Transforming ICT4D through Web 2.0

R Quilling
School of Information Systems & Technology
Faculty of Management Studies
University of KwaZulu-Natal
Westville Campus
E-mail: quillingr@ukzn.ac.za

C N Blewett
School of Information Systems & Technology
Faculty of Management Studies
University of KwaZulu-Natal
Westville Campus
E-mail: blewett@ukzn.ac.za

M Hughes
School of Information Systems & Technology
Faculty of Management Studies
University of KwaZulu-Natal
Pietermaritzburg Campus
E-mail: hughesm1@ukzn.ac.za

Abstract

The potential impact of ICT as an enabler for development (ICT4D) has long been recognised with existing work being grounded in meeting the Millennium Development Goals (MDGs). Lessons learned through ICT4D programmes suggest that development initiatives require a new approach that better meets the needs of the communities they are intended to serve. In 2009, an "ICT4D 2.0" model was put forward that proposes a new ICT4D paradigm.

Also in 2009, the NextEd project was launched to address the MDGs through the development of virtual collaborative learning spaces supported by Web 2.0 technologies and principles.

Our experiences with the NextEd project suggest that the "new" ICT4D model still contains a key weakness; that of compartmentalising participants into "donor" and "poor". Until this divisive approach to what is, in effect, a series of global problems is approached as a shared and mutually beneficial collaboration, the potential for failure is still high.

The alignment of the underlying philosophy of the project and the tools for implementation are central to ensuring that no disconnects occur between what is intended and what actually transpires. The underlying philosophy of NextEd project is reffered to as an Ubun2.0 approach. This is based on three key principles: the win-win principle of Ubuntu, where participants share equally in the benefits of an engagement; the expectation that peer-based co-creation of value by all who participate will occur; and the acceptance of a "beta is better" or continual adjustment and refinment approach.

The NextEd project moves collaborators along a trajectory that allows them to become gradually more committed to a process that they jointly create. These participants then become the means by which projects can be scaled and sustained.

The NextEd project's 6C model is presented as a model of engagement that is currently being used and tested.

1. Introduction

The notion of information and communication technologies (ICTs) for development (ICT4D) was born out of a rapid growth in the availability of ICTs in the 1990s, together with the signing of the United Nations Millennium Declaration and the drawing up of the Millennium Development Goals (MDGs) in 2000. The development potential of ICTs in terms of communication and information exchange is beyond question, yet to date, most ICT4D projects have been either partial or total failures.

Richard Heeks, in his 2009 paper, "The ICT4D 2.0 Manifesto" reflects on some of the lessons learnt over the past decade and suggests a new direction for ICT4D that focuses strongly on creating, implementing and managing development projects that are sustainable, scalable and can be subjected to objective evaluation. In addressing these three criteria, it may be argued that examining the fundamental thinking behind a project and its implementation strategies is just as critical as focusing on the actual tool or technology being introduced.

The NextEd-Africa project, whilst not explicitly conceptualised as an ICT4D project, is also rooted in addressing the MDGs. It has as its focus the idea that education is the greatest vehicle for effecting change because it shapes the next generation and hence provides a platform for a new and different future. The programme is not about bringing ICT to Africa to effect socio-economic change, but is about using ICT to rejuvenate education in Africa.

The parallels with the latest discourses in the ICT4D field suggest exciting possibilities for cross-project sharing of philosophies and ideas. In particular, the focus on reframing the ICT4D target population as a group of creative individuals who are actively producing and innovating, rather than as a "mass" of passive, economically-poor consumers, i.e. it suggests an active role for the "poor". This paper focuses on the use of Web 2.0 thinking and the concept of Ubuntu as a potential catalyst for transforming ICT4D 1.0 into ICT4D 2.0.

An introduction to both ICT4D 2.0 and NextEd provide the context for a discussion on the lessons that have been learned to date. The discussion of NextEd provides insight into the initial thinking which underpinned the approach, as well as the reality experienced during the first year of implementation. The information provided in these three introductory sections is then used to suggest principles, paralleled in the Web 2.0 domain, which underpin the NextEd initiative. The contribution of these principles to the broader ICT4D project space is highlighted for further consideration.

2. ICT for Development (ICT4D) - The state of play

The basis: millennium goals and pyramids
ICT4D has its roots in the eight MDGs, set out in the Millennium Declaration of 2000. The MDGs are primarily focused around freeing a larger portion of humanity from poverty, hunger, illiteracy and disease, together with placing a greater emphasis on issues such as gender equality, environmental sustainability and the fight against HIV/AIDS (UN, 2009).

More recently, the target population of the MDGs has come to be known as the "base of the pyramid" (BOP) (Prahalad & Hammond, 2002), the estimated 4 billion people concentrated in the world's developing countries that live on $3000 per year and below (WRI, 2007).

A silver bullet?
The widespread emergence of ICTs during the 1990s, most notably the Internet, seemed at the time a most serendipitous tool to begin tackling the MDGs.

A 2001 report by the United Nations Development Programme (UNDP) lists several unique characteristics of ICT that potentially make it an enabler for development, specifically in terms of its communication and information exchange capabilities. Summarised, these include: that ICT is "pervasive and cost-cutting"; it is "a key enabler in the creation of networks"; it "fosters the dissemination of information and knowledge"; it "allows for zero or declining marginal costs" owing to its "digital" and "virtual" nature; it can lead to "efficiency gain in production, distribution and markets"; it "can lead to the creation of innovative business models and whole new industries"; it "facilitates disintermediation"; and it is "global", transcending cultural and linguistic barriers allowing local communities to become part of the global network economy (UNDP, 2001: p14 - 15).

