

Grounding Innovative Promotion of Literacy in Local Funds of Knowledge¹

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Abstract

Literacy can be understood as a cultural practice comparable to other cultural practices such as story-telling, song and dance. In that theoretical framework, the process of individual literacy learning involves the appropriation of constructs and rules that inform recurrent cultural activities. The sociolinguistic character of the Zambian society includes both societal linguistic diversity and individual multilingualism. Within this context, an innovative application of instructional technology to initial literacy learning was launched in Zambia, under the auspices of the Centre for Promotion of Literacy in Sub-Saharan Africa (CAPOLSA). Evaluation of its local effectiveness has included field-testing of an interactive digital letter-sound correspondence game on various platforms, teacher orientation, composition and distribution of child-friendly texts in several Bantu languages. Ramifications of the programme include the challenge of orthographic harmonization. The paper highlights the importance of integrating new technology with indigenous cultural resources in the designing of appropriate, effective and sustainable educational practices in Africa.

Key words: cultural practices, multilingualism, primary schooling, initial literacy learning, Zambia

Introduction

Curriculum and instruction specialists bent on promoting literacy in Zambia and elsewhere in Africa have recognised the importance of the learner's familiarity with the language of instruction, motivation to learn, and perception of contextual relevance. Moreover, considerable resources have been invested over the past 50 years by the Zambian government and its international partners in raising the scope and quality of basic education (World Bank 2007). Access to primary schooling has been expanded so that the net enrolment ratio in the lower grades is close to 100 percent, and access to secondary schooling has been expanded, such that about 16 percent of those entering Grade 1 complete Grade 12. This paper is concerned with what levels of literacy the other 84 percent acquire from schooling. National statistics continue to show massive rates of educational failure, resulting in the majority of the children leaving primary school without having acquired the skill of reading for meaning (Hungu *et al.*, 2010). Over the past decade, international interest in addressing this challenge has placed considerable emphasis on new advances in information and communication technology (ICT). Although I acknowledge that ICT brings with it some important technical advantages, I argue in this paper that, if its application in Zambia is to generate sustainable improvements in the national rate of

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literacy acquisition, the technology must not only innovate but also be grounded in local funds of knowledge.

An illustrative case of literacy acquisition

The encounter with literacy for young people growing up in rural areas of Africa is often a confusing experience. Consider, for instance, the story of Gillian, one of a cohort of 50 children born in a rural neighbourhood of Zambia's Katete District in the 1960s. We followed the life-journeys of these young people for 14 years to explore the significance of schooling in their personal development (Serpell, 1993). When the research team from the University of Zambia (UNZA) first met her in 1975, Gillian was enrolled in Grade 1 at the local primary school, but when we interviewed her family in 1979, they told us she had stopped attending classes in Grade 5. They assured us that it had been her own decision, and when we asked her to explain, she said:

"I could see I didn't know how to read ... money could just be wasted on me going to school"

Four years later, in 1983, one of her former childhood neighbours, Peter Phiri, who was now an undergraduate at UNZA, looked her up for a follow-up interview, and asked her again:

"Why did you drop out?"

"School was too tough for me [*linandikanga sukulu*]", she replied.

Later in the same interview Gillian told Peter that she was able to read, but only in ciNyanja. She went on to assert:

"The one who taught me how to read in ciNyanja is my Mum"

Four years later, in 1987, we had an opportunity to check out these remarkable claims. In a short informal test, Peter presented Gillian with a list of ten ciNyanja words, and she correctly read each of them aloud, but in a parallel test in English, she only recognised one word from a list of ten. Then we contacted her mother, who explained to another member of the research team that she had been asked by her daughter, Gillian, to teach her how to read so that she could follow the prayers at their local church. Gillian's mother was a subsistence farmer and had completed just four years of schooling back in the 1950s. She had kept her old school books from those days, and using them, she told us, it had taken her about four weeks to teach the young adult Gillian how to read in ciCewa (the local dialect of ciNyanja). The following excerpt from the tape-recorded interview reveals some intriguing features of this rural mother's beliefs about schooling:

"What was the main reason behind her leaving school?"

"She kept failing again and again...I tried to reason with her...'go to school, so you can learn'. She refused."

"How come ? ..."

"May be she wasn't listening to/understanding [*sanaliumvela*] what the teachers said ... May be she was just thick-headed [*kaya ndikufa kwamutu iye*]"

“But you yourself taught Gillian to read and write in ciCewa and Gillian learned: which means her head was just fine, you know!”

