

Sustaining a Nepali Telecenter: An Ethnographic Study Using Activity Theory

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ABSTRACT

While advances have made it possible for the average Nepali to access mobile phones, computers, and digital cameras, barriers continue to impede access. Like other governments, Nepal responded in 2004 by creating about 80 telecenters to push sustainable technology to its people. Five years later, most telecenters struggle with sustainability. This ethnographic study explores tensions youth face when using a telecenter located in Sankhu, Nepal, a Newari village 20 kilometers southeast of Kathmandu. To understand the complex tensions, an ethnographic approach was adopted as the method for data collection. Given the nature of the problem, Activity Theory was used as a framework for analyzing and understanding the tensions. Tensions are categorized in order of frequency as they appeared in the data. Major tensions included gender norms, generational distrust, lack of awareness, and funding. Moderate tensions included lack of training and time. Minor tensions were location, power, and connectivity.

Keywords: *Telecenter; Nepal; ICT; Ethnography; Activity Theory; Tensions*

INTRODUCTION

Nepal and Technology

Developing countries such as Nepal struggle to keep up with 21st Century technology. While advances have made it possible for the average Nepali to access mobile phones, computers, and digital cameras, barriers continue to impede access. Like other governments (Huerta & Sandoval-Almazan, 2007) (Mokhtarian & Ravikumar, 2002), Nepal responded in 2004 with telecenters to push sustainable technology to its people. Five years later most telecenters struggle to accomplish their purpose (Lee, 2009a).

Technology in Nepal is evolving rapidly (Lee, 2004). In many rural communities, homes do not have landlines, yet cell phone usage is abundant, cheap, and reliable. Cell towers have been built throughout Nepal so that all 75 districts have coverage. In terms of Internet connectivity, communities in mountainous regions are significantly more limited. In such cases, communities can use either SIM cards from cell phones to connect to the Internet or USB connection devices called CDMI to connect computers and laptops to the Internet (Lee, 2009b).

Telecenters in Nepal

In 2004, the government of Nepal responded to local technological needs by creating a series of telecenters in rural villages. These centers provide basic computer needs such as Internet access, email, printing and photocopying to the communities. Over time, these centers evolved to further meet community needs.

On the surface, it may appear that telecenters are successfully serving the needs of the community. However, based on nearly ten years of ongoing interaction with over a dozen telecenters in Nepal, it was apparent that most struggle with sustainability. A deeper investigation into Nepali telecenters revealed that most are youth driven and operated. Youth face the reality of a new post-civil war government and economic instability and are eager to take control of their future and embrace technology as a means of creating change. This parallels similar countries around the world where youth are looking to technology as a vehicle to mobilize support for change (United Nations, 2007). As a result, youth tend to be the biggest consumers of technology and participate the most in telecenter activities.

Like other developing countries, in Nepal, technology often symbolizes wealth. Nepali's living conditions are poor, and government instability creates a climate of uncertainty. Ownership of technology is representative of power and authority. On many occasions, donors discovered telecenter equipment to be locked up and inaccessible for the youth, who are the intended users. Male elders, who are the main decision makers for Nepalese communities, play a significant role in this struggle for control. Several telecenters reported that elders do not understand how to use technology, yet lock the technology up as a means of control (Lee, 2005).

PROBLEM STATEMENT

Anecdotal findings suggested a need for a deeper understanding of tensions within Nepali telecenters. This study focused on one Nepali telecenter by seeking to answer the research question: What tensions exist within the Sankhu telecenter? To understand the issues, an ethnographic approach was adopted as the method for data collection. Given the nature of the problem, Activity Theory (as described by Engestrom, Lompscher, & Ruckriem, 2005) was used as a framework for analyzing and understanding the tensions Sankhu youth face. As a descriptive theory, it fits properly with an ethnographic study (Spradley, 1979). The analysis of tensions will provide valuable information for improving current and future telecenter programs.

Significance of Study

The findings of this study are significant in the following ways. The findings can: inform local stakeholders in future telecenter and ICT decisions in Nepal; inform stakeholders working with ICT in other developing countries; and shed light on current cultural norms and decision making protocols in Nepali villages related to technology. Furthermore, the methodology for the study offers an interesting approach to analyzing qualitative data by looking at ethnographic data through the lens of Activity Theory.