Although there were caveats placed on these potential advantages both from development agencies (UNDP, 2001) and academia (Avgerou, 1998; Heeks, 1999) about implementing technology for technology's sake, governments, non-governmental organisations (NGOs) and development agencies ploughed substantial amounts of money into ICT as a panacea to cure a host of development ills (Heeks, 2009).

A false dawn and a new
However, there is widespread acknowledgement that most of these early initiatives were either partial or total failures (Heeks, 2002). Heeks (2009) points to important lessons learnt about sustainability (the failure of ICT4D projects to deliver and/or survive), scalability (limited reach) and the need for objective evaluation.

In spite of this, however, research has shown that support for the use of ICT in development remains high and there is more demand than ever for knowledge about how to use ICTs in development projects (GKP, 2009). A key driver behind this trend is the fact that a much higher proportion of the BOP now has access to at least some form of ICT (driven largely by the diffusion of mobile technologies). In addition, a more recent development is that major ICT companies such as Microsoft, Intel and Nokia are beginning to specifically adapt their technologies for use by the BOP, not only as part of their corporate social responsibility programmes (GKP, 2009), but also as an attempt to tap a vast and increasingly viable market (Prahalad & Hammond, 2002).

Phase Change
The target date for achieving the MDGs was initially set at 2015, but the United Nations has acknowledged that real progress towards this outcome has been slow (UN, 2009). ICT4D projects must bear their share of responsibility for this lack of progress. Heeks

(2009) draws a line under the first decade of ICT4D by stressing the need for a re-appraisal of development priorities, processes and purposes. The prevailing feeling is therefore that ICT4D is on the threshold of a major phase change, a change that Heeks (2009) refers to as the transition from ICT4D 1.0 to ICT4D 2.0. Although this new paradigm is still in its infancy, Heeks' "ICT4D 2.0 Manifesto" (2009) maps a potential way forward by suggesting several key elements that could constitute ICT4D 2.0, two of which are important in the context of this paper.

ICT4D 2.0 unbundled
The first of these facets is a re-evaluated set of priorities. ICT4D efforts have largely followed a continuous cycle of taking the "latest" Western technological innovation and transferring it virtually unaltered into a development context. Heeks (2009) argues for a "use-up" rather than an "invention-down" approach, i.e. that ICT4D 2.0 should not focus on "dumping" new innovations into local communities, but to understand and build upon the tools and technologies that have already been successfully adopted, mobile being the most notable example.

Secondly, Heeks calls for new models of innovation. He dismisses the notion that we should rely solely on "passive diffusion" and should look to remain active innovators, but also showing awareness of three modes of innovation, namely pro-poor, para-poor and per-poor (Heeks, 2009). These will be discussed in detail, and an alternative approach suggested, later in this paper.

The ICT4D 2.0 challenge
Heeks (2009) summarises the phase change from ICT4D 1.0 to ICT4D 2.0 as being about changing the way in which the target population (namely the BOP) is perceived. Whereas in ICT4D 1.0, the BOP was seen as marginalised and passive, requiring only a supply-driven focus, ICT4D 2.0 recognises the BOP as centralised and active, calling for a far more demand-driven focus. What is therefore needed in ICT4D 2.0 is the emergence of new engagement models that recognise this shift in perception and allow the target population to become active and innovative. The following sections describe a project and underlying philosophy that the authors believe could contribute strongly to this evolution of ICT4D 1.0 into ICT4D 2.0.

3. NextEd: The Plan

Over the past 16 years, academics at the University of KwaZulu-Natal (UKZN) in South Africa have been exploring alternative educational engagement models, based on culturally aligned pedagogies, in an attempt to meet the needs and challenges of students in Africa (Erwin & Blewett, 1994; Blewett & Singh, 2003; Shea *et al*, 2009; Quilling & Blewett, 2009).

African universities have, in the main, simply adopted teaching pedagogies used by the Western world. While these Instructivist style approaches have been acceptable in the West, they are counter-cultural to Africa. Hofstede (2001), in his landmark work on culture identified five cultural dimensions. One of these, Power Distance, is a measure of the gap between students and teachers. Africa was identified as a continent where Power Distance is high (Hofstede, 2001). This means that students are hesitant to approach, question or challenge their teachers. The impact of using Instructivist teaching models (copied from Western countries where Power Distance is low) is that students are often unable to learn in a culturally appropriate way. The impact of this is that students are also not being prepared properly for the challenges they will face within our African context.

In order to achieve higher levels of student cognition and richer student engagement in the learning process, a variety of pedagogical learning theories have been postulated. These range from Instructivism to Constructivism. Instructivism is characterised by an instructor providing some form of formal instruction to the class, where the student plays a passive role (Gulati, 2004). Constructivism, on the other hand seeks to place the student at the centre of the learning activity where they construct the knowledge themselves (Gulati, 2004).

Yet while Constructivist approaches may be more in line with our students' cultural dimensions, they have however been inherently hard to implement. One of the key challenges is that adopting new paradigms is often initially accompanied by an increase in the workload of the staff. Furthermore, higher education organisational structures have not matured to a point where they can accommodate this form of interaction. In most African universities, learning spaces are still dominated by formal lecture halls and areas of "quiet contemplation", such as libraries and study halls.

