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Why Did Rwanda Shift from Knowledge to Competence Based Curriculum? Syllabuses and Textbooks Point of View

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Abstract

The present study aimed at analyzing the goodness of competence-based curriculum and usability of textbooks related to this curriculum. It accommodated a sample of 44 national teachers' trainers (NTs) on Rwandan new competence-based curriculum. The study accommodated a mixed research design where inferential statistics was used and qualitative data were analyzed thematically. Using a t-test, the comparison between Knowledge Based Curriculum (KBC) and Competence Based Curriculum (CBC) was found to be statistically significant (at .05 level of significance) in a favour of Competence-Based Curriculum in form of practicability to teachers' needs and interests, well organization and timing, appropriateness of activities, competences of curriculum developers, carrier guidance as well as market orientation. However, it was found to be loaded as it is in the former knowledge-based curriculum. The textbooks were also compared in form of structure, illustration as well as content. Activities in CBC textbooks were found learner based. Therefore, learners interact

and work together in acquiring skills; however, some contents are too heavy for learners' level; so activities needed to be broken down to fit learners' ability and engagement.

Key Words: Knowledge-Based Curriculum, Competence-Based Curriculum, Rwanda Education Board, National Trainers, Syllabuses and Textbooks

Introduction

The numerous prospects of curriculum, instruction, and assessment could be conceived on the basis of interactions existing among technologies and modern knowledge (Pellegrino, 2006) because the best way to forecast the future is to create it. A tremendous shift moved from a knowledge-based to competence-based curriculum, and from knowledge and skills acquisition to knowledge creation and application in order to fulfil the development of students' autonomous, lifelong learning habits; appropriate skills and knowledge as well as be able to apply those skills in their real life (Ngendahayo & Askell-williams, 2016). Actually, competencies are delivered from sets of skills; they reinforce one another from basic to advanced levels as learning growths. However, competencies within different contexts also require different bundles of knowledge, skills and values/attitudes. Therefore, progress refinement of well-defined competencies would be necessary in order for improved performance in a variety of contexts can be easily assessed (Mbarushimana & Kuboja, 2016). For sure, the concept of competence has a fairly long history in education and training research and practice. For instance, while in the German and Dutch discussions on competence-based education, a more holistic approach is advocated, to overcome the risks of the disintegrative approaches, in Australia and the United Kingdom, competence-based education has been implemented as a crucial part of national training reform plans.

Recently, in Rwanda, there was an implementation of education for all that was purposively laid on knowledge-based leading to the economy with particular emphasis on science and technology as an engine of development. In 2016, knowledge-based was shifted into competence based curriculum (Rwanda Education Board, 2015b). Besides that, it is very important to consider the change, challenges, and difficulties teachers might meet as they are the first implementers of the curricular activities to students.

The Rwandan education philosophy guarantees learners to achieve full potential in terms of appropriate knowledge, skills, and values and attitudes allowing them to integrate into society and exploit employment opportunities (Rwanda Education Board, 2015b) after graduation. Rwanda's new competence-based curriculum matches global trends and is in line with the 2013 harmonized curriculum framework for the East African Community (Rwanda Education Board, 2015b).

On the road to education, all policies related to the primary and secondary education are set out by Rwanda Education Board (REB). As in its mission to fast-track education development in Rwanda by enabling education sector growth with the line of Ministry of Education guidelines, in order to educate a huge population of Rwandans (Gahamanyi, 2010; Ministry of Education, 2013) to achieve the millennium goals such as education for all and free education with quality. The country as it particularly gave chances to any candidate to catch up the learning occasions to acquire competences and qualifications for the future in teaching; there is still a big challenge for teachers to implement what competence-based curriculum requires.

The competences suggested for Rwanda's educational system are critical and problem solving skills; creativity and innovation; research; communication in official languages; cooperation, interpersonal management and life skills; and lifelong learning (Ngendahayo & Askell-williams, 2016) and those competences are confined in basic and generic competences. A competency-based curriculum is a curriculum that accentuates what learners are expected to do rather than focusing on what they are

expected to know. Such curriculum is learner-centred and adaptive to the changing needs of pupils, students, teachers, and society (Kabita & Ji, 2017). Curriculum is the vehicle through which a country empowers its citizens with the necessary knowledge, skills, attitudes and values that make them to be empowered for personal and national development. Curriculum should, no doubt faces the needs of the individual citizens and the state country (Kabita & Ji, 2017). Competence based training would mean an institutional process that moves education from focusing on what academics believe graduates need only to know to what they need to know and be able to do in any simple or complex situations (Hoogveld, Pass, & Jochems, 2005; Mbarushimana & Kuboja, 2016).

