

# Investigating English In Content Subjects for Multilingual Africa: Ammunition for Content and Language Integrated Learning?

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## **Abstract**

*The paper sought to investigate achievement in Zambian languages and the relationship between academic achievement in English and that in mathematics and science of Grade 7 students of three cohorts following the change of medium of instruction from English to Zambian languages for Grade 1 learners in 1996, with content subjects still being taught through English. A quantitative method was used to analyse the results, the purpose of which was to explore ways in which outcomes of the relationship could be apportioned to the change of the medium of instruction and not interpreted as impetus for teaching English as Content and Language Integrated Learning (CLIL). Results showed that the pass rates for the cohorts under study were generally low while the relationship indicated higher pass rates in English than those of mathematics and science subjects. Given the poorer pass rates in the content subjects which are taught in English, the outcome of the relationship brings into sharp focus the value of CLIL as a mediating factor in normalising achievement across content and language subjects. The research is of significance as it puts the foundations of academic achievement on the table of educational human development in a multilingual African context.*

**Key terms:** English language, multilingualism, academic achievement, content and language integrated learning

## Introduction

The aim of this paper is to investigate the relationship between academic achievement in English and achievement in content subjects, namely mathematics and science of Grade 7 students, with a view to highlighting the value of a neglected area of Content and Language Integrated Learning (CLIL) when it comes to education and human development in multilingual African context. One issue that has been less researched regarding English proficiency in multilingual contexts is that of teaching English as a subject and using English as a medium of instruction. One way of understanding the difference between the two is by seeing teaching English language as a subject by specialised teachers and seeing it as a medium of instruction through both teachers of speciality in other subjects and teachers of English language using English to teach content and to teach it as a subject. In much of sub-Saharan Africa, English has been adopted as a lingua franca largely because literacy opportunities are more readily available in English. Unfortunately, in the Zambian context, previous studies have tended to focus on the issue of using English as a medium of instruction creating a wrong impression that Zambian languages are not taught in Zambian public schools. The research reported about in this article is part of a larger project that looked at a combination of variables of academic achievement across primary and secondary schools and reading in English in the Zambian context. This part focuses on primary school education because unless a strong foundation is laid, educational human development would not be possible.

## Literature review

### *Mother tongue education*

Much of the previous research has suggested that academic achievement in Africa has been problematic because most learners have been deprived of acquiring education through African language mother tongue (MT). Advocates of MT education seem to be motivated by principles and practice underpinning the teaching of a language to young learners that see “teaching children as an extension of mothering rather than an intellectual enterprise” (Cameron, 2005: xii). In other words, such advocates of MT tend to understand MT as a zero-sum game by believing that critical thinking, creativity and problem solving can only be achieved in MT African languages. Although at the centre of the discourse on language of education are the important issues of additive and subtractive bilingualism, MT or home language is shibboleth to MT advocates. In fact, a mischaracterisation a popular language like English has often suffered in some contexts is that it is not immediately seen as an MT for some users. Those who have associated MT with African languages only, for example, have tended to believe that critical thinking, creativity and problem solving have eluded African learners because they have acquired learning in foreign languages.

In one study in a Zambian context for example, Serpell (1993) looked at academic achievement and tends to blame low academic achievement in Zambia on the use of English as medium of instruction. In that study, Serpell (1993) links education success in Zambia to the expansion of formal education provision through increasing the number of primary schools, secondary schools, institutions of higher

learning. However, he is critical of this kind of conception of education success, pointing out that it has failed to assimilate the majority of the poor rural people into the system. In other words, his view was that schooling had not been effective in Zambia. Thus, in case studies he conducted in the Eastern Province of Zambia among the Chewa speaking people to ascertain the significance of schooling, Serpell (1993) examined the profile of children going through school. He found that the majority of rural people who had been born and brought up in low income subsistence farming families had failed to go beyond the first few years of schooling. He gives as a typical example of one of his respondents who believed that it was his fault that he failed to learn anything from school: *Nzelu ndalibe.....linanikanga sukulu*. 'I didn't have the brains...school was too tough for me' (Serpell, 1993:10). One interesting revelation of this response is how education has been equated to intelligence. In Chewa, the language of the respondent in Serpell's research, to be bright is the same as to be intelligent or to have brains, which is '*Nzelu*'. The same understanding true among the Bemba speaking people where the word '*mano*' which is an equivalent word for intelligence is used to describe a bright person. Similarly, education is equated to intelligence in English. Although this may be an unfortunate interpretation of the meaning of intelligence, it is illustrative of the value attached to formal Western education in major Zambian languages. When it comes to academic achievement, Serpell (1993:10) quotes one of his respondents who said:

I failed to pass the exam in Grade 4 to go into Grade 5. I tried repeating but I still failed. That is when I decided I might as well leave school since there was nothing I was getting out of it. I didn't even know how to read properly.

