Chapter 8
eGranary and Digital Identities of Ugandan Youth

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Introduction

> I think it's important for the teachers to use eGranary in teaching us because if they use eGranary in the class and teach us, the students can come on a screen of the computer and see exactly what is the teacher is trying to teach and understand. [Zuena, Ugandan student, November, 2008].
>
> It's important when the student is allowed to search information on his or her own, will be able to discover and internalize information easily. (Mary, Ugandan teacher, August, 2009)

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Zuena and Mary, who hail from different rural regions of Uganda, are participants in a program of research on language and literacy education, conducted in collaboration with faculty and graduate students (Ugandan and Canadian) at the University of British Columbia (UBC). They are discussing some of the merits of the eGranary digital portable library, which has been incorporated into the UBC research program. As student and teacher, respectively, Zuena and Mary are highlighting the potential of digital technology to enhance learning and teaching, and to promote both collaborative and independent learning.

Responding to an invitation by Ugandan scholars, a research team at UBC has for more than a decade been researching the potential of new literacies to transform educational practice in the country, particularly with respect to language and literacy education. This chapter will focus on the research we have conducted with the eGranary digital portable library, documenting its strengths and limitations for learning and teaching. To this end, the chapter draws on insights from students, teachers, teacher educators, and researchers in diverse regions of Uganda. The chapter begins with a description of eGranary, and provides background to the use of digital technologies in Ugandan education. It then addresses the theoretical framework for our research, following up with an elaboration our research program with respect to eGranary in particular. Findings and analysis provide a larger context in which to understand the insights provided by Zuena and Mary above.

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The eGranary Digital Library

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, p. 8), a process that is enhanced by engagement with technology and the Internet (Burbules and Torres 2000; Stromquist 2002). A United Nations 2006 report notes that while 14% of the world's population was using the Internet by 2004, over half the population in developed regions had access to the Internet, compared to only 7% in developing countries, and less than 1% in the 50 "least developed countries" (UNDESA 2006). The United Nations' Millennium Development Goals (MDGs) of 2000 thus called for global partnerships that make available the benefits of new technologies, particularly information and communication technologies (ICTs). Notwithstanding the excitement about the potential of ICTs to transform learning and teaching in Uganda, one of the world's 50 "least developed" countries, two well-documented problems are connectivity and bandwidth (Castells 1996; De Roy 1997; Warschauer 2003). Our team has learnt that conventional uses of ICT, apart from mobile phones, are beyond the reach of most Ugandan students and teachers, particularly in rural areas (Mutonyi and Norton 2007). In our search for more creative approaches to ICT, we have drawn on a range of low technology instruments, such as cameras and audio recorders, to explore intersections between ICT and literacy (Kendrick et al. 2006). In this process, we have identified the new 'internet in a box' eGranary portable digital library as a potentially powerful resource.

The eGranary system, which is continually updated, was developed by the Widernet Project at the University of Iowa in the United States (www.egranary.org). It is an intranet that comprises a 750 Gb hard drive with specialized browsing software, which can be attached to a PC or a local area network. It contains approximately 10 million educational documents, including Wikipedia, which can be searched like the Internet. While electric or solar power is needed to run the system, there is no need for connection to the wider Internet, and costs are kept as relatively low. Not only does eGranary provide a wealth of information for users, but users can also develop digital skills like browsing and searching, without connectivity. Further, the system can be updated, and includes software that enables users to upload local content and distribute it to other users. While the development of eGranary remains in progress, the ones used in our research program are the first generation made available by the Widernet Project. In June 2008, we contacted Cliff Missen, the Director of the eGranary project, to order the product, and to invite him to meet our research team at UBC. We learnt that if eGranary is to achieve its potential in Ugandan education, both students and teachers needed to be able to adapt the system to local needs. To provide insight into these local needs, the next section provides a description of the Ugandan contexts in which we conducted our research.

