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The 'cone effect' and its implication for an emerging economy: The case of Cameroon.

Abstract

In order that Cameroon achieves its 2035 vision (emerge economically) and raise its citizens to middle income; there is need to reconceptualise the training in its high schools in such a way that learners are imbued with the knowledge, skills and attitudes that will enable them to assume man power roles in various sectors. By so thinking, the study was set to find out the extent to which learners assimilate the curriculum. Incumbent on the plethora of unemployed youth, other literature, and the vacancies for which there is acute shortage in STEM related occupations (World Bank, 2012), the study hypothesized that the type of learning occurring in classrooms in Cameroon is more driven by the exam syllabus than the teaching syllabus. This often leads to teaching to the test.

Therefore the study established the link between classroom content in some selected High Schools in Mfoundi Division, teaching and exam syllabi. 171 cases were analysed for physics teaching content to see the link between it and; teaching and exam syllabi. The mixed design sampled teaching content in terms of assignments and classroom references as well as content analysis for sequence and integration. Purposive sampling was employed in order to meet as many teachers as possible who teach physics in high school.

Firstly, sequence tests in physics were correlated with both teaching and exam syllabus using the Pearson Product Moment Correlation Test. Secondly, classroom content (notes) was correlated against teaching as well as examination syllabi. The results established a higher correlation between sequence tests and exam syllabus; .512 $p < .05$ ($n = 171$) compared to sequence tests and teaching syllabus .311$p < .05$ ($n=171$). Secondly, there was a higher correlation between classroom content and examination syllabus .490, $p < .05$ ($n=171$) compared to correlation between classroom content and teaching syllabus .400, $p < .05$.

The results supported the 'cone effect', in which a lot of 'meaningful' learning is sieved out of the curriculum due to the fact that classroom behaviour is dictated by examination syllabus. This however is undesirable, given that students tend to miss out on a lot of learning experiences which likely rub them of the learning intentions; for them to be able to socioeconomically insert into society. The study therefore recommended that teachers need to reconceptualise their classroom processes to give teaching a preferential role over testing, or to prioritize the teaching over the tested curriculum. By so doing, the additional gains, although at a higher price, cannot be underestimated given the additional gains that will result from more adequate man power provisions in dire need for the emergence of Cameroon by 2035.

Introduction

Cameroon has as a prerogative to become an emerging economy by 2035 (Cameroon Vision, 2009). Emergence in this context includes technological and infrastructural development that is required to enable its citizens to cope with the ever increasing challenges in the global economy. Unlike before, people need to move faster and to work more efficiently, in order to cope with technological revolution (World Bank, 2006).

The vision 2035 is coherently formulated in phase with the Millennium Development Goals (MDGs) that focus on the 6ps; Person, People, Planet, Prosperity, Partnership and Peace (MDGs, 2000). Among others, it is hoped that by emerging Cameroon, its citizens will have more access to various amenities that make them live as worthy citizens (World Bank, 2006). In terms of health; modern hospitals and health facilities that can further reduce the incidence of infant mortality, still birth, and cardiovascular diseases for example. In terms of technology; improve on Information Communication Technologies (ICTs) in order to advance health, education, transport, security, economy, agriculture and communication (Cameroon Vision, 2009).

Furthermore, in terms of agriculture; high tech agricultural technicians and engineers who can improve upon food production and breeding techniques to cope with the need for an increase in food production culminating from population increase (World Bank Institute, 2007). Last but not the least, in terms of education; improve upon the education sector which should continue to provide the man power requirements that will occupy these career roles and professions in question.

Indeed, irrespective of the type of sector mentioned or left out, it is self-evident that the quantity and most importantly, the quality of key players such as electrical engineers for example will invariably depend on the nature of training (Almeida, 2012). If the educational aims are incongruent or out of phase with vision 2035, what other tool do we have? There has been a high correlation between education and infrastructural development (ILO, 2010). In spite of the arguments that education does not necessarily bring about development, there is still room to establish that development does not depend on education.