The excerpt above can be interpreted to be an indictment of the quality of education in Zambia. This sort of self-blame led Serpell (1993) to the conclusion that education in Zambia had created a form of trap for the rural people who believed that formal schooling produced failures in their society. Serpell considers this a moral dilemma. Although he does not report on other rural learners who may have profited from education through the medium of English, he questions how the English medium of instruction could be beneficial to the rural people in any way. He believes that his respondent would have benefitted something from schooling if he had received it in his mother tongue. He further points to the hegemonic nature of English, arguing that English in Zambia has a distinctive character that is associated with aspects of power which dictate the direction of ideas and interpersonal relationships.

Other research has looked at the problem of English with respect to reading abilities of Zambian school children. Research done by Kapembwa (1990), Williams (1993) and Nkamba and Kanyika (1998) indicate poor reading achievement among Zambian primary school learners during the period when Zambia implemented English for literacy in Grade 1. Although there were many studies that indicated that reading ability among Zambian students was poor, the centrifugal force behind the change of the medium of instruction in Zambia in 1996 was the study done by Williams (1993). In that study, Williams conducted comparative reading tests on Grade 6 children in five primary schools in Malawi

and Zambia. Williams found that the reading levels of learners in both Malawi and Zambia were low. While in Malawi where learning was conducted in a Malawian language from initial schooling, the learners were able to read in the local languages better than their Zambian counterparts did in the Zambian languages, reading ability in English was poor in both countries. Although Williams did not investigate the teaching of Zambian languages, he still concluded that the poor performance of Zambian learners in the Zambian languages was due to the neglect of the teaching of Zambian languages. For the poor results in English for Zambian learners, Williams argued that this was due to too early exposure to English which is a foreign language for most of the learners. Williams' study brought the language policy under renewed scrutiny, which in turn led to the adoption of Zambian languages as media of instruction in Grade 1. According to MoE (2003: vii), "The use of familiar language for initial literacy (at Grade One) has ...been implemented" since 1996. Since the implementation of the NBTL in Zambia, the materials have been hailed by many as successful (Sampa, 2005). Later, Kotze and Higgins (1999) evaluated the NBTL and seemed to concur with the Zambia Ministry of Education reports of reading success following the change of the policy from initial literacy in English to Zambian languages. Among published claims of the reading success in Zambia are international reports such as UNESCO/DANIDA (2002).

A point should however be made that most of the research alluded to above has neglected to acknowledge that as much as English has been used as a medium of instruction for content subjects, it has also been taught as a subject alongside Zambian languages.

## ***Multilingualism***

Zambia is a multilingual country. According to Kashoki (1978), more than seventy dialects exist within the boundaries of Zambia. However, Mpepo (1990:31) states that "only eight languages, including English, Icibemba, Cinyanja, Citonga, Silozi, Cikaonde, Cilunda and Luvale have been designated as official languages." All the Zambian languages are classified as Bantu languages (Guthrie, 1967). Zambian languages were first codified into a writing system after the arrival of the British. They are written with the Latin alphabet so that knowledge of a single orthography is required for biliteracy (Underwood, Serlemitos and Macwangi, 2007). In referring to the Zambian languages in English, prefixes are usually dropped. Thus, instead of "Icibemba" or Cinyanja, the words Bemba and Nyanja are used to refer to these languages. In terms of the regions where these languages are spoken, Bemba is mostly spoken in Northern, Luapula, Copperbelt, Central and parts of Lusaka provinces. Nyanja is predominant in Eastern, Central and Lusaka areas. Tonga is mostly spoken in Southern province. Lozi is the regional language for Western province while Luvale, Kaonde and Lunda are regional languages of North-Western Province.