Digital Technology in the Ugandan Context

Uganda, like many countries in the developing world, faces many challenges of poverty, political instability, gender inequities, and HIV/AIDS. In 2001, in a population of approximately 28 million, the population below the poverty line was estimated at 35%, and the literacy rate approximately 70%, with males at 80% and females 60% (Uganda Bureau of Statistics, UBOS 2002). A British Protectorate until 1962 when Uganda was granted independence, English is now the official language, although few Ugandans speak it as a mother tongue. There are many ethnic groups in the country, with over 60 languages in use. With 80% of the population living in rural areas, access to ICTs remains an ongoing challenge.

However, despite multiple challenges, Uganda's educational ambitions with respect to accessing new technologies have much in common with the most developed regions of the world (Brock-Utne 2000; De Roy 1997; Tikly 2003), and the Ugandan Ministry of Education is seeking diverse means of incorporating new technologies into its education system. There is a growing recognition that contemporary ICTs are becoming increasingly influential in the country, especially among young people (Edejer 2000; Nawaguna 2005), many of whom are experienced in cell phone and Internet use in terms of text messaging and resource searching (Mwesigwa 2002). The National Curriculum Development Centre (NCDC) is currently trying to develop an ICT curriculum for teachers and schools, capitalizing on out-of-school ICT practices. Further, to promote ICT usage, some organizations are stepping in to provide access to contemporary communication media (Jensen 2002). Makerere and Kyambogo Universities are becoming centers for training teachers to use the Internet as a resource in their classrooms (U-connect.org 2005; USAID 2006), and some 130 urban schools have benefited from the U-connect initiative (Nawaguna 2005). Computer science has been introduced as a subject in many of these schools, although it is currently not an examinable subject in the Uganda National Examination Board (UNEB) (Eremu, n.d).

In order to bridge the rural and urban ICT divide, Worldlink and Schoolnet are setting up telecenters in rural schools (Mayanja 2002). While only about 30 primary schools have so far benefited from this initiative, the goal is to connect all schools through Schoolnet. In addition, the goal is to provide subsidized Internet services to teachers and students to enable them to develop more teaching materials. The major concern is that there are few curriculum resources in schools, and the hope is that ICT and especially the Internet can ease the resource burden in schools. The challenge, in addition to electricity cut-offs, is the limited number of Internet providers and the high costs of satellite via telephone connections (U-connect.org 2005). In general, there remain relatively few people in rural communities of Uganda who access contemporary ICT services, including radios, TVs, cell phones, and computers. It is this context that eGranary has much potential to address prevailing ICT challenges in Ugandan education.

Research Questions and Methodology

In a prescient observation, Warschauer (2010, p. 136) argues that as efforts to expand educational technology into the developing world increase, "a host of new research questions related to digital literacy practices and outcomes will be thrust on the agenda." The two eGranary research questions we have addressed in our Ugandan research program are as follows: (i) how does eGranary function as a placed resource in Ugandan education? (ii) to what extent do identities shift as multilingual students and teachers engage with eGranary and develop digital literacy? These research questions are centrally concerned with the innovative use of educational resources to promote social inclusion in the wider global community (Warschauer 2003).

Reviewers have asked how and why Canadian researchers have become active in an East African research program, and some have raised questions about the extent to which this research may be producing a local elite in the African context, with young people who may aspire to a future that may be unattainable for most of them. Are we helping to produce "third world consumers of first world technology"? Could eGranary be another cultural imperialist tool? It is important to note that our research program began with an invitation from our Ugandan colleagues to work with them on research projects of interest and importance to the Ugandan community. Their position, and ours, is that research is a conversation between local and international stakeholders, and that we need to work collaboratively to set protocols, determine priorities, and assess progress. Our research projects with eGranary were thus conducted in the spirit of capacity-building advocated by the indigenous scholar, Linda Tuhiwai Smith (Smith 1999), who argues that research should be of benefit to all stakeholders in the research process, enhancing future possibilities for research participants and their communities. We have discussed in prior publication (Norton and Early 2011), that researchers, nevertheless, need to be vigilant about unequal relations of power between researchers and participants, and, as Stein (2008, p. 17) notes, "it also means being extra-sensitive to the possibilities of absences and silences in the data, which may come about due to cultural, linguistic, gender and racial differences."