At the same time, technology and business models relating to computer mediated communication (CMC) are now being dominated by what is called Web 2.0 (O'Reilly, 2005). These technologies seek to empower the individual user(s), as the creators and publishers of content, whilst also allowing them to draw information to themselves. Communities and networks are socially constructed with greater emphasis being placed on sharing, working together and communal resources (open source platforms and developments) (O'Reilly, 2005). This causes the focus to move away from a Teacher-Student (high Power Distance) model to a collaborative Mentor-Student (low Power Distance) model.

Web 2.0 is now, for the first time, offering new and exciting ways for universities in Africa to look at altering their teaching approaches to be more in line with both our culture and our unique needs. Parameswaran & Whinston (2007, p763) challenge researchers to take the lead in social computing research: "Social computing will impact numerous academic disciplines due to its pervasive influence and is thus a rich area for research". No place is this challenge more keenly needed to be accepted than in Africa, where a huge economic gap starkly divides the continent from the rest of the world.

After initial experimentation on models of engagement, as reported in Quilling, Erwin & Petkova (1999) and Blewett & Singh (2003), the focus moved towards specifically addressing the MDGs. As such, the NextEd-Africa project was launched in 2009 with funding from the Association of African Universities (AAU). This project seeks to investigate "how Web 2.0 social communities spanning multiple African universities can be used to support learning and equip students to engage in economically viable business opportunities both locally and internationally" (Proposal to AAU, p7). Whilst previous research explored the effectiveness of Web 2.0 technologies on culturally aligned learning processes, the NextEd-Africa project focuses on the impact of using Web 2.0 technologies to leverage communities of learning. The focus is thus on collaboration through Web 2.0 technology as a means of addressing the MDGs.

Collaboration is the foundation of the NextEd project, both in terms of the technology being used (Web 2.0), the learning approach (social constructivism) and the implementation of the project between multiple universities and industry players.

The NextEd-Africa project is attempting to address the following MDG-aligned goals:
- The utilisation of ICTs to both enrich education and equip students to engage in the new world economy

- The development of academic leaders through learning and shared courses; and student leadership through participation in multi-national team projects

- The improvement of the quality of both the learning experience and the courses delivered via the NextEd project through collaborative teaching with academics around the world

- Actively developing world-leading curricula through participative course engagement and promoting new social constructivist pedagogical paradigms through supported Web 2.0 technologies

- Forging and strengthening of mutually beneficial partnerships between key industry players and the university in the development and use of Web 2.0 technologies

The project was launched in 2009 and consists of the following 4 phases:

1. Setting up of NextEd World
The first phase (April 2009 - September 2009) involved the setting up of an interactive space where students who are part of the NextEd-Africa project (from all universities) can meet and interact with each other and with lecturers and industry representatives. Two virtual spaces were established. The first is a Social Learning Network environment. This environment enables students to create their own learning spaces, as well as collaborate with one another. This space forms the portal through which communication takes place. The second space is a virtual Island in Second Life. This virtual space contains lecture rooms, tutorial venues, social spaces and more. This virtual space is important as it brings with it a sense of "situatedness". Chiu *et al* (2003) explains this as the impact of actually appearing to be in a virtual place. "Situatedness" brings with it a sense of belonging and engagement that is not always present in standard 2D web pages.

2. Running Collaborative Courses
The second phase (October 2009 - March 2010) saw the extension to the development of the NextEd Island and its learning environment. Furthermore, it sought to extend the level of collaboration between universities in terms of the number of shared topics and multi-university groups involved.

3. Implementation of a Microblogging Environment
The third phase (April 2010 - Sept 2010) is the implementation of a microblogging platform. The objective is to use mobile-friendly tools to enable a broader reach for collaboration and a deeper engagement with students in terms of opportunities to connect to the learning platform.

4. Integrated Environments
The final phase (October 2010 - March 2011) builds on the previous phases with the extension and integration of the various spaces, namely the social learning space, Virtual World and microblogging environment. For this final phase, the focus will be on assessing the effectiveness of learning across multiple courses' platforms.

Key to guiding the process was the development of the 5C Model of Engagement. This model provides both the guiding process and philosophy (as discussed later in this paper) for NextEd.

Step 1 - Come
This is the invitation process, whereby communication and discussion is engaged with potentially interested parties.
Step 2 - Consume

The second step is for parties who are prepared to engage the philosophy to then become consumers. This means that they will be able to participate in a course with little or no contribution required from them.

Step 3 - Collaborate

The next step is for the consumer to develop into a collaborator. This means that they will not only receive, but also contribute to the courses they are involved in by running parts of the course for other students.

Step 4 – Create (own courses and collaborations)

At this stage, the participant is able to create their own courses and is therefore initiating the cycle with others (Come) by inviting their networks into NextEd. This will initiate the process of enabling additional parties to engage in the NextEd process.

Step 5 – Contribute (lessons learned to NextEd knowledge base)

Finally, the participant will become a contributor, not only in terms of courses created, but in terms of the body of knowledge, artefacts etc that constitute the greater NextEd project.

