizens to hold authorities accountable and responsive on the question of curriculum.

This study intends to examine curriculum effectiveness in three countries in East Africa (Uganda, Tanzania and Kenya). The study seeks to establish curriculum key features, scope and sequence, as well as alignment between curriculum standards and assessments. The overall aim of this review is to establish the extent to which the curriculum facilitates or constrains learning achievement. While the review will map out the coverage of the curriculum content, it will not assess the quality of the curriculum implementation processes, such as curriculum instruction and availability or non-availability of teaching and learning resources.

2. Conceptions about curriculum

There are different conceptions[1] about curriculum. Arguably, Parkay, Hass and Anctil (2010) provide the most comprehensive definition of curriculum. They define curriculum as: a course of study; course content (information or knowledge that students are to learn); planned learning experiences intended learning outcomes (designated as the result of instruction as distinguished from the means of instruction (materials, activities, etc.); all the experiences that students have whole at school or in non-school educational programme.

For purposes of this analysis, we define curriculum as a prescribed content to be taught and learned which provides the basis for assessment in form of testing. In this regard, we will only deal with the formal

[1] For a comprehensive list of the various definitions of curriculum readers can visit this link http://www.homeofbob.com/pedagogy/plan/curDev/defList.htm

curriculum[2], which is the one that appears in the official curriculum guidelines, including policy documents and other Government circulars that state the officially sanctioned scope and sequence of learning. In all the three East African countries, the responsibility for curriculum development falls under the jurisdiction of curriculum bodies, namely Tanzania Institute of Education (TIE), Kenya Institute of Curriculum Development (KICD) and the National Curriculum development Centre (NCDC) in Uganda. As such, this analysis will limit itself to the curriculum materials sanctioned by these bodies, though we will not be oblivious of the international standards that also inform curriculum development in any country. Additionally, the focus of this analysis will be on the formal basic education curriculum up to 12 years of schooling covering both primary and secondary education levels.

Porter (2001) identifies four types of formal curriculum. Firstly, there is the enacted curriculum, which refers to the actual curricular content that is delivered to learners in the classroom. This is where most of the learning is expected to happen. This type of curriculum has also been referred to by other authors as the 'taught curriculum' (English, 2010). Secondly, there is the intended curriculum, which refers to policy guidelines and tools that outline what teachers are expected to teach. Thirdly, there is the assessed or tested curriculum, which involves the standardized tests administered to students to assess their level of learning with respect to learning outcomes. Fourthly, there is the learned curriculum, which refers to what has actually been learned. While it is closely associated with the assessed curriculum, the concept of learned curriculum goes beyond test scores to also look at the level of proficiency offered by test scores. In our analysis, we will seek to examine the alignment among the four types of curriculum, but with a keen focus on the enacted and intended curricular, which are arguably the most important features of any curriculum. This is because these two types provide a framework for assessing practically how much the expectations of the prescribed curriculum are realized with respect to coverage and actual learning outcomes. In the analysis, we will seek to examine the alignment between what was planned/intended to be taught/learned (intended curriculum) and what was actually taught/learned.

The curriculum content plays a significant role in determining learning outcomes but it is an issue that is always taken for granted. In Tanzania, for example, the public has always been concerned with the performance of students in various national examinations, but little attention is paid to what curriculum content is actually taught to students. The main focus of our analysis is therefore on the 'curriculum clutter'. We will be examining the relevance and appropriateness with respect to scope and focus of the curriculum content at various levels of basic education and how it is related to and coherently aligned with the test content. Understanding the curriculum content is important in facilitating stakeholders' engagement with schools, especially that education and training policies in East Africa emphasise the need for parents to monitor how various educational reforms are being implemented.

3. Methodology

There are two key interrelated tasks in this analysis. First, we will review the history and philosophy of curricular reforms in East Africa with a view to establishing how such reforms may have been consistent with the national development agenda. Second, we will examine the alignment between the four types of curriculum, and particularly between the intended, enacted and assessed curriculum so as to establish the extent to which the curriculum may be associated with learning outcomes.

[2] Other types of curriculum in schools are: informal curriculum which represents the unrecognized and unofficial aspects of designing or delivering the curriculum and hidden curriculum, which denotes the expectations and presupposition about social conduct of the members of the learning community.

Thus, two methodological approaches will be employed to achieve the above milestones. The first one will involve a review of the literature on the key education reforms in the region with a focus on curriculum reforms. The second approach will involve a content analysis of the curriculum materials to establish the depth and breadth of various teaching and learning curriculum materials and the extent to which curriculum standards and assessments are aligned. The framework for content analysis of the curriculum is presented below.

