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9. Achieving inclusive and transformative ICT education practices in rural schools in marginalized communities

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Abstract

Information and Communication Technology (ICT) can do more than benefit teaching and learning in rural schools; it can also be a catalytic and transformative tool that induces knowledge reformation and production amongst learners in an informed society. In this paper our focus is on how ICT education practices in rural schools in marginalized communities can be transformed to develop knowledge that is transformative, empowering, and emancipatory in order for learners to pursue a vision of a good life in a desirable society. The study employs critical research to acquire deeper meanings and insights from in-class teaching events and observations at Alabama High School (a pseudo name) in Eastern Cape of South Africa. Through our critical reflective, the research confirms that current ICT education and curricula practices in rural marginalized schools have failed to develop transformative knowledge that makes rural schools sites of possibility for learners to become active in society from a position of empowerment. Developing transformative ICT educational experiences in rural schools could face challenges in the context of dominant educational practices and structures that in essence also need transformation. Transformative ICT education practices in this study suggest transforming learners' learning experiences such that the learners question or reframe their assumptions, knowledge, and education experiences in relation to their community life. In this paper we argue that more effective transformative ICT education in rural schools requires a sufficiently longitudinal perspective and action that takes into account the general impact of ideas on education practices in relation to school and community needs.

Keywords

Transformative, Inclusion, ICT, Learners, ICT knowledge, ICT education, CAT

Introduction

The *Dakar 2000 demand for Education for All by 2015* is based on the premise that education is a human right that enables people to improve their lives and transform their societies (UNESCO, 2000); a process that is enhanced by engagement with technology and the Internet (Burbules & Torres, 2000; Stromquist, 2002). Information Communication Technology (ICT) education practices support the development of knowledge and skills

needed for sustained economic development and social transformation in developing countries (Lall, 2000, Chopra et al. 2009). ICT education does not only produce knowledge for creating an informed society, but it is also an important catalyst and tool for inducing knowledge reforms that change learners into productive knowledge workers (Newby, 2013). Within education, ICT is seen as a way to promote educational change, improve skills of learners, and prepare them for the global economy and the information society (UNESCO, 2000; McNamara, 2003; Wagner & Kozma, 2005; Letseka, 2014).

Rural schools in developing countries are considered important because of the wide range of potential benefits they offer; these include shaping and strengthening of learners as individuals in relation to their fellow people, to nature, and to the world (Mbogo et al., 2014). Rural school education also plays a role in building capacity for life-long learning in individuals, and developing knowledge, skills and attitudes which contribute to the general development of communities (Lemon, 2004). With the ICT revolution that promises to shape learners, ICT education and knowledge is becoming important for social participation and better quality of life (Fuchs, 2010).

ICT can therefore do more than benefit teaching and learning; it can also help with the induction of learners into technology-embedded practices of post-schooling societal development. However, despite the availability of ICTs in many rural schools, they are not applied appropriately. The danger is that they focus solely on issues of basic access, and as such, schools and government are overlooking the development of ICT education strategies and pedagogies. Such strategies should be responsive to the experiences, culture and environment of the learners. Moreover, current formal learning practices focus on an exam-driven educational system and only on what is to be tested. As a consequence, rural schools are not providing context-based learning and teaching (Perin, 2011; Hismanoglu, 2012). While noting this point as important, it must also be understood that community practices cannot be divorced from the practical realities of education, nor from the political reality that schools themselves are concrete historical expressions of the relationship between education and society (Freire, 1993).

In response to this context, this study through employing critical research, reflect on the potential for marginalized rural community inclusion afforded by transformative ICT education practices in rural schools. Walsham (2006) suggests that critical research focuses

on what is wrong in the world. Subsequently, we are interested in a more elaborate understanding of what is wrong with ICT education in rural marginalised schools given our understanding in our particular context. In doing so we unpack, based on our initial research experiences, how we believe ICT knowledge can be transformative, empowering, and emancipatory in order for learners to be able to pursue a vision of a good life in a desirable society (Stahl, 2006; Stahl and Brooke, 2008). We therefore briefly also explain what we mean by concepts such as social transformation, inclusion, and empowerment. In light of this, we seek to uncover how ICT education in rural schools can be more inclusive in rural marginalize communities through ICT knowledge that is transformative.

