RURAL ACCESS TO EDUCATION THROUGH DIGITAL MEDIA

by

BEZAYIT MENKER
Bachelor of Fine Arts, 2015
Ryerson University
Toronto, Ontario, Canada

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**Abstract: Rural Access to Education Through Digital Media,**
**by Bezayit Menker, Master of Digital Media Program, Ryerson University, 2018**

This paper is a summary of the research conducted during the development and design of *Rural Access To Education Through Digital Media*, a pilot education technology project in Tipling, Nepal. Beginning with an analysis of the relevant socioeconomic factors affecting school attainment nationally and those affecting Tipling in particular; the current challenges to formal and informal education are identified. The considerable potential of digital media and ICTs to address long-standing issues of access to both childhood and adult learning and thereby contribute to international development and education reform efforts are explored. Key project considerations and challenges are discussed along with project outcomes.

Keywords: ICTs, Rural Education, Literacy, International Development, Education Technology

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**Introduction**

*Rural Access to Education Through Digital Media* is a collaborative effort between the

Master of Digital Media Program at Ryerson University (Toronto, Canada) and local

community members in Nepal. This major research project aims to help address the disruption

toformal childhood education resulting from the 2015 earthquakes by providing the schools

withinthe rural community of Tipling, Nepal with ICTs and curating digital, educational content

for immediate use in primary through upper-secondary schools.

As a particularly hard-hit area wherein rebuilding efforts moved slowly and the

educational system was already in an embattled state prior to the natural disaster; on-site team

members involved in local relief efforts strongly articulated concern with the subsequent gap in

education being created in Tipling. Utilizing the tablet-based educational devices of the Rumie

Initiative, a non-profit that makes access to free digital education possible for underserved

communities worldwide through dedicated mobile devices and crowd-sourcing free content; this

Master of Digital Media major research project aims to help mitigate the negative, short-term

impact of these earthquakes on childhood education and identify long-term strategies and

opportunities to contribute to an improved learning environment for the community as a whole

through digital media.

**Project Management and Planning**

At this initial stage, my role as project manager consisted primarily of research,

development and planning in preparation for deployment by on-site team members. Drawing on

my recent academic experience within the field of digital media, my directives were to:

1. Provide strong contextual knowledge of the community, and its current educational landscape.

2. Identify and evaluate underlying barriers and impediments to education; not just for school-aged children, but for the community as a whole.

3. Explore the affordances of digital media, particularly Information Communication Technologies ( ICTs), that can be leveraged to add value to educational pursuits.

4. Outline notable initiatives that have utilized digital media in education reform inunderserved communities.

Deliverables included the identification of online resources and potential partner organizations currently operating within the local international development ecosystem for the deployment lead's review, curation of appropriate digital content, and preparation of ten Rumie tablets for deployment in the pilot phase of the project.

## About Tipling, Nepal

Nepal is a landlocked, southeast-Asian nation that shares borders with the two largest populations in the world; India and China. A culturally and geographically diverse country comprised of several ethnic groups and 123 mother-tongue languages (Central Intelligence Agency [CIA], 2017), this Himalayan nation is home to 8 of the 10 tallest peaks in the world (CIA,2017) . Agriculture and tourism are the mains ays of its economy with significant reliance

on remittances from those working abroad (CIA, 2017). Despite two decades of unrest, the Federal Democratic Republic of Nepal had begun to move towards political stability with the drafting of a new constitution in 2015 when a series of earthquakes causing large scale destruction further stalled national progress and bringing GDP growth to halt the following year (Asian Development Bank [ADB], 2016).

Given its proximity to the epicenter of one of these earthquakes, the rural community of Tipling, a collection of villages in the Dhading district [1], was among the hardest hit. Prior to this event, this community faced considerable geographic and socio-economic challenges that lowered quality of life; challenges that have impeded humanitarian relief as well as rebuilding efforts in the earthquake's aftermath.