REVIEW OF LITERATURE

This review of literature is unique due to the narrow scope of this study. Peer reviewed articles that target the specific topic of tensions within Nepali telecenters revealed very little data. As a result, this review of literature covers a wide range of topics in an attempt to illuminate the landscape of researched work on slightly broader, yet related, topics.

A background of Nepal will be shared. Then, a survey of technology in developing countries will be examined, followed by discussion on the need for technology in Nepal. Next, the review will explore Nepal's response to local needs by creating telecenters. Finally, a slightly broader exploration on how other developing countries are using telecenters as an approach to infuse technology in rural locations will shed light on the appropriateness creating telecenters in Nepal.

Background of Nepal

Nepal, with eight of the world's ten highest peaks, is a landlocked country tucked in the Kathmandu Valley of the rugged Himalayan mountains. Eighty-six percent of Nepal's terrain is identified as rural, with an agriculturally dependent economy. This dramatic landscape creates significant obstacles to education, health care, and dissemination of information. Compared to major cities, literacy rates are significantly lower in rural areas of Nepal (49% overall, 63% male, 35% female). Those living in remote mountain villages are often a day's walk from education and health services. Formal schooling is constrained by economic and cultural factors such as a need for children to work at home or in the fields and a bias against educating girls. Furthermore, Nepal is ranked amongst the poorest countries in the world with a per capita income of \$322USD. According to Nepali standards, 31% of the country lives below the poverty line (US Department of State, 2000).

Becoming a unified state over 200 years ago, Nepal is influenced strongly by China in the north and India in the south and has a 2000-year history of urban civilization. Buddhism and Hinduism peacefully coexist in the Nepalese culture. Lumbini is the birthplace of Gautama Buddha and is considered the Mecca of Buddhism and is one of four holy places of the Buddhist religion (Whelpton, 2005).

In recent years, three major events helped shape the Nepal of today. The convergence of the People's Movement for Democracy (1990), the massacre of the king and the royal family (2001), and the intensified insurgency of Maoists (since early 1990's). The later led to the resignation of King Gyanendra Bir Bikram Shah and the formation of the first democratic government of Nepal. In the summer of 2008, Nepal elected its first president, Ram Baran Yadav (Whelpton, 2005).

Nepal's multiple barriers - both economic and cultural - allow only a small percentage of its citizens to obtain education. Only 2% of the total population receive higher education. Half of that 2% drop out largely due to financial constraints (US Department of State, 2000). Remote access to learn via the Internet offers a way to reduce this barrier given that technological advances are penetrating Nepal's geographically isolated environment. As technology becomes a reality in everyday lives, access to information is accelerating the interaction between Nepalese people and other communities and individuals around the world. Compared to previous generations, Nepalese women and those in lower castes are becoming more empowered through technology (Rennie, 2007).

The Need For Technology in Developing Countries

Information and communication technology (ICT) is a key tool in narrowing the digital divide, especially for developing countries. The Internet can help the disadvantaged gain access to resources that otherwise would be inaccessible due to economic and geographic constraints. For communities with households that cannot afford technology, telecenters and community phone shops are providing access to these resources (Hafkin & Taggart, 2007).

It is said that two billion children in developing countries around the world are either inadequately educated or not educated at all. One in three does not finish fifth grade (Massachusetts Institute of Technology, 2007). The need for educational resources has been recognized by organizations like The One Laptop per Child (OLPC) team, who suggested that any country's most precious natural resource is its children (Massachusetts Institute of Technology, 2007). Developing countries must leverage this resource by tapping into the child's innate capacity to learn, share, and create. One tool to achieve this is through the use of a personal computer.

The OLPC project targeted two key concepts in developing countries. First, it addressed the issue of access. OLPC has aimed to mass-produce and distribute \$100USD laptops in an effort to provide access to technology for children in developing countries. Second, OLPC took a constructionist approach to technology integration where all children in schools will have their own laptops and a connected community will emerge (OLPC, 2007). According to Floridi (2001), only 7% of the world's population currently has access to ICT.