Given the particular context we encountered we therefore ask; Can ICT education practices in rural schools contribute to community development, social inclusion, and transformation? We answer that ICT education can contribute social inclusion and transformation, but there are also risks of further exclusion and disempowerment, and therefore an appropriate understanding of the problem context and transformative ICT education practices are necessary. For the purposes of this study, we define social inclusion as the extent that individuals and communities are able to fully participate in society and control their own destinies, taking into account a variety of factors related to social economic resources, employment, health, education, housing, recreation, culture, and civic engagement (Selwyn, 2002; Foley, 2004).

Social inclusion is a matter not only of an adequate sharing of resources, but also of participation in the determination of both individual and collective life chances (Stewart, 2000). ICT education for the promotion of social inclusion cannot rest on the provision of devices or Internet alone in rural schools. Rather education practices and community structures must also be take into account if meaningful use of technologies is to be provided (Brookfield & Preskill, 2005); and in our study, whether ICTs also lead to emancipatory social transformation. Drawing from Mezirow (2000) we further see transformative ICT education as focussing on how one can learn to use ICTs to negotiate and respond to the purposes, values, feelings and meanings of those that need empowerment and transformation most, rather than those uncritically assimilated from others or from our own biases and prejudices. The aim of transformative ICT education is to allow people, learners and teachers in rural marginalised schools in particular, to gain greater control of their lives “as socially responsible, clear-thinking, decision makers” (Mezirow & Associates, 2000, p. 8).

Ultimately, this study focuses on our employing of critical research to present a more elaborate explanation of what is wrong with ICT education practices given the context of rural schools in marginalised communities in the Eastern Cape province of South Africa. We draw upon our reflections from the Alabama (a pseudo name) project, which we describe in a following section. The ideas in this paper have been developed from on-going reflection about our own practices as ICT trainers and teaching Computer Application Technology (CAT) at Alabama High School.

The paper proceeds as follows: First the Alabama project is introduced; we focus on the background, objectives, and its inception in Eastern Cape Province in South Africa. This is followed by a brief discussion of the research approach we used to come up with emerging themes from the context situating phases of the project. The paper concludes with the discussions and lessons learned from the project.

The Alabama project

The Alabama project started in June 2013, with an initial purpose of exploring how the Department of Information Systems (IS), Rhodes University, could assist Computer Application Technology (CAT) teachers at Alabama High School in the Eastern Cape Province of South Africa, with refresher training in the use of HTML and Microsoft Access. At the end of April 2014, two CAT teachers were trained by the second author. Sought outcomes during this training included; to engender self-learning, peer-learning, knowledge discovery, and information literacy, and to teach teachers how to develop lessons and exercises for teaching HTML and Microsoft Access.

As a result of this first engagement, the teachers and school principal expressed a further need for tailored Microsoft Excel training for all of the school's teaching staff. An Introduction to Microsoft Excel course for teachers was facilitated between the months of June and November 2014, and a total 11 teachers were trained in Microsoft Excel. Similar to the first training course, the course aims included; skills in self-learning, peer-learning, knowledge discovery, and information literacy. Although the training is not certified or accredited, it assisted teachers with hands-on practical experience in Microsoft Excel with the purpose of integrating ICTs into their teaching and administrative activities. In April 2014, the third author and visiting lecturer to the Department of Information Systems, joined the initiative

and facilitated an additional training event for the teachers on Information literacy and Internet searching.

Our twelve-month engagement at Alabama has enabled a relationship of trust and collaboration, where we are seen as part of the school and participators at the school. During the month of February 2015, the first and third authors took responsibility to teach for teaching four weeks of CAT classes to Grade 10, 11 and 12 learners, while the current CAT teacher was on sick-leave. This gave us an opportunity to further explore the impacts of different teaching methods on marginalized high school learner engagement and performance. Our overarching objective, during this time, was to develop transformative ICT education practices at Alabama which could provide knowledge that is relevant for community developmental needs and realities.

As researchers we sought to understand how our ICT teaching could be transformative by employing teaching practices that involve changes in the CAT approach and reference to what made sense in learners' broader community life. Our practices included that we sought to interpret the meaning of our experiences and learners' experiences and how it guide our action and rationale for further action (Mezirow 2000). The practical capability of the approaches was tested in the context by re-contextualised techniques and practices. Project practices have strong motivational and inspirational approaches, as can be seen from the project objectives above.