Background to the problem

There has been a paradigmatic shift to emphasis on 'professional' education in Cameroon. Stemming from the orientation law on education in 1998 (The Law of Orientation of Education in Cameroon, 1998), the educational philosophy continued to shift from that of the erstwhile colonial masters to insert graduates into specific socioeconomic roles. Present emphases on technical and

professional education align with the need to solve problems in the context of Cameroon (Fonkeng, 2007). The creation of more professional institutions has been governments' response on the need for capacity and man power requirements for emergence and subsequent industrialization.

Statement of the problem

In spite of the hope that education can be used to provide the man power requirements in Cameroon, this hope is dwindled with the surge in unemployment (World Bank, 2012 & 2018). Although it can be argued that the structuring of the economy is not inclusive enough to accommodate young graduates (World Bank, 2018), it seems more obvious that young graduate in themselves leave school without the adequate knowledge, skills and attitudes that these schools are supposed to imbue in them (ILO, 2012; World Bank, 2018). It would appear that some companies are looking for skilled graduates, and skilled graduates are looking for jobs. However, a more important question is, if students are trained to acquire jobs, who is to create those jobs. It can be said that the most important role of schools is to educate students in a way that they can create jobs or become successful entrepreneurs when they leave school (Ansu et al, 2012).

The problem however is the fact that inputs into the school system have not yielded enough fruit. Maybe because the inputs are inadequate, but more so, it is strongly argued that stakeholders have reduced success in education to passing of exams (Nenty & Lusweti, 2014). By so doing, examiners tend to exert more influence in what students learn and what teachers teach in our schools, thereby leaving out fundamental facets of knowledge, skills and attitudes that are critical to socioeconomically insert in today's society.

This results in teaching to the test, which does not produce expected learning outcomes. It would be without say that, learning in itself is a means and not an end (McAlphine, 2015). But by using test/exam results to punish and reward teachers and schools, it pressurizes the parties involved not just to find ways to improve results, but may lead to inadequate paths to getting results such as examination malpractice and mark inflation in the exam boards (Ornstein & Hunkins 2009)

Leaving out essential learning content (intended curriculum) to focus on what is tested (exam syllabus or tested curriculum) results in what we refer to as the 'cone effect'. A scenario in which the 'learned' curriculum is a subset of the 'tested', which is a subset of the 'taught', which is a subset of the 'stated' which is a subset of the 'intended' (see conceptual diagram). With such a scenario, a lot of useful material is sieved out, reducing the curriculum by an index of multiple fractions.

Furthermore, according to Ornstein and Hunkins (2009) even when a good test blue print is used to design exams that reflect the content such as the syllabus for example, with current taxonomies such as the Blooms Taxonomy of Educational Objectives (BTEO), young and inexperienced teachers may not be dexterous enough to use them in determining important attitudes such as perseverance, tolerance, patience, caring for one another, respect, integrity, dignity and learning to learn, which more readily emerge in other taxonomies such as Finks

Taxonomy of Significant Learning (Fink, 2003).Without being able to capture the some of these important attributes concerning themes such as character, ethics, interpersonal relationships, it remains difficult to address some of the socioeconomic concerns of the 21stcentury (Nketchi, 2015).

General objective of the study

To find out how the 'cone effect' influences what learners learn in school in Physics in the sixth forms.

Specific objectives:

1. To explore the relationship between teaching and examination syllabus and sequence tests in GCE A/L system in Cameroon.
2. To examine the relationship between teaching and examination syllabus and subject content in the sixth forms in GCE A/L system in Cameroon.

General research question

How does the 'cone effect' influence what learners learn in school in Physics in the sixth forms?

Specific research questions

1. What is the relationship between teaching and examination syllabus and sequence tests in GCE A/L system in Cameroon?
2. What is the relationship between teaching and examination syllabus and subject content in the sixth forms in GCE A/L system in Cameroon?

General research hypothesis

Ho: The 'cone effect' does not significantly influence what learners learn in school in Physics in the sixth forms in GCE A/L system in Cameroon.

Specific research hypotheses

Ho_1: Sequence tests do not significantly correlate more to examination syllabus than teaching syllabus in GCE A/L system in Cameroon.