3.1 Framework of curriculum content analysis

There are several models of curriculum alignment analysis, such as Webb Model, Surveys of Enacted Curriculum (SEC) Model, Achieve Model, La Marca et al. model and CBE model. For a full description of these models see Li and Sireci (2005) at http://www.umass.edu/remp/docs/MCAS-RR-9.pdf. In this analysis, we will employ SEC model. This model has been chosen because is able to provide alignment indices at the enacted curriculum level (Kurtz, Elliot,Wehby, & Smithson, 2010), and it is arguably the most predictive model of student achievement scores (Case & Jorgensen, 2004).

A survey of enacted curriculum is a research strategy for collecting information about curriculum content and implementation processes from teachers and education administrators. It is a tool that is used to analyse the degree of alignment between classroom instruction practices and the content of curriculum and assessment standards. Surveys of enacted curriculum (SEC) involve several items such as school and classroom characteristics, teacher preparation and teacher demographics (Polikoff, Porter & Smithson, 2011).

The SEC model has three main dimensions. The first dimension involves identifying the specific content topics for the intended subjects with respect to different levels of content. The second dimension involves the analysis of student performance expectations, which are also referred to as categories of cognitive demand similar to the Bloom's taxonomy (Kurt et al., 2010). These categories describe what learners are to know and do with the content upon completion of each lesson (see Appendix 1 for a description of Bloom's taxonomy). The example of content matrices for standards, instruction and assessment is as shown in Table 1.

The third dimension involves a survey of teachers' opinion and views about the curriculum implementation processes. In particular, this dimension looks at the extent to which curriculum is translated in the actual teacher classroom practices.

Table 1: ***Content Matrices for Curriculum Standards, Instruction and Assessments***

Subject……

	Standards (categories)						**Instruction (categories)**						**Assessment (categories)**					
Topic 1	*C1*	*C2*	*C3*	*C4*	*C5*	*C6*	*C1*	*C2*	*C3*	*C4*	*C5*	*C6*	*C1*	*C2*	*C3*	*C4*	*C5*	*C6*
Topic 2																		
Topic 3																		

Additionally, using Jong and Ferguson-Hessler's (1996) classification of knowledge framework, we will analyse the types of knowledge covered in various topics. According to Jong and Ferguson, there are four types of knowledge, namely factual knowledge, conceptual knowledge, procedural knowledge and strategic knowledge (see Appendix 1 for description).

Overall, this curriculum effectiveness analysis intends to address the following four research questions:

i) How relevant is the curriculum to the country development context? *Relevance here is defined as the extent to which the content is applicable, transferable and approximates the context in which learning takes place?*

ii) To what degree are the content topics and expectations stated on the national curriculum standards being taught in the curriculum?

iii) Is the content being taught with sufficient rigour or depth?

iv) Are the expectations for students, as reported by their teachers, consistent with the defined expectations on the national assessment?

v) To what degree might the misalignment of instruction be related to lower student achievement?

3.2 Activity Plan

Table 2 below presents the activities, outputs and budgets related to this assignment

Table 2: ***Activity Plan for Curriculum Effectiveness Analysis***

Activity Description	Expected Output(s)	Time Frame				Responsible Person
		Sept	Oct	Nov	Dec	
1. Literature review of education reforms with a focus on curriculum changes in the region. • *Purpose: to be abreast with key reforms that have informed the current state of the curriculum and how much these are in line with national development agenda*	A paper highlighting key education reforms and curriculum changes over a period of independent countries in the region					JA-Ug RM-Ke KM-Tz KM-Regional Report
2. Content analysis of curriculum standards and assessments alignment • Purpose: to examine relatedness, coherence and consistency between curriculum content and assessment content so as to establish how much these focus on promoting learning	Content analysis report with tables, charts and maps summarizing the alignment indices					• A panel of experts • JA-Ug • RM-Ke • KM-Tz • KM-regional coordination
3. Survey of enacted curriculum • *Purpose: to examine the extent to which the planned curriculum is being implemented in classroom instructional practice*	A report of survey of teachers and education administrators					• A panel of experts • Consultant

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Appendix I
Descriptions of Knowledge types and cognitive domains

Types of Knowledge

- *Factual knowledge*: The specific details and elements in a subject that learners should know to be acquainted with a discipline or solve problems
- *Conceptual or declarative knowledge*: the interrelationships among the basic elements within a larger structure than enable them to function together. This is where the learner learns about classification and categories, principles and generalisations, themes, models and structures.
- *Procedural knowledge*: specific skills and techniques and methods that learners need to know to be able to solve a problem
- *Strategic or metacognitive knowledge*: knowledge about cognitive tasks. It also refers to self-knowledge.