The constitution of the Republic of Zambia states that English is the official language of the country. It is the language of Parliament, the language of business and the medium of instruction for content subjects in schools such as mathematics and science. From this account of the position of the English

language in relation to the Zambian languages, it is clear that English has taken a prominent role in learners' academic achievement. There are respectable views for this. For example, The Brazilian educator Paulo Freire (2000) once propounded the idea of literacy along with his pedagogy of the oppressed. In her foreword to Paulo Freire and Donald Macedo (2005), Margaret Meek looks at the spirited critique mounted by Paulo Freire on literacy campaigns, including those spearheaded by UNESCO. Freire showed how forms of basic and functional literacies were unable to transform and emancipate those oppressed in society because the forms did not bring with them access to powerful means of "speaking out" and direct access to publishing what the near literates were writing" (Ibid, 2005: vii). According to Meek, Freire saw 'basic' education as a particular kind of insult because it is not sufficient to equip the student with his or her reading of the world. That is why when it comes to the role of language in literacy, Freire advocated a confrontation of the relationship between community languages and standard languages if students are to find their voices in speaking or writing their reading of the world.

*The goal should never be to restrict students to their own vernacular.... Educators must understand the value of mastering the standard dominant language of the wider society. It is through the appropriation of the dominant standard language that students find themselves linguistically empowered to engage in dialogue with the wider sections of society (Freire and Macedo, 2005: vii).*

Evidently, the dominant standard language in much of sub-Saharan Africa is English. The multilingual situation illustrated in the case of Zambia is common across sub-Saharan Africa.

## **Academic achievement**

Academic achievement has been defined variously. For example, James, Jurich and Estes (2001:x) define academic achievement as the learners' ability to "obtain good grades (C or higher), take standardized and college entrance exams (e.g. SAT, ACT, Achievement, and Advanced Placement tests) and successfully pursue graduate/professional school degrees or fulfilling work in their chosen career". For the purposes of this research, academic achievement is defined as Grade 7 pass rates in English, Zambian languages, Mathematics and Science. The data were pass rates published by the Examination Council of Zambia (ECZ) for the 2005, 2006 and 2007 cohorts following the implementation of the Zambian languages medium of instruction in 1996 for Grade one learners.

Elsewhere, some studies have looked at the relationship between multilingualism and academic success. For example, in a study in the USA, García-Vázquez, Vázquez, López and Ward (1997) looked at the connection between language proficiency in English and Spanish and academic success involving Hispanic students. The study found significant correlations between proficiency in Spanish (reading and written language) and standardized achievement test scores. Because significant correlations were found between reading and written language, these findings indicated that literacy in Spanish positively influenced scores on standardized achievement tests. In addition, there was a significant correlation between English proficiency (reading, oral and written language) and the standardized achievement

tests. This finding suggested that as English proficiency increased, so did achievement measured by standardized tests.

Similarly, Mahon (2006) in a study on high-stakes testing and English language learners looked at the relationship between multilingualism and academic achievement involving elementary school learners (Grades 3 – 5) in Colorado (USA). Findings showed that English proficiency was significantly related to English academic achievement, even for English language students who had been in U.S. schools for 3 years or longer. These findings bring further light to bear on the view that well managed bilingual programmes have no detrimental effects on learners' academic achievement.

Within sub-Saharan Africa, a number of studies have attempted to look at the relationship between multilingualism and academic achievement in content subjects from a slightly different angle, namely the literacy perspective. For example, large-scale reading assessments are conducted by international organisations such as SACMEQ and IEA, organisers bring on board experts in the field of reading literacy and assessment. In this regard, large-scale reading assessments are considered to be useful sources of information for researchers and policy makers alike. Much has been made since the initial Millennium Development Goals, almost 16 years ago. However, consensus exists that progress regarding the Millennium Development Goals has particularly been problematic.

Almost 15 years ago, the Millennium Development Goals were agreed. These provided an important framework for development and significant progress has been made in a number of areas. But the progress has been uneven, particularly in Africa, least developed countries, landlocked developing countries and small island developing States (The UN, 2015:6).

Zambia is both a least developed and landlocked country. The current Millennium Development Goals came into effect on 1<sup>st</sup> January 2016. Thus, countries recommitted themselves to achieving all the Millennium Development Goals, together with those that were not achieved. An important realisation was the integration of the 17 development goals into an indivisible whole. With respect to educational human development, the United Nations member states committed themselves to “providing inclusive and equitable quality education at all levels —early childhood, primary, secondary, tertiary, technical and vocational training” (Ibid, pp. 7-8).

When it comes to educational human development, a clear departure of the new Millennium Development Goal from the initial one is that the new one is more comprehensive and multidisciplinary cutting across early childhood, primary, secondary, tertiary, technical and vocational training. Such educational human development entails society speaking to water, the earth and the gases. In that regard, it is imperative that language arts are used for benefiting from the affordances of mathematics and science. Implicit in that agenda is the value of CLIL.