Drawing on research conducted in marginalized communities internationally (see Snyder and Prinsloo 2007), Mutonyi and Norton (2007) identified five "lessons" that are relevant to ICT research in Uganda: Collect empirical data that can be used by policy makers and curriculum planners; recognize local differences between rural and urban areas; promote professional development of teachers and teacher educators; integrate in-school and out-of-school digital literacy practices; and provide opportunities for Ugandans to both access and contribute to global knowledge production. These insights were integral to our research program with eGranary, begun in 2008, and conducted at five separate sites in widely dispersed regions of Uganda. Research on eGranary was not the only focus of research conducted at each site, but was incorporated into each respective case study. The five regions are in both rural and urban areas, including: the Masaka area in the south-

western part of Uganda, where we worked with Kyato youth in a community library (Norton and Williams 2012); the Mbale area in the east, where we worked with Sibatya Secondary School teachers and students (Early and Norton 2011, 2012); the Gulu area in the north, where we worked with teachers from four primary schools (Oates 2012); the city of Kampala in central Uganda, where we worked with teacher educators (Andema et al. 2013); and Arua in the northwest, where we are currently working with a primary teachers' college and two rural schools (Abiria et al. 2013). While an eGranary was already installed at the Kyato site when our research began, we donated an eGranary and laptop computer to each of the other four sites in our research program. Insights from research participants have been shared in diverse data forms, including face-to-face interviews (conducted in English), questionnaires, email exchanges, professional conversations, photographs, video-footage, and written and audio-taped reflections. The names of research participants and schools are pseudonyms.

Theoretical Framework

The theoretical framework for the research is drawn from work in two related areas, each broadly corresponding to the two research questions, respectively: (i) the New Literacy Studies; and (ii) language and identity.

Digital innovations in New Literacy Studies

Research on digital innovations in New Literacy Studies (NLS) that is relevant to our project is associated with the work of Hornberger (2003), Prinsloo (2005), Blommaert (2010), and Street (2001). These researchers take the position that literacy practices cannot be isolated from other social practices, and that literacy must be understood with reference to larger historical, social, and economic processes. However, as scholars such as Snyder and Prinsloo (2007) and Warschauer (2003) note, much of the research on digital innovations in this area has focused on research in wealthier regions of the world, and there is a great need for research in poorly-resourced communities to contribute to global debates on new literacies. The extent to which digital resources offer opportunities for users, and the ways in which they are used, needs to be established by research, rather than simply assumed.

In contrasting old and new literacies, Prinsloo (2005) distinguishes between literacies that are paper-based with ones that integrate written, oral, and audiovisual modalities within screen-based and networked electronic systems. Drawing on Blommaert (2002), Prinsloo argues that despite their global impact, the new literacies, including digital literacies, "are best studied as resources situated in social practices that have local effect" (2005, p. 87)—they are, in other words, "placed resources." He critiques models of globalization that do not address complexity and

hybridity at local level, arguing that what is needed is a theory of globalization that seeks to understand local cultural processes.

Blommaert (2003, 2010), focusing more on language than literacy, argues similarly that there needs to be a paradigmatic shift from the study of language as static to one that is dynamic. As he notes, "[W]henever sociolinguistic items travel across the globe, they travel across structurally different spaces and will consequently be picked up differently in different places" (2003, p. 612). These different places, Blommaert argues, are structured by inequality, and the impact of social and cultural forms of capital across these spaces, whether geographical or social, varies greatly. His conception of place as "scale," which captures the relationship between space and time, is a useful lens through which to analyse our data on practices associated with eGranary. The scale associated with an event has important implications for what Blommaert calls its "indexical meaning." This refers to instances of communication that can be seen as "pointing towards socially and culturally ordered norms, genres, traditions, expectations" (2010, p. 33). In addition, whenever discourses travel globally, Blommaert argues, what is of great interest is not their shape, so to speak, but their value, meaning, and function. These are "a matter of uptake, they have to be *granted* by others, on the basis of dominant indexical frames and hierarchies" (2003, p. 616, italics in original). As Blommaert notes:

> Consequently, we are facing '*placed resources*' here: resources that are functional in one particular place but can become dysfunctional as soon as they are moved into other places. The process of mobility creates difference in value, for the resources are allocated different functions. The indexical links between signs and modes of communication, and social value scales allowing, for example, identity construction, status attribution and so forth—these indexical links are severed and new ones are projected onto the signs and practices. (2003, p. 619)

As eGranary "travels" from a highly industrialized site in North America to poorly resourced sites in Uganda, what value is ascribed to eGranary and what functions does it serve? What are the indexical links between eGranary and Ugandan sociocultural norms, traditions, and expectations? Such questions provide a window into both practice and theory with regard to digital innovations and New Literacy Studies.

