Proposal for

The UDS Intelecenter: Promoting Health Education in Kamuli, Uganda

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Education 303X: Designing Learning Spaces
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THE NEED

Lack of health education and access to health resources is one of the most pressing problems in the developing world. There are an estimated 4 billion+ people who lack adequate healthcare, and, as a result, suffer needlessly from preventable diseases (Health in Underserved Regions, Intel, 2005). This is particularly the case in Uganda, Africa, where only 49% of households have access to health care facilities and only 1175 physicians, 1350 nurses and 850 midwives attend to a population of 28 million (WHO Global Atlas of Healthcare Workforce, 2004). Uganda’s primary health care challenges include high mortality and morbidity from treatable disease, lack of access to quality care in rural settings and limited numbers of skilled professionals at the local level.

Researchers in both industrialized and developing countries hail information and communication technologies as the solution to improving health in the developing world. Indeed, technological advances have already contributed to some of the biggest breakthroughs in modern medicine, changing virtually every facet of health care, disease control and prevention. Since 2005, Intel has sought to explore ways in which its architecture products can address the health care challenges mentioned above. This proposal presents a set of recommendations for how Intel can promote and support health education and learning in one rural town in Africa - Kamuli, Uganda. We hope these recommendations can serve as a viable model for health education implementation that can be replicated in other parts of Uganda and in other developing countries.
THE CLIENT

The client is the Digital Health Group of Intel’s Health Research and Innovation practice. Their goal is to conduct exploratory research on the role Intel can play in improving health in underserved regions. As part of this work, Intel has joined a collaborative called Community Health Ecosystem Support (CHES) Uganda. CHES Uganda is a group of research projects championed by a broad network of partners who seek to improve the quality of health care service delivery in Uganda. CHES partners have a range of skills spanning technology design, policy, development, research, and health care delivery, and hope to use their collective expertise to infuse critical resources into Uganda’s health ecosystem. In addition to Intel, partner organizations include the Ugandan Ministry of Health, Uganda’s Office of Science and Technology, The Center for Sustainable Rural Livelihoods at Iowa State University, as well as several non-governmental organizations (NGOs) such as Uganda Development Services (UDS) and Volunteer Efforts for Development Concerns (VEDCO). Based on field research, various discussions with partner organizations and a collaborative workshop in Uganda in October of 2006, CHES identified two districts in Uganda – Kamuli and Lyantonde – in which to launch their initial health ecosystem support activities.
THE CONTEXT

Uganda Facts*

- **Full name:** Republic of Uganda
- **Location:** Eastern Africa; landlocked between Kenya, Sudan, Congo, Rwanda and Tanzania
- **Population:** 27.6 million (UN, 2005)
- **Capital:** Kampala
  - **Area:** 241,038 sq km (93,072 sq miles)
- **Major Languages:** English (official), Lugandan most widely spoken, Swahili, Ganda, various Bantu languages
- **Major Religions:** Christianity, Islam
- **Life Expectancy:** 48 years (men), 49 years (women) (UN)
- **Monetary Unit:** 1 Ugandan shilling = 100 cents
- **Main Exports:** Coffee, fish and fish products, tea, tobacco, cotton, corn, beans, sesame
- **GNI Per Capita:** US $280 (World Bank, 2005)
- **Date of Independence:** October 9, 1962, from Britain
- **Education:** Based on British system; 7 years primary education followed by lower secondary cycle of 4 years and upper secondary cycle of 2 years then 3-5 years of university studies
- **Literacy:** 70% (2003)
- **Internet Users:** 17 per 1000 people (2005)
- **Cellular Telephone Subscribers:** 53 per 1000 people (2005)

*Information for chart compiled from [http://news.bbc.co.uk](http://news.bbc.co.uk), [www.alertnet.org](http://www.alertnet.org), [www.myuganda.co.ug](http://www.myuganda.co.ug)
Kamuli District

The Kamuli District is located in eastern Uganda, approximately 100 miles northeast of Uganda’s capital city, Kampala. It borders the districts of Toro in the east, Jinja and Iganda in the south, and covers 4,348 square kilometers. The people of Kamuli are Basoga and speak Lusoga. Kamuli Town is the district’s administrative center, a village of approximately 5000 residents, with a high level of poverty and a low level of external development assistance. The majority of the district’s population depends on agriculture for their livelihood but the sector has not been well funded and Kamuli farmers continue to practice subsistence farming (http://kamuli.go.ug). The district is a tsetse fly prone area, leading to high risk of sleeping sickness (Ibid).