One of the most consequential of these is Tipling's isolating geography. Although the 8 villages that constitute this rural area (Aaran, Namsa, Labdung, Majet, Phayang, Puru, Linjo, Patale and Somdang) are relatively close to Kathmandu valley and therefore the resources of the country's urban center; the difficult, mountainous terrain that surrounds them has a significantly restrictive effect on fundamental aspects of life (Gurung, personal communication, June 22 2017). Even during seasons with ideal weather, the village is a two-day, arduous trek from Jhansang (the closest point accessible by car) which complicates travel and the transport of goods to and from the community. Adding to this isolation is the lack of regional tourist attractions. This excludes Tipling from benefitting from of one of Nepal's larger sources of revenue while diminishing government incentive to build key infrastructure like cell phone networks and internet access to sustain it.

[1] Dhading District is one of the 75 districts of Nepal. It lies in the Bagmati zone of the Central Development Region. (**District Coordination Committee Office** Dhading, 2017)  3

According to the Nepal government census published in 2014, Tipling's population is among the smallest in Dhading district, comprised of approximately 464 households and 2,072 people; 52% of which are under the age of 25 (Central Bureau of Statistics [CBS], 2012, p.23). The average household size is 4.47 and the vast majority of its citizens are farmers (CIA, 2017; CBS, 2012, p. 16) . While Tipling does not yet have access to the internet, there has been some nominal degree of exposure to media and technology (CBS, 2012, p.12). More than 84% of the 464 households are listed as using electricity as the usual source of lighting (with approximately 15% using solar), 10% of households have a mobile phone, and 7% have a TV (CBS, 2012, p. 13).

Of the three main languages, Tamang (a non-mutually intelligible dialect cluster) is the most ubiquitous with 96% speaking it as their mother tongue and 58% who do not speak any other languages (CBS, 2014, p. 46). Comparatively, only 5.6% of the national population speak Tamang dialect (CIA, 2017). The next largest is Ghale ( 37%) followed by 4% who speak Kami and 1% simply categorized as "other"(CIA, 2017). Only 4% of Tipling's population speak Nepali as their mother-tongue; the nation's official language of instruction in schools (CBS, 2014, p. 46; Khadka,  Chaudhary, Jung, Chaudhary, & Pokhrel 2006).

**Current Educational System: National**

As the recipient of significant international aid, the considerable barrier to economic growth that Nepal's current educational system poses has been widely documented by large, international development bodies like the Asian Development Bank (ADB, 2015) as well as academic studies into rural livelihood diversification strategies in Nepal (Rahut, Ali, Kassie,

Marenya, & Basnet, 2014, p. 261). Accordingly, improved literacy and educational standards seem to have featured heavily in the government of Nepal's budget which allocates 15% to education despite its severe economic challenges (Ministry of Education; 2017).

Primary education is provided free of charge in Nepal and is also the point where enrolment rates are highest (CIA, 2017; CBS, 2014, p.64). Categorized into either community (or public) schools and institutional (or private) establishments, the system divides childhood education into four levels: Primary (grades 1-6), Lower Secondary (grades 7-8), Secondary (grades 9-10), and Upper Secondary (grades 11 and 12) ( Neupane, 2017, p.70). Until 1992, grade ten was the terminal level and therefore the point where students have traditionally taken their School Leaving Certificate (SLC) examinations. Overseen by the Higher Secondary Education Board (HSEB) of Nepal, the SLC is comparable to the GCSE in England and has recently been updated by the new Education Act (2016). Beginning this year, Nepalese students will take the Secondary School Examinations (SEE) at the end of grade 10 and the SLC upon completion of grade 12. Grade 10 is also the point where students can opt for vocational training instead of continuing to upper secondary.

**Current Educational System: Local**

When contextualized within Nepal's national standards, Tipling is an arguably underserved community. While Nepal's literacy rates have technically been climbing throughout the last two decades to 63.9% (CIA, 2017), this number belies a huge disparity along gender lines (76.9% of men and 53.1% of women) (CIA, 2017). The literacy rate in Tipling itself is 46% with an additional 4% that are able to read but not write (CBS, 2014, p.56). While educational

attainment is similar between genders in primary school, the number of female students that

achieve a 10th grade education is half that of male students (CBS, 2014, p.64). In 2011, 31 male

students had obtained a School Leaving Certificate compared to only 7 female students (CBS,

2014, p.64). Enrolment drops by 80% between primary and lower secondary school and then

drops another 61% by secondary school (i.e. grade 10) in Tipling (CBS, 2014, p.64). Correlating

with these numbers, the community has three primary schools and only one higher secondary

school (Gurung, personal communication, June 22, 2017). The influencing factors in regard to

quality of education as well as the main barriers to education in Tipling are discussed at length in

the following section.