Language and Identity

While Blommaert expresses some interest in the relationship between language and identity, as do other new literacy studies scholars, this relationship is of central interest to my own work on identity and investment in the field of language education (Norton 2013). Drawing on poststructuralist theory, particularly associated with the work of Christine Weedon (1996), I take the position that 'identity' is not a fixed character trait, but must be understood with reference to a learner's relationship to the wider social world, changing across time and space, and reproduced in social interaction. In this view, I argue, identity cannot be essentialized; it has multiple

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dimensions, is constantly changing, and often a site of struggle. The construct of investment, which I developed to complement notions of motivation in the field of language education, has broader application to other areas of language, literacy, and learning (Norton 2013). Inspired by the work of Bourdieu (1977, 1991), and drawing on a wide range of research, I make the case that learners invest in the target language at particular times and in particular settings, because they believe they will acquire a wider range of symbolic and material resources, which will increase the value of their cultural capital and social power. As the value of learners' cultural capital increases, so learners reassess their sense of themselves and their desires for the future. Hence, I argue, there is an integral relationship between learner investment and learner identity. Further, investment assumes a wider range of questions associated with a learner's commitment to learning. In this chapter, more specifically, I ask, 'What is the learner's investment in the digital literacy practices of eGranary?'

Related to the construct of investment is that of imagined communities and imagined identities (Anderson 1991; Kanno and Norton 2003; Norton 2013; Pavlenko and Norton 2007). Developing this notion with reference to language education, I have argued that in many language classrooms, learners may have the opportunity to invest not only in the classroom community, but in communities of the imagination—desired communities that offer possibilities for an enhanced range of identity options in the future. Imagined identities can be highly varied, from the imagined identity of the more public professional, such as doctors, lawyers, and teachers, to that of the more local homemaker or farm worker. I argue that an imagined community assumes an imagined identity, and that investment in language or literacy practices must be understood within this context.

Findings and Analysis

I now return to the two research questions that are the focus of this chapter, and address the relevant findings:

1. how does eGranary function as a placed resource in Ugandan education?
2. to what extent do identities shift as multilingual students and teachers engage with eGranary and develop digital literacy?

eGranary as a Placed Resource in Ugandan Education

In seeking to understand how eGranary functions as a placed resource in Ugandan education, with particular meanings and functions across space and time, I begin with an extract of a conversation that Margaret Early and I had with a number of teachers at Sibatya Secondary School in August 2009. The teachers were

commenting on the limited resources available at this rural school, where classes sometimes reach 200, and the teacher may be the only person with a textbook:

Teacher 1 In fact the teacher is just the (whole) Bible-
Teacher 2 The teacher is just the Bible in the school. [laughs]
Teacher 1 There is no other [laughs]
Norton Is that right, the teacher is the person who has the knowledge.
Teacher 2 Yes.
Teacher 1 Yeah
Norton There is nobody else.
Teacher 1 Yeah.
Teacher 2 Because the students-
Early The "e-Granary."
Norton You're the e-Granary.
Teacher 1 [laughs]

In such local contexts where resources are minimal, and the teacher is in fact often the sole source of information for students, constituting "the whole Bible" or the metaphorical "eGranary", a digital portable library has great potential to provide a large database of information, materials, and resources for both students and teachers. Teachers from Sibatya Secondary School noted that the eGranary has a wealth of information, and that "in the absence of textbooks, as it has been in most schools in Uganda, the eGranary is very resourceful". Teachers noted other advantages, including the fact that it is "easy to store and access information", "easily portable and usable where there is no internet service", "cheaper", and "more reliable" than the Internet. Lauryn Oates, working with teachers in the Gulu area, noted in an email of February 25, 2010, that teachers particularly liked the Tools for Teachers resources, while Sam Andema, who participated in an eGranary workshop at Bondo Primary Teachers' College in Kampala, on June 18, 2010, had similar findings:

> At the end of the session I asked participants to share with me their experiences with the use of ICT broadly and the eGranary more specifically and the possibility of integrating it in their professional practice. Interestingly, participants were all positive about the possibility of integrating ICT in their professional practice. It was exciting to hear participants explaining how they could use ICT to improve their teaching in their respective subjects.