*CLIL*

CLIL has received much attention in the European setting. Unfortunately, the relationship between multilingualism and academic achievement has not been confronted as a mediating factor in education and human development within CLIL in the African setting. CLIL has been “often seen as an umbrella term covering aspects of bilingual education, cross-curricular teaching, content-based teaching, and ESP” (Darn, 2009:275). Graddol (2006) places English at the centre of discourse by arguing that although CLIL is related to English for Specific Purpose (ESP), the difference is that CLIL is best suited for delivery in bilingual contexts. Over the past two decades an increasing body of research has demonstrated that CLIL can enhance multilingualism and provide opportunities for deepening learners’ knowledge and skills. CLIL has been found to be additive (one language supporting the other) and not subtractive (one language working against the other) (British Council, 2014:1). Thus, it is further postulated by the British Council (2014) that

The logic lies in the acronym: in delineating that *Learning* involves the *Integration* of both *Content* and *Language*, CLIL makes explicit the fact that the learning of any content must involve the learning of *the language associated with the content*. At the level of schooling, successful education in either a first or additional language requires that learners are equipped with the *language for thinking about the content* (p.4).

In much of Africa, education is enacted in traditional ways, and not within a CLIL framework. As a result, learners have difficulties in establishing linkages between subjects (Hallet 1998).

## **Problem statement**

What is known about research that has investigated the role of English in multilingual education in Africa is that such research has tended to look at English as a medium of instruction. Consequently, using English as a medium of instruction in multilingual Africa has been thought to be responsible for poor academic achievement and literacy. Such research is important because it helps us scrutinise the possible unintended consequences of using a foreign language like English which is essentially a colonial language to many African countries. However, little is known about the relationship between learners’ academic achievement in African languages and the relationship between academic achievement in English on the one hand and their achievement in mathematics and science on the other hand. A relationship that creates multidisciplinary synergies between the arts or social sciences and natural sciences does not only concretise our knowledge of enhancing quality education across mathematics and science subjects but it also throws up useful ideas on how Africa can exploit the affordances of education for the continent’s human development. Therefore, understanding such a linkage is of significance.

## **The research design and methodology**

The research design for this study was informed by both ontology and epistemology. Ontology refers to the philosophical issues about the nature of reality and ways of knowing (McDonough and McDonough,

1997). Because I was interested in investigating the problem objectively, I designed this research in the ontological view of quantitative research that is objective (Bryman, 2004). Objectivity in quantitative research emanates from the fact that the researcher investigates an issue from an outsider's perspective, within the constraints of human nature (Nunan, 2008). The approach that assumes that reality should be understood from an objective point of view is called a positivist perspective. Another important term influencing the design of the research being reported about here is epistemology. Epistemology deals with the relationship of the known to the unknown (McDonough and McDonough, 1997). The fundamental epistemological quality of the quantitative approach is that aspects of phenomena can be isolated and described numerically (Labaree, 1998) and therefore the findings may be generalizable. Because quantitative research involves numerical measurement, statistical analysis and drawing inferences about the constructs, it assumes deductive reasoning (Gorski, 2004). Deductivism refers to reasoning that begins from the general to the specific. This means that the process involves the evaluation of generalizations, rules or hypotheses before arriving at the conclusion (Gorski, 2004). This research is based on evaluations of generalizations using rules before conclusions are arrived at.

This study was a quantitative study in terms of how the numerical data are recorded in percentages to make it more comprehensible. Quantitative research is the method of enquiry that seeks to understand phenomena through experimental and nonexperimental research using numerical data (Lomax, 2004). The present research was nonexperimental using numerical data. As Seliger and Shohamy (2001:16) explain, the purpose of describing an investigation is that

[t]he methods used to obtain empirical knowledge will be carefully documented by the researcher in order to permit others to attempt validation and replication of the findings.

Primarily, this purpose was achieved by using quantitative methods for the collection of data as well as for answering the research question, which is: *What is the relationship between multilingualism and academic achievement in terms of maths and science for Grade 7 students in Zambia?* The outcome of the relationship was used to explore the ways in which English language academic achievement manifested itself in mathematics and science subjects thereby tapping into the growing body of literature on the value of CLIL.