Ho_2: Subject content does not significantly correlate more with examination syllabus than teaching syllabus in GCE A/L system in Cameroon

Literature review

The syllabus is a guiding document that generally includes some of curriculum content (Tambo, 2003). Although the syllabus operationalizes the curriculum, content in itself is the means through which learners can acquire the intended knowledge, skills and attitudes that are required for socioeconomic insertion into a particular society and the world at large. Some studies reveal that teachers tend to rely on content that emerges out of the exam

syllabus, which narrows the curriculum and syllabus to the detriment of intended learning (Jaipal, 2017).

Studies have indicated that some teachers are unable to translate the curriculum according to the contextual needs of learners (Martin, 2003). Matin (2003) observed while investigating the relationship between inclusion in the curriculum and student achievement (in Botswana, South Africa and Tunesia) that this led to teaching of low order cognitive skills often resulting to high failure rates.

Research has it that when teachers are not dexterous enough, there is a large lacuna between the intended and taught curriculum, and that it is the place of educational stakeholders to reduce this gap as much as they can (Nenty&Luswti, 2014). In order words, the purpose of the teacher is to scaffold the learners to bridge the gap between the intended and stated curriculum through the zones of proximal developments of the learners (Tchombe, 2019).

Teaching to the test among other factors, seems to be a precursor to high failure rates, resulting in the inability to transfer learning to novel situations among learners (Nenty&Fetogong, 2015). Many educational stakeholders use exam results to sanctions schools. As such, the pressure on teachers may result in undesirable consequences such as teaching to the test or focussing on past examinations.

Some researchers have advocated that the judgement of achievement strides of students should be based on what they learn and not solely on what they are taught or are tested upon. Matin (2003) carried out a study with the intent to compare the relationship in inclusion between intended curriculum and student achievement and observed that the relationship was not straight forward in science as was it in mathematics.

With a derailed focus by examination syllabuses, some teachers have tended to avoid sanctions from proprietors and administrative authorities by teaching to the test (ARG, 2002). In the Cameroon GCE subsystem, there is plethora of pamphlets that largely contain past GCE questions and answers and little or no room for innovation on students learning materials. It is not to be argued that the pamphlets are not useful, but that they can rub students of their learning experiences by reducing them to rote rather than meaningful learning (Mvesso, 2005).

As such, students become familiarized with past exam to the extent that some regurgitate subject matter as facts without an understanding of the link to relationships and concepts (Mvesso, 2005). Literature also holds that poor setting of exam is responsible for this ‘coning effect’. Many past GCE questions repeat word verbatim, encouraging students to focus on getting and memorizing past exams. Once it works for both students and teachers, there is little motivation for them to focus on learning and meaning (Tchombe, 2019). This is evidenced by questions which often require students to regurgitate rather than synthesize, analyse, apply and evaluate concepts. Even when the questions require these higher levels of Blooms Taxonomy of Educational Learning outcomes, they appear in the same context.

Indeed therefore, students who spend most of their time going through past questions may tend to relatively get more rewards than those that are actually putting in effort and energy to study. This phenomenon is heightened by exams with poorly developed test blue prints and questions that do not coherently link to intended learning outcomes in a meaningful way. In order words, the performance of students in exam may rather reveal inability by classroom teachers to challenge learners to thought provoking incidences that can lead to mastery of appropriate attitudes (Nenty, 2006)

Research has not clearly established that students who passed in their exams in schools were most successful or outstanding in their communities. Instead what is clearly established is the fact that those who became models were those that had particular motivation and focus on some salient aspects of the curriculum (World Bank, 1994d & 2003). Not surprisingly, the overemphasis on the Blooms taxonomy has not had as much advantage on the system, given that that taxonomy is good at assessing conventional knowledge, skills and attitudes, but not others say meta-cognition.

