Women's Empowerment through Increased Access and Understanding of Technology

An Interactive Qualifying Project submitted to the faculty of Worcester Polytechnic Institute in partial fulfillment of the requirements for the Degree of Bachelor Science.

The digital divide in access to and understanding of computers is an issue for developing communities worldwide. This divide is exaggerated by unequal opportunities for adult women to advance their Information Technology (IT) skills. This project sought to empower members of Sizakuyenza's Women's Networking Group (WNG) by addressing this digital divide in the township of Philippi, Cape Town. Our team facilitated a pilot technology training programme, taught by a small group of co-researchers in a peer learning-based environment, and used the knowledge of the WNG to create an asset map of technology access points in local communities. We developed a proposal to obtain funding for programme continuation and to establish a new technology access point at Sizakuyenza. Our hope is that increased opportunities afforded to the WNG as a result of this programme are the start of a positive shift in the reach of new kinds of technology into the greater community.

This is an executive summary of a WPI Cape Town Project Centre project that is fully reported at **http://wp.wpi.edu/capetown/projects/p2015/sizakuyenza/**

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Opportunity Statement

Addressing the Digital Divide

Many South Africans have experienced a digital divide as the influx of new types of technology in the last two decades have intersected with social, political, historical, and economic inequalities. Dijk and Hacker (2003) suggest that the divide exists as a result of lack of interest, possession, skills, and usage opportunities. For the purposes of this project, we have defined access as possession of technology and understanding the skills needed to use it. According to a 2011 Cape Town census, roughly 90% of the population owned cellphones and 40% a computer, and around 50% had access to the Internet (City of Cape Town, 2011). The digital divide has been identified as particularly evident in poorer communities (Dijk & Hacker, 2003), especially among adult women in South Africa (Martineau, 1997). Community members within Philippi, Cape Town, a historically disadvantaged township highly affected by unemployment (City of Cape Town, 2011), have identified a desire to increase access to and understanding of new types of technology with hopes for empowerment and changes in their community.

This project sought to address these issues using the strategies for increasing access and understanding detailed in the project overview seen in Figure 1. The major deliverable of this process was the proposal for the Technology for Women's Empowerment Programme (TWE Programme). This was created based on the successes and failures of a pilot technology training programme, which utilized peer and project-based learning, and an exploration of available technology in the community through the creation of an asset map and informal IT learning lab.

Background

Challenges and Opportunities as a Result of Technology

In order to inform the methods for addressing the digital divide, we looked at research and case studies that explore these issues in areas similar to the townships of Cape Town. Certain communities have been left behind as the world grows in its access to technology, but have creatively adapted to the changing circumstances. A community in Bangladesh is one area where the growth of technology elsewhere has been a cause of problems for skilled laborers. Fishermen in the community were no longer able to provide for themselves in the roles they once knew as a direct result of not being able to keep up with new techniques (Faruque & Dhaka, 2015). The solution proposed was an Information Service Centre, set up by the community, where they could learn and teach technology with other community members, as well as have interactions and discussions. This is just one innovative way that groups can integrate changing technology into their lives, and show that these "gaps" in technology access are also opportunities for growth.