Uganda Development Services (UDS)

UDS is one of the CHES collaborative partners. UDS’s mission is to develop “people and institutions empowered with knowledge, information and skills that lead to the sustainable socio-economic transformation and prosperity of communities” (http://www.uqandadev.com/uds_uganda.html). To realize this mission, UDS works with community groups and the Kamuli District government to fight the various features of poverty that thwart social and personal development such as insufficient and ineffective technical and social infrastructure, poor agricultural methods, high burden of preventable diseases, deforestation, low industrial production, and insufficient information management systems for planning at various levels (Ibid).
THE PROJECT

The Kamuli district is one of the two districts identified by CHES as a focal point for its initial activities. CHES selected Kamuli because of its “unique ecosystem of health centers” and because it exemplifies “many of the challenges in the delivery of quality health services to rural Uganda” (Project Proposal Overview, Intel, 2006).

The primary objectives of the CHES project in Kamuli are:

1) To establish wireless connectivity between 4 sites, the hub being the UDS Telecenter, using Intel Architecture
2) To build a health kiosk inside the UDS Telecenter that allows the community to access public health information and allows patients to connect remotely with medical professionals too far away for them to visit physically
3) To provide continuing medical education for local health professionals at the UDS Telecenter
4) To support improved data collection and health nutrition information dissemination through ultra mobile devices (UMDs)

What is a Telecenter?
“...is a public space where people can access computers, the Internet and other technologies that help them gather information and communicate with others at the same time as they develop digital skills” (www.telecentre.org).

UDS Telecenter

UDS is part of a worldwide movement pioneering the use of telecenters to support community and social development. UDS established a small multipurpose community telecenter in Kamuli Town in 2000. Some of the center’s key resources and services include:

• Thirteen second-hand computers with Internet access that community members can use for a small fee (128 kbps internet bandwidth for all computers)
• Basic computer skills training
• Business services such as fax, telephone, photocopying, binding and sealing
• A small store that sells basic office supplies
• A generator that provides electricity during frequent power outages
• Two rooms and an outdoor courtyard
OUR DESIGN SOLUTION

After considering the CHES project goals, Intel’s overarching goals, and our own research into the telecenter movement, our team decided to focus our redesign efforts on the UDS Telecenter in Kamuli. Rather than creating a single health kiosk inside the already existing UDS Telecenter, we opted for a complete redesign of the space. We believe that the UDS Telecenter can be a hub for technology and health-related education, as well as a place for residents to come together and share knowledge. The new UDS Intelecenter will be a resource for health professionals as well as the public at large. Our approach was to:

- Overhaul the UDS Telecenter so it becomes a health-focused center that allows individuals in Kamuli to better educate themselves about their own health and the health of their families
- Optimize the space to support collaborative as well as individual learning with individual computer stations and classroom space
- Promote a range of social interactions to create a hub for community and social development around health care and education

Services

In addition to providing services such as internet/email access and general administrative services such as printing and faxing, the new telecenter will offer:

- Technology Training and Certification
  - These basic technology workshops will introduce people to the keyboard, the mouse, how to turn the machine on and off, and some basic applications that will enable them to use the computer without supervision and prepare them for more advanced computer health training in the future
  - Certification workshops for applications such as word processing, spreadsheets, graphic design, etc.
- Computer-based health education curriculum and materials as well as updated health library resources
  - Website with organized health care content and links (packaging Uganda Chartered Health Net’s existing digital health content and VEDCO’s health and nutrition content)
  - General health workshops focusing on public health issues such as nutrition, hygiene, malaria, sleeping sickness, etc.
- Continuing health care education training and certification for health care workers and NGOs
  - Classroom–based and instructor-led workshop series providing health care workers with ongoing certification
Learning Goals

We divided our learning goals into health and technology goals for individual and group users. In order to reach these goals, students must be provided with hands-on workshops on a variety of technology and health topics by trained facilitators.

<table>
<thead>
<tr>
<th>USERS</th>
<th>LEARNING GOALS</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals “Accomplished Novices”</td>
<td>Health: Awareness of current health issues, how those issues affect them, and behavioral changes that lead to improved health outcomes</td>
<td>Technology: How to use various software packages, the Internet and videoconferencing to achieve personal and community goals</td>
</tr>
<tr>
<td>Groups Health Care Workers “Adaptive Experts”</td>
<td>Increased knowledge of current health practices, particularly as they relate to care in remote villages; ability to pass professional certification exams</td>
<td>How to use new health technologies in daily practice; transfer skills to new problems encountered in the field</td>
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New UDS Intelecenter Features