Therefore, it can be argued that these students whom although were not labelled successful in school, but became really successful, most have acquired a great deal of the curriculum that the others did not (World Bank, 2018). Conventional testing philosophies and taxonomies such as BTEO may not reveal these other attributes that are pertinent for the acquisition of 21st century skills in a way that others such as Finks Taxonomy or McRELs would do (Hua, 2015; McREL, 1997). Such skills such as caring for others, learning to learn, patience, tolerance, perseverance, self-directed learning, arguably may be what stands between job seekers and job creators in this generation (Fonkeng, 2007). Ideally speaking, it is important that students acquire knowledge, skills and attitudes, but most important is what they do with them.

RESEARCH METHODS

The mixed methods research design (Amin, 2004) was employed to expound perspective on how the relationship between past exam, exam syllabus and teaching syllabus may affect what teachers teach in their classrooms in high school in Cameroon. The methods, procedures and instrument employed at obtaining data for the study were as follows.

Content analysis: A rating scale was designed to explore characteristics of the content. The scale permitted tallying of the following characteristics of the content; the scope of the content in terms of depth and breath, the sequencing of the content which established the relationship in ordering of content with criteria being teaching and exam syllabus, integration which established the manner in which teachers inculcated proposed didactic material in their teaching (in terms of whether their assignments and references were from textbooks recommended by the GCE board or the MINESEC).

Questionnaires: the questionnaire was separated into four main sections. The demographic data provided data which was eventually used to find out how experience affected the nature of testing. The scope section found out what influenced the depth and breadth of what was tested. The sequence section sorted the criterion that influenced the way content was

sequenced. The integration section found out what criteria guided the selection of didactic material such as textbooks.

Interviews were used to get teachers' perspectives about scope, sequence and integration of their lessons in relation to acquisition of knowledge in other domains such as the psychomotor and affective.

Data analysis and interpretation of results

Ho_1: *Sequence tests do not significantly correlate more to examination syllabus than teaching syllabus* in *GCE A/L system in Cameroon.*

In order to find out whether teachers set tests basing to a greater extent on the examination or teaching syllabus, analysis using the Pearson yielded a correlation coefficient of .512 $p< .05$ between sequence tests and examination syllabus and .311$p< .05$ between sequence tests and teaching syllabus as indicated on Table 1. It was concluded that teachers in Cameroon GCE A/L rely more on exam syllabuses in setting sequence tests than teaching syllabuses.

Table 1: correlation between sequence tests and examination/teaching syllabus (n = 171)

Pearson correlation	exam syllabus	teaching syllabus
Sequence test content	.512	.311
Sig. (2-tailed)	.038*	.038*
N	171	171

*. Correlation is significant at the 0.05 level (2-tailed).

Ho_2: *Subject content does not significantly correlate more with examination syllabus than teaching syllabus in GCE A/L system in Cameroon*

The subject content was correlated with both teaching and exam syllabus with assignment and exercise references being criterion. The correlation was more for examination syllabus, .490, $p< .05$; than for teaching syllabus, .400, $p< .05$; as on Table 2, leading to rejection of null hypothesis. It was concluded that subject content relies more on examination than on the teaching syllabus.

Table 2: correlation between sequence tests and examination/teaching syllabus (n = 171)

Pearson correlation	exam syllabus	teaching syllabus
Sequence test content	.490	.400
Sig. (2-tailed)	.029 *	.029*
N	171	171

*. Correlation is significant at the 0.05 level (2-tailed).

Summary of findings

- Physics Teachers in GCE A/L system base their classroom testing more on examination syllabuses than learning outcomes.

- Physics Subject content in GCE A/L system is based more on the examination syllabus than teaching syllabus.

DISCUSSION

The findings from the study corroborate that of; Nenty, Fetogang & Ernest (2014) who examined the relationship between syllabuses in Botswana to realize likewise that teachers were more focussed on teaching what was being tested rather than what was being learned in their classrooms. Certainly, this rubs students of their learning and examinations of their validity, given the curriculum as criterion. As indicated in the conceptual diagram, when teachers' main preoccupation is to let students pass exam, it leads to undesirable phenomena within the classroom. Students' marks become more important than the process that led to those marks, which may result in undesired behaviour and malpractice (ARG, 2002).