With the competence-based Curriculum, a teacher is required to teach many skills. A competence-based school curriculum is seen as a great approach to addressing the aspirations of a society and its young people as children do not parse the world into domains of knowledge in order to satisfy their needs, as does the school system. However, previous aims of education at large have been to equip young generations with the capability to develop the knowledge accumulated by the human mind throughout millennia of development (Singer, Samihaian, Holbrook, & Crisan, 2014).

The traditional methods for teachers are not suited to produce the deep understanding that can assist students becoming intelligent users of knowledge thought from schools. According to competence-based curriculum towards education quality in Rwanda, teachers need to shift from traditional methods of instruction and adopt participatory and interactive methods that engage students in the learning process (Ministry of Education, 2015). However, there is no empirical research done in regard to identifying teachers' struggle (Uworwabayeho, 2009). Furthermore, most of the education systems in all societies adopted a separation, subject-based approach to educational development, and this becomes the failure of many educational reforms (Singer et al., 2014)

Theoretical Point of View

The competence based teaching and learning approach are one of the most relevant issues discussed concerning curricular reforms all over the world because this it has some controversial edges and consequently, it is visualized from different theoretical viewpoints (Mbarushimana & Kuboja, 2016). The same study conducted by Mbarushimana & Kuboja (2016) on Competence-based training has gained a paradigm shift in Rwanda encouraging the hands-on activity and the sense of self-employment. This model was supported by the inspiration of constructivism theory which always makes a projection on learner-centred. Therefore, teachers need to shift from traditional methods of instruction and adopt participatory and interactive learning methods that engage learners in the teaching and learning process, both in groups as well as in individuals learning environment avoiding passive learning in order to personalize and address learners' individual needs and expectations. The learner-centred approach is better than everything in term of teaching and learning since it preserves involvement of diverse learning experiences, including individual, paired and group work, oral questioning, discussions, debates, role play, presentations, projects, practical work, investigations, research, prediction, problem-solving, assignments, field visits, tests and quizzes (Rwanda Education Board, 2015a).

Competence-based education is constructed based on standards and the way we want a learner to act, therefore leading paradigm for innovation, creativity, and role model at the system and at the learning atmosphere level (Wesselink, Mulder, Elsen, & Biemans, 2004). An important reason for the above concept of competences is the expectation held by many stakeholders in the vocational education and training field that the gap should be reduced to the labour market and education using competence-based education. This competence-based education was however factually based on a behaviourist model of training and learning, within a Taylorism industrial model (Wesselink et al., 2004) since during the 1970s, the competence movement (Friedlander, 1996; Lucia & Lepsinger, 1999 and

Wesselink et al., 2004)) was characterized by exhaustive analysis of the numerous behavioural aspects of professional tasks. Tasks of professionals were divided into the specific parts resulting in long lists of fragmented behavioural components. As result, competence-based education became primarily associated with behaviourism, mastery learning and modular teaching (Mulder, 2004).

Textbooks Point of View

According to Ministry of Education (2016), a teacher needs to improve the quality of teaching mathematics by adjusting instruction to the level of the learners, use creativity and innovation in the teaching and learning the process, link the use of subjects and real-life situations, have a good mastery of content. As the vision (Habiyaremye, 2017) on knowledge-based and competency-based curricula rely on qualified teachers who can deliver useful knowledge to students, research on teachers' struggle is needed instead of putting the most efforts in updating pedagogical documents. It is observed that most efforts are put in the distribution of updating syllabus and other materials such as textbooks or other methodological documents (Ministry of Education, 2016). What is more, the remaining issue is to know how teachers manage the changes and challenges from those updates in relation to competence-based curriculum and usability of textbooks related to it (UNESCO, 2010).

At the beginning of CBC implementation, Rwandan government got support from USAID to have 183,106 curriculum and training materials developed and disseminated, over 11,000 teachers, administrators, and officials, and other education officials were also trained, while ICT with training was provided to 416 sector education officials in line to support monitoring of the new curriculum, which is expected to promote learning and monitoring into the future. Therefore, this resulted to education stakeholders better understand the philosophy of competency-based education as well as mastering their role to support its implementation, and the skills of teachers on the field have increased in order to implement competency-based pedagogy in classroom settings. Furthermore, the competency-based approach will no doubt increase the quality of education (UNICEF Rwanda, 2017).

