Turkana Children's Rights to Education and Indigenous Knowledge in Science Teaching in Kenya

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ABSTRACT

Using a qualitative ethnographic study of early childhood centres and lower primary schools operating in rural areas in a nomadic Turkana community of Kenya, this paper considers the failure of universal education to meet the culturally relevant educational needs of nomadic children. The study explored the extent to which the curriculum of schools in nomadic communities integrates indigenous epistemologies and social cultural lifestyles of the people in science instruction. Drawing from the literature and theories of indigenous people's education in Canada, New Zealand and the United States of America, the paper discusses the critical role of indigenous epistemologies in science education.

INTRODUCTION

This article problematises the implementation of the rights to basic education for nomadic children through an ethnographic study of science teaching in schools operating in Turkana nomadic community in Kenya. The article reports an auto-ethnographic narrative of my teaching experiences in early childhood and secondary schools in Turkana, Kenya together with a recent exploratory pilot study I carried out to refine the ethnographic research methodology for my doctoral dissertation. The goal of the paper is to articulate ways in which curriculum subjects can integrate Indigenous epistemologies and social cultural practices of the nomadic Turkana pastoralist community in formal school science instruction. I draw from my outsider/insider narratives of stories of children and of my own as a student and as an educator in early childhood education. The narratives are based on participant observations and ethnographic interviews of teachers, school administrators, community leaders, parents and elders. The ethnographic methodology was framed from qualitative ethnographic studies carried out in various indigenous communities in the United States, Canada and other countries (Kouritzin, 1991; Li, 2002; McCarty, 2002; Mendoza-Denton, 2008; Moll, 2005). In addition, the study draws from the theoretical framework of funds of knowledge (Rosebery, Mcintyre & Gonzalez, 2001). As part of the pilot study, I reviewed Kenyan schools curriculum documents which included lesson plans; syllabi, guidelines, textbooks, schemes of work, examination tests and examination grades of students. I also studied Turkana people's artifacts and archival materials in the community museums and achieves.

POSTCOLONIAL EDUCATION POLICIES IN KENYA

Since Kenya acquired independence from the British in 1963, there has been a willingness by the government to reform an education system inherited from colonial education to reflect the social, economic and cultural aspirations of Kenyan people. The ministry of education established a number of education commissions and reports to review colonial education systems. For example, the Ominde Commission in1964 proposed an education system that would foster national unity and human capital for national development. Other significant reports were the Gathathi report of 1976, the Mackey report in 1981, Kamunge report on education and manpower training (1988) and the Koech report undertaken in 2000, which recommended Totally Integrated Quality Education and Training (TIQUET) (Government of Kenya/Ministry of Education [GoK/MoE], 2005). These commissions in general were concerned with an education curriculum to foster national unity, economic, social development and maintenance of cultural heritage of the Kenyan people.

However, education policies in Kenya did not take a radical shift to indigenize. Partial policy changes were implemented piece meal without major structural overhaul of the inherited colonial education system. Reflecting on education development trends in Kenya since independence, one can argue that even with these many commissions costing the taxpayers millions of dollars, no significant changes happened in Kenyan education system. The system continued to be criticized as experiencing regional and gender disparities, declining enrolment ratios, questionable quality and relevance, high wastage due to high drop out rates and mismanagement (Abagi & Odipo, 1997; OWN & Associates, 2004; Sifuna, 2005).

To continue the education reform agenda, Kenya has made a commitment to implement Universal Primary Education (UPE) in conformity with International pressure engineered at the world Conference on Education for All (EFA) held at Jomtien, Thailand, 1990 and reviewed in Dakar Conference in 2000. These commit developing countries to plans of action in meeting goals for basic education (Torres, 1999). Kenya is also a signatory to the Convention on the Right of the Child (CRC) and has also embraced the Millennium development goals (MDGs) that have set targets for developing countries to implement basic education for every child by 2015 (Torres, 1999). In response to the goals of basic education, Kenya initiated the Free Primary Education (FPE) policy in 2003 (Abagi & Odipo, 1997; OWN & Associates, 2004). Before the introduction of FPE, enrolment in Kenyan Primary schools was 5.9 million (GoK/MoE, 2005). This figure has since risen to an estimated enrolment of 8.6 million children in public primary schools according to recent media report.