It is understood that teachers are held accountable for their proficiency in the teaching learning transaction through test results with learning outcomes being the criterion (Tchombe, 2019). However, by narrowing down the teaching curriculum to the tested curriculum, a lot of knowledge, skills and attitudes are left behind, with the result that students emerge from schools without the required competences to socioeconomically insert into the Cameroonian economy. This inference is corroborated by findings of the World Bank (2018) on skills development in Cameroon. The problem however is more complex than it looks. Most corporations and businesses require students to acquire 21st century skills, which however are difficult to assess through the current assessment scheme used in GCE in Cameroon (BTEO).

The implication of such practice is that over emphasis on the cognitive domain resulting from the type of assessment scheme employed, rubbing students of other very important types of intelligences which they require in real life such as interpersonal and intrapersonal intelligences. It is important to acquire knowledge, skills and attitudes, but most important is what is done with such knowledge skills and attitudes (Fink, 2003). According to McREL (1997) subject content is useful to learners if it is meaningful. However, a lot of the content in the GCE system requires students basically to recall and regurgitate knowledge and facts. The danger here is in the fact that albeit to scoring pass marks, students may not be able to make meaning out of the subject content, since the content is learnt as if it were an end and not a means to an end. The end is the ability to strive, to survive, to actualize themselves through harnessing available opportunities in their environment.

Although it has been argued that teachers are compelled to teach to the test being compelled by the need to have their students pass in high stakes exam (Fink, 2003; Matin, 2003; Nenty, 2006), it is obvious that the knowledge, skills and attitudes that students can transfer to novel situations is more meaningful and functional to their lives. The need to complete syllabi, due to time constraints and pressure from administration, may be among the reasons for teaching

to the test. It is however important that teachers understand that the most important thing they can do for students is to help them acquire life-long attributes that will enable them acquire positions in various walks of life in society either as job creators, or to take up some roles in real life (Giroux, 2005) whether or not these attributes can be easily be assessed or not. One way to achieve this is to focus on teaching and not just the exam syllabus, on the depth and breadth of the content and transfer of competences to novel situations.

CONCLUSION

To define quality of education as the extent, to which curriculum outcomes are met, entails that teachers should not limit their place in the lives of students to a pedagogic function, but should be more encompassing to look out of the funnel, such that the curriculum becomes a means through which students can socioeconomically emerge into society. By this main preoccupation, curriculum content and testing should focus on knowledge, skills and attitudes that relate scientific principles to real life in the students' contextual environment. As such, the curriculum would be more meaningful to students, being a means and not an end, in which they would be able to develop the Cameroonian society in various fields and walks of life. In spite of the need to be accountable and to follow pedagogical procedures, teachers should prepare high school students as if they were having their last education, given that many will may not necessarily have the opportunities to pursue further formal education.

RECOMMENDATIONS

To discourage teachers from narrowing their setting to past exams and frequently tested topics, schools and MINESEC should invest in the development of question banks that will leave teachers with limitless possibilities in their assessment, thereby impeding over reliance on past exam and exam syllabi.

Alternative assessment should enable students transfer their knowledge, skills and attitudes in meaningful ways to novel situations by requiring students to develop long term portfolios, which should add up to their summative marks to make them more meaningful. As such classroom content would be more comprehensive and less reliant on exam syllabi.

In order to reduce the 'cone effect', teachers should reference real life models, situations, occupations, skills, knowledge and attitudes as evidence to meaningful learning and not just references to an 'A' grade which in effect may be accumulation of unclear protocols.

REFERENCES

Cameroon/World bank Report (2012) **Governance and Management in the Education Sector**. Report No. 67201-CM

World Bank (2006) **Global Issues for Global Citizens: An Introduction to Key Development Challenges**. The World Bank, Washington DC.

World Bank (2006) **Information and Communication for Development: Global Trends and Policies**. The World Bank, Washington DC.

Republic of Cameroon.Ministry of Planning, Economy and Regional Development. February 2009. Cameroon Vision 2035.Working Paper. Yaoundé, Cameroon

World Bank Institute (2007) **Building Knowledge Economies: Advanced Strategies for Development.** The World Bank, Washington DC.