Teachers were particularly interested in ways in which eGranary could improve student learning and encourage independence on the part of students: "It's important when the student is allowed to search information on his or her own, will be able to discover and internalize information easily," said Mary, a teacher at Sibatya Secondary School, quoted at the beginning of the chapter. Our research has provided much evidence of the challenges students face in learning independently, given the scarcity of resources available. Another teacher at Sebatya noted perceptively that "Learners can access information without necessarily having to move out of their setting," a very important consideration in contexts in which transportation is limited and costly.

Students themselves were also quick to see the potential of eGranary to improve learning, as Zuena, quoted at the beginning of this chapter, noted. EGranary would

provide students with an additional source of information besides the teacher, and an opportunity to read and reread information that might not have been initially comprehensible. Both students and teachers saw in eGranary an opportunity to access a wide range of information, and to better understand their own location—geographical, political, and personal. They eagerly sought information about their President Museveni, about the history of Uganda and its people, and about Africa more broadly, but they also used eGranary to make sense of more personal histories and experiences. Theo, a student at Kyato library, for example, spent much time searching for information about fish, explaining as follows:

> When I was young, I could see people moving down the lake just feeding the fish in the water … and then my grandmother was always cooking fish, mostly on Sundays, and then it was very sweet. So that's why I check all the information about fish. (Interview, November 24, 2008)

Both students and teachers commented that the use of the commercial Internet was difficult because they had to go to an Internet café to use it, which was expensive, and the costs were exacerbated by the slow bandwidth, because they paid for usage by the minute. With eGranary, users could search for information without having to pay for the period of time in which it was used. As Theo said,

> Because I can search different information from the eGranary, thus I can even spend little time, or much of the time without going to the Internet just to pay money. (Interview, November 24, 2008)

From a different perspective, a student Mohammed took the opportunity to learn the eGranary and the computer in order to develop a provisional plan for his future. In the event that he could no longer attend school due to financial constraints, he could take advantage of his computer skills to seek related employment until he was able to return to school. As he noted,

> For me, it will help me because I may, I may, I may leave the KCSS. I could, I should, I could finish my "O" level when I have no further assistance for further education, so I may use that knowledge that I acquired from the eGranary to get jobs like secretariat and also some simple jobs like playing discos, playing music on discos, and also other jobs in the category of computers. So I'm gaining future knowledge on the eGranary. (Interview, November 24, 2008)

However, some the limitations associated with the use of eGranary, and ICT more broadly, were the cause of much frustration and disappointment. As Andema noted in his 2010 report:

> [Workshop participants] were also cognizant of the possible challenges they would most likely face in trying to integrate ICT in their professional practice. Examples of the possible challenges mentioned included: not having personal computers to use at their convenience, lack of power point projectors at the college, intermittent electricity supply, and having limited skills and knowledge of ICT.

At the local level, the site into which most eGranary systems were placed had little socioeconomic infrastructure, no electricity, and no running water. Teachers at Sebatya noted with disappointment that eGranary "Works only on electric power", and is "'useless without electricity." It was sometimes only with solar power that the

eGranary was able to operate, and even this resource was often unreliable. As the student Theo at Kyato noted,

> Power is still a problem, because we just use the solar system and then sunshine takes sometimes long without shining, and it rains for two and three days. So if it rains and then to me there is no power. So we just need more solar panels just to connect the power to the computers. (Interview, November 24, 2008)

Lauryn Oates, drawing on her research in the Gulu district, noted that teachers had experienced problems with installation of eGranary onto the laptop computer, and that problems were exacerbated when technical support was not available:

> [The technology assistant] needs to be on hand to get the program going each time the lab opens, or if there is a power outage and things need to be restarted. Sometimes he is away from the lab or busy, which is a problem if users can't start up the program easily on their own. (email to Norton, February 25, 2010)