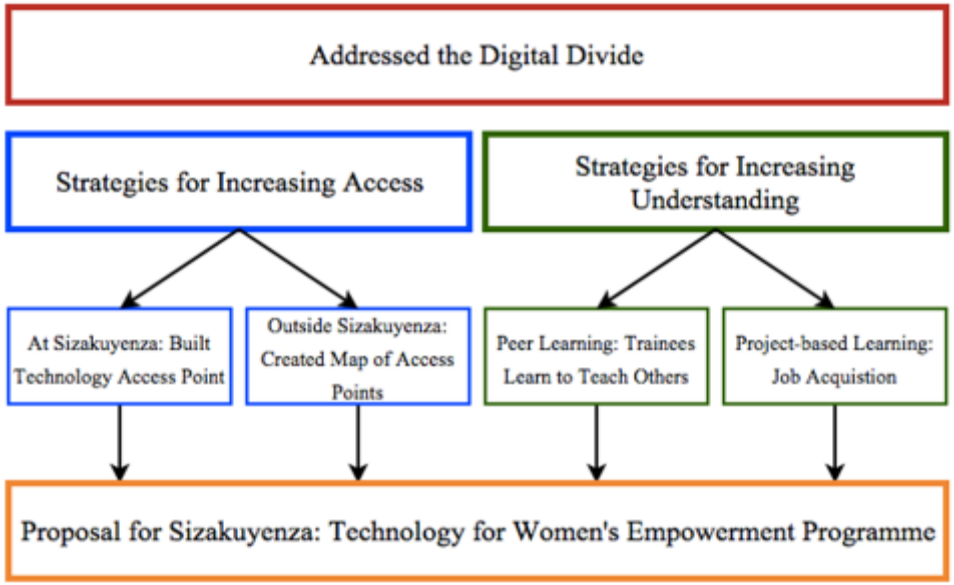


Figure 1: Project Overview

Technology Usage and Availability in Cape Town

We collected insight from public and private agencies to better understand the current technological climate members of the

community we worked in experience. Since the access to cell phones has been significantly higher (City of Cape Town, 2011), the majority of technological developments happened with cell phones. However, programs exist to increase knowledge and accessibility of other forms of technology for the general population. E-Powering the People has set up multiple free technology access points across Cape Town (Valentine, 2014). In addition, there are 101 public libraries and numerous mobile libraries that are not part of the E-Powering project, but still offer Internet and computer access for no cost (Community: Cape Town Libraries, 2015). In the private sector, Silulo Ulutho Technologies is an Internet café and training centre chain found in many cities including the townships of Philippi and Khayelitsha in Cape Town and others across Eastern and Western Cape. These cafés are not free, so consistent visits are an expensive form of access for the community. While cell phones make up the majority of technology in Cape Town, changes are being made to diversify the types of technology available to allow more people access to these resources.

Adult Learning Philosophies and Strategies

In order to create a base programme for increasing technological understanding, we looked at alternative teaching methods that would help us to approach the divide. Research has shown that to effectively teach adults, it is important to make careful considerations that allow for departure from rote schooling methods that children often experience in classrooms. A change in perspective is necessary to facilitate successful learning later in life. Adults in particular needed to have much more self-motivation than young people, allowing them to share their knowledge with the community and serve a higher purpose (Mezirow, 1981). Making topics interrelated has allowed for a better level of understanding and not just memorization of given tasks. This shifting perspective could not only change the way one viewed their education, but the way a student lives their life (Eisenberg, Johnson, 1996). In "Pedagogy of the Oppressed," Paulo Freire (1970) offers a similar idea, which states that the result of education should be an increased desire by the students to learn, instead of just knowing more information, resulting in a process where the students seek to teach themselves. This monumental change often brought about fear, self-doubt, and a sense of alienation. To combat this, it was important to learn in groups to promote solidarity and support among the group while perspectives and relationships change (Mezirow, 1981). To increase the likelihood that adults will successfully gain knowledge, the learning process should relate to opportunities that impact the community as a whole.

Asset Mapping

As a method for addressing the perceived lack of access to technology in the community, we looked at asset mapping as a way to visualize connections to technology in communities. Asset mapping focuses on mapping social entities as well connecting them to the physical environment around them (Safiullin et al., 2014). This method can be used as a community development process, where members use their knowledge to identify the assets; this both relies on and draws strength from the direct

involvement of the partnering community members. Asset mapping takes into account both the physical and social environment, encouraging mappers to get more involved with the service providers in their communities and raise awareness of both where they are located and what they have to offer. Interactive Community Mapping (ICM), a method that focuses on community involvement, helps to empower mappers and aid them in becoming leaders in their community by addressing the problems that motivate people to continue mapping (Vavilina and Skalaban, 2014). The Open Development Technology Alliance's model of ICM and its participatory nature allows community members to be heavily involved in the mapping process and learn skills relevant to leading their community (Shkabatur & Kumagai, 2014). Community involvement is a crucial part in the creation of an asset map that not only increases the value of the map, but also has a wealth of benefits for those involved in making the map.