Castells (2004) recognized that ICT is the most significant factor separating developed and developing countries. Developing countries are encouraged to join the information age because, if used properly, ICT can promote industry and increase productivity in administration and communication. According to Pradhan and Metcalfe (2002), countries that are unsuccessful in keeping up with ICT often collapse and are unable to achieve social-economic growth.

Technology in Nepal

In Nepal, the High Level Commission for Information Technology (HLICT) created the National Information Technology Center (NITC) initiative in 2002 and thus created the first telecenters. These telecenters targeted rural areas, with a focus on those with the most marginalized access to resources. The telecenters served as public facilities for communities to access information on the Internet, print and reproduce material through the use of computers, and learn how to use technology. The HLCIT identified telecenters as a vital initiative to bridge the digital divide (High Level Commission for Information Technology, 2007).

Nepal's Telecenters

Around 2004, when Nepal was nearing the end of its decade long civil war, HLCIT created approximately 80 telecenters throughout Nepal. These telecenters were funded for two years by the Nepali government and became a valuable bridge between rural indigenous villages and the rest of the modern 21st Century world. Although the attempt to infuse technology was noble, the two-year stoppage to funding was harsh. As a result, most telecenters failed (Bhattarai, 2009b).

In 2004, the principal investigator of this study began working with 10 telecenters on approaches to long-term sustainability. Based on this experience, it was obvious that telecenters are youth driven and barriers to sustainability are much more complicated than just funding. Cultural norms, division of labor obstacles, and community opinions prohibited telecenters from reaching their full potential (Lee, 2004).

The Sankhu telecenter was one of these 10 centers the principal investigator has worked with since 2004. Although this center has overcome some of the mentioned obstacles, it continues to struggle with sustainability. According to HLCIT, community members may or may not know the benefits of technology, telecenters often times have intermittent electricity and Internet access and gender divides prohibit females from fully accessing technology (Bhattarai, 2009b). The Sankhu site clearly represents some of the tensions mentioned.

Telecenters around the World

Telecenters offer a wide variety of services for their communities. The concept of telecenters has been around for the last decade (2000 – 2009). These are primarily used in developing countries where hardships of owning personal technology exist. Many telecenters provide a means for access to information technology. They tend to be in the public sector and are operated by government bodies or nongovernmental organizations. "Generally they serve a low-income clientele and have a community development mission" (Colle, 2003, p. 388). James (as cited in Colle, 2003) comments on the significance of telecenters:

Community access centers are the way to go. In many third world countries, there is little chance to find individual ownership of all sorts of ICTs. Even mobile phones. I always come across scenarios in rural Uganda where two or three people own phones and are 'forced' to offer public commercial calling services as a result of need. Telecenters create an aggregation of ICTs and enable the general public to access them at a nominal fee and benefit from the advantages they have to offer. [Since] a number of rural folk are not exactly financially liquid, it would be good for one to explore the possibility of accepting payment for services using alternative methods, e.g. farmer X brings a heifer to the telecenter, valued at an amount of XYZ and getting the services for the equivalent. (p. 24)

As ICTs becomes a reality in the lives of those in both developed and developing countries, the Internet plays a vital role in narrowing the physical boundaries of the world. Not only does the Internet promote interaction, it has redefined learning. Developing countries have taken leaps that are unimaginable in previous times, and gained almost instant access to global knowledge (Gregson & Upadhaya, 2000).

Located in Nakaseke and Kaasangombe, Uganda, the Nakaseke Multipurpose Telecenter is regarded as one of the most visible telecenters in Africa. It was initially supported by the International Development Research Center, UNESCO, and International Telecommunication Union and hosts a library of over 3000 volumes. The Nakaseke Multipurpose Telecenter also provides access to various communication services such as telephones, photocopying, and faxing (Colle, 2003).

Other examples of telecenters also are beginning to emerge in literature. Telecenters in Ghana provide services including desktop publishing, community newspapers, sales or rental or audio and video recordings, book lending, training, photocopying, faxing, and telephone services. In Hungary, telecenters even provide postal, banking, and employment services (Colle, 2003).