Free primary education in Kenya created under enrolment in early childhood as policy continued to require parents to pay for the salaries of preschool teachers in addition to construction of classrooms and provision of learning materials. This trend has affected early childhood enrolment as teachers are no longer getting the salaries they used to get from parents before the introduction of FPE.

An increase in national enrolment of children in primary schools does not necessarily mean that educational gains are equitable across all regions and for all groups in Kenya (Abagi & Odipo, 1997; Krätli, 2001; 2000; OWN & Associates, 2004; Sifuna, 2005). For example, in nomadic Turkana District,

which is the focus of this study, FPE has not resulted in a significant increase in enrolment in primary education. During the initial stages of FPE enrolment in Turkana Primary schools only increased to 43% in urban centers and 20% in rural nomadic settlements. Dropout rates at the initiation of FPE were as high as 49% in urban centers and 73% in rural nomadic pastoralist settlements (Oxfam-Turkana, 2008; United Nations Girl Child Education Initiative [UNGEI], 2009). However, the enrolment has since picked up in Primary schools in Turkana and according to the recent estimates 65% of the children are in schools (GoK, 2008).

Early childhood education continues to be problematic. A visit to preschools in Turkana district showed that children teach themselves as lack of teachers, classrooms and learning materials continues to be a major problem in communities operating in abject poverty such as the nomadic communities of Kenya. Preschool children in Turkana are most likely to come to school to feed and return home without receiving any form of stimulation from an adult. Enrolment statistics given for early childhood are not necessarily of children receiving education, but are figures of children benefiting from feeding program.

The implementation of UPE through FPE in Turkana nomadic district will not necessarily lead to a sustainable education program that can keep nomadic children in school. The implementation of Kenyan FPE policy is hard to realize in nomadic communities as meeting the children's rights to education continues to be an elusive concept in harsh terrain pastoralist environments. Turkana people are in dear need of policies of education that go beyond FPE and address issues of curriculum relevance that explore education goals that match western curriculum with the cultural lifestyles of Turkana families and children (Dyer, 2006). Often the curriculu in Kenya has tended to alienate and marginalise pastoralist nomadic children as it fails to include indigenous knowledge epistemologies in skills children learn in schools which are critical for the survival of children and families. Addressing educational needs of nomadic children in Turkana, while respecting their cultural rights, is critical in the provision of educational opportunities that are focused to meeting the full realization of the rights of pastoralist children.

As long as Kenya continues to pursue a historically acquired colonial education system, postcolonial reform policies will not make significant improvements to the lives of many children and families in nomadic communities. Instead nomadic children in Kenya are among indigenous communities in the world that suffer from an education system that does not recognize their cultural values and the resources of the people essential for self determination. Education taught to nomadic children today perceives their culture as barbaric, archaic, primitive and the cause of cognitive deficiency in school children (Dyer, 2006, Ntaragwi, 2004). Schools in nomadic communities appear to be institutions where children are taught to hate their culture and 'hate themselves' (Ntaragwi, 2004). Consequently, it is assumed that 'backward cultures' like those in nomadic indigenous communities will have to be exterminated and replaced with modern lifestyles through schooling. The replacement order of primitive culture is hierarchical, from nomadic to agriculture and then to modern industrial economy (Dyer, 2006).