“It was a case of not wanting school [*usafuna sukulu*]”

“But the urge to learn was there in her heart [*m'tima ofuna uphunzila unalipo*].”

“Yes, it was there”

“... because she did learn ciCewa.”

“Yes”.

How can we explain the fact that after more than four years of instruction by trained school teachers, Gillian failed to achieve basic literacy in 1979 and dropped out of school, and yet a few years later her untrained, minimally schooled mother managed to teach her to read within a few weeks? The first and most important factor is contextual relevance, which is best understood within the theoretical framework of literacy as a cultural practice. A key aspect of Zambia's cultural context is the patterning of the nation's sociolinguistic diversity. Against that background, it becomes apparent that the professional context in which the local primary school offered initial literacy instruction was less motivating than the informal context of social participation in which Gillian eventually appropriated the skills of literacy.

Literacy as a cultural practice

Scribner and Cole (1981) conducted a seminal study of literacy in West Africa. They described three different literacy practices that co-existed in Liberian Vai society: official writing taught through English medium schooling, Qranic literacy taught in Arabic-medium Madrasa religious schools, and letter writing in the indigenous Vai syllabic script passed on through individualised tutorials in local communities. These practices differed in script, language and social context. Some adults in the study sample were competent in only one of these literate practices, others in two, and some in all three. The authors proposed an account of literacy as a cultural practice comparable to the practices of law and weaving.

A cultural practice comprises recurrent patterns of activity, informed by a system of meanings, shared among participant member-owners of a culture (Goodnow, Miller, & Kessel, 1995). Novices acquire competence in a cultural practice through a process of participatory appropriation (Rogoff, 1993; Serpell, 2001). Other examples of cultural practices found in many societies, imbued with culturally particular meanings are the care of infants, song and dance, and story-telling. UNESCO has acknowledged the significance of the landmark study by Scribner and Cole (1981) as well as other studies designed to reveal the nature of literacy as a cultural practice (e.g. Street, 1995; Barton, 2007) in its current mission statement:

The uses of literacy are changing rapidly in contemporary societies in response to broad social, economic and technological changes...UNESCO's concept of literacy has moved beyond the simple notion of a set of technical skills for reading, writing and counting to one that encompasses multiple dimensions of these abilities. In acknowledging recent economic, political, and social transformations – including globalisation and the progress of information and communication technologies (ICTs) – UNESCO recognises that there are many practices of literacy embedded in

different cultural processes, personal circumstances and collective structures (UNESCO, 2015)

Individual literacy learning

In my view, if educational programmes are to be sustainable, including those involving the introduction of ICT resources and practices, they should not seek to extract children from their natal community (Serpell, 1999; Ngwaru, 2014). Rather, education should build on what Moll and his colleagues (1992) have termed as the “funds of knowledge” in children’s families and community. Those local funds of knowledge include languages, scripts, communication practices, socialisation practices, indigenous educational practices, local history, politics, and economics (Serpell & Nsamenang, 2014).

The cultural practice of literacy in Zambia includes a variety of practices (e.g. personal correspondence) that combine technological artefacts (e.g. pencils, paper, cellphones) with recurrent, patterned activities (e.g. letter-writing, email, sms text-messaging) (Serpell, Baker & Sonnenschein, 2005). Each activity is informed by a system of cultural meanings shared among the participant member-owners of a given culture. Other relevant “cultural processes and collective structures” within local funds of knowledge include the cultural practices of song and dance (Mtonga, 2012; Mukela, 2013), and the cultural practice of story-telling.

Narratives are popular in all human societies but their forms vary across cultures. African traditional story-telling is a cultural practice with distinctive features, some of which differ from those of European storybooks. In the Zambian society, grandparents are often perceived as more legitimate storytellers than parents. Common features of traditional storytelling in Zambia, sometimes emulated by modern Zambian writers such as Stephen A. Mpashi (in *iciBemba*) and Julius Chongo (in *ciNyanja*) include: call and response routines, repetition, inviting audience participation, and ideophones (words that evoke an idea in sound) (Cancel, 2013; Mazombwe, 1981; Moyo *et al.*, 1986; Wendland, 2004).