## Literature Review: Barriers To Education In Rural Communities

In her comprehensive 2013 survey paper on the barriers to education faced by rural

communities in developing countries, Sonia Lazlo (Associate Director of McGill University's

Institute for the Study of International Development) implicitly identifies four main categories

that the most prevalent pain-points fall into (Lazlo, 2013):

1.  physical infrastructure (i.e. the availability of viable roads, rural electrification,

    quality of construction of school building)

2.  social infrastructure/context (particularly lack of support for learning based on

    gender, caste/ethnicity and similarly marginalized groups)

3.   direct and indirect cost of education (for example tuition and loss of child's wages

    due to attendance)

4. quality of instruction (specifically teacher absenteeism, limited/poor teaching

materials/training).

The findings of a study published in 2017 by Pramila Neupane at the Center for

Education and Global Communication at Tsukuba University in Japan corroborate Lazlo's

assessment. Conducted at four villages with similar ethnic and socio-economic characteristics as

Tipling in the Sindhupalchowk district, this study employed both quantitative data (in the form

of a questionnaire administered to all students and final exam scores provided by the schools)

and qualitative data collected "via classroom observation and in-depth interviews at each of six

schools" (Neupane, 2017, p.73). *Barriers to Education and School Attainment - Evidence from*

*Secondary Schools in Rural Nepal* identifies eight determinants of school attainment (Neupane,

2017). These are, gender, caste, ethnicity, household obligations related to social norms or

wage-earning responsibilities, father's education, land sufficiency, student-teacher ratio and local

caste/ethnic composition (Neupane, 2017, p.76-80); all of which are reflected in and seemingly

confirmed by the statistical data on Tipling discussed in the previous section.

While the research discussed above has focused on influencing factors that have been

long-established, Shrestha and Krolak examine a less obvious yet equally relevant barrier to

education in rural areas; the absence of literate environments. Shrestha and Krolak argue that,

> "Once a person acquires basic literacy skills, he or she needs continuous learning
> opportunities and easy access to appropriate materials [.] In the absence of such
> learning opportunities, it is likely that the person will lose his or her improved level of
> literacy skills and relapse back to a lower level." (Shrestha and Krolak, 2014, p.402)

To demonstrate the relevance of literate environments, Shrestha and Krolak's article delineates

the model of community libraries established by Rural Education And Development (or READ)

centers in Nepal (Shrestha and Krolak, 2014, p.405-415). Founded in 1991, READ is an NGO

that has set up 56 operational community libraries within Nepal and several more in both Bhutan

and India at the time of their article (Shrestha and Krolak, 2014, p.405-415). Based on a

community owned and operated business model similar to the one employed with great success

by Canadian Organization for Development through Education in Ethiopia (CODE-Ethiopia)

(Shrestha and Krolak, 2014, p.404), READ has received strong impact evaluations by 3rd party

organizations (San Francisco-based Learning For Action, for example) as a result of focusing on

creating better learning environments by providing opportunities for self-directed, informal

education and skill building (Shrestha and Krolak, 2014, p.406-407). The continued success of

these centers supports Shrestha and Krolak's argument that the presence of literate environments

would likely add value if incorporated into large-scale, systemic literacy efforts and considered

to the same degree that social and physical infrastructures are.