Huerta and Sandoval-Almazan (2007) point out that physical access to ICTs only reduces the digital divide, a term used for highlighting the differences in opportunities to use ICT. However, when the skills to take advantage of the resources are not apparent, the digital divide still persists. Therefore, telecenters are only relevant solutions to bridging the digital divide if they address access, literacy, and computer literacy.

Literature Review Conclusion

As developing countries leapfrog into the 21st Century, technology access becomes a key factor. Like many other developing countries, Nepal responded to this need by creating telecenters. There appears to be some research done on telecenters around the world. In Nepal, technology and telecenter research is significantly less available. This lack of peer-reviewed research clearly points to a pressing need to better understand Nepali telecenters. A deeper investigation into the various types of tensions that exist within the Sankhu telecenter will begin to shed light on the various challenges telecenters face each day.

METHODOLOGY

Spradley (1979) defines ethnography as “the work of describing culture” (p. 3). Ethnographies attempt to paint the entire picture in an effort to describe, interpret, and analyze the subject of the study (Creswell, 2003). Roles of various individuals, mediating factors such as division of labor, rules, and even tools used, influence the complex web of decisions made within such an environment. Due to the complex tensions that exist within the Sankhu telecenter, the use of an

ethnographic approach was necessary to gain an in-depth understanding (Patton, 2002). Since the tensions present are complex and likely to be cultural, social, and historic in nature, Activity Theory provided a solid framework for analyzing these tensions (Engestrom, 2005). The unique approach of analyzing ethnographic data using Activity Theory allows for insightful conclusions to be drawn.

Site Selection

Located 16 kilometers east of the capital Kathmandu, Sankhu is a Newari community. The Sankhu site was selected out of convenience. It is one of 10 telecenters the principal investigator has worked closely with since 2004. The Sankhu telecenter, also known as the Sankhu Youth Managed Resource Center (SYMRC), is located in the heart of the village. This center is a common meeting place for the community. On a typical day, the center opens at 7:30 am and services over 20 people per day. The center provides computer training for local community members and has services for photocopying, laminating, faxing, Internet, and email.

SYMRC was created by HLCIT in the early 2000's and was one of approximately 20 centers created at that time. HLCIT hoped that after two years of full funding the community would embrace the concept of a telecenter and take over funding and sustainability. In the case of Sankhu, the abrupt halt to funding came as a shock to the community. Sustaining a telecenter is costly to a community like Sankhu because local villagers, like much of Nepal, makes under \$1USD per day.

In 2004, when the center was near collapse, the Sankhu youth took a leadership role in finding ways to help the center become sustainable. For several weeks, they charged local youth money to play computer games in order to pay the electric bills and rent payments. Since then, youth volunteers have found other stable means of sustainability including collecting fees for services such as Internet access, photocopying, resume writing, and computer classes.

Participant Selection

Participant selection for interviews included 43 people, specifically 32 youth ages 18-26, and 11 adults or elders. For this study, it was important that all voices were heard and that there were equal representations of age, gender, and caste. Interviewees consisted of participants who interacted with the telecenters as well as locals in the community who were not directly involved. Institutional Review Board approval was granted by the researcher's home institution, Azusa Pacific University. Local board approval was granted and all participation was voluntary.

Types of Data

Data for this study consisted of group interviews, individual interviews, field notes based on observations, pictures, videos, and careful examination of appropriate artifacts. In addition to the use of a translator, a cultural informant filled in the gaps when social and cultural background information was needed.

Strengths and Limitations

Ethnography is the methodology most appropriate for this study. When conducting ethnographic studies, the lens of data collection and analysis is the researcher (Patton, 2002). This can be either a strength or a limitation. To ensure that proper rigor is in place, the researcher used a cultural informant when necessary. A cultural informant is an individual with cultural knowledge as well as local awareness. Also, the researcher has extensive knowledge and skills working with technology, education, and youth, which all strengthen the lens of data collection.

When data were unclear or questionable, an expert panel made up of cultural and content experts was called upon to make sense of the data. If the expert panel was not able to provide proper direction, the data were discarded. This protocol ensures for internal reliability of data, thus strengthening a known limitation of an ethnographic study.