In contemporary urban Zambia, the early literacy socialisation of most children of low-income families is probably mediated by unguided observation of adult literacy practices (which generates an understanding of the functions of print), by guided participation in writing by school-going siblings (generating graphic skills and knowledge of orthographic rules), by nursery rhyme play, both in English and in Zambian languages, with peers and elder siblings (generating phonological awareness), and by occasional exposure to traditional indigenous narratives by grandparents, and everyday narratives by adults and older siblings (generating narrative competence). Chansa-Kabali (2014) has documented several of these learning opportunities in her recent study of low-income families of children enrolled in the first grade of public primary schools in Lusaka (Chansa-Kabali, Serpell, & Lyytinen, 2014; Chansa-Kabali & Westerholm, 2014).

Societal linguistic diversity and individual multilingualism

The literate culture of the Zambian society in which children are being socialised is multilingual and fluid. It differs in several respects from the prototypical literate cultures of most contemporary industrialised countries. English is widely regarded in Zambia as the language of power and prestige, dominating the state bureaucracy, legislature, formal sector economy and the mass media. Several Bantu languages are widely acknowledged as indigenous to Zambia and used in everyday discourse, fluidly mingled with one another and with English. There is little standardisation of the Zambian languages and they share many similarities. There is very little published literature in the Zambian languages other than the Bible and prayer books. Many Zambian adults are more literate in English than in any Zambian language. Reading for pleasure is not widely acknowledged as a leisure activity in Zambia, but English-medium newspapers are widely read.

Zambia's linguistic diversity is often misrepresented in the local press and in superficial international profiles, due to excessive reliance on a colonial era survey of ethnic groups (Brelsford 1956). Kashoki and Mann (1978) analysed the returns of the first national census of population after independence (conducted in 1969). They found that the 80 Bantu speech varieties identified fell into a much smaller number of groups, each constituting several dialects of a single language. Only 10 of those groups were claimed as a first language by more than one percent of the population, seven of which are used as an official medium of instruction in the lower grades of public primary schools. Most adult Zambians speak at least three languages: a 'mother-tongue', a Zambian lingua franca (Bemba, Nyanja or Lozi) and English (Mytton, 1974; Underwood *et al.*, 2003). Moreover, most Zambians who migrate to a city learn to speak the local lingua franca within a few weeks. Thus individual multilingualism is the norm in Zambian society.

Furthermore, significant commonalities have been identified by linguistic scholars across the Bantu languages, including the four most widely used Zambian languages (iciBemba, ciNyanja, chiTonga and siLozi), as well as kiSwahili and several other languages widely used in Tanzania (Sukuma, KiChaga, KiHaya). Commonalities in grammar are described by Gutman and Avanzati (2013), in core vocabulary by Kashoki and Mann (1978) and in phonology by Kashoki (2009), whose monolingual Bemba dictionary terms consonants *bakapaaso* (headmen) and vowels *imfumu* (chiefs). The University of Zambia's Centre for Promotion of Literacy in sub-Saharan Africa (CAPOLSA) was inspired by the commonality of the vowel sounds across Bantu languages to create an 'edutainment' video, designed to draw the attention of children across several Bantu languages spoken in Lusaka homes to the cardinal sounds represented by the letters A E I O U.

The notion that linguistic diversity makes the design of early literacy instruction in a familiar language impossibly difficult is informed by the monolingual bias of Anglophonie which has exercised a hegemonic constraint on the design of initial literacy research and pedagogy. Across the world societal multilingualism is the norm (Mohanty & Perregaux, 1997; Verma, 2016).

Orthographic transparency

The spelling systems (orthographies) of Bantu languages have a short written history and have thus preserved the clarity of their original design, making them more transparent and thus easier for children to learn than the more opaque, deeper spelling system of English. For instance, in English spelling, the letter 'a' represents different sounds in the letter-name A and in the words hate, hat, and arm; 'e' represents different sounds in E, err, and bed, and i represents different sounds in I and tin, whereas in any of the Bantu languages indigenous to Zambia, each of the letters a, e and i consistently represents a single sound across all words of the language.

Research with English-speaking children in England has shown that a child's familiarity with "nursery rhymes" and mastery of the letter names through songs about A-B-C are both positively correlated with the rate of literacy learning by children in English (Goswami & Bryant 1990; Hammill 2004). But the letter-sound correspondence rules of English are very different from those of any of the Bantu languages. CAPOLSA has, therefore, developed some popular songs for dissemination on the radio that correctly match the letter-sound correspondence rules of ciNyanja, many of which are also shared with the other six Bantu languages currently used in Zambia for initial literacy instruction in Zambia's government schools: iciBemba, chiTonga, siLozi, kiKaonde, Lunda and Luvale. The songs and videos to accompany them are openly accessible on YouTube (CAPOLSA, 2013a).