**Conceptual Framework: Educational Technology & International Education Reform**

Few situations epitomize the need for effective communication as completely as the act

of teaching. Therefore, any pedagogical approach is predicated on a guiding philosophy

informed by communication theory. In *A Cultural Approach to Communication (1989)*, seminal

theorist James Carey identifies and distills a dichotomy in conceptions of the process and

function of communication. These contrasting but not necessarily contradictory models (as they

are both rooted in religion) differ in their understanding of the communication process, its

purpose, and the prioritization of the elements involved therein. The transmission view, which

Carey describes as analogous to the processes of trade and transportation, commodifies and

prioritizes information (Carey,1989). Here, every aspect of this process revolves around the utilitarian objectives of transmission and reception as seen in the propagating of religious ideologies for example. The other model is reminiscent of the ritualistic aspects of religion; those that serve to engage participants and reinforce shared views (Carey, 1989). Where the transmission view has parallels to the communicative, such as trade and transport, the ritualistic view has parallels to the communal, as seen in worship practices like attending mass. Given that effective pedagogy is contingent on effective communication, these two fields are inextricably related. Therefore, the distinction Carey (1989) makes is very pertinent to the root question discussed here. This research asks: how can the use of Information Communication Technologies (ICTs) in education be optimized to address the longstanding gap between efforts in literacy training and return towards literacy rates in rural, developing areas? Using Carey's models as a framework, my research examines two technology-assisted education reform efforts to identify the potential design and pedagogical approaches in education technology that can support broader gains towards improvements in community literacy rates.

**OLPC**

Given the considerable visibility with which the One Laptop Per Child (OLPC) project was founded and launched at the turn of the century, this landmark international education development project has come to epitomize the traditional, transmission-oriented thinking on successful models of education. The perceived correlation between the transmission of information and the success of communication at the core of its efforts is implicit in its title. The goal here was to drive education reform in developing nations by providing unprecedented

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access to digital technology as a way to address barriers to childhood education. Led by MIT's

Nicholas Negroponte and strongly endorsed by (then) UN secretary-general Kofi Annan, this

initiative was strongly supported by the United Nations and incorporated into the Millennium

Development Goals for 2015 (UN News Center, 2005). Their ambitious target of ensuring

universal primary education was unofficially yet implicitly associated with this project through

the UN's highly visible campaign (UN News Center, 2005; (Steeves and Kwami, 2017). Given

the wide reach of that UN support, OLPC has consequently become emblematic of international

education reform attempts that try to merge the conventional classroom with state-of-the-art

technology.

Despite the initial support it enjoyed as a result of this UN endorsement, most of those

nations that showed interest in adapting this technology have rescinded their requisitions for

OLPC's XO laptops as a result of unimpressive impact evaluations and higher-than-anticipated

cost structures (James, 2015; Steeves and Kwami, 2017; Kraemer, Dedrick & Sharma 2009).

Among several other salient points raised in *New Technology In Developing Countries: A*

*Critique Of The One-laptop-per-child Program (2010)*, Jeffery James of Tilburg University

makes an insightful point in his problematizing of this initiative that could have been exploited to

achieve significantly lower costs (James, 2015, pg.381):

> "The OLPC requires poor countries to use fewer students per computer than is
> recommended even in the developed countries. [James] argues, by contrast, in favor of a
> balanced pattern of sharing that reflects the level of per capita income in poor relative to
> rich countries."

Steeves and Kwami's *Interrogating Gender Divides In Technology For Education And*

*Development: The Case Of The One Laptop Per Child Project In Ghana* (2017) is an

examination of a pilot OLPC project that supports this point and then takes it further. Their

research showed the ownership responsibilities of repair and maintenance as more

counterproductive than the benefits of individual ownership were towards improved academic

performance (Steeves and Kwami, 2017). This is even despite the remarkably durable

engineering of the OLPC's XO[2] as rural electrification issues complicate the use of technology in

many developing communities (Steeves and Kwami, 2017). The shared model would also allow

for shared cost as well as a pooling together of technical skills that serve to improve the

usefulness of the laptops. The validity of these criticisms is apparent in the final deployments of

the 1000 XO laptops ( i.e. the product name of the laptop produced by OLPC) purchased by the

Ghanaian Ministry of Education (Steeves and Kwami, 2017, Project Outcomes) before

cancelling further requisitions. These were not given to individuals as mandated by the OLPC

but housed in labs as the one to one ratio proved "too expensive and not sustainable" ( Steeves

and Kwami, 2017 p.12).