Learning

- Hands-on, collaborative health workshops for the community
- Hands-on, collaborative continuing education courses for health care workers
- Disease/preventative care tip of the week w/ prize
- Soccer posters/Soccer PSAs
- Kids corner with childcare and health-related games
- Certification wall with pictures of individuals who have successfully completed certification classes
- Health start screen on all computers
- Pod casts / Live video conferencing with professionals at a health center or Makerere University
- Redesigned library with updated health-related materials (books, magazines, etc.)
- Dynamic center leader and trained professionals who work in telecenter
- “Training the trainers” program – novices trained by telecenter leader and instructors to train and operate center
- Television, DVD player, health/training DVDs
Community Engagement
- Community notice board for residents to post announcements, meeting notices, health care advice, agricultural tips
- Telemedicine video conferencing so residents can see their relatives in the hospital/health center
- Local groups/organizations can rent space for meetings and other activities
- Small soccer field (courtyard) to engage children/young adults
- Regularly scheduled movies or other entertainment activities in courtyard
- Transparent wall with view of classroom
- Comments and suggestions board

Comfort/Aesthetics
- Comfortable chairs
- Bright lights/warm colors on walls
- Air conditioning/fans
- Sliding white board walls – usable on both sides, classroom and individual space
- Welcome kit for first-time center users
- Free pens, pencils and stationery
- Separate “private printer” for printing personal health information
- Tables and desks with wheels to allow for easy re-configuration of rooms
- Overhead projector
- Personal storage space (bins, lockers, filing cabinets, cubbies, etc.)
- Movable computer stations / laptops instead of desk-top computers
- Toy bin and games for kids
- Store that sells snacks and other “health” items (like mosquito nets)
- Free water/coffee/tea

Marketing
- Signage bright and clear outside to increase visibility
- Larger storefront opening to the outside to engage people walking by
- Free Internet access for those under 17
- Free Internet access prizes for frequent users
- Posters of the local Kamuli residents with quotes about why they love the telecenter
LEARNING THEORY and FEATURE

Zone of Proximal Development
- Staff trained in technology and health education
- Open layout to allow for staff circulation
- Opportunities for peer-to-peer learning in social spaces
- Collaborative classroom environment

Legitimate Peripheral Participation
- Posters and exhibits
- Transparent wall with view of classroom
- Videoconferencing to observe classes in remote locations

Shulman’s New Table of Learning
- Engagement: linking cultural elements (i.e. soccer) to health
- Motivation: Posting healthcare certifications on wall
- Knowledge and Understanding: weekly health quizzes
- Performance and Action: health simulations in classes
- Judgment and Design: comment board

Model of Science Inquiry
- Surprising Phenomena: on a poster, screen saver or on quiz
- Exploration/Explanation: screen with health links, health exhibits
- Relevance: speakers from community or personal stories posted

Solitary vs. Shared Learning
- Solitary: "quiet" computer room and library
- Shared: "loud" computer room, collaborative classroom, courtyard
Operational Considerations

Unsuccessful instructional technology-based ventures often fail because of inadequate technical support. Therefore, we believe the key to the Intelecenter’s success is a knowledgeable technical team that can provide ongoing technology support and training. We also believe that the Intelecenter can only be successful if it is operated by a strong leader who is well respected in the Kamuli community. This leader will need extensive training in technology, learning, design, customer service and management. It will be the leader’s responsibility to ensure the center adapts to the changing needs of its customers and it is the leader’s passion and knowledge that will allow the Intelecenter to be more than just an Internet café.

Theoretical Framework

Our design is based on several key theoretical frameworks:

Vygotsky defines his Zone of Proximal Development as the distance between what a learner is able to do on his or her own, and what he or she can accomplish with the aid of a more advanced or “expert” instructor or peer. We incorporate this idea by including expert staff (in both health and technology) circulating in the space and a mixture of quiet and “loud” spaces that afford collaboration and peer learning.

According to Lave and Wegner, “Legitimate Peripheral Participation provides a way to speak about the relations between newcomers and old-timers, and about activities, identities, artifacts, and communities of knowledge and practice” (Leve and Wenger, 1991). Elements in the telecenter introduce students to health and technology “communities of practice” gradually (e.g. posters, displays, view into classroom, open collaborative areas). We believe these elements will enhance LPP and aid users’ transformation from novice to expert (How People Learn, 2000).

Shulman’s New Table of Learning has four components: Engagement and Motivation, Knowledge and Understanding, Performance and Action, and Judgment and design. To Engage and Motivate we took cultural elements, like Ugandan’s love of soccer, and linked them to health. For continuing education students who are very motivated by earning certifications, we put the certificates on the wall with pictures of the students who’ve earned them. We emphasize Knowledge and Understanding with formative assessments cleverly disguised as weekly health quizzes. Our learners are able to engage in Performance and Action through medical simulations in our continuing education classes. Meanwhile, the comments and suggestions board provides an opportunity for Judgment and Design, because people can comment on their classes, ask questions, and make suggestions for future classes and health topics to explore.