Data Analysis

It is important to understand that Activity Theory is a descriptive theory, not a predictive theory. (Center for Activity Theory and Developmental Work Research, 2009). Tensions within the system impact the activity of the subject, the object, and the outcome. These tensions are identified by arrows among subject, object, community, division of labor, community, and instruments (see Figure 1). By using Activity Theory, the researchers could identify underlying tensions within an activity system.

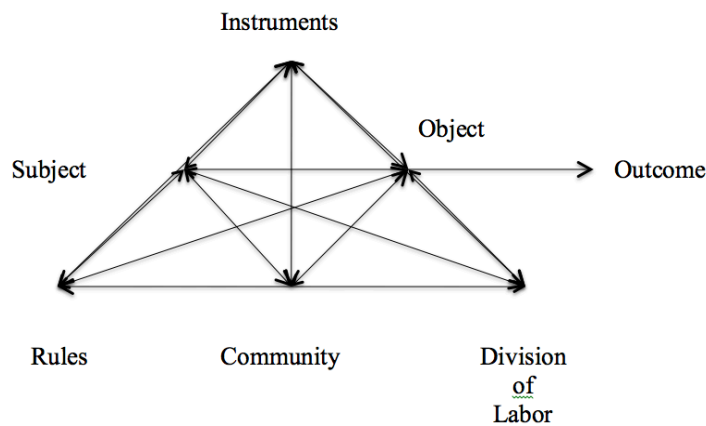


Figure 1: Activity Theory Triangle (Revised from Engstrom, Lompscher, & Ruckriem, 2005)

The themes that emerged from data coding were then analyzed using the Activity Theory triangle. Data was sorted according to subcategories: instruments, rules, community, and division of labor (Engestrom, 2005). When the data were sorted, tensions (represented by arrows above) emerge. Once detailed tensions were mapped out, specific smaller triangles emerge. For example, should youth (subject) using technology (object) to find sustainable approaches for telecenters (outcome) run into barriers in the area of cultural norms (rules) relating to elders restricting access to technology because elders are in control of interactions within the village, then the below triangle would be identified and analyzed.

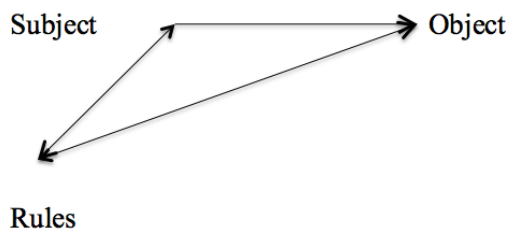


Figure 2: Smaller Activity Theory Triangle Focusing on a Rules Tension

Because Activity Theory has a strong social-cultural foundation, it has been an important tool for research in the social learning field, specifically in three recent studies (Cummings, 2007; Wallace, 2007; Wilson, 2008). Activity Theory can be applied to an activity system, taking into consideration mediating factors in an activity system. This thus highlights tensions within the system.

FINDINGS

This study focuses on the tensions youth face when using technology in the Sankhu telecenter. Ethnographic data was captured and tensions were extracted from the data using Activity Theory. Once the data were coded and analyzed, some tensions were observed to be more prominent than others, resulting in a need for them to be categorized according to the frequency they appeared in the data. Table 1 displays the frequencies various tensions appeared.

Table 1: Categorization of Tensions

	Elder Men	Elder Women	Adult Men	Adult Women	Male Youth 18-22	Male Youth 23-26	Female Youth 18-22	Female Youth 23-26	Total
<u>Major Tensions</u>									
Gender Norms		X	X	X	X	X	X	X	7
Old Board Awareness	X		X		X	X		X	5
Funding	X	X		X	X	X	X		5 [*]
<u>Moderate Tensions</u>									
Training		X		X				X	3
Lack of Time		X		X		X	X		4
<u>Minor Tensions</u>									
Connectivity					X		X	X	3
Electricity					X		X	X	3
Location							X		1

**Note: Although the Lack of Awareness on the Benefits of Technology tension only has two total appearances in the data, it is categorized as a major tension.*

As seen in the table above, 33 frequencies of tensions were identified. Major tensions are defined as tensions that consistently emerge throughout various data points. Moderate tensions were identified as tensions that occur frequently, and minor tensions occasionally appear in the data. Although the Computer Training Tension occurred the same amount of times as some of the minor tensions, the expert panel recommended categorizing it as a Moderate Tension because it appeared to be thematic throughout many of the interviews.