Mission Statement

This project was intended to empower members of Sizakuyenza's Women's Networking Group through increased access to and understanding of technology. This mission was achieved through these four objectives:

Objectives

i. Foster relationships to better understand the nature of the digital divide in this community .

ii. Develop tactics for peer based IT learning.

iii. Collaborate to build an asset map of technology access points.

iv. Create a plan to turn the pilot learning programme into the Technology for Women's Empowerment Programme and set up a technology access point at Sizakuyenza.

Methodology

We first built relationships with our co-researchers through sharing photos, games, food, and stories. It was only after this that we were more comfortable asking them questions about their current knowledge of computers and smartphones, what technology they have access to, and what they hoped to learn. After discussion, we collectively decided to start with essential computer skills.

The setup for the pilot training programme is shown in Figure 2. By working closely with a small group of peer teachers, knowledge diffused throughout the WNG. These peer teachers worked to guide the pilot trainees in a project-based learning environment with obtaining jobs as the theme of the sessions. These activities also sought to strengthen the connection of the WNG.

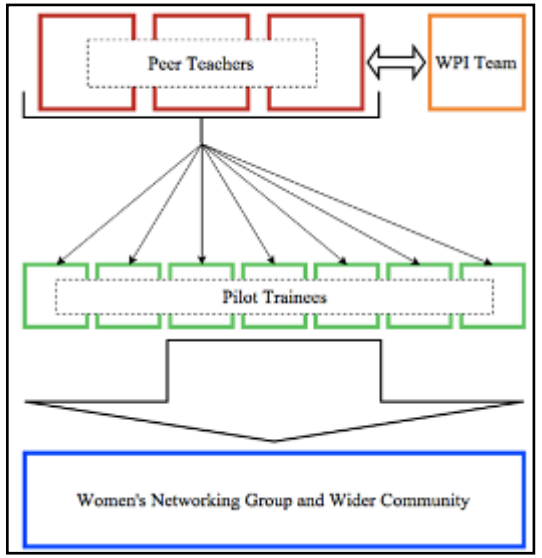


Figure 2: Teaching model developed to create a flow of knowledge to the entire Women's Networking Group

Alongside our sponsor liaisons, we assessed the scope of the asset map by considering both its physical area and the types of resources it would include. We collaborated with our co-researchers to find a mapping method which best met the group's collective needs. Figure 3 details the method used to build the map of

technology access points.

To create a continued peer learning experience, we planned for the continuation of our pilot programme after we left. We developed this plan into a proposal for funding based on conversations with our sponsor and our observations in the programme that we facilitated. The central idea of the proposal was to increase both understanding and access in relation to technology through creating a technology access point at Sizakuyenza where past participants in the training programme would teach others.

OUTCOMES

This section explores the outcomes of the project that led to the creation of the final Technology for Women's Empowerment Programme. We discuss both tangible and intangible outcomes of the project , and reflect on things we might have done

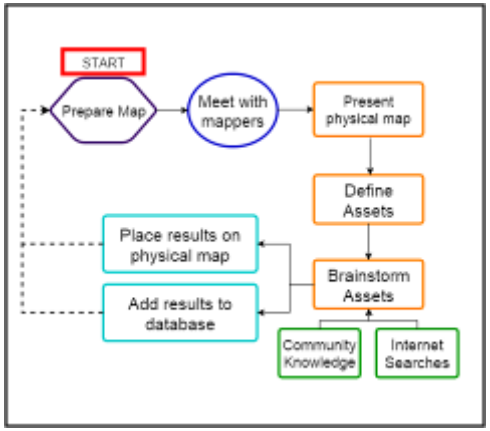


Figure 3: Complete mapping method

differently in light of what we learned through our engagement. Initially, we expected that the technology learning would be used to build an asset map for Sizakuyenza. However, as the content of our map changed and the plan for the map changed with it, the women showed an increasing interest in the IT learning aspect of the project. Through this, it became evident that the IT programme could develop far beyond our time here. Writing the proposal for funding turned our seven week programme into a sustainable plan for increasing access and understanding for the members of the WNG.