Research Methods Used

The present study is aimed at revealing teachers' trainers (NTs) perception on shifting from Knowledge to Competence Based Curriculum and issues of related textbooks used.

CBC training has two streams; administrative stream and technical stream. The administrative stream provides an organizational leadership training for DEOs, SEOs and HT/DOSs and it aims at introducing the concept of the new curriculum and the monitoring mechanism to all education stakeholders. On the other hand, the technical stream aims at providing technical contents to all teachers. In order to equip all teachers in service, the technical stream applies a combination of cascading training and Continuous Professional Development (CPD) as shown in the diagram below. REB develops training contents and train National Trainers (NTs). NTs train Sector-Based Trainers (SBTs), who will train teachers in a series of Sector-based CPD sessions. Sector/School-based CPD will serve as a platform to continuously explore the best approaches to the learners in the sector. This continuous cycle of professional development at the last phase of CBC training is expected to contribute to improving teachers' mastery in CBC and self-sustaining development of teachers and schools (Rwanda Education Board, 2017). Therefore, national teachers' trainers (NTs) were good to fit this study.

Forty-four out of one hundred fifty National Trainers were randomly selected for the study. The questionnaire survey used for data collection was made up of quantitative and qualitative questions. It sought information on the comparison between knowledge-based curriculum and competence one as well as respective textbooks related to national trainers' experience since they themselves are teachers. The instrument related to curriculum comparison was a 9-item Likert scale questionnaire

based on a 4-point rating scale; from “fair” scored 1, up to “excellent” scored 4 points so that an item in the questionnaire was therefore considered a goodness of competence based curriculum if the mean of the respondents on it was 2.5. The instrument related to textbooks comparison, however, was based on revealing strengths and weaknesses of each type of curriculum (CBC and KBC).

Analysis of Findings and Presentation

Using M-excel to evaluate Likert scale national trainers’ perception related to how old (KBC) differ from new (CBC) curriculum, descriptive and inferential statistics was used to analyze nine components, these are: useful material coverage, practicability to teachers’ needs and interests, organization of contents in syllabuses, time frame, quantity of content, effectiveness of activities, curriculum developers’ competences, carrier guidance, and market orientation towards students. The compiled frequencies and significance among the components between these two curricula are presented in table 1.

Table 1 Mean and Standard Deviation Results on the wellness of shifting from KBC to CBC

s/n	Item	Variation		SD	df	t-stat	t-crit	Significance at p<.05	
1	Covered useful material	CBC	40	3.03	0.73	69	4.07821	1.667239	Yes
		KBC	31	2.32	0.70				
2	Practical to my needs and interests	CBC	39	2.97	0.84	67	3.965082	1.667916	Yes
		KBC	30	2.17	0.83				
3	Well organized	CBC	38	3.00	0.62	66	3.374859	1.668271	Yes
		KBC	30	2.37	0.93				
4	Well timed	CBC	40	2.73	0.82	69	2.630623	1.667239	Yes
		KBC	31	2.23	0.76				
5	Loaded	CBC	37	2.62	0.83	63	1.155147	1.669402	No
		KBC	28	2.39	0.74				
6	Effective activities	CBC	40	2.95	0.88	67	3.731424	1.667916	Yes
		KBC	29	2.14	0.92				
7	Curriculum developers' competences	CBC	39	3.18	0.79	67	4.460808	1.667916	Yes
		KBC	30	2.23	0.97				
8	Carrier guidance	CBC	39	2.82	0.82	68	3.44827	1.667572	Yes
		KBC	31	2.13	0.85				
9	Market-oriented	CBC	38	3.08	0.78	67	4.821548	1.667916	Yes
		KBC	31	2.06	0.96				

From the national trainers' teachers' observations, Table 1 showed that the reason to change curriculum is statistically significant in a favour of Competence Based Curriculum. It is covered with useful material, practical to teachers' needs and interests, well organized and timed. It contains appropriate activities, Curriculum developers' had enough competences, and it well also guides learners' carrier and orient them on the competent market. However, it is still loaded same as the former knowledge-based curriculum.