Oates also noted in her research that there is a need for more material with an African perspective, while teachers at Sibatya noted that information on the eGranary could be a little overwhelming. As one teacher said:

> [The eGranary] has too much information, some of which we might not need … right? For our purposes. So we're looking at the possibility of looking for those sensitive topical issues which we need for our own particular [course work]. (Interview, August 2009)

The central challenge for teachers is to determine what information on eGranary is in fact relevant to their needs, and how best to access it. As a teacher at Sibatya noted,

> So our coming together like this is a way of putting out heads together to know what you can grasp—you can grasp a small part, he grasps another one, she gets another one. Now tomorrow the part which defeats you to get is the one you run to the friend and say 'now how do we do this?' so that together we can access that information for our own good. (Interview, August, 2009)

Another limitation of eGranary is associated with the fact that information on the downloaded websites is "frozen" in time, and some information may be out of date. When we were conducting our research at Kyato community library in 2008, for example, Barack Obama, an African-American, was standing for election as President of the USA. Although this was not a local event, it created much interest in Kyato, as it did in many parts of the world. One student, for example, tried to search the eGranary to address the following question, "How did Obama get to be in America since he is a black person?" Interestingly, because the particular eGranary that was sent to Kyato only included information to December 11, 2006, students were unable to locate much information about Obama on eGranary, except that he was a popular senator in the state of Illinois. Further, when they searched for information about Obama's rival, John McCain, they were directed to McCain foods, and came up with many references to McCain's pizza pops, frozen foods sold in North America. This was clearly a limitation of eGranary.

At Kyato community library, we also became aware of a darker set of practices associated with eGranary, which could not possibly meet local demands for its use.

The students often made reference to the fact that only one eGranary was available, but that hundreds of students and many teachers wished to use it. As Williams noted in her journal on October 13, 2008:

> EGranary has created mild chaos in the library. Order in the court! Big crowds have started to cause a lot of disturbance (to me and Dan especially) and distraction. Will next discuss establishing order around the computer. Rules and signup sheets perhaps? Yes!

Because of the "chaos" in the library, Williams in fact wrote a "Notice to All Computer Users" in which she outlined "a few friendly rules to follow" with the use of eGranary, and attached it to the eGranary computer. Despite these rules, however, competition for the use of eGranary became intense, and, occasionally, Williams had to limit the use of eGranary to only the research participants. This led to resentment amongst students who were not included in the eGranary study. Comments from the excluded students were typified by the following: "Why send us away from computer and yet we want to learn?" (Williams 2009, p. 64).

eGranary and Digital Identities

While research on placed resources is theoretically generative, what Blommaert and Prinsloo do not develop more fully is the issue of "uptake" by participants in a given literacy event. As indicated in the theoretical framework, Blommaert notes that when discourses travel, their value is "a matter of uptake, they have to be *granted* by others, on the basis of dominant indexical frames and hierarchies" (2003, p. 616). Of central interest in our research program was precisely the issue of "uptake", or what I would call the investments of students and teachers in eGranary, and the extent to which the identities of users were implicated in the indexical meaning of practices associated with eGranary.

A central argument of this chapter is that users were highly invested in eGranary because eGranary expanded the range of identities available to them, in both the present time and in their imagined futures. It is clear from our data that users' cultural capital and social power increased as they became more digitally literate and proficient with eGranary, and digital technology more broadly. In our research at Kyato community library, for example (Norton and Williams 2012), the students who were part of the study were initially learners and trainees. By the end of the research, the students had transitioned from being learners and trainees to teachers and trainers, sharing knowledge, skills and information with students, teachers and other members of the wider community. They took their identities as trainers very seriously, considering it their responsibility to make the eGranary accessible to the community, residents of other villages, and even "the world in general." As Theo noted,

> I want to spread technology about, over the village and then, if time goes on, even the world in general, because there are many people in our villages that don't know about using the computer, and they cannot read. But if I train them how to use the computer, you never know, they can use it. (Interview, November 24, 2008)