This tangible outcome is a result of the qualitative awareness of the community. By building on the pilot program and asset map to increase understanding and access to technology, we were able to create a plan for the programme. All of this was made possible through our relationships with co-researchers, sponsor liaisons, and members of the WNG.

Reflecting on Relationships: Insights Gained and Lessons Learned

The relationships with our co-researchers were very important to the progression of our project, and importantly, our personal growth. The relationships with the peer teachers and pilot trainees helped us see through the eyes of people who experience disempowerment. We considered both how disempowered they felt when initially using a computer and how their abilities to sing together in a language we didn't understand made us feel disempowered. Riding with Sylvia, one of our co-researchers in the teaching group, to work every day developed these relationships further. We engaged her in small group conversations where we learned about her life, including the struggles of finding a job and getting transport to the job site. The friendship we developed with Sbu, our fourth co-researcher and interpreter, helped us learn from the similarities that came with being roughly the same age and grow as people from learning about his life and the everyday realities that come with growing up in Philippi. In addition to these positive relationships, there were moments of raw emotion, including a "moment of silence" where everyone sang and read the bible together. While we worked at

Sizakuyenza, four people close to those we worked with passed away, and it became numbing to see how frequently, yet how well, the people in this community dealt with something so harsh. We will never understand what the people we worked with have been through or what they will go through, but just seeing glimpses was enough to realize how resilient they are.

Increasing Understanding through Peer and Project- Based Learning

The most obvious result of the technology trainings was that the women left with a set of skills essential to operating computers. These skills included:

- Starter Computer Skills: powering on

a computer, mouse and keyboard operation, and navigating windows and file browsers

- Internet Skills: navigating webpages, troubleshooting problems, Google, G-mail, and Facebook
- Microsoft Word: skills associated with preparing a Curriculum Vitae

The structure of learning, as seen in Figure 2, began with our team working alongside the peer teachers to prepare for the sessions with the pilot trainees. This gave the teachers time to practice their teaching skills and gave the pilot trainees the chance to learn in Xhosa. This facilitated a peer-based learning environment.

In order to build structures in the training sessions, we used job acquisition as the focus of a project-based learning strategy. By creating CVs and email addresses, the women saw the benefits of what they were doing in a relevant context. Despite the success found with this form of project-based learning, there were times, such as navigating the mouse or windows, when we found ourselves unable to incorporate this model and relied instead on more simple, one-sided teaching methods, with us in the role of teachers. It became clear, however, that this traditional teaching method, especially focused heavily on computers, was a very clichéd scenario and disempowering for our co-researchers. We considered what would have happened if we had started the program using cell phones, and tried to find ways to incorporate them into our trainings on skills that would help the women obtain jobs. By revisiting other objectives, we found that most of the women already use their phones extensively. Through these conversations we developed the idea of expanding awareness of access to other types of technology in the community.

Increasing Access through Asset Mapping

The asset map of technology access points was created to promote continued computer access for all members of the WNG as well as exercise the practical skills learned in the pilot programme. We established a mapping area after learning that WNG are spread throughout Greater Philippi and Khayelitsha, two of the largest townships in Cape Town. The women built initial familiarity with the map by marking where they live, and quickly oriented themselves, finding their neighborhoods by recognizing major roads. The women developed their bearings further by marking schools and shopping centers. By using these landmarks, it was easier to use addresses and Google Maps together to locate assets. Due to limited time, we got a smaller number of assets on the map than originally expected, but this map lent itself to continual updates. In order to make the map easy to update, it was composed of three physical maps, each representing a different community, and a Microsoft Excel database available on Sizakuyenza's computers.