Box 1 CBC Textbooks strengths and weaknesses

Strengths	Weaknesses
<ul style="list-style-type: none"> • Activities are learner based, learners interact and work together in acquiring skills • More practical exercises, example are simplified, well-structured within the arrangement from simple to complex • Well-presented of title and contents, easy to be used by learners. The unit titles are found at the top of the page • Activities are sufficient, good illustration, contents are covered • Pictures, illustrations, drawings are attractive to the level of the students, the size of the book is good (not too big, not too small), the content rhymes with the syllabus, tasks & exercises are appropriate to the level of the students • They are set, prepared using the CBC strategy, use Bloom's taxonomy levels • The language used is appropriate to the level of the learners, all texts and images are in the Rwandan context • Courses fit in the curriculum, activities are well organized, assessments are being done continuously • Content adapted to the current situation of living conditions, effective examples, and exercises, Cross-cutting issues well integrated • Follow the structure of the syllabus • Clear examples, well-organized units related to the syllabus, understandable English, examples are related to real life • Teacher's book matches with students' book 	<ul style="list-style-type: none"> • Some contents are too heavy for learners' level; activities needed to be broken down to fit learners' ability and engagement • Many exercises do not allow learners to think on real-life situation • Activities are not practical and engaging activities aspect of developing competences • Questions are based on knowledge, most of the units there are no tasks • Lack of ICT tools to improve teaching and learning process • It is somehow hard according to the level of the students, the books have many materials to deal with, it does not match with the time given (more time needed) to finish it • Many experiments which need expensive equipment, much contents in relation to time, some units are at high level of learners, not available at schools • Some typo errors and spelling words • There are insufficient syllabuses and textbooks delivered to schools

Box 1 exposes the national trainers' teachers' observations about strengths and weaknesses of competence based curriculum. The strengths and weaknesses are mostly in form of structure, illustration, content, and usability.

Box 2 KBC Textbooks strengths and weaknesses

Strengths	Weaknesses
<ul style="list-style-type: none"> • Time management since the teacher presents the content to the learners who are passive • Variety of assessment activities (exercises), Well explained concepts and content • Many activities and assessment, well understood 	<ul style="list-style-type: none"> • Lack of learning based activities • Activities are over-loaded compared with 40 min lesson • Focusing on knowledge and a lot of notes for learners, lack of competences, since they are in the abstract format • No tasks, no enough activity, no unit • Too long and unnecessary information, vague activities, not addressing cross-cutting issues, No model lesson plans • No illustrations • The role of the students in these books was very low, the students mostly depend on the teachers • Does not specify the level of students and context of Rwanda • Lack of experiments, lack of enough activities for learner, difficult questions for learners • Not organized, some content available in the syllabus but unavailable in books

Box 2 exposes the national trainers' teachers' observations about strengths and weaknesses of the knowledge-based curriculum. The strengths and weaknesses are mostly in form of structure, illustration, content, and usability.

Discussion of Results

Rwanda is striving to build a knowledge-based economy, with particular emphasis on science and technology as an engine of development. One of the national priorities in the education system in Rwanda is to ensure that education quality continues to improve through closer integration of curriculum development, quality assurance and assessment, improved supply of learning materials, particularly textbooks, and improved teaching and learning strategies (Rwanda Education Board, 2015a). From the results, Competence-Based Curriculum was found to be better than Knowledge-Based Curriculum and the reason to shift to it, is statistical significance. According to useful material coverage, practicability to teachers' needs and interests, an organization of contents in syllabuses, time frame, and the effectiveness of activities, curriculum developers' competences, carrier guidance, and market orientation towards students CBC is always better. Only that it does not make any difference in terms of quantity of content, it is loaded with too much of content as KBC.

Mbarushimana & Kuboja (2016) while defining general opinions of candidates about competence based training program in Rwanda on general attitude, competence and future prospects, and mean scores were found to be (3.4357, 3.4357 and 3.4554 respectively) under the agreement zone while accessibility in the market was rated at 3.6464 under the strong agreement zone. These results may give the impression that even if candidates are easily accessing the internal market, they have little

doubt whether the knowledge and skills they have acquired are competent enough to guarantee them with future prospects such as further studies (Mbarushimana & Kuboja, 2016).

The dissemination and implementation of the new curriculum commenced in January 2016. In January 2016, curriculum for Pre-Primary, Primary 1 and 4 and Secondary 1 and 4 was rolled out. Primary and Secondary grades 2 and 5 will be implemented in January 2017, and Primary and Secondary grades 3 and 6 will be implemented in January 2018 (UNICEF Rwanda, 2017).

In the CBC textbooks, activities are learner based, enough practical exercises are provided, and examples are simplified and well-structured within the arrangement from simple to complex. Pictures, illustrations, drawings are attractive to the level of the students; the size of the book is also no claim.