Figure 1: The 5C Model of Engagement
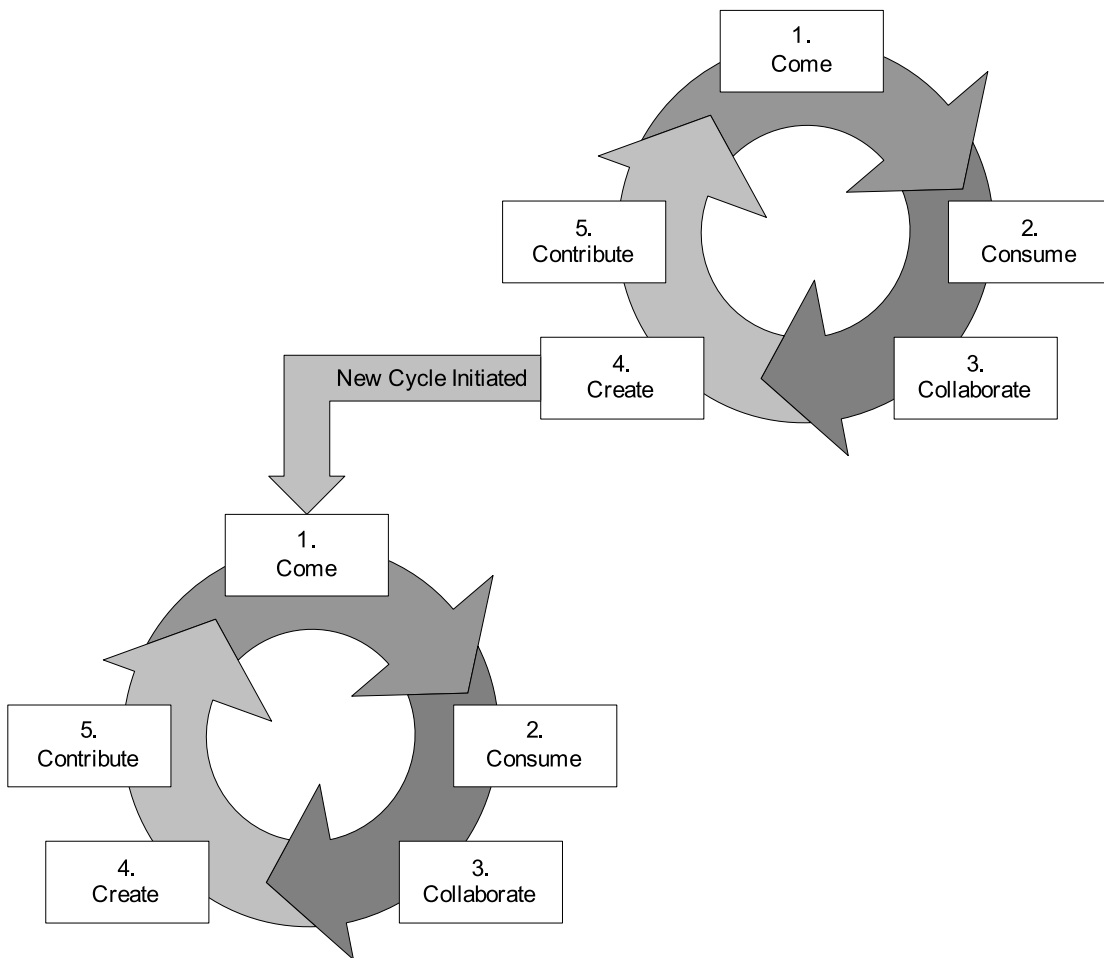
4. NextEd: The Reality

The first iteration of the NextEd-Africa project involved the running of a course hosted by the University of KwaZulu-Natal with Daystar University (Kenya), consuming as peers in the digital community.

As Heeks (2009: p5) stated, ICT4D 1.0 "took an invention-down approach - bringing new technologies into development contexts - much more than it took a use-up approach of understanding how existing technologies were being applied in poor communities". The approach adopted by NextEd in Phase 1 sought to adopt a "use-up" approach, where "consumers" come and experience the environment and its potential and then adapt this to their needs in Collaborate, Create and Contribute. The intention of this approach mirrors the intention of the proposed ICT4D 2.0 approach, where there is "less emphasis on fundamental technical innovation and more emphasis on application and business model innovation". In addition, with the focus of this project being on Web 2.0 platforms, the thrust is on using software tools already readily available, preferably in the public domain. Where possible, one is also looking to reduce hardware requirements by using applications that capitalise on the use of web-based applications and storage. Thus, there is "less emphasis on piloting and sustaining new applications, and more emphasis on assessing and scaling existing applications" (Heeks, 2009: p5).

The NextEd engagement cycle has at its core the need to create collaborations that are based on the "use-up" approach, where the strengths of African universities can be developed within a digital community that offers opportunities that can evolve to suit each participant's unique situation.

The planning and model of engagement was based on two key elements: Firstly, our experience in working with students in virtual spaces over an extended period, and secondly, an engagement cycle with the University of Massachusetts, Dartmouth in 2008 (Shea *et al*, 2009), with whom we had met and already established a tentative working relationship prior to the inception of NextEd. The reality of working with an African institution who had responded to a call for Expressions of Interest, brought with it valuable lessons and the requirement to adjust the model, as discussed below.

The Missing Connection
A guide on customs and etiquette in South Africa states that: "Personal relationships are important. The initial meeting is often used to establish a personal rapport and to determine if you are trustworthy" (Kwintessential, 2009). Another guide, discussing Zimbabwe, says: "Socialising is an important part of doing business; people like to be seen as good hosts" (Swallow, 2009). Key to collaborating, whether it is in business or education, is the establishment of relationships. The first realisation was that the NextEd 5C engagement model was missing the all-important "relationship" phase. This became apparent in the first NextEd engagement cycle with Daystar University.

After responding to a call for interested parties (Come), Daystar University joined the UKZN students to share (Consume) in a course being offered by UKZN academics. However, it soon became apparent that engagement requires a closer synchronicity of expectations. The expectations, support and time-commitment of Daystar University were not the same as that of the host institution. It was clearly challenging for the incoming academics, as they had little on which to judge what was required of them and how realistically they perceived the collaborative requirements to be. Without any opportunity to establish a relationship up front, the attempted Collaboration was immediately under pressure.