Understanding and Access Sustainability: From Pilot Programme to Technology for Women's Empowerment Programme

The sustainability of the understanding gained in the pilot programme originally relied on the manuals we created, which provided picture-based explanations of the concepts the women learned. Throughout the programme, it was made evident that consistent access to computers for skills practice was necessary. A partner organization of Sizakuyenza, Blue Sky

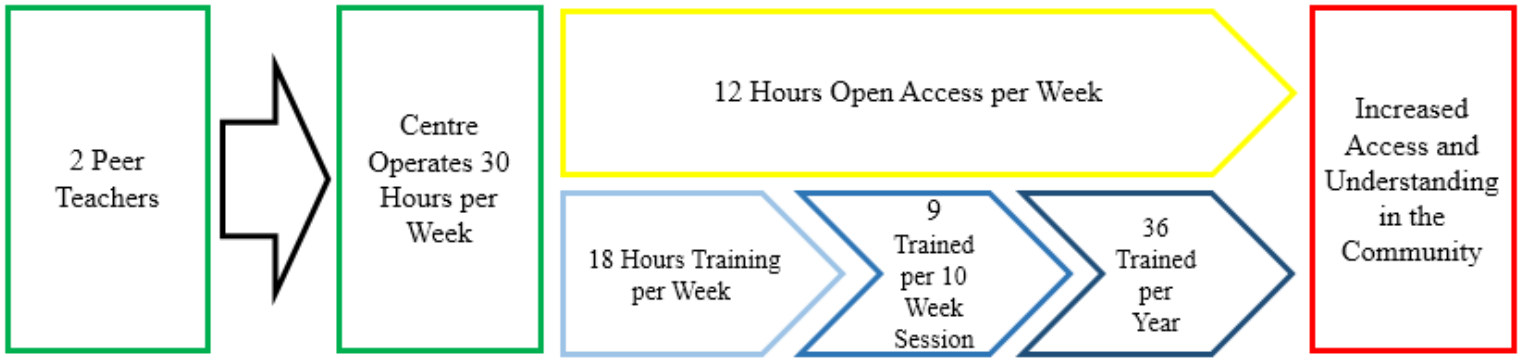


Figure 4: Project implementation plan

Recycling, gave us three computers to refurbish that we made available to the WNG by leaving them in the Inyanda Youth Network Shipping Container, located on the same property as Sizakuyenza. These computers became the beginning of the Technology for Women's Empowerment Programme, which was extended through a proposal we prepared to apply to a European Union sub-grant for women's empowerment programmes. This would provide money for more computers, continual maintenance, space rental, and a salary for some of the peer teachers and pilot trainees to continue training members of the WNG. This programme will provide opportunities for peer teachers and pilot trainees to become leaders of the center, running the training programs and providing opportunities for members of the WNG to type their CVs and search for jobs online. The proposal included:

- A plan for implementation with comprehensive schedules, explained in Figure 4
- A two-year budget that took into account salaries, space rental, new machines, machine maintenance, and possible limited funding.
- A vision as seen by our co-researchers, the Sizakuyenza management team, and ourselves:

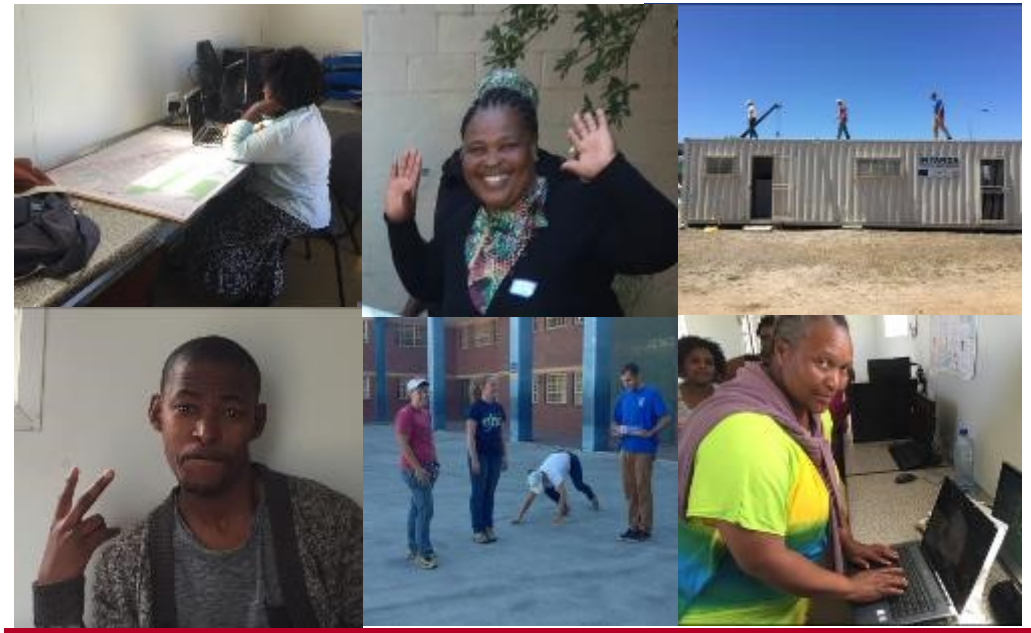
Our vision for this programme is that women will be empowered through the development of technological skills and see the opportunity to build upon the strength of women in family, community, and wider society. This can open new opportunities for them economically and as individuals and leaders in South Africa's social transformation.