Methodological approach

The project used inductive exploratory approach while following our objective to understand how ICT education practices in rural schools can be transformed to develop transformative ICT knowledge relevant for development and social inclusion of rural communities. As a group, we have a considerable collective knowledge base to draw from, e.g. previous academic and rural research experiences, critical reflections, and observations from the empirical context. Following this, a critical research approach was applied to acquire deeper meanings and insights from the class teaching events and observations.

The data studied in this paper represents our experiences during the class teaching interactions which were mostly done in February 2015, and which involved daily reflective

conversations (which we recorded) amongst ourselves on our teaching experiences and observations. During our conversations we focused on what happened during the day, what learners did and what they said in response to how activities evolved. The reflective conversations helped us to address emerging issues while it also guided further teaching and fieldwork practice at Alabama.

In addition, critical reflexivity as a methodology was used to critique the relevance of our own fieldwork and teaching approaches. As practically engaged researchers, we thus questioned our own assumptions, beliefs, understandings, and ideologies and opened them up for debate (Stahl, 2008), during the reflexive conversations. Also, by questioning the possible implications of our own knowledge-base and prejudices, we intentionally expressed, questioned, and reflected on our subjective experiences, our beliefs and values and how they may possibly affect our interpretations in and of practice, as well as how they shaped research participants (teachers' and learners) understanding in the process (Alvesson & Sköldberg, 2000; Čečez-Kecmanović, 2001). Through reflexive conversation, contradictions in the classroom events were identified and taken as themes that show potential shifts in our teaching practices.

We sourced guidance on how to deal with reflexive conversations and the unstructured qualitative data generated inductively, by referring to literature on critical hermeneutics and critical reflexivity. The second author would typically facilitate the reflective conversations by asking questions and interrogating interactions within the teaching sessions, about learners' responses to the learning process, and about outcome of the class practices. The questions focussed on what may be happening for the learners, and also focussed on what may be happening for us as researchers. Our value judgements were guided by what we sought through our project objectives. These included to inspire, motivate and seek emancipatory relevance of educational practices and to not divorce ICT teaching and integration practices from the realities of community needs (Kress, 2011; Krauss, 2015). New themes that emerge from the reflexive conversation were then related to classroom practice through a cycle of trailing and refinement. The reflexive conversations constructed the meanings and identities from the classroom events.

The issue of relevance came into play here, as we sought to understand the meaning of relevance, given the context and activities we were immersed in, and how possible political agendas and ideologies (Čečez-Kecmanović, 2001), could have affected how we interpret and do things. Our reflections about the learners and our practical interactions indicate our emerging views from the project. Our reflections represented in following sections are based on observations, remembrances and impressions and may be accurate, inaccurate, or represent part of the realities of the learning practices during the project. The reflections express our version of what we saw happening at Alabama High School and through such reflection we formulate and review our understandings of transformative ICT knowledge that learners gained during the class sessions. Issues that emerged in the research process were dealt through our critical reflections to pursue the meaning and justify our concerns and reliability in interpretation. All of this is to say that as researchers who combine reflection and action in the interest of empowering learners with skills and transformative ICT knowledge, our teaching practices attempt to address injustices and develop a world free of oppression and exploitation (Freire, 1993; Kress, 2011).

Our view on transformative learning, therefore, involves critical reflection of assumptions that may occur either in group interaction or independently (Taylor, 2000). In transformative knowledge acquisition by the learners our emphasis was on critical reflection and critical self-reflection, assessing what has been taken for granted in ICT education, to consider a world from their perspective, and to consider those experiences that have confirmed their assumptions. This transformative ICT knowledge is the knowledge that foster the conditions under which the livelihoods of poor and marginalised people can be improved using ICTs (Feinstein, 2005). Consequently, not only are ICTs now seen as instrumental, they have become a platform through which developmental activities can be mediated.