Sue Allen’s “Inquiry Cycle” (2004) includes the presentation of a Surprising Phenomenon (e.g. rate of malaria infection as a screen saver, poster, or health quiz), Exploration and Explanation (e.g. via a mosquito net display and fact sheet), and Relevance (e.g. via a live net-user testimonial).
We also wanted to make sure our design struck a balance between Individual and Shared Learning. Those who visit alone, for example, value being able to engage in personal reflection without distractions; those who visit in company value being able to share the experience and discuss ideas with others.” (Packer and Ballantyne, 2005). Our design therefore, incorporates elements of both solitary (e.g. quiet, secluded areas) and group learners’ (e.g. open, collaborative spaces) “preferred approaches”.

Impact of Culture on Design

Educational Practices
According to Andrew Mwenda and our research, Uganda's current educational system stems from British colonial rule and is extremely traditional in nature, including explicit instruction from a single instructor, respectful and docile students, and extrinsic reward in the form of grades or certification upon completion. Mr. Mwenda also relayed that it would not be likely students would come into the Intelecenter to do health-related research. We incorporated this understanding into our two scenarios (See Appendix D), offering a classroom experience in which the learner was eased into collaborative learning with a highly trained instructor and a comfortable atmosphere, and given a reward for time spent in learning activities.

Communication and Community Building
Our research suggested, and Andrew confirmed, that Uganda is unique among African nations in its motivation and ability to communicate openly about taboo topics such as AIDS and other health issues. Andrew observed that Ugandans are very different from Americans in that they like to be very involved in each other’s lives at all levels, and people do not regard privacy with the same importance that Americans do. On the other hand, Andrew emphasized that while most Intelecenter users would be open to getting advice and training from fellow Ugandans, they might not respond as well to foreigners, especially Westerners. We incorporated his observations into our design in several ways: first, we discarded our original idea to include small booths or kiosks for health related inquiries, deciding instead that such attempts at privacy would be regarded with suspicion by most telecenter users; second, we included in our personas and scenarios both the community-building aspect of the telecenter, allowing for social interactions in a variety of settings within one establishment, and the vital leadership of a local NGO leader who might be more easily accepted and trusted by the general user.

Health Concerns
We found it very important to find specific concerns about health and disease that would be applicable on a local level in Kamuli. Uganda has one of the lowest incidences of AIDS transmission among African countries, having lowered the prevalence rate from 30% in 1990 to 9% in recent years (Health in Underserved Regions, Intel). We found that more prevalent health concerns in this region were malaria, pregnancy issues, and newborn health. We discussed selling malaria nets in the store and included malaria education in our scenario for Kwesi. Dembe's scenario, in turn, involves a medical technique for resuscitating newborns. While these two elements only begin to touch on these problem areas, we believe they demonstrate to potential funders and users our dedication to making the space, and the learning that goes on within, relevant to needs of the local population.
OUR ASSESSMENT PLAN

Our design team recognizes that the success of the Intelecenter requires that the Kamuli community change certain behaviors. To become fully functional users of the center, Kamuli community members must be aware of, accept, adopt, and ultimately champion the Intelecenter. Fortunately, research into change management provides an excellent roadmap for evaluating changed behavior.

Gathering and sharing current health data with the community is one mechanism for creating change. Involving community members in setting future health targets and deciding on the services of the center is another. The more control, understanding, support, and purpose (Bridges, 1991) the community is given, the greater their buy-in.

Evaluation

Impact is a function of both service uptake and learning effectiveness. The former can be assessed with straightforward metrics including number of unique visitors, class and/or event attendance, time-in-facility, and number of return visits. The latter requires the application of a robust framework like the Kirkpatrick Model (1959).

Level 1: Reaction

Through an online survey, the Operator can assess the extent to which users enjoyed their experience at the Intelecenter. A positive reaction does not guarantee learning, of course, but a negative one almost certainly precludes the possibility. Fred Reichheld (2006) views one reaction-related question as key in determining whether or not an organization has the foundation for success. The ‘Net-Promoter’ score is determined by asking users “Would you recommend this service / product to a friend?” and by looking at the ratio of yes’s to no’s. If the Intelecenter can achieve a high ratio relative to benchmark facilities, then the Operator is ready to move to the next level of analysis.

Level 2: Knowledge

This level focuses on knowledge transfer achieved. As it relates to health knowledge, the Intelecenter can measure success both directly via surveys (e.g. additional questions can be added to the ‘Reaction’ survey above that pertain to specific health knowledge pieces present in the Intelecenter environment), and indirectly via proxies like the ‘Disease of the Week’ question and student scores on health certification class tests.