TURKANA NOMADIC PASTORALIST PEOPLE

Turkana is the name of my ethnic community that occupies a vast semi-desert area of north western Kenya covering over 77,000 square kilometres. Turkana nomads number approximately 500,000 people according to the census of 1999. The result for the recent census done in August 2009 was not released even as the results of the rest of the communities in Kenya were announced by the Government. A recent report from the United Nations Development (UNDP) report indicated that 96% of Turkana people are poor compared to the rest of the communities in Kenya (Gisesa, 2010**).**

The majority of Turkana people depend entirely on relief food provided by the government and nongovernmental organisations (NGOs). As a result of poverty, Turkana people have remained behind in education as families cannot afford to pay school levies or build schools for children. Political elites in Kenya continue to unfairly blame the Turkana people's culture as the cause of their resistance to education. Other factors often cited for high dropouts in the nomadic environment are a lack of teachers, nomadic lifestyles of the families, insecurity due to ethnic conflicts, early marriages, long distances between schools, and lack of sanitary towels for girls. However, no significant attempt has been initiated in the education reform or in the curriculum review to address issues of curriculum relevance to nomadic children's cultural lifestyles (Dyer, 2006). Turkana people naturally have to rely on their traditional cultural practices such as nomadism to ensure their livestock survive for the sustenance of food security of the families and children. The mainstream society in Kenya arguing from the assumptions of western lifestyles, consider nomadic practices as barbaric and primitive. However, pastoralist lifestyles have continued to persist even as the educated elites attempt to change Turkana from nomadism to modern lifestyles. With increasing dropout from schools and lack of tuition to keep nomadic children in schools, education is not the best option for survival of families. Increasing number of school graduates are dropouts who neither have the skills to fit the modern economy nor possess the traditional skills to fit traditional lifestyles.

NOMADIC CHILDREN'S SCIENCE EXPERIENCES

There may be a lot going on in school children's hearts and minds that teachers and researchers should reflect on. In my initial training as a science teacher, I was trained to prepare a lesson and conduct an experiment for children in the laboratory. There was no mention of science experiences from the children's cultural knowledge. These conventional approaches to science teaching influenced my science instruction. However, in one of my science lessons, I was conducting an experiment to demonstrate pressure exerted on different surface areas (sharp, flat objects). I asked the students to give related examples of surface areas that exert pressure on different surfaces. The students spontaneously named hooves of donkeys, goats, cows and camels as examples of surfaces that exerted different amounts of pressure on surface areas. They did the ordering of hooves of their domestic animals in terms of those that exert greater pressure and those that exerted less pressure. They said a camel's hoof exerted less pressure because it is flat and a goat's and donkey's exerted more pressure because they are sharp.

I was not used to these types of answers in my science lessons. But I felt challenged by the students as their argument was logical and consistent with the laws of science. I encouraged more examples and the class was excited to talk about science from their cultural experiences. In this lesson I was being assessed for promotion by an official from the ministry headquarters in Nairobi over six hundred miles away. The official was sitting in class and listening to my conversations with the students. Surprisingly, at the end of the lesson the official said he was impressed by the amazing cultural examples given by the students during the physics lesson. I was surprised because these examples were not in the physics textbooks and were not those that I had anticipated and included in my lesson plan. In addition the national examinations in Kenya did not test this kind of knowledge as it is considered unscientific.

I remember when I was a student in at a local secondary school; one of the questions in a science examination was about drawing and labelling a cotton plant. I knew I had read about cotton in the textbooks but I had not seen the physical appearance of the cotton plant. It is a plant that grows in loam soil in some regions of Kenya. My community is semi-desert and only a few crops can grow along the rivers through irrigation. Although I tried to imagine what the plant looked liked, I tried to draw it without success. Many years later after I had finished school and I was travelling to Nairobi to start my teacher training, I was shown a cotton plant on the way. If children in nomadic communities do not get opportunities to travel to Nairobi or outside their community, much of the knowledge they learn in schools is mythical as it is has no application in their cultural life. Nomadic children suffer in two ways: first they fail the national exams because the knowledge tested is school culture or middle class urban culture and second they do not use the knowledge as it is not culturally relevant to their ways of life.