This resulted in an important modification of the 5C engagement model to enable potential collaborators to more actively experience the environment before committing to the engagement.

The new 6C model of engagement adds a phase where interested parties can connect without committing too many resources. An additional step (Connect), between Step 1 (Come) and Step 2 (Consume) has been added. Whilst Step 1 (Come) is an invitation for people to join, this is primarily based on calls to those who are interested. However, moving from here to Step 2 (Consume), where they participate in a course as consumers of content is too large a jump. The initial expression of interest does not do enough to enlighten the potential collaborators to the compatibility of their courses, technology and pedagogies to the NextEd programme. It also does not provide enough of an opportunity for the potential new partner to assess whether the program is what they envisaged or not. It is equally important to try and determine the commitment of those who express an interest during Step 1 so that only committed parties are involved in the Consume phase.

The exploratory Connect phase allows all participants to judge the potential of developing a sustainable, mutually beneficial (win-win) collaboration, rather than a "donor-recipient" relationship. The sustainability of the project depends on the presence of self-regulation mechanisms. As with the Web 2.0 domain, it should be possible for all participants to judge individual contributions and to self-determine their ongoing involvement. This is

probably most critical in the early stages of collaboration, where there may be limited trust between parties as a relationship has yet to be established. This mirrors online behaviour, where models which promote user-control and opt-in approaches to engagement, pulling information to yourself- rather than having it foist upon you have been shown to be most successful (O'Reilly, 2005).

The new Step 2 (Connect) sees potential partners being invited into the Virtual World (and other platforms) for orientation. This orientation involves a short course on navigation, building and pedagogical issues related to virtual learning and teaching. The objective of this is to better acquaint the potential partner with the environment, as this will better equip them to understand their students' challenges and requirements. Should all collaborators be comfortable with the proposed environment and learning model, they are then able to move onto the Consume phase. The new Ubun2.0 6C model of engagement is as follows:
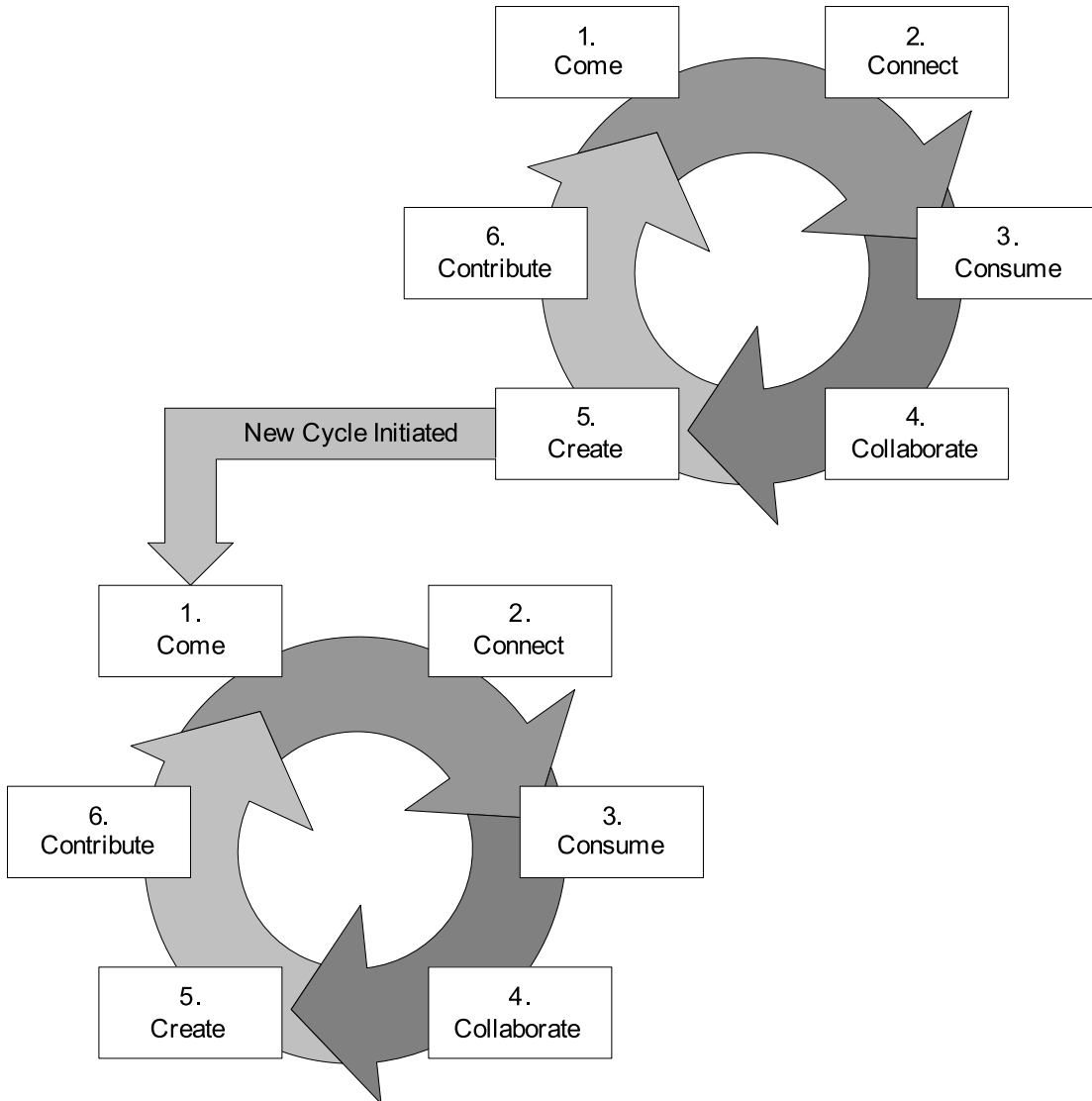
Step 1 - Come
Step 2 - Connect
The potential partner experiences the NextEd "village" (see Ubun2.0 below) through basic training and orientation in the technology platforms and proposed educational paradigm. They also have the opportunity, as "equals", to spectate in the virtual village and watch how the cyber engagement and culture operates.
Step 3 - Consume
Step 4 - Collaborate
Step 5 - Create
Step 6 – Contribute