CAPOLSA is based at the University of Zambia in the Psychology Department, which works closely with the Department of Literature and Languages, and the School of Education (Serpell, 2014). It was established in May 2011 in co-operation with the University of Jyväskylä, Finland. One of the major objectives of the centre is to promote literacy among Early Grade Learners in the indigenous languages of Zambia. In addition to production of phonemic awareness songs, CAPOLSA's activities have included the creation of child-friendly reading materials, training workshops for writers of children's reading materials in Zambian languages, publication of stories with a simplified spelling system, and orientation of teachers and trainers to GraphoGame, an interactive computer game as a learning resource for Early Grade primary school classes.

Innovative instructional technology

GraphoGame is an interactive, digital learning environment, developed by Heikki Lyytinen and his colleagues in Finnish (Ekapeli), and later translated into several other languages, including ciNyanja, Kiswahili, and English. The game's programme can be mounted on computers, tablets or cell phones. Key features of the programme are that a player's progression in the game varies according to the learner's current skills, providing at each stage of acquisition sufficient challenge and ample opportunity for success, which together facilitate engagement in the game. The player receives immediate feedback for each action: either positive auditory and visual feedback on the correct response, or visual for incorrect selection. A player must actively demonstrate learning by selecting the correct response before moving on to the next trial. And

players see a numeric index of their progress at the end of each completed task (Richardson & Lyytinen, 2014).

Several studies have been undertaken to assess the effectiveness of GraphoGame as a learning resource, both in industrialised countries such as Finland and England (Saine *et al.*, 2011; Kyle *et al.*, 2013) and in south-eastern Africa. In Zambia, a carefully controlled intervention study was conducted with a representative sample of 573 children in Grade 1 classes at 42 government schools drawing their pupils from low-income families in the capital city of Lusaka (Jere-Folotiya *et al.*, 2014). Participants, who played a ciNyanja version of GraphoGame on cell-phones for a few hours under supervision, showed significantly greater progress in early literacy learning than control group learners, especially when their class teacher also played the game.

Smaller follow-up studies were conducted to address the logistical challenges of distributing the game to learners in the low-income sector of Zambia's population. Walubita *et al.* (2015) deployed a limited number of low-cost tablets in six Lusaka schools selected for the enthusiasm of their Grade 1 teachers and invited them to explore alternative ways of scheduling access in such a way that several learners received sufficient exposure to GraphoGame for real learning. Ojanen, Jere-Folotiya *et al.* (2015) deployed GraphoGame on smartphones with a rural sample comprising 24 randomly selected Grade 2 teachers in three districts of Zambia's Eastern Province. The smartphones were used effectively in classroom settings and by lending phones to families for use at home. Based on these and other on-going studies in Kenya, Namibia and Tanzania (Ngorosho, 2015), research collaborators in the region have affirmed that GraphoGame can serve as a catalyst for multi-level promotion of literacy in diverse contexts, not only by directly improving children's reading performance but also by raising teachers' and parents' awareness of the development of reading skill and effective reading instruction methods (Ojanen, Ronimus *et al.*, 2015).

A guiding principle of CAPOLSA's development and application of technology for the promotion of literacy in Zambia and elsewhere in Africa has been systematic grounding of innovations in local funds of knowledge. GraphoGame, edutainment videos and printed reading materials are all expressed and introduced to children in indigenous languages that mediate child socialisation in the majority of African families. Widely accessible, affordable ICT devices have been used for individualisation of instruction to situate interventions within the existing constraints of public schooling and the socio-economic conditions of low-literacy families. The phonology of indigenous languages has been used to structure the letter-sound songs composed by a local musical group. And in the publication of Early Grade Readers, a progressive approach to orthographic reform has been adopted, designed to facilitate children's learning, social mobility and cross-cultural communication among African cultural-linguistic groups.

The challenge of orthographic harmonisation

The tablets and smartphones distributed in the latest Zambian projects hosted not only the GraphoGame programme but also the texts of child-friendly stories in ciNyanja, the Zambian language used locally as medium of instruction in the lower primary grades. Teachers were encouraged to use these stories as teaching resources, reading them aloud to their classes or inviting young learners to read them for practising their emerging literacy skills. These stories were edited, translated and published by CAPOLSA (2013b). Eight prize-winning stories, composed by Zambian writers in seven of the indigenous languages in response to a national competition, were translated and edited by language experts at the University of Zambia, and published in four languages. Hard copies were distributed to government primary schools in seven provinces, and are currently under evaluation for orthography, appeal and pedagogical usefulness.