Conclusion

This project was successful in increasing the ability of the Women's Networking Group to understand and access new types of technology. It was with the passion and cooperation of our co-researchers that we were able to set up a sustainable method of teaching, build a map of technology access points, and create a proposal for Sizakuyenza's very own technology training access point.

This project was just the beginning of what we see as a larger movement. The WNG has a strong interest in learning and developing these skills, and the map will play an integral role in their ability to locate consistent access to technology near their homes. If the funding sought out through the proposal is secured, the opportunities will grow; there will be consistent access and training sessions almost exclusively available to the WNG offered at Sizakuyenza. This programme also has the ability to continually empower and employ more women by providing opportunities to type their own CVs and search for jobs and to potentially be employed as an advisor of the training centre. The increased opportunities afforded to the Women's Networking Group as a result of this programme is the start of a positive shift in the reach of technology in the greater community.

Women's Networking Group: Vuyiswa Xati, Nosbongile Dube, Sylvia Ngobe, Thandi Ndlebe, Nonkanyiso Ndamase, Bukiwe Feya, Thembisa Moketsi, Ether Yalezo, Nomfezeko Kubane, Lulama Soyikwana



References

City of Cape Town. (2011). Retrieved September 5, 2015, from http://www.statssa.gov.za/?page_id=1021&id=city-of-cape-town-municipality

Community: Cape Town Libraries. (2015). Retrieved September 5, 2015.

Dijk, J. & Hacker, K. (2003). The Digital Divide as a Complex and Dynamic Phenomenon.

Faruque, & Dhaka, A. H. Information Technology Services for Rural Communities of Developing Countries Towards Poverty Alleviation.

Freire, P. (2000). Pedagogy of the oppressed. Bloomsbury Publishing.

Geddes, G. (2006). Old dogs and new tricks: teaching computer skills to adults.

Martineau, R. (1997). Women and education in South Africa: Factors influencing women's educational progress and their entry into traditionally male-dominated fields. Journal of Negro Education, 383-395.

Mezirow, J. (1981). A critical theory of adult learning and education. Adult education quarterly, 32(1), 3-24.

Safiullin, M., Ermolaeva, P., Yermolaev, O., & Selivanov, R. (2015). Current Perspectives on Social Mapping of Urban Territories. Asian Social Science ASS, 207-213.

Shkabatur, J., & Open Knowledge Repository. (2014).Interactive community mapping: Improving service delivery and empowering communities World Bank, Washington, DC.

Valentine, S. (2004). E-Powering the People: South Africa's Smart Cape Access Project. Council on Library and Information Resources. From http://www.clir.org/pubs/reports/reports/pub125/pub125.pdf

Van Dijk, Jan, and Kenneth Hacker. "The Digital Divide as a Complex and Dynamic Phenomenon." The Information Society (2001): 315-26. Print.

Vavilina, N., & Skalaban, I. (2013). Social mapping as a tool for public participation. Regional Research of Russia, 66-72.

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