If knowledge transfer is demonstrated, the Operator can then examine behavioral change.

Level 3: Behavior Change

Knowledge around good health practices is wasted if it remains inert. The Intelecenter will create mechanisms for action (e.g. selling mosquito nets, distributing condoms, and offering home health checklists) linked to specific learning activities present in the environment. The extent to which these mechanisms are successful provides a reasonable proxy for measuring behavioral change.
The final level is the holy grail for the Intelecenter, but is possible and measurable if levels one through three have been achieved.

**Level 4: Health Outcomes**

Health data regarding a combination of absolute incidents relative to benchmarks and percentage change over time provides the Operator with the ultimate measure of the Intelecenter’s value. For example, should the incidents of malaria per capita in Kamuli decrease significantly relative to comparable villages, it is likely the Intelecenter’s efforts to educate regarding malaria have been successful.

Naturally, one cannot ignore exogenous variables when trying to link changes in health outcome metrics to the performance of the Intelecenter. Nonetheless, when carefully applied, such measures provide the clearest indication of value.

Additionally, multiple qualitative studies will provide texture to survey results. Researchers can follow individuals over time through their Intelecenter experiences and examine both a) the extent to which the individual can achieve their original objective and b) the ways these objectives evolve through their interactions.
OUR CONCLUDING THOUGHTS

The prospect of increasing health knowledge and access to health information in Kamuli is exciting. While implementing this technology in a solitary kiosk within the UDS Telecenter would allow individuals to access health information, it would not create the cultural shift, learning and community impact that a redesign of the space would have. We feel that expanding the vision to create a health-based telecenter in Kamuli will not only provide more opportunities for the telecenter’s users, but will also allow Intel to play a significant role in proving that ICTs can indeed solve the health challenges of underserved populations. The Intelecenter can become a “best practices” model and training facility for other telecenter operators to learn about what works, what doesn’t work, and how a more holistic and targeted approach can lead to improved health outcomes.
APPENDIX

Appendix A: Education 303X

Designing Learning Spaces (Education 303X) is a project-based, collaborative course that gives students the chance to integrate learning principles into the design of specific spaces for real clients and develop a rubric to assess the impact that spaces have on learning. Throughout the quarter, we studied how various spaces were designed to maximize learning for individuals of all ages.

Appendix B: Design Team

We are six Stanford graduate students with interests in education, design, learning, technology, and business.

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Degree and Program</th>
<th>Class Year</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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Appendix C: Design Process & Timeline

Our Design Process

- **Understand**
  - Learn project goals and scope
  - Read available project documents
  - Meet with Muki Hansteen-Izora (Intel Project Sponsor)

- **Research**
  - Research information about Uganda and Kamuli
  - Research Telecenter movement
  - Learn about UDS Telecenter
  - Understand cultural context

- **Brainstorm**
  - Discuss ways to split group (Individual vs. group users)
  - Create NABC
  - Create personas and scenarios
  - Research theories of learning space design
  - Dream features and services – no limits

- **Validate/Assess**
  - Meet with Andrew Mwenda
  - Visit Plugged In (in EPA)
  - Online research of UN agencies and sites
  - Online research - virtual telecenters

- **Design**
  - Explore various methods of presentation – Second Life and Google Sketch
  - Revisit personas and scenarios
  - Evaluate features against learning theories
  - Create and review models, features
### Timeline*

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday, April 25, 2007</td>
<td>3-5pm</td>
<td>Meeting with Muki</td>
</tr>
<tr>
<td>Sunday, April 29, 2007</td>
<td>7-10pm</td>
<td>Team Brainstorming Meeting: Refining the scope of the project and determining the deliverable</td>
</tr>
<tr>
<td>Sunday, May 6, 2007</td>
<td>7-10pm</td>
<td>Team Brainstorming Meeting: Thinking about how the space has and could be used, the types of people that would come, what constraints we will work within</td>
</tr>
<tr>
<td>Wednesday, May 9, 2007</td>
<td>5-7pm</td>
<td>Small Team Working Session: Brainstorming how individuals will interact in the telecenter</td>
</tr>
<tr>
<td>Thursday, May 10, 2007</td>
<td>4-6pm</td>
<td>Small Team Working Session: Brainstorming how groups will interact in the telecenter</td>
</tr>
<tr>
<td>Sunday, May 13, 2007</td>
<td>7-9pm</td>
<td>Team Brainstorming Meeting: Bringing together ideas for the space to maximize learning of both groups and individuals</td>
</tr>
<tr>
<td>Thursday, May 17, 2007</td>
<td>3:15-4:45pm</td>
<td>Outlining Report and Presentation Meeting</td>
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<tr>
<td></td>
<td>6-8pm</td>
<td>Detailing Personas and Scenarios</td>
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<tr>
<td></td>
<td>8-9:30pm</td>
<td>Researching Learning Theory</td>
</tr>
<tr>
<td>Sunday, May 20, 2007</td>
<td>7-7:30pm</td>
<td>Team Brainstorming Meeting</td>
</tr>
<tr>
<td>Wednesday, May 30, 2007</td>
<td>4:30-11:30pm</td>
<td>Team Meeting: Discussing features of the final proposal, Completing the Sketch-up Model of the telecenter, Planning the class presentation</td>
</tr>
<tr>
<td>Sunday, June 3, 2007</td>
<td>8-10pm</td>
<td>Team Meeting: Reviewing final paper, Editing</td>
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*Timeline does not include individual time spent on project such as interviews, research, emails, telephone conversations, etc.*
Appendix D: Personas and Scenarios