A lot of learning that occurs in nomadic schools is textbook-driven to the extent that students either see the picture of an object in the textbook or just the name of the object in print. The textbooks usually represent the world of the school culture or western culture, which is far different from the world of nomadic children. In addition, textbooks and the curriculum all are written in Nairobi, the capital city of Kenya located several hundred miles away from Turkana. Moreover, the authors of school textbooks are educated elites who usually have no background in the cultural knowledge of nomadic peoples. For example, I had a chance to meet some publishers' marketing physics textbooks in Nairobi. On the cover of the text book, a photo of an electricity transmission power plant was displayed. I asked the publisher what meaning would a nomadic child using the textbook learn from this photo? The publisher was not happy with my question because he thought I was interfering with his business, and more importantly he did not see the link between what I was saying and children's understanding of science or the fact that the way science is represented in textbooks privileges dominant cultures at the expense of the cultures of minority children.

Text books should incorporate cultural examples such as those used, for example, by nomadic children in my class to explain pressure. In this way, teachers will be encouraged to use knowledge in science instruction in culturally responsive ways. This is important in contextualizing teaching in schools which operate in traditional cultural societies.

TURKANA CHILDREN'S EXPERIENCE OF SCHOOL

While travelling around schools and communities in Turkana, children may be found everywhere with their families, looking after animals, hunting, swimming, fishing, weaving, helping adults etc. In nomadic communities the survival of families is critical and every member of the household must contribute to the welfare and support of the family.

Nevertheless, parents are willing to take some children to school as they argue that it is better to stand with two legs (Krätli, 2001). Taking a child to school is like standing with one leg in school and the other leg remaining with the livestock. The metaphor of standing with two legs, describes how the Turkana nomads see the value of school as supplementing dependency on livestock herding. However, children very often run away from schools as the environment in schools is not usually interesting to children in addition. They also lack the school levies to meet their tuition. I interviewed some of these children and they were quick to point out that teachers cane them in schools; schools waste their time as they sit many hours without anything interesting to do, teachers are not friendly and there is no food in school. Parents on the other hand are happy to have their children at home and help them do household chores. Parents often do not know what goes on in schools either and they are often alienated by school programmes as they are considered not able to 'conceptualise' school issues.

A visit to schools shows business as usual. Children are sitting on the floor or sharing one or two desks. The walls are empty without charts or science equipments. In some schools there are no classrooms. Instead children sit under tree shelters. If a chart is on the wall it has usually been bought by the school from a bookstore in urban centre or has been packaged by the Curriculum Development Institute in Nairobi. Science textbooks and other textbooks used in the school do not reflect any of the local environments seen outside the school: the hunting of birds and squirrels, fishing, swimming, milking of goats, boat building, tree climbing, basketry, fruits gathering and stories and games etc. Yet the curriculum taught in Nairobi is the same one taught in a nomadic village school. I asked teachers why they were not incorporating children's life worlds in the school teaching of science. They answered that they must follow the syllabus and teach the content that is tested in the national examinations.

Life in schools in Turkana is a complex puzzle, especially when teachers and school officials continue to operate business as usual even though children continue to drop out of school in large numbers due to lack of motivation and interest in school activities. I keep asking the question; why are the teachers not willing to change their teaching instructions even when statistics show that year after year children performance nationally is far below the national average? I can only agree with Willis (1977) that education in Turkana schools is for training failures or workers for middle class leaders and not for training successful leaders of Kenya or leaders who can inspire their own communities to success. For many reasons I challenge the commitment of the Kenyan system of education to effect children's rights to education in the Turkana nomadic community, and I am very sceptical about the fairness of these policies in providing equitable education opportunities in the traditional cultural traditional communities of Kenya.