Almeida, Rita, Jere Behrman, and David Robalino, eds. 2012. *The Right Skills for the Job? Rethinking Training Policies for Workers*. Washington, DC: World Bank.

ILO (International Labour Organization). 2010. "Global Employment Trends for Youth." Special Issue on the Impact of the Global Economic Crisis on Youth. ILO, Geneva.

The Law of Orientation of Education in Cameroon (1998) **Law Number 98/004 of 14th April 1998: To lay down guidelines on education in Cameroon**, TheRepublic of Cameroon

Fonkeng, G. E. (2007). The History of Education in Cameroon: 1884-2004. Queenstown Lampester, New York: The Edwin Mellen Press.

Cameroon/World bank Report (2012) **Governance and Management in the Education Sector**. Report No. 67201-CM

Ansu, Yaw, and Jee-Peng Tan. 2012. "Skills Development for Economic Growth in SubSaharan Africa: A Pragmatic Perspective." In *Good Growth and Governance in Africa: Rethinking Development Strategies*, edited by Akbar Noman, Kwesi Botchwey, Howard Stein, and Joseph E. Stiglitz. Oxford Scholarship Online: May 2012. doi:10.1093/acprof:oso/9780199698561.001.0001

Nenty, H. J., &Lusweti, S. L. (2014). Assessment for learning (AfL): Implications for the achievement of the goals of basic education in Africa. *African Journal of Theory and Practice of Education Assessment (*EARNiA Journal), 1, 34-51

McAlphine. (2015). A qualitative study of learning from CAL programs in two tertiary education courses. *ERIC*. Retrieved from http://www.tandfonline.com>doi>pdf May 2017

Nenty, H. J., &Fetogang, B. E. (2015).Classroom practices and the validity of teaching mathematics in Botswana senior secondary schools.*African Journal of Theory and Practice of Education Assessment (*EARNiA Journal), 55-75

Fink, D. L. (2003). What is significant learning? Retrieved from http://www.ou.edu/idp/significant/WHAT%20IS.pdf

Nkechi, E. E. N. (2015). Competency level of fresh graduates of Nigerian universities in employment survival skill .*African Journal of Theory and Practice of Education Assessment (*EARNiA Journal), 38-54

Giroux, H. A. (2005). Schooling and the struggle for public life, 2nd ed. Boulder Co: Paradigm Publisher

Biggs approaches to learning (1987)

Ornstein A. C., &Hunkins, F. P. (2009). Curriculum: Foundations, principles, and issues. Boston. Peason.

Tambo, I. L. (2003) Principles and Method of Teaching**,** ANUCAM Limbe

Jaipal, R (2017). Psychology at the Crossroads: Sustainable Development or Status Quo? _*American Psychological Association, September 19.*Pp,125-159

Martin, M. O. (2003). The science curriculum. TIMSS and PIRLS international study center. Lynch school of education. (2nd Ed). Chestnut Hill, MA: Boston College

Lo-oh, J (2014). 'Le Cameroun des Grands Ambitions'; The Place for the Youth in Cameroon's 'Vision 2035' to become an emerging Economy by 2035. Journal of Educational Policy and Entrepreneurial Research. Vol 1, no 4, 2014

Mvesso, A. (2005). Pour une nouvelle education au Cameroun; Les fondementsd'uneecolecitoyen du developpement. Yaounde: Presses Universitaire de Yaounde

Kumar, A. (2014). Access to Basic Amenities.*Journal of Land and Rural Studies, Febraury 18.Pp, 127-148*

Hua, M. T. (2015). Using the Biggs' study process questionnaire as a diagnostic tool to identify 'at-risk' students: a preliminary study. Retrieved from http://www.learnerstogether.net/wp-content/uploads/2006/07/identifying-at-risk-students-with-spq-pdf July 2017

Mid-Continental Research for Education and Learning (McREL).(1997). Dimensions of learning. Retrieved from http://www.gov/pubs/triedandtrue/dimen.html

Amin, E. M. (2004) Foundations of Statistical Inference for Social Science Research Makerere University Printery, Kampala Uganda

World Bank. 2018. Skills development in Cameroon