One of the challenges we faced during this project was finding ways to understand the user at a level that could influence the design of the space. Given that none of the members of the team had ever been to Uganda, we were certain we did not know enough. We addressed this challenge initially by creating Personas based on two target users of the telecenter. The first is a local nurse, Dembe, who uses the Intelecenter for professional development, and the second is a secondary school student, Kwesi, who uses the Intelecenter to check email and surf the web. We used Dembe’s scenario to guide our design for group learning such as taking a professional development class with others. We used Kwesi’s scenario to guide our design of individual telecenter users as well as key features to drive engagement opportunities for younger clients. After constructing the personas and scenarios we were able to validate them with a Ugandan Fellow at Stanford. The feedback we received allowed us to better understand aspects of Ugandan culture that had previously eluded us - approach to learning about health as well as degree of comfort with technology.

Dembe’s Persona

Dembe is a nurse working in the only medical clinic in Kamuli with emergency medicine capacities. The clinic is a level IV center and is affiliated with Rubaga, the Kamuli Mission Hospital. She is expected to work in several different areas of the clinic, but prefers and feels some expertise in the area of pediatric nursing. She finds her work with children with HIV/AIDS particularly rewarding.

She has wanted to be a nurse since ever since she was young child, when both her mother and father were diagnosed with AIDS. Her father died when she was eight, and her mother died when she entered nursing school directly after secondary school. She is 27 years old and has been a nurse for 5 years. She still feels enthusiastic about her job and is happy that she is able to make a difference in people’s lives, the way one sympathetic nurse made a difference in hers. She is sharp and quick to make decisions, and has a soft and caring bedside manner that her colleagues admire. She is dedicated to reducing the high incidence of infant mortality in Kamuli and is eager to share her knowledge with the young mothers and the children in her care. She has been having a particularly difficult time convincing the women to come to the clinic for regular prenatal care and to deliver their babies rather than delivering at home; it’s almost as if they don’t consider themselves “real women” unless they can push the baby out on their own. She remembers feeling the same way at some point but now understands the dangers, especially when the labor is complicated.

She has two children, Kizza, who is 3 years old, and Kwame, who is 5 months. She is very busy. When she is not at work she takes care of her children and her husband, David. Her children are in the care of her mother’s sister while she is working. Her husband works hard at a remote factory in Jinja and is often away from home due to long working hours and the travel time (Jinja is a little more than one hour away from where they live).
Dembe’s energy and alertness at work belies the fatigue she feels when her workday is done. Only her family sees how tired she really is from her responsibilities at home and the pace she keeps at work. She often has to be away from them for days at a time when she travels to some of the rural clinics. In fact, next week, she is scheduled to spend four nights on Bavuma, an island on Lake Victoria where there is no permanent medical clinic. The last time she was there, she and her colleagues must have easily seen 1000 patients. Those visits are particularly difficult for her because there isn’t enough time to carefully examine anyone. She has to use her instincts to quickly determine what is wrong with each patient and dispense the necessary tablets. People refuse to leave without some medicine – many had traveled far and placed great faith in the healing power of medicine. If she sent them away without a prescription, they would just join the line again and hope to get someone else who would prescribe something.

Dembe is known for her cautious manner, and likes to be well prepared before tackling new or challenging activities. When she has a question at work, her first impulse is to ask Mussa, the supervising nurse with whom she is very close. Mussa has more than 20 years experience and is a valued resource in the community. On rare occasions, Mussa will direct her to the manuals to find the answers she is looking for, but this is not Dembe’s first choice for finding information. She finds the manuals somewhat removed from reality, frequently out of date, and cumbersome to use. Dembe feels similarly about technology, and has a hard time using computers. Although she is getting better at checking email and keeping in touch with her relatives in Mbarara, she doesn’t feel comfortable using the computer for anything else. She knows she needs to become more familiar with the technology if she is going to continue to excel at her job. She enjoys the role her clinic plays in the community and the interaction she has with her neighbors as a result of her work there. She wishes she had more time to visit with her friends, however, but social time is nearly impossible with such a busy home and work schedule.