According to the MoE (2006), there are 4,705 public primary schools in Zambia. The research setting on which the present study is based includes Zambian public schools. While observing the ethical requirement of the condition of anonymity for the human participants in the study, the sample drawn on from the ECZ identifies 10 schools by name to situate academic performance in English, Mathematics, Science and Zambian languages within the regional context of the five Zambian languages (i.e. Bemba, Nyanja, Lozi, Tonga and Luvale). Written permission to use the data was obtained from ECZ. As 10 public schools were sampled taking into account the urban and rural differentiation, the data drawn on can be generalised from samples to the Zambian public school populations. This fits with Mackey and

Gass' (2005:101) suggestion that "if researchers want the results of a particular study to be generalisable, it is incumbent upon them to make an argument about the representativeness of the sample". Because the names of the schools were listed in the electronic data files of the ECZ, the names of the schools were picked by simple random sampling using Microsoft Office Excel. For the analysis of the data, national examination results were captured from the data files in the subjects of interest for Grade 7. The analysis of the data entailed exploring the relationship between academic achievement in English and that of mathematics and science subjects to bring the value of CLIL to the surface.

## Findings

As explicated in this article, little is known about achievement in African mother tongue languages and the relationship between scholastic success in English and mathematics and science. To explore the research question, data for the 2005, 2006 and 2007 Grade 7 cohorts were analysed.

Table 1 below presents Grade 7 academic achievement in Zambian languages from 2005 to 2007 in 10 public primary schools.

### Grade 7 academic achievement in Zambian languages

Table 1: Grade 7 pass rates† in Zambian languages in public schools

Name, area and main language of school	Mean and number of students			Overall pass rates† and SD*
	2005	2006	2007	
Mutende, Mansa (urban), Bemba	72.8 % (N= 227)	48.6% (N= 252)	58.1% (N= 210)	Pass rates= 48.5% SD=12.8
Chibolya, Samfya (rural), Bemba	68.1% (N= 110)	50.2% (N= 116)	59.6% (N= 107)	
Mongu, Mongu, (urban), Lozi	49.5% (N= 187)	48.4% (N= 193)	50% (N= 181)	
Shangombo , Shangombo (rural), Lozi	52.2% (N= 56)	53.5% (N= 51)	53.9% (N=72)	
Bimbe, Chongwe (rural), Nyanja	57.1 % (N= 35)	30.4% (N= 41)	26.6% (N= 45)	
Chibelo, Lusaka (urban), Nyanja	60.6% (N= 240)	35% (N= 278)	25.7% (N= 307)	
Kikombe, Solwezi (rural), Kaonde	38.2% (N= 193)	60% (N= 235)	36.7% (N= 254)	
Solwezi, Solwezi (urban), Kaonde	47.1% (N= 355)	62.2% (N= 326)	39% (N= 318)	
Holy Cross, L/stone (urban), Tonga	57.7% (N= 143)	60.2% (N= 150)	34.3% (N= 148)	
Zambezi, L/stone (rural), Tonga	57.8% (N= 157)	32.7% (N= 155)	29.9% (N= 146)	

\*SD – Standard Deviation

†Pass rates express average percentages of students who passed in each school

The pass rate in Zambian languages three cohorts after the change of the policy of the language of initial literacy in the 10 public schools was 48.5%. The implication is that more than half of the students did not make it in Zambian languages over the three-year period.

## Grade 7 academic achievement in English

Table 2: Grade 7 pass rates† in English

Name, area and main language of school	Mean and number of students			Overall pass rates† and SD*
	2005	2006	2007	
Mutende (Mansa, urban, Bemba, public)	74.5% (N= 227)	56.2% (N= 252)	57.5% (N= 210)	Pass rate= 56.8% SD = 9.6
Chibolya (Samfya, rural, Bemba, public)	67.7% (N= 110)	51.4% (N= 116)	46.5% (N= 107)	
Mongu (Mongu, urban, Lozi, public)	51.5% (N= 187)	55% (N= 193)	49.1% (N= 181)	
Shangombo (Shangombo, rural, Lozi, public)	39.8% (N= 56)	49.2% (N= 51)	55% (N= 72)	
Bimbe (Chongwe, rural, Nyanja, public)	57.9% (N= 35)	36.6% (N= 41)	43.5% (N= 45)	
Chibelo (Lusaka, urban, Nyanja, public)	66.3% (N= 240)	49.9% (N= 278)	50.2% (N= 307)	
Kikombe (Solwezi, rural, Kaonde, public)	64.5% (N=193)	70.7% (N= 235)	56.1% (N= 254)	
Solwezi (Solwezi, urban, Kaonde, public)	55.2% (N= 355)	67% (N= 326)	52.6% (N= 318)	
Holy Cross (L/stone, urban, Tonga, public)	69.4% (N= 143)	72.2% (N= 150)	60.4% (N= 148)	
Zambezi (L/stone, rural, Tonga, public)	67% (N= 157)	58% (N= 155)	54.5% (N= 146)	

\*SD – Standard Deviation  
†Pass rates express mean percentages of students who passed in each school

The pass rate in English three cohorts after the change of the policy of the language of initial literacy in the 10 public schools was 56.8%. The implication is that at least more than half of the students made it in English over the three-year period.