The ICT educational impact in rural communities in Eastern Cape

The improvement of educational systems is seen as a primary way for developing countries to prepare for global, technology-based changes (OECD, 2004; World Bank, 2003; Fleisch & Shindler, 2012). In trying to improve ICT education, a small minority of rural schools in the Eastern Cape province of South Africa are relying on informal ICT educational projects such SchoolNet, awareNet, eKhaya ICT, and ICT for Rural Education (Gudmundsdottir, 2010; Dzansi & Amedzo, 2014). These initiatives have mostly been attempts to introduce more ICT

infrastructure and provide Internet to schools. At a more formal level, some schools in rural areas have taken advantage of incorporating Computer Application Technology (CAT) into their curricula; an ICT subject stipulated by the Department of Education (Pade et al, 2009; Mncube & Harber, 2010; Kenea, 2014). Alabama school is one of such rural schools taking part in ICT projects, both formal education with the Department of Education (DoE) and with other organizations involved in informal ICT projects and learning.

Throughout the Alabama project we observed that rural schools in the Alabama community face many challenges that differ from their urban counterparts. Particularly, the challenge centres on the wide gap in terms of access to both formal and informal ICT education between rural and urban schools. This confirms observation by Ncanywa (2014), who shows that rural school learners in the Eastern Cape lag up to seven years behind their urban counterparts in basic skills like reading and writing. Moreover, the community of Alabama community faces challenges such as lower levels of community development, high unemployment, high crime rates, lack of knowledge of tertiary education opportunities, and the need for small business development (Pauw, 2005; Armstrong et al., 2008; Chitiga, 2014). Previously Alabama community was a thriving farming community. However, very little social economic activities are left to stimulate growth and development. Communities, however, have expectations from learners and schools. For example, parents put forward the resources, and expect their children to gain knowledge that will make their lives better off upon learning completion, with a further expectation that the graduated learners will employ knowledge gained to improve the communities. Communities, also rely on the schools to engage in local community events and to cooperate with other public sectors, organisations and people. Rural schools are expected to function as social agents and to support the social cohesion of the communities; yet not much emphasis has been placed on developing learners with action-oriented strategies which solve concrete problems in their communities (Kalaoja & Pietarinen, 2002).

Our project also reveals that without explicating the relationship between current ICT-education practices in rural schools and the desired community developmental reality, and outcomes and possible ways of building these outcomes into transformative ICT knowledge, it is unlikely that ICT education practices in rural schools will contribute to local and national economic and social development efforts. Furthermore, it is less likely that such education programmes will have the ultimate impact on development.

Rural schools are often the most important public institution in a rural community, and also represent the economic lifeblood of the community (Shepherd, 2011). However, the community while seeking to address these challenges through high school education have failed, and this has resultant implications for the community's livelihood (Mncube & Harber, 2010; Kenea, 2014). Schools need to be assisted through the use of ICTs in reversing their fortunes to avert the negative impacts of challenges such as unemployment, poverty and lack of business opportunities. Moreover, in rural areas every child passes through primary or high school education and therefore the school is the appropriate place to develop transformative ICT practices and knowledge.

ICT knowledge is increasingly playing an important role in the development of nations and individuals (UNDP, 2001; Unwin, 2009; Van Zyl, 2013). At the same time, the lack of proper enlightenment of learners to the possibilities which technology provides is an important factor that leads to the deepening of social inequities. To avoid the latter, it is necessary to develop transformative ICT learning that promotes knowledge necessary for rural community developmental needs. We stress the importance of transforming the nature of ICT learning in rural schools to act as vehicle of disseminating knowledge and social inclusion.

It is important to note that the provision of education geared towards rural development may be seen as a lifeline for sustainable development in rural ecologies (Arnason, 2013). It is very important to keep in mind that with this project, our intention is to understand systems of communities; as well as begin to think (again) of relations and connections between these systems and ways ICTs are learned.

ICT education and social inclusion in Eastern Cape context

As we noted at the start of this paper, relatively little is being done to link overall ICT education in rural schools to broader community realities and needs. Historically, rural schools in South Africa have made some important contributions to rural people's development and integration into society (Engelbrecht, 2006; Taylor, 2011). While it is conceivable that links of this sort could happen without ICT, we suggest that the presence of ICTs in education practices can act as a stimulus for developing this sort of socially inclusive practice.

Our research confirms that current ICT education practices at Alabama school have failed to develop transformative knowledge that makes rural schools sites of possibility. In other words, ICT education practices in rural schools do not produce particular forms of knowledge, social relations, and value for learners to become active in society from a position of empowerment, as opposed to being simply integrated into society from a position of ideological and economic subordination (Freire, 1993).