James, Steeves and Kwami' have demonstrated how the OLPC's elusive goal of lowered

costs can be achieved without sacrificing the quality of materials and sophistication of design the

XO incorporated by embracing a shared model. In fact, given the pivotal role of sharing in

collaboration, (discussed in detail in the following sections) this will likely only add to the value

and functionality of this tool.

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[2] Previously named the $100 laptop by founder Negroponte; XO is the name of the laptops OLPC produces.

**Hole-In-The-Wall Experiments**

Application of more communal approaches to teaching in education reform are less prevalent but seem poised to become far more so. At around the same time as the development of the OLPC project, research was being conducted by education technology professor Sugata Mitra into an approach to childhood education that is diametrically opposed to the one discussed above. In a series of research experiments beginning in 1999, Mitra discovered a considerable correlation between self-organized student collaboration and improved learning outcomes (Mitra, 2014). Mitra's *The Future Of Schooling: Children And Learning At The Edge Of Chaos (2014)* describes the development of the concept of self organized learning environments (SOLE) and and the research findings from which it has emerged. It then "describes how SOLEs operate, and their possible effects on primary education in remote areas,"(Mitra, 2014, p.547). The children who participated in Mitra's experiments demonstrated that students could navigate seemingly impossible barriers (for example, language barriers) when permitted to engage with content/information in groups (Mitra, Tooley, Inamdar, and Dixon 2003; Mitra & Dangwal, 2010) and it can be argued that the same social structures that have successfully supported learning in a religious and cultural context are capable of (and possibly more effective at) supporting academic endeavours (Carey, 1989; Mitra, 2014). Where OLPC had somehow failed to translate into improved test scores (Sharma, 2012)[3], Mitra's experiments seemed to succeed based on the very aspect of classroom learning that OLPC intended to eradicate: high student to

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[3] In his evaluation of the OLPC program implemented by the Open Learning Exchange chapter in Nepal "using a pre-post test quasi-eperimental design that consists of 26 program schools and 39 control schools that are spread across six different districts of the country [...] more than 6500 students ... [and] 65 public primary and lower-secondary schools", Sharma found that " The exposure to computer-assisted learning in Nepal had no impact or a negative impact on student learning, non-cognitive skills and attendance. Students from grade 2 in treatment schools did particularly poorly in year-end English tests compared to control school students." (Sharma, 2012)

computer ratios. It is this collaborative learning style that has continued to thrive and gain

traction almost two decades later, and has now taken root in formal education and supporting

technology. This is evidenced by the current prevalence of features such as discussion forums

and chats in digital academic spaces like Ryerson's own Desire2Learn (D2L). This digital

learning management system is implemented throughout Ryerson University courses and

features a set of communication and collaboration tools (Ryerson University, n.d.). It is also

noticeable in a growing trend towards collaborative course structures and a general shift towards

the development of community and collaborative skills (Jenkins, 2009). The same trend towards

empowering learners to engage with content in a more collaborative way is discernible in the

policies of the current international development community as seen in the research recently

published by UNESCO on their family literacy programs in sub-Saharan Africa (Hanemann,

McCaffery, Newell-Jones & Scarpino, 2017) and in the "community library" (Shrestha &

Krolak, 2014) model of education reform implemented quite successfully in India, Nepal and

Bhutan by READ Global (Shrestha and Krolak, 2014).

The design and implementation of digital media devices and programs that prioritize

collaboration and communal engagement with education materials over the mere transmission of

information are strongly indicated by this review of literature. The most considerable challenge

to practical application of these research findings is that the structure of the traditional

classroom, having been conceived of in relation to the industrial revolution (Robinson, 2010), is

based on transmission-oriented principles and does not lend itself easily to the changes research

indicates (Mitra, 2014). Therefore, I would argue that one possible answer to the research

question posed at the start of this section is: the use of ICTs in education can be optimized to

address the longstanding gap between efforts in literacy training and return towards literacy rates by empowering the restructuring of the traditional classroom into self organized learning environments.