## Grade 7 academic achievement in Mathematics

Table 3 below presents Grade 7 academic achievement results in Mathematics from 2005 to 2007 in 10 public schools.

Table 3: Grade 7 pass rates† in Mathematics

Name, area and main language of school	Mean and number of students			Overall pass rates† and SD*
	2005	2006	2007	
Mutende (Mansa, urban, Bemba, public)	66.2% (N= 227)	42.5% N= 252	54.1% (N= 210)	Pass rate 51.5% SD=10.3
Chibolya (Samfya, rural, Bemba, public)	72.8% (N=110)	51.3% (N= 116)	47.7% (N= 107)	
Mongu (Mongu, urban, Lozi, public)	46.3% (N= 187)	43.8% (N= 193)	46% (N= 181)	
Shangombo (Shangombo, rural, Lozi, public)	32.9% (N= 56)	43.5% (N= 51)	54.6% (N= 72)	
Bimbe (Chongwe, rural, Nyanja, public)	58.9% (N= 35)	35.8% (N= 41)	45.7% (N= 45)	
Chibelo (Lusaka, urban, Nyanja, public)	62.4% (N= 240)	38.3% (N= 278)	49.2% (N= 307)	
Kikombe( Solwezi, rural, Kaonde, public)	48.1% (N= 193)	66.3% (N= 235)	47.8% (N= 254)	
Solwezi ( Solwezi, urban, Kaonde, public)	42.4% (N= 355)	63.3% (N= 326)	45.9% (N= 318)	
Holy Cross (L/stone, urban, Tonga, public)	65% (N= 143)	68.3% (N= 150)	52.6% (N= 148)	
Zambezi (L/stone, rural, Tonga, public)	62.6% (N= 157)	43.8% (N= 155)	49.2% (N= 146)	

\*SD – Standard Deviation  
†Pass rates express mean percentages of students who passed in each school

each school

The overall pass rate in Mathematics three in Grade 7 cohorts after the change of the policy of the language of initial literacy in the 10 public schools was 51.5%. This achievement was just slightly above average. The implication is that almost half the students did not make it in mathematics over the three-year period.

## Grade 7 academic achievement in Science

Table 4 presents Grade 7 mean pass rates in Science from 2005 to 2007 in 10 public schools.

Table 4: Grade 7 pass rates† in Science

Name, area and main language of school	Mean and number of students			Overall pass rates† and SD*
	2005	2006	2007	
Mutende , Mansa (urban), Bemba	68.7% (N=227)	32.9% ( N=252)	35.9% (N=210)	Pass rate = 43.6% SD = 15.9
Chibolya, Samfya (rural), Bemba	74.6% (N=110)	45.9% (N=116)	30.7% (N=107)	
Mongu , Mongu (urban), Lozi	31.3% (N=187)	30.8% ( N=193)	31.6% (N=181)	
Shangombo , Shangombo (rural), Lozi	32.9% (N=56)	35.4% ( N=51)	43.2% (N=72)	
Bimbe, Chongwe (rural), Nyanja	58.6% (N=35)	24.7% ( N=41)	29.2% (N=45)	
Chibelo, Lusaka (urban), Nyanja	63.1% (N=240)	29.2% (N=278)	32.7% (N=307)	
Kikombe, Solwezi (rural), Kaonde	38.9 % (N=193)	66.8% ( N=235)	34% (N=254)	
Solwezi, Solwezi (urban), Kaonde	33.1% (N=355)	66.1% ( N=326)	32% (N=318)	
Holy Cross, L/stone (urban), Tonga	66.8 % (N=143)	70.2% ( N=150)	38% (N=148)	
Zambezi, L/stone (rural), Tonga	64.1% (N=157)	32.7% (N=155)	34.2% (N=146)	

\*SD – Standard Deviation  
†Pass rates express mean percentages of students who passed in

each school

The overall pass rate in Science three in Grade 7 cohorts after the change of the policy of the language of initial literacy in the 10 public schools was 43.6%. The results indicate that on average, most students performed extremely poorly in Science in Grade 7.