Descriptions of cognitive domains

Domain	Descriptions and examples of key words and tasks
Remembering	***Description***: Recall or retrieve and reproducing learned information (basic facts, terms and/or properties of objects. It may also involve use of simple procedures and/or formulas. ***Examples of key words***: List, identify, define, outline, describe ***Examples of tasks***: Basic calculation (e.g., addition, subtraction, etc.), locating or retrieving information verbatim; recognition tasks such as identification of features, objects and/or steps; simple writing tasks such as spelling, punctuation; basic measurement tasks such as using a ruler to measure length; application of a simple formula; locating information in a map, charts, tables, graphs and drawings.
Understanding	***Description:*** Comprehending the meaning, translation, interpolation and interpretation of instructions and problems. State a problem in one's own words. ***Examples of key words***: convert, distinguish, defend, estimate, explain, give an example, predict, rewrite, summarise, translate, interpret Examples of tasks: rewrite the principles of test construction, explain in your own words the meaning of..; translate the equation into…
Applying	***Description:*** Use a concept in a new situation or unprompted use an abstraction. Applies what was learned in the classroom into novel situations in the work place. ***Examples of key words***: Apply, change, compute, construct, demonstrate, modify, operate, prepare, predict, relate, show, solve, use, produce ***Examples of tasks***: Use a manual to calculate the number of days requiring for school vacation; Apply the principle of statistics to evaluate the validity of test;
Analysing	***Description:*** Separates material or concepts into component parts so that its organisational structure may be understood. Distinguishes between facts and inferences.

Domain	Descriptions and examples of key words and tasks
	Examples of key words: analyse, break down, compare, contrast, differentiate, discriminate, distinguish, identify, illustrate, relate, select. ***Examples of tasks***: Creating graphs, tables and charts; Identifying a research question; designing investigations to answer a question; proposing a solution; making predictions.
Evaluating	***Description:*** making judgments about the value of ideas or materials Examples of key words: appraise; compare; conclude; contrast; critique; defend; describe; evaluate; justify; Examples of tasks: Selecting the most effective solution; explain and justify a new budget
Creating	***Description:*** Building a structure or pattern from diverse elements; Put parts together to form a whole, with emphasis on creating a new meaning or structure; express ideas through writing, speaking, drawing; intergrate with other topics and subjects; create/develop connections with text, self-world; synthesize content and ideas from several sources; develop reasonable alternatives. ***Examples of key words***: categorise, combine, compile, compose, create, devise, design, explain, generate, modify, organize, plan, rearrange, reconstruct, reorganise ***Examples of tasks:*** Design a machine to perform a specific task; Integrate training from various sources to solve a problem; revise and process to improve the outcome; creating graphs, tables, charts; tasks that require perspective taking and collaboration with a group of individuals for purposes of persuasion.

Appendix II:
Basic Education Curriculum in Tanzania

1. **Structure of education: 2-7-4-2-3+ (changing in the context of the new E & T policy of 2014)**
   - Two years of pre-primary education
   - Seven years of primary education
   - Four years of secondary education (Form 1-4)
   - Two years of Advanced secondary education (Form 5-6)
   - Three years (or more) of higher education

2. **Schooling years**
   - Seven years of compulsory education
   - Age at which children begin primary education: 7
   - School calendar year: 194 days divided into two terms each with 21 weeks

3. **School time**
   - Standards I and II: Three and half (3 ½) hours a day
   - Standards III –VII: Six (6) hours a day. More hours for visually impaired students.

4. **Learning areas (6)**
   - i) Languages
     - a. Kiswahili
     - b. English
     - c. French
   - ii) Social Studies
     - a. History
     - b. Geography
     - c. Citizenship
   - iii) Science and Technology
     - a. Sciences
     - b. ICT
   - iv) Life Skills Education
     - a. Personality Development and Sports
     - b. Life Skills
   - v) Religious Studies
   - vi) Mathematics

5. Distribution of subjects in the Timetable

SUBJECT	NUMBER OF PERIODS/CLASSES		
	Standards I-III	***Standards III-IV***	***Standards V-VII***
1. Kiswahili	6	7	7
2. English	7	7	7
3. Mathematics	7	7	7
4. Science	2	4	4
5. Geography	-	3	3
6. History	-	2	2
7. Civics	-	2	2
8. Life Skills	3	2	2
9. Personality and Sports	2	2	2
10. ICT	1	2	2
11. Religious Studies	2	2	2
12. French	2	2	2
Total	**32**	**42**	**42**

13. Resource requirements for implementing the curriculum

a. Human resource
    i. Head teacher: Minimum qualifications: Form Four with Division III pass level, certificate in education plus at least five years of experience
    ii. Teachers: Form four with Division III pass level and certificate in education
b. Class size: 1 teacher to 40 students (1:40). Teachers should teach between 28 and 32 classes per week. This translates into 18-21 hours of teaching per week.
c. School inputs: subject syllabi, teacher guides, books and teaching aids

14. Teaching methodology: Participatory

15. Assessment

a. Continuous assessment (50 marks): home works, tests, term examinations, projects, Q&A sessions, individual tests, practicals, etc.
b. Final examination (50 marks): Primary School Leaving Examinations (PSLE) by NECTA