**Dembe’s Monologue**

Good morning, my name is Dembe. I’m a nurse at a medical clinic in Kamuli. I made two trips to the telecenter before it was rebuilt. Both times it felt hot and small and dark inside. Yesterday I went to the new Intelecenter. There are certain classes we have to take to keep our certification up to date with the Ministry of Health. The classes used to be held in the evenings at Rubaga, the Kamuli Mission Hospital, but now they are taking place at the Intelecenter. I brought my daughter with me because my husband was on his way to work overnight in Jinja.

I couldn’t believe how much it had changed! The building was air-conditioned and Jeffrey, the Director, brought me some cold water and showed me where I could get some more. He also showed Kizza the toys in the box where she could play and there was someone there to watch her as I took my class. At first I didn’t know where to sit in the classroom because there weren’t any desks. The teacher told me we would be working together and I should sit at the table, so I did. There were 3 other people in the class, so we all sat at one table together. I’ve never been to a class like that before. First I should tell you, we were learning about resuscitation methods for newborns. Did you know that over 60% of babies who die of suffocation could be saved with a simple tool called a valve-bag-mask?
The teacher showed us a video on a very large screen, which talked about the masks and showed us how to use them. As the video played, we wrote down the procedure on a whiteboard with magic markers we could erase. It helped me to remember to see the words on the board. After we took a brief break to use the restroom and to get snacks, the teacher went to a cabinet and brought back one of the masks we had seen in the video along with a doll newborn that was made to breathe just like a real one. We each got to practice using the mask on the baby to make sure we were doing it correctly. I felt a little strange the first time I did it in front of everyone else, but we laughed a lot and that made it fun. Plus I think it will be a lot less scary when I have to use the mask on a real child who might be dying.

All this time, I was watching Kizza through the window of the classroom. She went inside and outside, playing with the toys. Afo was watching her so I didn’t worry about her.

After we practiced with the mask, it was time for us to take a test, but it wasn’t like written tests I’ve taken before. Our teacher used a machine to call the Certification Supervisor at the Ministry of Health in Kampala. We could see her on the screen and she could see us. We could also see another class that was happening in Bavuma with two other nurses. The Director observed each one of us using the mask for our certification and then we were allowed to ask questions. The teacher in Bavuma was able to answer one of my questions about preventing the spread of infection.

The end of the class came very quickly. We were given certificates for completion and had our photos taken with our new diplomas. I guess Jeffrey is going to hang them on the wall at the entrance. I will be famous! I’d like to go back there for more classes. It was very comfortable and I learned more than I learn from books and one teacher, and I was happy to see Kizza playing with people from the village.

**Kwesi’s Persona**

Kwesi is a 15-year-old secondary school student who was born and raised in Kamuli. His favorite subject is mathematics and he is an avid sports fan. Like all of his friends, Manchester United is his favorite football team and he often pretends to be Patrice Evra, Manchester’s newly acquired defender from Senegal, when they play football after school. Kwesi has 3 younger siblings (2 sisters, Namazzi and Nantale, and 1 brother, Akello). Kwesi dreams of attending Makerere University in Kampala and studies hard to make sure he can accomplish his dreams. It is very difficult to be admitted to Makerere, as it is the biggest university in Uganda and one of the best in all of Africa. Although his parents’ dream of him becoming a doctor, he is not sure what he wants to study. However, he knows that Makerere will open many doors for him. His father is an office worker at Citizen Link Development Project, a local NGO, and his mom prepares food for the kids at the elementary school and digs the family land.
Kwesi’s parents have made many sacrifices to ensure opportunities for Kwesi and his siblings’ success. Kwesi is very grateful for their sacrifice and works hard in school to make them proud. He is intrigued by technology, but he has very limited access to it. He often spends what little money he has to go to the local telecenter to do homework, play computer games and follow English sports and pop music. There aren’t usually many kids his age at the telecenter so he doesn’t really interact with anyone there. He often just emails his friends in Kamuli, looks up sports scores, and learns about new music for about 30 minutes. He would like to spend more time on the computer, but he cannot afford it. His favorite web addresses at the moment are www.mak.ac.ug, Makerere University’s website, and www.manutd.com, Manchester United’s official website. When he is at school, he daydreams about what he is going find on the web the next time he goes to the telecenter.