IMPLICATIONS FOR SCIENCE TEACHING IN THE PRIMARY YEARS

The findings from this study challenge dominant international discourses of education, especially those related to children's rights to education focusing on EFA, FPE, UPE, CRC and similar policies. The questions asked by Brock-Utne (2000) - Whose education for all? Education in whose language? - are very relevant to this study and critically important for all teachers in Turkana. Nomadic children do not perform well in national examinations. School examinations test the dominant culture of the upper middle class residing in urban cities of Kenya. Turkana children do not necessarily apply knowledge learned in school in the cultural survival lifestyles of their families. Schooling alienates the children from the families and disempowers them culturally, socially and economically (Dyer, 2006). Education in Kenya is by structure and design western (Ntaragwi, 2004). Research in indigenous communities shows that children who discontinue school or who remain faithful to their cultures are better equipped with traditional skills useful in supporting the survival of the families (Dyer, 2006, Brock-Utne, 2000; 2007; Kawagley, 2006). Hawkins (2002) points out that formal education belonged to the culture he described as 'the folk-culture of the already well educated' (p. 138). In other words, the culture of formal education represents the culture of the privileged middle and upper affluent individuals of the educated Kenyan elite society. The consequence of universal education in the Turkana nomadic community is early school leavers, the production of youth who will not fit in the life of their families and at the same time they will not participate effectively in the economic activities of modern, industrial urban life. The overall effect of formal education in traditional cultural societies is to render the community ineffective. The result is vulnerability of the community leading to 96% of the people living in poverty as reported in UNDP reports.

Drawing from Kaomea's theory of defamiliarising the familiar (2004;2003) it appears that children of nomadic families in Turkana are being subjected to schooling that adds no value to their development as effective citizens capable of making a positive contribution to their own future. Dyer (2006) put it aptly that FPE alone is not enough, policies of education in traditional communities such as the Turkana should also address issues of relevance of the school curriculum to the cultural practices and lifestyles of the people.

As demonstrated earlier in the study, schools in most nomadic communities teach science basically from the textbook. These textbooks do not capture any aspect of nomadic children's lifestyles. For example the environment surrounding the schools may have activities such as fishing (including traditional methods of fishing like drying, salting etc), boat building, rafts and the lake with all its aquatic life and children's social cultural activities like hunting, herding, swimming, milking and others. These activities are not captured in any of the textbooks despite the fact that many of these activities are scientific and are represented in the same textbooks but taught through examples from western culture. One study in the United States (Sertima, 1983) reported that science textbooks exclude African scientists and as a result African students are denied the opportunity to learn science from their fellow African scientists as role models. Further, Jegede (1997) indicated that school

text books promote a mythic view of science rather than present the true image of science that reflects the real nature and outcome of scientific enterprise.

Studying indigenous science in Yupiaq culture in Alaska in the United States, Kawagley, Norris-Tull and Norris – Tull (1998) found that Yupiaq culture is highly technological and its cultural inventions are highly scientific. They include river fish traps and different types of hunting and fishing gear. The Yupiaq people developed this technology as a result of highly extensive scientific knowledge of the flow of rivers and tides including feeding, resting and migratory habits of fish, mammals and birds. In Alaska there is a curriculum for teaching Yupiaq children which incorporates all the Yupiaq cultural knowledge of for example, fishing and processing, weather, mental healing, Native diet and others (Barnhardt, 2009; Kawagley,2006). Turkana children could benefit from a similar curriculum if adopted in Kenya.

Studies on cross-cultural science education (Aikenhead, 2000; 1996; Aikenhead & Jegede, 1999) argue that there is a difference between a student's cultural identity and the culture of science or school science. Effective instructional strategies of science should enable students to cross the cultural border between the culture of western science or school science. According to Watt:

> A person's engagement with scientific knowledge must fit with his or her self – image and lifestyle, to enable them to act with confidence and self – direction. Where these features of learning are weak then engagement with ideas and concepts is likely to be insecure.
>
> (quoted by Aikenhead, 2000, p.185)

To ensure smooth crossing between cultures, (Aikenhead, 2000; Aikenhead & Jegede, 1999; Jegede, 1997) proposed the theory of collateral learning, in which students learn western and traditional meanings of simple concepts of science side by side. Collateral learning recognises multiplicity of cultures and allows students to learn not only the ideas of science but also the context in which these ideas are valid.