Figure 2: The Ubun2.0 6C Model of Engagement

1. Come	2. Connect
6. Contribute	3. Consume
5. Create	4. Collaborate

New Cycle Initiated

1. Come	2. Connect
6. Contribute	3. Consume
5. Create	4. Collaborate

The Time Trap

Another issue that arose was the underestimated impact of time constraints on the engagement cycle. Whilst in the world of "models" and "theories", engagement cycles appear flawless, the real world and its demands on energy and time reveal unforeseen weaknesses.

The NextEd project is highly innovative, both in terms of its pedagogical approach and the supporting technological platforms. This requires a huge investment in time, both in terms of adjusting traditional teaching and learning approaches and in constantly reviewing and adjusting the supporting platforms.

In addition, there is the requirement of teaching and assessing students from other universities and the additional administrative load of trying to coordinate courses across countries and time zones. A key tenet is that the collaborations are not based on any financial remuneration for involvement. Collaborations of that nature are likely to be ephemeral, present while the financial support is available, but disappearing as soon as the money dries up. In hard economic times, and in Africa one tends to feel like it is always "hard economic times", a currency other than a monetary one should be sought. The

model promotes win-win collaborations, where partners have expectations of giving and receiving, whether in terms of content and formal course deliverables or research outputs etc.

Involvement in NextEd activities, in addition to a normal teaching load, results in increased time pressures on all activities. Collaborators need to realise and accept this in advance. However, it is very important to realise that many of the costs would be incurred in some form if the academic involved is in general committed to improving their teaching, and specifically if they are investigating constructivist-oriented methodologies. Furthermore, like any new endeavour, the initial efforts are later rewarded by decreased time demands when tried and tested effective solutions are implemented.

Whilst a time overhead was not unanticipated, it was found to be even higher than expected. With hindsight, it is possible to see that when one initiates a personal start of the cycle, overheads will be substantially higher, as well as the fact that the time expended will vary greatly dependent on the nature of the course, students and academics with which one is collaborating.

The Technology Trap
Another underestimated difficulty was the technological challenges of the collaboration. The Second Life platform, which was central to the deployment of the course, was upgraded towards the end of 2008. This presented a series of additional technical challenges in the 2009 NextEd-Africa collaboration.

It appeared that the connectivity available in Kenya is fraught with challenges. Numerous times, students experienced problems with attempting to login to SL. However, while SL is bandwidth- and processing-intensive, these problems appear to have extended to all Internet-based communications. Access to a less bandwidth-demanding social learning network also appeared to present challenges.

Virtual collaboration is, by its very nature, highly dependent on technical infrastructure and this appears to present a problem right from the outset. The project design attempted to limit this problem by approaching collaborators who self-assessed their technical ability to participate. Thus, this was not expected to present a challenge.

As observed by Heeks (2009: p7) a "new broadband divide is growing". As such, it appears that focus should be adjusted to those collaborative platforms that are less bandwidth-intensive than virtual environments, such as social learning networks, which potentially extend to mobile devices and microblogs.

The key is identifying which aspects of the course are mission-critical and giving careful thought to the platforms supporting these aspects. Non-mission critical aspects can rely on riskier platforms and therefore still expose the students to rich interactive environments such as SL without jeopardising the course.

Whilst the current NextEd-Africa project is only in its second collaboration cycle, the lessons learnt have already been applied and have resulted in an adapted model of engagement. Whilst these lessons are valuable in terms of this project and future NextEd collaborations, greater value can be gained from these insights by generalising the lessons learned in this specific context to the broader arena of ICT4D engagement. These principles, key to the success of the project, we refer to as the principles of Ubun2.0: the same principles which underpin the Web 2.0 evolution of the Web.

5. Discussion: NextEd - The Key Principles

ICT4D2.0 has at its core the adoption of Web 2.0 to improve its success. "This movement has already been through its cascade from pro- to para- to per-poor innovation, and has evolved methods for capture, assessment and scaling of new ideas from poor communities. Such methods may arguably be enhanced during ICT4D 2.0 by adding features from open source and Web 2.0 innovation models" (Heeks, 2009: p15).

However, whilst the opportunities of Web 2.0 technologies for collaboration and innovation diffusion are obvious, the actual application of Web 2.0 principles is not so obvious. Three key principles underpinning Web 2.0 are:

Firstly, trusting users as co-developers (O'Reilly, 2007), or as Rollett *et al* (2007) put it, "cooperate, do not control". Secondly, "harnessing collective intelligence" (O'Reilly, 2007) and allowing users to add value through peer production and co-creation (Rollett *et al*, 2007). Thirdly, using "lightweight user interfaces" (O'Reilly, 2007) and realising that Web 2.0 applications are in "perpetual beta, constantly evolving, (and) never really leaving the beta state" (Rollett *et al*, 2007: p91).