Four complementary considerations converged to determine the spelling system (orthography) adopted by CAPOLSA for its first set of readers: simplicity and transparency, for ease of learning by young children; harmony across the different indigenous Zambian languages adopted as media of initial literacy instruction in Zambian government schools; harmonisation across the Bantu languages of the South-East-Central African region; and acceptability among parents and teachers of children currently enrolled in Early Grades. This rationale was elaborated at a consultative workshop hosted by CAPOLSA, bringing together expert participants from the national government's Curriculum Development Centre and the community of linguistic scholarship on Zambian languages. The latter group included three of the investigators in an ambitious sub-regional project on harmonisation of orthography across the languages of Zambia, Malawi and Mozambique (Banda *et al.* 2008), where, for instance ciNyanja is widely spoken but spelled differently.

Each edition of CAPOLSA's Early Grade readers includes a short preface in the language of the stories, addressed to teachers and parents of the learners for whom the books are intended. The key part of this explanatory preface (in English translation) reads in part as follows:

The story in this book was written for children. It is expressed in the language of play and the spelling has been chosen by CAPOLSA as simple and easy for early learners to read. As much as possible, words are written in the way that children hear them spoken in their everyday lives. ... We have chosen to spell the words in this book in such a way that it will be easy for young children learning to read to recognize the sounds not only in ciNyanja but also in other Zambian Languages.

Specific aspects of spelling that have given rise to a critical discussion in this context include segmentation, and the specific graphemes used to represent particular sounds. The concept of a word is less fundamental in highly inflected languages such as the Bantu languages than in English and French. Long strings of letters are, therefore, probably less challenging for a beginning reader in a Bantu language, where, for instance, *ananimenyesanso* (in ciNyanja) can easily be understood without the text being broken up into the segments *ana ni menyesa nso*

corresponding to the English words “he hit me again”, or to the French words “il me frappa de nouveau”.

These and other conventions adopted by CAPOLSA for the spelling of the first edition of Early Grade Readers have been discussed in detail among Teacher Education College Lecturers, serving early grade teachers, and parents in different regions of the country in the course of an on-going evaluation that will be reported to the national Ministry of Education in the context of deciding whether departures from the guidelines formulated by the Ministry in 1977 are acceptable for teaching in public schools. Discussions with various stakeholders have revealed considerable variation in attitudes and expectations. In addition to addressing issues of language loyalty and ethnic pride, a national educational policy will need to determine how to respond appropriately to the “African advantage” (Prah & Brock-Utne, 2009) of widespread individual multilingualism, and to the emergence of various forms of “translanguaging” (Garcia, 2009) such as code-switching, lexical adoptives and urban dialects (Banda, 2016).

Integrating new technology with indigenous cultural resources in the design of educational practices

The overall thesis of this paper is that sustainable innovations in literacy promotion must be grounded in local funds of knowledge. Lest I be misunderstood, let me clarify that grounding does not mean exclusive reliance or static conservatism; local does not mean narrowly parochial; and literacy, like language, is a dynamic resource. The opportunities for literacy to enhance the quality of life for a young woman living in a village of Zambia’s Katete District in the 1980s (like Gillian whose experience I have described above) have expanded by the second decade of the twenty-first century to include text-messaging on a cell-phone. Not only school teachers but also many village headmen and emergent farmers now own that modern technological resource. But, like the prayers at Gillian’s local church, most of the phone conversations in Katete take place in the indigenous language, ciCewa. Many parents of children entering Grade 1 in Lusaka express a preference for initial literacy to be taught in English (Ferguson, 2013; Nkolola-Wakumelo, 2013). But the massive failure rates experienced with Zambia’s English Medium Scheme curriculum in the 1970s and in the 1980s confirmed the position of most international researchers, endorsed by UNESCO, and eventually convinced the Zambian government to revert to a policy of introducing children to literacy in a familiar language.

International communication is an all-pervasive feature of the contemporary world, and cross-cultural communication is a two-way process of interaction. Because something is new we should not assume that it is necessarily progressive. Information and Communication Technology (ICT) has the potential to empower those with access to it. To realise that empowerment, technology must be harnessed and appropriated by the individuals and communities using it. A child learning to read and write comes to the task with a pre-existing repertoire of competencies, and membership of a community. A community adopting literacy has a pre-existing system of meanings and social institutions that inform its practices, including cultural values and socialization goals. To successfully address economic and health needs,

application of new technology must engage with the local meaning-system, so that its appropriation will generate social progress.

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