## Rural/urban dichotomy

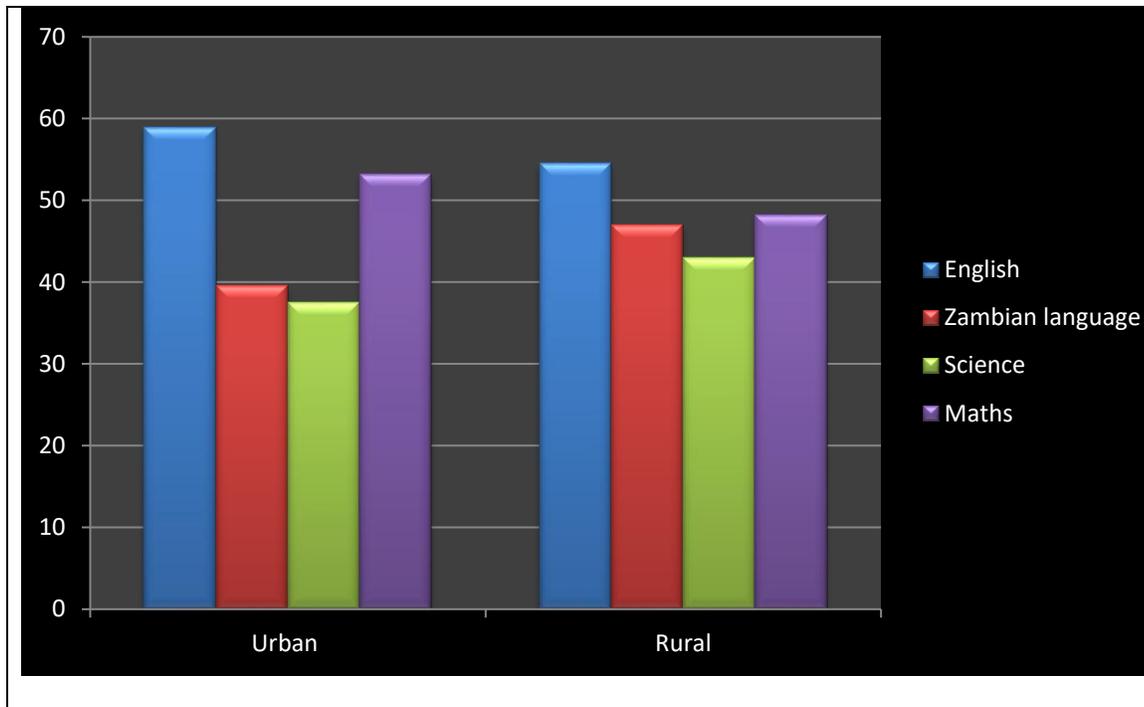
Since Zambia is a least developed country, I was interested in exploring achievement taking the rural and urban dichotomy of the learners into context. Table 5 below shows the results.

Table 5: A comparison of Grade 7 pass rates across rural and urban schools

Rural schools (2005-2007)	Overall mean pass rate	Urban schools (2005-2007)	Overall mean pass rate
<b>Overall rural schools</b>	38.5%	<b>Overall urban schools</b>	47.6%
English = 54.5%		English = 59%	
Mathematics = 48.3%		Mathematics = 52.3%	
Science = 43%		Science=37.6%	
Zambian lang. = 47%		Zambian lang. = 39.6%	

It is seen in Table 5 above, that the overall pass rate of Grade 7 public **rural** schools in the four subjects (i.e. English, Mathematics, Science and Zambian languages) is lower at 38.5% than that of public **urban** schools at 47.6%. Figure 1 below depicts the results in bar chart form.

Figure 1: Bar chart depicting academic achievement across rural and urban schools.



There was unevenness in overall pass rates across subjects. Although the overall pass rates in English and Mathematics were higher in urban schools (at 59% and 52.3% respectively) than those in rural schools (at 54.5% and 48.3% respectively), the pass rates in Science and Zambian languages in urban schools (at 37.6% and 39.6%) were slightly lower than those in rural schools (at 43% and 47% respectively). While this may serve to suggest the impact of strengthening Zambian languages, caution should be exercised before arriving at such a conclusion. First, motivation for ascribing the slightly higher results in Science in rural schools than those in urban schools to Zambian languages would be weak because Science is taught in English even in rural schools. Secondly, achievement in both Mathematics and Science within rural schools was consistently below average.