The language used is appropriate to the level of the learners, all texts and images are in Rwandan context. Assessments are being done continuously and use Bloom's taxonomy levels. Cross-cutting issues are well integrated (said by NTs). However, instructional and learning objectives, as well as generic competences are not pointed out. According to CBC, teachers are expected to ensure that learners participate in learning activities that help learners acquire the desired knowledge, skills, and attitudes. One possible way to help teachers to meet this expectation is to give an adequate mechanism to construct knowledge and meaning of the new curriculum. The SIIQS project should support school-based in-service training (INSET) as an effective mechanism to enhance teacher practical and professional knowledge and skills to ensure quality learning for all (Yamashita et al., 2017).

Nevertheless, some weaknesses were pointed out like some contents are too heavy for learners' level, so activities needed to be broken down to fit learners' ability and engagement; questions are based on knowledge, most of the units there are no tasks in some textbooks, it is somehow hard according to the level of the students, the books have many materials to deal with, it does not match with the time given to finish it, this reflection of teachers, however, need to be taken into consideration by themselves because expertise, mastering of the content can allow them to summarize important key points to teach to students. They also claimed experiments which need expensive equipment, not available at schools; here also teachers should think on the use of improvised science materials (Ndihokubwayo, 2017). Study books and other teaching materials have been prepared (NewTimes, 2015). Some of them are being delivered to schools and others are scheduled to be delivered to schools before the beginning of the 2nd term in April as the printing is being done progressively by publishers. However, the respondents in the present study claim that textbooks contain with typo errors and misspelling words, there are insufficient syllabuses and textbooks delivered to schools too.

The old knowledge-based curriculum has little strengths, however, it displays a good time management than New competence-based curriculum since the teacher presents the content to the learners who are passive (pointed out by teacher' trainers). The KBC textbooks weaknesses among others are the role of the students in these books was very low, the students mostly depend on the teachers, lack of enough activities and difficult questions to learners, and some content available in syllabus mismatch in books.

The study of These and Be (2015) has proposed characteristics of a good student textbook such as a clear and easy to use page design with easy to understand headings, captions and signposts to aid learner navigation through the textbook and the individual topics, clear topic or lesson objectives, key competencies and learning outcomes aimed at the learners, clear and accessible informative, explanatory or descriptive text written at the right level that presents essential topic information in a well-structured and logical manner, clear and relevant illustrations, which contribute to learner understanding, essential data in the form of tables, graphs for interpretation, textbooks should be interesting and challenging questions addressed to the learners, have a menu of activities for group, pair or individual work – ideally organized for mixed abilities, should have activities for the learners

that can be used by the teacher for formative assessments of the strengths and weaknesses of individual learners.

Accordingly, characteristics of a good teachers' guide should present a lesson objectives, key competencies and targeted learning outcomes, support material accurately cross-referenced to each topic/lesson in the textbook, additional subject content beyond the content of the textbook aimed at increasing teacher knowledge and confidence, guidelines to support lesson planning by the teacher – including sample lesson plans, it should have a list of the resources required to support the topic/lesson including suggestions for no cost/low cost alternative resources, contain suggestions on classroom methodologies aimed at providing alternative approaches to cater for different school facilities, resources and classroom conditions, it should provide extension material for higher performing learners and remedial suggestions for lower ability learners and those with learning difficulties, provide alternative/additional exercises and activities as well as formative assessment activities and guidelines for recording results (These & Be, 2015).

Conclusion and Recommendations

The new competence-based curriculum (CBC) was launched in April 2015 aiming to increase students' skills and learning outcomes by mostly equipping students with the knowledge, skills, attitudes, and values needed for a knowledge-based economy that can boost Rwanda to compete on the global market.

Rwanda has chosen to adapt competence-based curriculum because the last one was covered with useful material, practical to teachers' needs and interests, well organized and timed. Its activities were appropriate, curriculum developers developed it with competences, it guides learners' carrier and orients them on the competent market. However, the way is loaded with content is claimed by most of the national trainers' teachers.

Currently the designing and writing is still ongoing process, however national trainers (NTs) are claiming the textbooks delivered have still some problems like too many contents, scarcity of materials to cover experiments recommended, so Rwanda Education Board and Ministry of education should remind the designers and textbooks writers the previous claims to take them into consideration. Typo errors and misspelling words are also found in the current textbooks already in schools, so the proof-reading has to be taken care of before publishing as this can lead to the misconception of students and non-trust by teachers. Recommendation and guidance to create and use teacher-made teaching aids should also be given to teachers in order to solve the experiment claim which needs expensive equipment.

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