## Issues and Challenges

As stated previously, this project utilized a tablet-based educational device. The Rumie Initiative, a non-profit focused on international development through technology assisted education reform, makes access to free education possible for underserved communities worldwide through dedicated mobile devices and a crowd-sourcing content management system, LearCloud (Rumie, n.d.). While these tablets are targeted at underserved communities like Tipling with low cost, durable hardware and software designed for offline use, some of the root structures of this system proved counter productive for this project's purposes. The most significant of these is that the Rumie tablet system is designed for a traditional classroom and therefore, requires an administrator to function optimally. Primarily a support tool for use by a teacher or facilitator who curates content, monitors student profiles and student access to educational games and applications, this design aspect of the system was a considerable impediment in remote communities like Tipling where teacher absenteeism is an issue (B. Gurung, Personal communication, 22 June 2017).

Content curation using the LearnCloud was also problematic given the language requirements of this project and as a result, not all the suitable content located could be made available on the tablets. Rumie tablets (at least with the early model available when these devices

were purchased in late 2015 prior to this research phase) can only be updated through the LearnCloud where the majority of crowd-sourced content is in English. This meant our team did not benefit from the driving force behind Rumie's design - crowd-sourced content.

The use of large content collections proved to be difficult with these devices. An obvious drawback to crowd sourced content is that quality of materials will vary as much as the qualifications of the wide range of contributors. Content collections compiled by subject experts provide a solution to this problem and this is how we ultimately addressed the need for high quality educational materials in Nepali for this project. E-Pustakalaya, "an education-focused, free and open digital library [containing] thousands of books, educational videos, audio-books, reference materials and interactive learning software." (Open Learning Exchange [OLE] Nepal, n.d.) developed by OLE to support the Ministry of Education Nepal's curriculum, proved a valuable resource. Unfortunately, making this resource available through Rumie presented a challenge as the Learn Cloud restricts item size. Ultimately, as content aggregators in consequent phases will not have to contend with the language barrier, this will not be an issue going forward. The increased time required to add content however, is still somewhat problematic. For this reason, it is unlikely any future phases will utilize this educational system.

## Project Outcome

Guided by the research summarized above and using the logical framework approach[4], I was able to complete the research, development and planning phase of the project and provide

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[4] The logical framework approach is a methodology for designing and planning international development projects across a wide range of disciplines (see Appendix A and B for sample project management documents).

for language and age-appropriate educational materials and recommendations for potential local

partner organizations currently operating within the international development ecosystem for the

deployment lead's review. Curation of appropriate digital content for immediate use (while

facilitators familiarize themselves with the content management system) was completed as well

as the testing and troubleshooting of all devices prior to shipping. Arrival of the tablets in Nepal

has been confirmed by on-site team members and preparations for deployment within Tipling are

currently underway.


**Conclusion**


This research shows that while the continually decreasing costs of mobile technology

seems likely to make the eventual incorporation of digital tools in education reform a certainty,

the efficacy and value of those tools will depend to a great extent on the implementation of

innovative pedagogical approaches that are cognizant of the new, collaborative skills required.

Based on this academic exploration of technology assisted education reform efforts, I posit that

those educational tools that allow for collaborative environments, self-directed learning, and

focus on collaborative new media literacies will likely prove more capable of producing

pronounced and sustainable gains towards universal literacy.