Using a curriculum described as rekindling traditions, Aikenhead (2001) taught Aboriginal students in Canada western science along side aboriginal cultural practices which included: snowshoes, nature's hidden gifts, the night sky, survival in our land, wild rice, trapping etc. Aboriginal content is used to introduce the science lesson; for example, going on a snowshoe hike, finding indigenous plants that heal, listening to an elder, interviewing people in the community, or assisting in a local wild rise harvest. The students use their knowledge to help discover similarities with the western science or use the local science knowledge to critique school science knowledge. For example aboriginal culture has 13 moons and western science has 12 moons. Each culture maintains the number of the moons without forcing the other to change or assimilate to the other. Rekindling traditions enables the students learning science in traditional cultural environment to use local science knowledge to frame the science lesson so that the instructional strategy is community based, and enriches the students' science knowledge without necessarily leading to acculturation (Aikenhead, 2001).

CONCLUSION

This article argues that Kenya education policies are not sensitive enough in ensuring that nomadic children receive high quality education that values their culture. The use of indigenous science knowledge has not been recognised in Kenyan education system as critical in helping children learn science in culturally responsive ways Respecting children's rights to education should be supported by genuine and honest efforts by the international community to call for investment in nomadic children's education that is relevant to their culture. Recognition of nomadism as a philosophy and an intellectual resource of the Turkana people is critical in the provision of education of nomadic pastoral children.

The erosion of culture in African children begins in preschool education which continues to be in the hands of the missionaries and NGOs which operate as custodians and agents of western Euro-American culture in Africa (Prochner & Kabiru, 2008). Early childhood education policy in Kenya has not helped in minimising the control of missionaries and charitable organizations in the management of preschools. Most poor communities relyy on these foreign organizations in funding early childhood education. In this way western culture grows roots not only in the curriculum in elementary schools but even more so in the formative years of young children.

The global education policies pursued in the Kenyan education system do not necessarily result in meaningful change in the quality of life of young people after graduating from school in Turkana nomadic pastoralist communities. Instead, education disempowers children by weakening their cultural ability to contribute effectively to the nomadic lifestyles critical for socioeconomic survival of the families. The failure of universal education to incorporate the cultural concerns of nomadic families in school curriculum has created early school leavers. Even though a few youth continue to be in school and remain until the national examination, they end up scoring low grades. These youth are regarded as failures and will not progress to higher education. The end result is that these youth in addition to being unable to fit in their cultural lifestyles are unable to participate in urban modern industrial economy that is purported to be the aim of modern education. The study therefore finds the notion of children's rights to education in nomadic communities very problematic. It argues that strategies for implementing each child's rights through universal education should be based on curricula that contextualise the content of education to make it culturally sensitive and relevant, and community centred. In science, like other areas of the curriculum, teaching that integrates local people's epistemologies improves children's science understanding and heightens their level of confidence, self-esteem and motivation while furthering their rights to an appropriate education. When investments in early childhood education are left in the hands of foreigners, African children's cultures are likely to be replaced by western ideologies.

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I am a Kenyan born in April 21st, 1959 in Turkana district - a nomadic pastoralist ethnic community. I am graduating with a PhD degree in curriculum and Instruction (Early childhood education) at Arizona State University this December and looking forward to returning to Kenya to teach early childhood education at Kenyatta University. The title of my dissertation is 'Turkana Children's Sociocultural Practices of Pastoralist Lifestyles and Science Curriculum and Instruction in Kenyan Early Childhood Education'. I have a teaching and training experience of over 28 years. I spent a half of this time teaching in Kenyan high schools and later joined early childhood education to train teachers in Turkana district and at Kenyatta University. I have Masters and Bachelors degrees in early childhood Education from Kenyatta University and a diploma certificate in science education from Kenya Science Teachers College. I intend to take up teaching position in Kenyatta University beginning January 2011 and continue doing research in nomadic communities focusing on Indigenous epistemologies. The goal of the research is to develop Indigenous epistemologies and explore opportunities for integrating this knowledge to the national education curriculum of Kenya.

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