Not only should attempts to create meaningful collaborations be based on Web 2.0 technologies, but equally important is the instantiation of Web 2.0 principles into the engagement model itself.

The instantiation of each of these principles within NextEd is discussed below.

Cooperation through Ubun2.0 Engagement
The objective of the NextEd model of engagement is to enable potential future content creators and contributors to experience the environment in both a "consume/receive" and "collaborate/give" manner before moving on to adapting the model and extending the collaboration. This is based on the principle of "cooperate, do not control" (Rollett *et al*, 2007).

Heeks (2009: p13) suggests that there are three different models for innovation; laboratory (pro-poor), collaborative (para-poor) and grassroots (per-poor). He suggests that attempts to diffuse technology into poor communities have gone though these three phases over time. The pro-poor model saw innovation done outside of these communities, but on behalf of them. However, this was unsuccessful (Heeks, 2009: p13). The second attempt, para-poor, saw innovation taking place alongside poor communities. This too did not work, because of the divides created and specifically "Western vs non-Western mindsets" (Heeks, 2009: p14). Finally, "grassroots" (per-poor) innovation is seeing innovation by and within poor communities. This sees these communities adapting and applying the technology in new ways. Heeks argues that "there will be pressure within ICT4D 2.0 for more systematic means to 'harvest' grassroots innovations" (Heeks, 2009: p15).

Whilst the history of the West's attempts to bridge the "digital divide", and "benefit" poorer countries with technology has followed this process, the authors believe that an Ubuntu-style approach to innovation is more appropriate. The underlying assumption in all of the above models is one of "giver and receiver", "rich and poor", "solutions and problems" etc. Whilst economically speaking these groups are "poor" or BOP, these labels further propagate the mental divide and underlying philanthropic spirit of the engagement. The result is that rather than peers working together to learn from each other, the giver teaches the receiver, the rich help the poor. The first model (pro-poor) failed because of this mindset. The second model (para-poor), whilst attempting to get in touch with the poor, was nonetheless "alongside", and as Heeks points out, plagued by "multiple divides"

(Heeks, 2009: p14). However, the new model (per-poor) still has this underlying philosophy, even within the nomenclature, of divide and status-separation. Whilst the principle of the per-poor approach is to allow these "poor" BOP communities to take and adapt technologies for innovation, it is nonetheless driven, monitored and observed by "the haves". This therefore inherently has within it the same seeds of failure as the pro-poor and para-poor approaches. Rather, a Web 2.0, or Ubuntu approach is better.

Nelson Mandela (Wikipedia, Year Unknown) defined Ubuntu as follows. "A traveller through a country would stop at a village and he didn't have to ask for food or for water. Once he stops, the people give him food, entertain him. That is one aspect of Ubuntu, but it will have various aspects. Ubuntu does not mean that people should not enrich themselves. The question therefore is: Are you going to do so in order to enable the community around you to be able to improve?"

And so, in our country called "Academia", travellers from Africa or elsewhere are stopping in at our Digital Village. Yet, rather than waiting for travellers to ask for help, the residents freely share what they have in a spirit of equality, knowing that the traveller is likely to move on and use the experiences and insights gained to enrich his own community.

So, unlike the pro-para-per -poor separation, Ubuntu is not about seeing ourselves as "separated from one another (but rather as) ... connected" (Archbishop Desmond Tutu, Wikipedia, 2009).

To this end, the NextEd 6C cycle of engagement seeks to implement a cooperative, Ubun2.0 style of engagement, i.e. the application of Ubuntu principles supported by Web 2.0 philosophy and technology. "Travellers", academics from other universities, who are exploring this new world are invited (Come) into the NextEd virtual village. Nothing is expected of them, but rather they are treated as "full" and equal members of the cyber community. They spend time familiarising themselves with the course and platforms (Connect) and then they partake freely (Consume) of the entire course experience. Later on, they take something that they have and share it (Collaborate) with the NextEd Village. The time then comes for them to move on and enrich their own communities (Create), by taking what they have received and developing their own village. Finally, they too establish a village where other travellers can come and partake freely and over time may even share with the original village, and others, the new insights they have gained from their village and the travellers they have hosted over time (Contribute). Whilst the Ubun2.0 approach has elements of para-poor and per-poor principles, the fundamental and important difference is an engagement approach based on mutual, shared benefit as a "connected" whole.

Co-Creation through Peer Production
Wikis are a classic example of the Web 2.0 principle of co-creation. Whilst many visitors to a wiki are "lurkers" (Preece, 2000), all visitors have an equal opportunity to edit and create content. However, typically a visitor does not create the content from scratch, but rather arrives at a page that already has content and then proceeds to add or edit this content. This principle is key to the success of the NextEd engagement model. Whilst the students from the visiting university were being hosted by UKZN, they had equal opportunity to participate in the course and contribute to all aspects. The lecturer from Daystar University arrived at a course already containing content and during the Come and Consume phases engaged with the course. Now, in the Collaborate phase, he is a co-creator of content and is able to bring in elements that better suit his background and environment. This is vital to both the adoption of the teach approach by the "visitor" and the extension of the approach to their domain and networks.

Beta is Better

The third key principle of Web 2.0 that underpins NextEd is the perpetual beta nature of Web 2.0. This is totally non-traditional when it comes to education. Most education over the ages has involved the careful design of a course in terms of both its content and delivery. Only once the course is considered complete is it launched. However, Web 2.0 sees web sites (and their content) being constantly released in beta form, and often remaining in beta even through multiple improvements and evolutions.