Kwesi’s Monologue

Hello! My name is Kwesi. I am 15 years old, and I am in the fourth form at the local school in Kamuli. I go to the telecenter to play soccer outside, and video games on the computers. Sometimes there’s a health quiz on the computer and if we find the answers we get free time on the computers or a free snack in the courtyard. They also show soccer matches there. Before the game, sometimes they have a short advertisement about health. I liked the last one because it was David Beckham talking about mosquito nets and malaria.

From one of the quizzes, I learned that 25-40% of all medical visits in Uganda are because of malaria. When I grow up, I’m going to Makarere University to become a doctor and help people who have malaria and other diseases get better.

Appendix E: NABC

**Needs:** Our client is Intel’s department of health education in developing countries. The Intel HED group’s goal is to bring health education and services to the outer reaches of developing countries around the world. This project is focused on a specific telecenter in Uganda that is owned and operated by UDS. Intel’s needs are to design opportunities for health education in the existing telecenter in Kamuli. Intel is targeting health care workers as well as the general public as the primary audience. The initial market size will be the town of Kamuli and its surrounding residence, Intel would like to keep an eye on further expansion/scalable opportunities to other regions of Uganda as well as other countries such as India.

**Approach:** We plan to initiate a complete center redesign to optimize the space to include health learning for both group and individual learners. We will restrict the center's footprint to the current real estate, but otherwise do not intend to limit our creative use of materials, technology, and human resources in our design. We aspire to create an end product that will serve as a point of inspiration for our client, not a final design for wholesale implementation.
Our design focuses on creating four distinct spaces, using the following verbs as our framework: CONNECT, LEARN, CREATE, EMPOWER (telecenter.org, From the Ground Up). For community events and informal gatherings, we will revitalize the courtyard. For individuals who prefer traditional media, we will expand the library to include both health-related material and quiet reading space. The store will serve both in-house customers as well as passing traffic on the thoroughfare. Finally, we will create a customizable learner space that - via a sliding wall - enables simultaneous individual and group classroom use. When the wall is collapsed, the space can be used as an expanded classroom or as an expanded individual computer café. Given the sensitivities regarding health content, we plan to include several innovations (e.g. computer monitor shields, headphones) that improve privacy. Additionally the learner space will be designed for comfort and to scaffold tech understanding to minimize barriers to learning about health.

**Benefits:** Intel will provide improved computing resources allowing users to access more complete health resources. Improvements to technology, aesthetics, and comfort level will benefit all users. Benefits for individual learners include: increased health care knowledge, ability to research health topics in privacy, and increased potential for social exchange and learning around healthcare and other topics. Benefits for groups of learners (especially healthcare workers) include: setup that accommodates large and small class sizes, incorporation of physical artifacts to aid in healthcare demonstrations, and learner-centered classroom design that encourages active, participatory learning.

**Competition:** While it is difficult to assess the competition in a village and country none of the designers has ever visited, we believe that the combination of services and amenities offered in our design of the telecenter will uniquely appeal to health care practitioners as well as the general public. It is our understanding that at least one other telecenter exists in Kamuli that provides roughly the same services that the UDS telecenter currently provides. In addition, as the telecenter movement grows, other technology organizations, both national and international, are entering the field with a vision to use technology to improve the quality of health care services in Uganda. As a result, our approach to the redesign of the UDS telecenter incorporates flexibility and a wide variety of applications, such as a collaborative learning classroom, a storefront, a library and a communal gathering place. The CHES group has researched telecenters around the world and found that they offer many services, including continuing education, Internet access, banking, guest rooms, and tutoring, among others. We believe that by improving the services already offered at the telecenter and introducing a number of new services, we will provide an engaging, comfortable and eminently useful center for our clients.

Competition from other telecenters is certainly one factor that can impact this project. However, we believe that sustainability is an even bigger challenge. A great number of telecenters in Uganda and other developing countries have had to close their doors because of limited funding, high costs, lack of use, staff turnover and limited training, as well as donor/investor pull-out. Since Intel’s commitment to UDS will end after two years, our challenge is to incorporate design strategies that enhance community involvement and participation, thereby ensuring the telecenter’s sustainability after Intel’s departure.
Appendix F: References


Shulman, L. Making Differences: A Table of Learning. From the e-library of The Carnegie Foundation for the Advancement of Teaching.

Websites:

BBC News website - http://news.bbc.co.uk/


From the Ground Up, The Evolution of the Telecentre Movement - Telecentre.org

Kamuli District website – http://kamuli.go.ug

My Uganda website - www.myuganda.co.ug

Reuters Foundation – Alert.net website - www.alertnet.org

Uganda WHO/AFRO Health Centers, Updated July 17, 2001 http://www.afro.who.int/uganda/healthsytems.html