## Discussion

Overall, the pass rates appear to favour the urban schools. However, there is much unevenness in pass rates at the school level from cohort to cohort, across subjects and across rural and urban schools. Considering that the pass rate was slightly better in English than the Zambian languages, it might be argued that the poorer pass rate in Zambian languages is indicative of a subtractive linguistic model of

learning whereby learners lose out on their first languages as they make gains in a second language. However, since the high achievement in English is not commensurate with that of Mathematics and Science subjects which are taught through English itself, the findings do not seem to support the hypothesis of poor English proficiency as the reason for poor academic achievement in Mathematics and Science. Furthermore, they do not support any benefit of changing the medium of instruction from English to Zambian languages in Grade 1 from 1996, nor do they support any transfer of skills from the Zambian languages to English or content subjects. Whereas it may be arguable that using Zambian languages as medium of instruction only in Grade 1 is not enough, results in other contexts like South Africa where the policy advocates the use of African languages for the first four years of schooling are not promising either. Howie, van Staden, Tshele, Dowse and Zimmerman (2012: xvi) notes that:

*South African Grade 4 learners, particularly those tested in African languages, achieved well below the international centre point despite having written an easier assessment. They were still performing at a low level overall on an easier assessment compared to their counterparts internationally.*

Therefore, a more enduring way of interpreting the findings is that the type of English students is proficient in, is dissimilar to that of the content subjects, what Cummins (1991) refers to as cognitive/academic language proficiency (CALP). In this sense, these results bring much light to bear on the unsustainable myth of first-language or mother tongue instruction supremacy because the results indicate that academic language proficiency is substantially different from Basic Interpersonal Communicative Skills (BICS), naturally available to mother tongue speakers of a language. Rather they point to the value of CLIL.

## **Main contributions of the research and conclusion**

The difficulty for some has been the understanding of how academic language proficiency can be fostered in early primary schooling. Sir Herbert Read (cited in Ashton-Warner, 1986:13) cautions us that “great changes in the destiny of mankind can be effected only in the minds of little children.” The educational formalities of mathematics for instance differ from ordinary communication (Glaserfield, 1995). The implication of this is that practices of learning mathematics should involve the language of mathematics in the earliest form of learning for any schoolchild. What this means is that children’s initial reading and writing texts should equally involve mathematical language that they can practice in addition to literary texts. When it comes science, Carrasquillo and Rodriguez (2002:132) have made the point that “science is, in itself, a language and each different science (biology, physics, chemistry) is a separate language”.

One example of a lesson with an integrated approach to English language learning is the one recommended to Grade 2 learners by Freeman, et al. (2010). In that lesson, the researchers recommend

content in which learners' name uses of various simple machines and explain/demonstrate how they work. They show that learners could identify simple machines and their parts (e.g., bicycle, gears, wheels), and demonstrate and label the workings of simple machines (screws, wheel and axle, lever, pulley) on a compound machine, the bicycle. Key vocabulary for such a lesson could include wheels, gears, machine, parts and work. Similarly, oral language could include naming, retelling, reporting and asking for explanations while grammar could involve the teaching of future tense such as "going to", helping verbs such as "can" and "can't" as well as commands. Comprehension could include visualization and description of information from text and charts while literacy could involve the use of alphabet to find information. At the level of writing, children could be exposed to writing about simple machines such as writing about how a bicycle works as well as labelling of a diagram of simple machines such as wheelbarrows, pulleys and pivots. This is consistent with what Cameron (2005: xii) means when she says that the teaching of language needs a highly skilled teacher "to reach into children's worlds and lead them to develop their understandings towards more formal, more extensive and differently organised concepts." Evidently, this suggests the value of CLIL or what has been referred to as languages across the curriculum. Since children are usually taught by one teacher in most of African primary schools, primary school teachers need to be trained in teaching methods using CLIL if they have to make a difference in the development of the whole child.

The thrust of this paper was to investigate academic achievement of Grade 7 pupils in Zambian languages and the relationship between their English language academic achievement and that of their mathematics and science. Findings have indicated that the pass rates for the cohorts under study were low while the relationship indicated above average pass rates in English compared to those of mathematics and science subjects. Given the below average pass rates in the content subjects which are taught in English, the outcome of the relationship suggests the value of CLIL as a possible mediating factor of achievement across content and language subjects. In this sense, this research significantly adds to the emerging body of literature that points to the complementary role of CLIL in multilingual learning contexts which have been critical of the hegemony of English language, while offering very few solutions. One limitation of these findings however is that they may be dated. Other research based on more recent data may arrive at different conclusions. In this regard, further research that draws on newer data is firmly recommended.

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