The original 5C NextEd model's evolution to a 6C model of engagement is one illustration of this beta mindset. As each phase of the model is completed, adjustments are made and the process is continued. On the technological front, multiple platforms have been used as the supporting social learning network. These include CollectiveX, Ning, Grou.ps, Mahara, Elgg and others. Whilst it is beyond the scope of this paper to discuss these, each of these platforms brings numerous benefits and challenges. Sometimes it was possible to hang onto the platform, despite the challenges, whilst other times it was necessary to abandon it. However, key to the development of the engagement model is the acceptance of the beta mindset and the realisation that change is the only constant in this process.

Without this principle it is not possible to pursue this form of engagement. Perfect, working, tried-and-tested platforms, approaches, and courses no longer exist. Waiting for these will simply perpetuate the already entrenched divides. Rather the "beta" nature of Web 2.0 should be embraced as a part of lifelong learning for all parties involved, be they students, lecturers or researchers.

Figure 3: NextEd - Guiding Principles and Potential Outcomes (Summary)
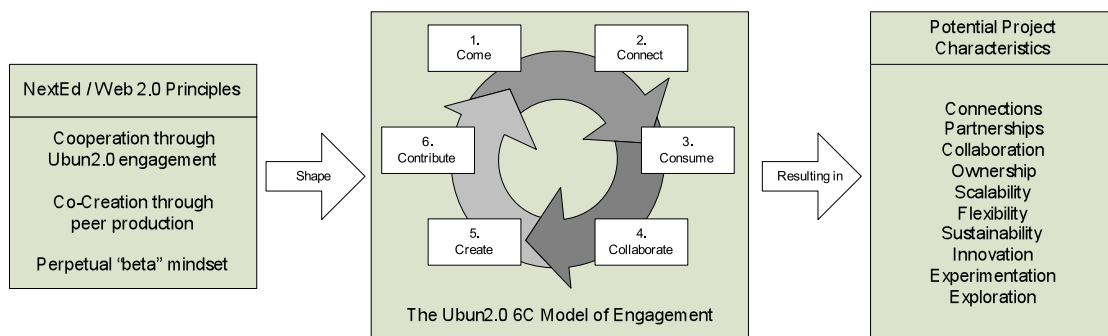
6. Conclusion

In order to advance the field of ICT4D, it is necessary to include the lessons learned from individual ICT4D projects into the broader body of knowledge within the domain. In this way, the foundation available to support and scaffold future work is continually enriched and, one hopes, progress can be made.

The work of Heeks (2009) provides a multi-faceted context, including guidelines, questions and suggestions for future work that can serve this role: a mirror, in which each project can be viewed and compared to what has gone before, and what is suggested for the future. However, Heeks himself suggests that one should be careful about taking up definitive positions and presents his work as a working paper with the intent of eliciting input and debate.

This discussion of the NextEd project and its initial phases has aimed to highlight three key aspects for consideration by the ICT4D community, namely the Web 2.0 principles of Ubunt2.0 engagement, co-creation and beta-thinking.

Heeks has stressed the importance of a "use-up" approach, which looks at the application of technology to a specific context in a sustainable and scalable fashion. However, we suggest that critical to the ultimate success of a "use-up" approach is the understanding of the spirit of Ubunt2.0, a collaborative, supportive philosophy aimed at helping an individual, whilst assuming it will be for the ultimate good of all. There is no place for divisive terms within this concept: There are no rich-poor or haves-have-nots; there are merely people sharing space and experiences to the mutual benefit of both. Until our nomenclature in ICT4D begins to reflect this, there is a real possibility that participants will be seen as having an unequal role to play.

The second principle is that of co-creation: Unless collaborations and projects are designed with explicit contributions from, and benefits to, all participants the likelihood of success and sustainability are slim, because there will be little intrinsic ownership of the project by either of the participants. Co-creation allows the outcome to represent the thinking, involvement and experience of all role-players. It is thus greater than the some of its parts, is situated in the environment and reflects application to the specific circumstances of those people. This makes the endeavour not only sustainable but also scalable as it allows for ongoing adaptation to each changing nuance in a single environment as well as the potential for its adaptation by local people to their own, yet different, context.

The final principle is maintaining a beta-mindset. This ensures that participants feel they are allowed to experiment and try out options as they are "beta" and are thus up for discussion, have the potential for both success and failure and are probably imperfect. The scope for innovation, experimentation and exploration are magnified merely by the fact that one is not expected to deliver a perfect solution. Rather, one is continually aiming to try alternatives and aim for an ever-improving resolution of a problem.

The principles to stress in ICT4D 2.0 are therefore those of ongoing application, refinement and engagement, with technology and people, and a tolerant, supportive philosophy that invites participation. Simultaneously though, all participants are encouraged to have expectations of benefit from the project, as well as being required to contribute to the effort. Each retains the right of self-determination and the interactions become self-regulated.

The potential for moving development away from a passive recipient model towards an engaged active participation model with win-win relationships resulting for all stakeholders therefore becomes a potential reality. In addition, at a practical level, the assumption at the outset that the project, participants and processes are likely to be imperfect allows for a deeper and richer learning experience for all collaborators: Failure is anticipated as a forerunner to success.

The potential for moving development away from a passive recipient model towards an engaged active participation model with win-win relationships resulting for all stakeholders therefore becomes a potential reality. In addition, at a practical level, the assumption at the outset that the project, participants and processes are likely to be imperfect allows for a deeper nd richer learning experience for all the collaborators: Failure is anticipated as a forerunner to success.

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8. Acknowledgements