Ultimately during our CAT teaching, we identified that the current curriculum is not contextualized to learners' community realities and does not contribute to the development of transformative ICT knowledge. Consequently, learners are unable to take advantage of the opportunities ICT may bring in their communities. Reflecting on the content of CAT and the teaching guide and contrasting it with our own practical attempts to present ICT education that is relevant and transformative, we found that, it stipulates that learners should simply learn to use Microsoft Office packages in a decontextualized manner. This is limited and irrelevant because it does not transform learners' learning experience such that the learners' questions or reframes their assumptions and knowledge in relation to their community life. The CAT curriculum content does not consider the expectations that the learners hold of themselves which mirrors the expectations held by people in their communities. The curricula and its teaching practices fail to provide learning which touches learners at deeper concrete levels of knowing, meaning, perception, and action.

In the same way, as part of the project, our approach to CAT teaching was to make ICT education and learning more sensitive to the local context and therefore more effective by transforming the learning through contextualized teaching practice. As we applied our particular approach, during class sessions, students contributed their personal experiences and understandings of ICTs, by questioning our prior assumptions of their understanding of technologies; we employed reflexive teaching practices to solicit contributions from learners. Our teaching approach therefore engaged the learners' views and problems in ways that concern their everyday lives while also prompting learners to defend their assumptions. This helped us to consider learners' worlds from their perspective and experiences.

Knowing how and where the learners' first experienced technology use helped us to be thoughtful in developing ICT knowledge practices that build on existing patterns of

community life. For example we noticed that school and community worlds are in a coherent relation, and learners see their assumptions confirmed by events or actions they experience in their community. It is widely recognized that paying attention to the diversity of context either in a formal or informal learning experience in everyday community activities can significantly contribute to addressing the social inclusion problem (Omolewa, 2007; Perin, 2011). In other words, the diversity of learners and their community needs to be acknowledged and incorporated when transforming ICT practices in rural schools, otherwise we will continue to marginalize learners and promote social exclusion. Our teaching, using transformative knowledge practices revealed how changes in perspective of learners manifested in the ability to relate their community situations with the ICT knowledge gained.

In addition, this study recognizes the value of ICT education in rural schools and use of technology in building transformative knowledge which exposes learners to contextualized learning and skill acquisition. The presence of transformative ICT education in rural marginalized schools is a possible means of tackling social exclusion. Rural schools serve as the bridge to connect the haves and have nots, and ultimately, to address the social inequity (Attewell, 2001; Harper, 2003; Warschauer et al, 2004). Therefore, transformative ICT practices in rural schools is acknowledged as a means for equipping students with both the technological skills and the abilities to independently make decisions. Hence, they become capable of selecting and using the appropriate ICTs for accomplishing personal objectives in efficient ways. Also evident in this study, is that developing transformative ICT educational experiences in rural schools could face challenges in the context of dominant educational practices and structures that essentially are not themselves transformed. By being sensitive to learners' ICT experiences and knowledge, transformative ICT teaching approaches and practices will potentially make ICT knowledge easier to integrate in the daily life of marginalised communities, while increasing learners' competencies.

Conclusion

The work described in this paper acknowledges ICT education and transformative ICT knowledge as it shows to transform learners' perceptions of possibilities which ICTs brings, enabling them to see things differently and act differently in their communities. While technology potentially allows for social inclusion of societies, there is a need for integrating activities that acknowledge community specific needs in ICT education in rural schools. Therefore, we must examine the direct relation of ICT education and community realities

through transformative ICT knowledge as a catalyst for expanding learners' social capabilities in a rural marginalised community. ICT education with transformative knowledge should enable learners to have 'real and meaningful' access to ICTs and allow them to appropriate these technologies as instruments for their community's development. Transformative ICT education in particular foregrounds a narrative of local environments that are attuned to the particularities of where learners actually live, and that is connected to global development trends that impact local communities. Hence, we must capture the developmental consequences of ICT education knowledge in the society, both at the informal and formal levels.

It is important to understand that strategic use, and integration of ICTs is equally important for privileged communities to continue to prosper as well as for marginalised communities to develop (Spaul, 2011). This paper argues that building more effective transformative ICT education in rural schools require a sufficiently longitudinal perspective that takes account of the general impact of ideas on education practices to enhance school and community needs. Hence we put forward a consideration for further similar work; to develop a unified and comprehensive experiential learning theory grounded in and highlighting dimensions of transformative ICT learning in rural schools.

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