# Appendix B

## Logical Framework: Access To Education Through Digital Media Project, Tipling Nepal

| Program Summary | Verifiable Indicators | Means of Verification | Assumptions/Risks |
|---|---|---|---|
| **Overall Goal:**<br><br>Facilitate access to education in rural communities through digital media. | - Rise in local literacy rate<br>- Rise in post secondary enrolment<br>- Post-secondary enrollment rates<br>- Improved learning outcomes<br>-Improved graduation rates | - Nepal National Census data<br>-UNESCO census data<br>- Post-secondary enrollment rates<br>- Adult education program enrollment and completion rates<br>-Survey results | - Community support for adult learning and literacy programs<br>-Teacher and academic institutions administrative support of the use of ICTs<br>-Availability of funding to provide adequate equipment (i.e ICTs) to facilitate program implementation<br>- Limited access to device repair and maintenance |
| **Purpose/Specific Objectives**<br><br>- Provide relevant, supportive educational content to existing academic institutions within the 8 villages in Tipling.<br>- Ascertain wether there is community interest in partnering to develop adult learning and literacy programs as part of academic research into rural education through ICT's.<br>- (Contingent on previous objective) secure a partnership agreement with Tipling VDC to provide educational programs and content.<br>-(Contingent on previous objective) Secure partnership with local NGOs to facilitate implementation and excelarate transfer of program ownership and management to local community | -Reduced reliance on traditional, paper-based texts<br>-Documented partnership agreements with both the local community and relevant NGOs<br>- Establishment of local adult education programs. AND rate of engagement therein | - Academic institution data (school records) and teacher interviews as to the degree ICT's are incorporated into curriculum<br>-Project Management documents, particularly attendance records<br>- Household surveys | - As the initial phase of the project and with limited access to input from teachers and school administrators, content selection is mainly based on theoretical and not empirical data. Consequent phases will allow for better customized content curation. |
| **Outputs/Expected Results:**<br><br>A)Teachers and students in formal academic institutions have access to useful digital content<br><br>B) Project team establishes partnership agreement with the Community<br><br>C) Project team establishes partnership agreements with local education development NGOs | A) High teacher and student approval ratings.<br><br>B) Partnership documents<br><br>C) Partnership documents | - Surveys<br>- Project management documents<br>- Academic institution data<br>- Statistical and device data | - Community is able/willing to contribute to the project (whether monetary or donation of time/venue/labor) as per local NGO requirements<br>-Availability of NGO's service to Tipling villages |
| **Inputs/Activities**<br><br>1) Research current educational models in Nepal to determine relevant content (and sources thereof) and deployment methodology .<br>2)Curate and load content<br>3)Deploy ICTs and customized content for immediate use in local K-12.<br>4)Obtain and document partnership agreements with Tipling VDC<br>5)*Obtain and document partnership agreements with Local NGOs (contingent on previous)<br>6)*Produce baseline surveys and initial assessment for next phase of project cycle (contingent on previous). | **Inputs and Resources:**<br><br>1) *research conducted, paper pending.*<br>2) Identify sources of content and request access<br>3)Coordinate with Mr. Gurung to design feasible and optimal deployment plan<br>4 -5)Coordinate with Mr. Gurung and/or Jesuit community partners to present project proposal to VDC<br>6)-Design basic video-recording app as means to conduct research and allow for user feedback and survey responses through user-generated video testimonials. | -Partner pre/post-assessment trip reports<br>- Program Management documents<br>- Statistical and device data | - Availability of appropriate content<br>- Availability of bi-lingual personnel to evaluate Nepali and Tamangi content |

**Appendix B**



# Rural Access to Education
# Through
# Digital Media

## Project Charter

Bezayit Menker,
Master of Digital Media Candidate
August 23rd, 2017

## Executive Summary

*Rural Access To Education Through Digital Media* is an education development project. Using mobile technology to support formal childhood education with a long term goal of supporting both formal and informal educational programs for the whole community; this project will attempt to identify best practices in ICT software design that may allow for improved access to quality education in rural communities worldwide.

Initiated as a collaborative effort between the Master of Digital Media Program at Ryerson University and local community members in Nepal, this project began with an investigation into how tablet technology could be implemented to compensate for the gap in formal education created by the 2015 earthquakes in Tipling; a small village in Nepal's Dhading district.  Located near the epicenter of one of these earthquakes, Tipling was a particularly hard hit area wherein rebuilding moved slowly. On-site team members involved in local relief efforts communicated concern that this prolonged absence of educational opportunity in conjunction with an educational system that was already in an embattled state prior to the natural disaster would have a lasting and detrimental impact on the school aged children in this village. Our aim was to provide suitable educational materials and content to address this temporary need using the Rumie Initiatives' tablet-based ICT system (an innovative nonprofit  that makes access to free digital education possible for underserved communities worldwide). While examining current educational models, recent ministry of education mandates and the pertinent development landscape with that goal in mind, a compelling opportunity to address issues of access to education in this community in a more meaningful and sustainable way emerged.

This project will deliver an initial deployment of ten Rumie tablets to two academic institutions in Tipling for immediate use while determining the feasibility of the proposed larger,

long-term study.  Key determinants such as community interest, engagement,  availability of local NGO partnerships and requisite funding will be explored.