As the students in the Kyato study developed their skills and it became known at the school that this particular group of students had access to information and technology, they became more valuable members of the school community. It was well recognized by members of the community that they might need the assistance of research participants to gain access to eGranary, and to use it effectively. As Mohammed said,

> The library scholars, the eGranary has helped us to be famous, known, because many students have come to know that we are (?) whereby we use the eGranary to teach them how to find information on the eGranary and also the outside people have tried to come across us so that we can teach them. (Interview, November 24, 2008)

Over time, the eGranary and the laptop computer were no longer seen as mere physical tools and material resources—they became meaningful symbolic resources as well. The eGranary was associated with improved academic performance, enhanced possibilities of employment, increased financial resources, and greater access to social networking. Students were highly invested in the new technology, as they saw great benefits accruing from the knowledge gained and the digital skills acquired; indeed, a range of imagined identities emerged. The following extracts reflect the relationship between student identities, learning, and imagination. As Zuena said,

> I want help my generation also, our young sisters and brothers to have computers and to be allowed to come here in the community library and use computers because it is more important in the future to be knowing the computers. (Interview, November 24, 2008)

Zuena hoped to become a social worker in the future so that she could help her community learn and advance, and help local residents who were suffering from various health and social problems. She emphasized the importance of computers in the future education and progress of her generation, and was eager to play a part in this transformation.

John, similarly, was aware that digital literacy increases the privileges he had in his community. As he said,

> Yeah, it's, computer can give us advantages. Even you can get a job in the future for computer in, for example, in supermarkets you can get a job for accountants with a computer … I like to be a teacher! … I would like to teach biology and mathematics. (Interview, November 24, 2008)

The following quote from Joseph provides evidence of the value he places on being well known in the community. Throughout his interview, he emphasized the desire for public recognition, both for himself and for the library. Personal fame would make him more widely known as an intelligent, well-educated and well-trained individual. His comments also reflect his desire to share his knowledge and to help others. By being well known, he can serve as a resource person in the village. As he said,

> For me, I think it is important for me because I will, first of all I will be known, as I have some knowledge of using the eGranary. Some people will be, who will have come from very far, will tell others there is a gentleman, I am a gentleman, Joseph, eh? That he knows the eGranary, who can help you, can guide you, that is on my side very useful to be known by the community. It is a good thing. (Interview, November 24, 2008).

The data suggest that practices associated with eGranary, including social networking, enhanced what was "socially imaginable" (Prinsloo, personal communication. May 14, 2011) for these students. For example, we found that the University of British Columbia, most likely unknown to many of the students prior to the UBC research program, became one of the students' favorite sites on eGranary. Theo, for one, was eager to go to UBC to further his studies. His imagined identity was that of an internationally trained doctor. As he noted,

> My name is Theo. So mostly I want to ask different questions about the people of the University of British Columbia. I'm willing to join you in next two, three years. So that's after my S6. So because I'm just remaining with two years then to be almost done with my S6. So I expect to join your university. So that's where I become—I want to become a doctor. (Interview, November 24, 2008)

Further, it was interesting to note that eGranary also increased the social value of the educational site in which it was placed, at both local and translocal levels. As the student Joseph said,

> It is helpful that it can attract people to come and use it, eh? So that the eGranary can be known by many people, the library can be known. e.g. someone from far, like from Kampala, can come and see that the machine can display such information, and can tell many people that they can come—that our eGranary—that our library would be known all over the world, the country, and even outside the country. (Interview November 24, 2008)

Discussion

Findings from our research illustrate the ways in which eGranary functioned as a placed resource in a variety of educational sites across Uganda, and how issues of identity and investment are associated with the uptake of this particular digital resource. In a context in which material resources like textbooks are in short supply, where the Internet is largely unavailable and financially inaccessible, and where large class sizes compromise teaching effectiveness, the eGranary has enormous potential as a resource with extensive sources of information and the capability of promoting digital literacy in poorly resourced communities, despite challenging local conditions, to be discussed in greater detail below. Further, with regard to issues of identity and investment, the data suggest that both the knowledge gained from eGranary, as well as the new literacies developed, enhanced what was socially imaginable to Ugandan youth: advanced education, professional careers, study abroad, and other opportunities became part of the students' imagined futures and imagined identities. This is not to suggest that what was socially imaginable was also socially available, however, and remains an issue of great concern to all stakeholders in this project, both Ugandan and Canadian. However, it was clear that as the students developed valued digital skills and the ability to serve as trainers to other members of their communities, their identities shifted, and they gained increasing cultural capital and social power.

While it could be argued that eGranary did indeed "travel well" to Uganda, local constraints in the country nevertheless greatly limited its potential. Warschauer (2003) has argued that four key resources are needed to promote meaningful access to and use of ICT, particularly in the developing world, and it is helpful to consider the strengths and limitations of eGranary with reference to his four-part model. First, Warschauer argues that physical resources, such as computers and the Internet are key to uptake. As we saw with eGranary, while Ugandan students and teachers welcomed eGranary, the fact that there was only one digital portable library in each site, with one laptop, was a severe limitation. The lack of electricity was also a major hindrance in the use of eGranary, and there was disappointment that eGranary did not enable students and teachers to connect electronically with other users. Warschauer's second key resource, "digital resources," refers to online content and tools in multiple languages, appropriate to the needs of diverse learners. While the content on eGranary was extensive, the information did not extend beyond 2006; further, most of the content was available in English only, a concern to both Ugandan and international scholars (Canagarajah 1999; Pennycook 2010).

The third set of resources are called "human resources," and Warschauer refers to knowledge and skills developed through instruction, critical inquiry, and situated practice, asking as follows: How can ICT support literacy, and how can literacy support ICT? While all the participants in our research program were literate, and used English with relative ease, it is interesting to recall the comment made by Zuena in which she suggested that students and teachers should share the eGranary screen, so that students would know what teachers were trying to teach them. The suggestion here is that ICT provided students with direct access to information, so that learning could be co-constructed by teacher and student. The fourth key resource, "social resources," refers to the community, institutional, and societal structures that support access to ICT. In our study we found that despite educational policy goals that support the use of ICT in education, resources at local level remained extremely limited, and compromised the effectiveness of eGranary. Further, it is of great concern that these limited social resources may also limit the realization of students' imagined identities. The report card on eGranary is thus a mixed one; despite its great potential, limited key resources at local level reduced its impact and uptake across time and space.

Conclusion

In a sociolinguistics of globalization, Blommaert (2010) argues that there is a shift in seeing language as tied to a community, a time and place, and serving local functions, to seeing language as existing in and for mobility across time and space. Further, the process of mobility creates difference in value with respect to a given resource, and this has implications for its indexical meaning in a given community. In our research program, we have found that the value of eGranary was associated with a wide range of functions in a particular space and time, and its strengths and

limitations were best understood with reference to the key resources Warschauer (2003) has identified as necessary for meaningful use of technology. I have argued that there is a need for greater attention to issues of uptake with regard to the value of a given digital resource, and that constructs of identity and investment can contribute to studies of digital literacy in poorly resourced communities. In particular, an appreciation of students' imagined identities are important for enhancing the investments that students have in digital literacies.

An intriguing question for further research concerns the ways in which eGranary, and digital literacy more broadly, might shift perspectives of space and place amongst users in remote rural areas of the world. In our research program, we found that, in rural areas particularly, the "village" constituted the boundary of the students' worlds and the rest of the world was "outside" and "far away". In rural communities in Uganda, and no doubt many other parts of the world, word often travels by word of mouth, and people "tell others" about developments in communities they have visited. As the youth in our program gained greater access to both information and technology, they eagerly sought to shift the boundaries of their worlds, to learn more about Uganda, Africa, and the international community, and to make meaningful connections with a wider world. Digital practices thus helped to increase the range of the students' imagined identities, and their hopes for the future. Indeed, it was clear that the students were invested in digital innovations to transform both themselves and their place in the world. The implications for educational and social change are profound.

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Chapter 8: Author Query

AQ1. Please check the affiliation details of the corresponding author.

AQ2. The following authors are cited in the text but are not given in the reference list: “Mwesigwa 2002”, “Street 2001”, “Pennycook 2010”. Please provide full references or delete the citations.

AQ3. We have changed “Weedon 1997” to “Weedon 1996” to match the reference list. Please confirm or correct the change.