## Objectives

1) Support formal childhood education by :

   a) addressing the need for materials more efficiently through the affordances of the medium.

   b) gamification of course content to support different learning styles and provide more opportunities to practice.

   c) providing alternative/flexible modes of study such as homeschooling, distance education or independent study.

2)  Create opportunities for customizable adult education ( i.e. formal literacy programs as well as short-term skill or subject-specific based programs)

3)  Establish a community owned and operated library or educational establishment that can provide the community with a sustainable literate environment; a key factor in developing and maintaining the requisite learning environment.

## Assumptions, Risks, Constraints and Dependencies

The success of this project in terms of community impact as well as academic inquiry depends entirely on the presence and quality of community interest. Assuming this holds true, it is the opinion of the researcher that the second most consequential dependency is the participation of a resident  facilitator. Widespread anecdotal evidence in academic development journals affirms the value and necessity of this role in troubleshooting, reliable communication and in conducting applied ethnographic research and task analysis; all of which are key elements of

the work proposed here. While objectives 1 b) and c) are contingent on the outcome of the initial phase of this project, objective 1 a) is a relative certainty.

It is also  prudent to note here that this project plan is entirely tentative as it has been formulated off-site without informal assessment reports. While extensive research has been done to consider all discernable factors, an adaptive management style is essential as project structure will have to be responsive to first-hand, on-site developments and insights. The priority of this document is to delineate  goals and general strategy.

## Strategy and Implementation Plan

Using an adaptive management strategy, Human Centered Design principles and the Fogg Behaviour Model (FBM) as frameworks for collaboration and design, we will customize educational software for use in the cultural context of this community. Through task analysis and applied ethnographic research, we will either adapt existing or design custom software in support of the three objectives outlined above in the following phases:

Phase 1 :  *Project research & development, and pilot implementation*

Deliverables in this phase include:

- deployment of 10 tablets to academic institutions for review, assessment and user feedback.
- Identification, establishment and documentation of partnership agreements with collaborators; particularly teachers and school administrators
- Base-line surveys, setup and testing of project communication channels
- Estimate, identification and procurement of requisite resources including funding.

Phase 2 : *Support formal childhood education*

Deliverables in this phase include:

- Engagement of software developer on project team

- Second iteration of software based on initial user feedback

- Establishment of operational protocols that support efficient and timely response to user feedback

- Commencement of gamification of course content to support different learning styles, develop digital media literacy skills and provide more opportunities to practice.

- Research and development of programs and supporting software to begin  facilitating alternative/flexible modes of study such as distance education or independent study to address low secondary school enrollment.

Phase 3: *Support adult education and literate environments*

Deliverables in this phase include:

-  Establishment of a community library in collaboration with Local NGO's. (Some potential partnership opportunities include READ Nepal, Nepal Library foundation, Smart Villages Nepal and Open Learning Exchange Nepal; all of which offer proven track records developing libraries with both analog and digital content.

Phase 3: *After Action review*

Deliverables in this phase include:

- After Action Review report

- Academic documentation of study

- Project target of framework or guidelines and best practices in ICT software design that will allow for improved access to quality education in rural communities worldwide.

## Project Team

| | |
|---|---|
| Academic Supervisor | Michael Carter, M.Ed., PhD |
| On-site lead | Biren Gurung |
| Project Management | Bezayit Menker, M.D.M. Candidate |
| Software Developer/Programmer | TBD |
| Educator/Facilitator | TBD |
| Local Partners/NGOs | TBD |

## Project Communication Tools and Planning

Given the restrictive geography and lack of internet and cell phone networks, channels of communication are limited and will likely present a challenge to collaborative efforts between community members and project team. The pilot phase of this project will utilize the Rumie tablet's camera and video capabilities  to collect user feedback  and to conduct and record baseline and periodic survey responses . This will be in addition to periodic, in-person correspondence with partners/collaborators within the academic partner institutions. At this time, we anticipate significant reliance on community collaborators to provide measurable, verifiable indicators such as academic institution data /school records, degree of  ICT incorporation into curriculum and  attendance records.

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