Major Tensions

Gender norms tension. Figure 3 shows where Gender Norms Tension was extrapolated from the Activity Theory Triangle.

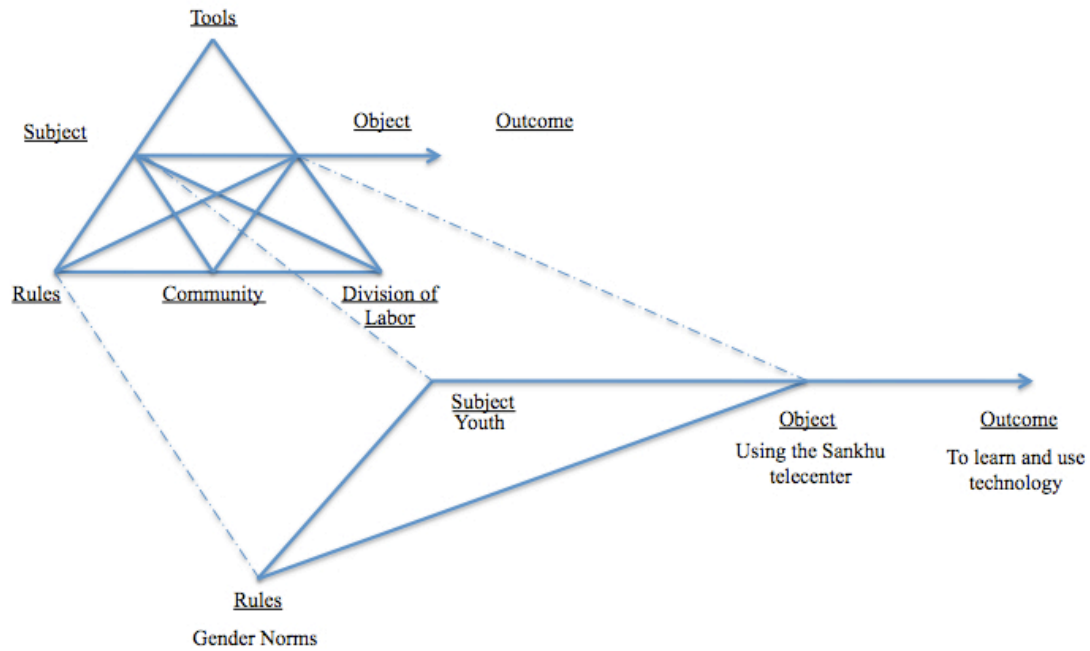


Figure 3: Major Tension 1 - Gender Norms Tension

In Nepal, gender norms dictate much of everyday life. Although women oversee and manage the activities within a house, men are the major decision makers for the family. Duties such as cooking, cleaning, farming during harvest time, and raising children are solely affiliated with women. Extended families live in large houses and the gender specific activities, although dominating every aspect of Nepali life, work seamlessly throughout the day. Boys are permitted to attend school and girls are typically limited to household responsibilities and do not attend school. It is a common Nepalese belief that it is a waste to educate a girl because she will be married to another family (Burchett, 2007).

During previous research in Nepal, the primary investigator has seen how this ideology dominates every aspect of life in Nepal. During the women's literacy movement a decade earlier, women were scolded for wanting to learn how to read and write. For example, men would say to women, "Why eat green cucumbers at the time of dying?" (Robinson-Pant, 2004, p. 1). This metaphor was used to scold someone that is doing something unnecessary because eating green cucumbers is considered a luxury in Nepal, and anything done 'at the time of dying' is considered a useless act. During the group interview with elder women in the Sankhu community, the primary researcher discovered that this metaphor is still used in 2009 when men scold young girls who use the Sankhu telecenter.

Old telecenter board tension. Figure 4 shows where Old Telecenter Board Tension was extrapolated from the Activity Theory Triangle.

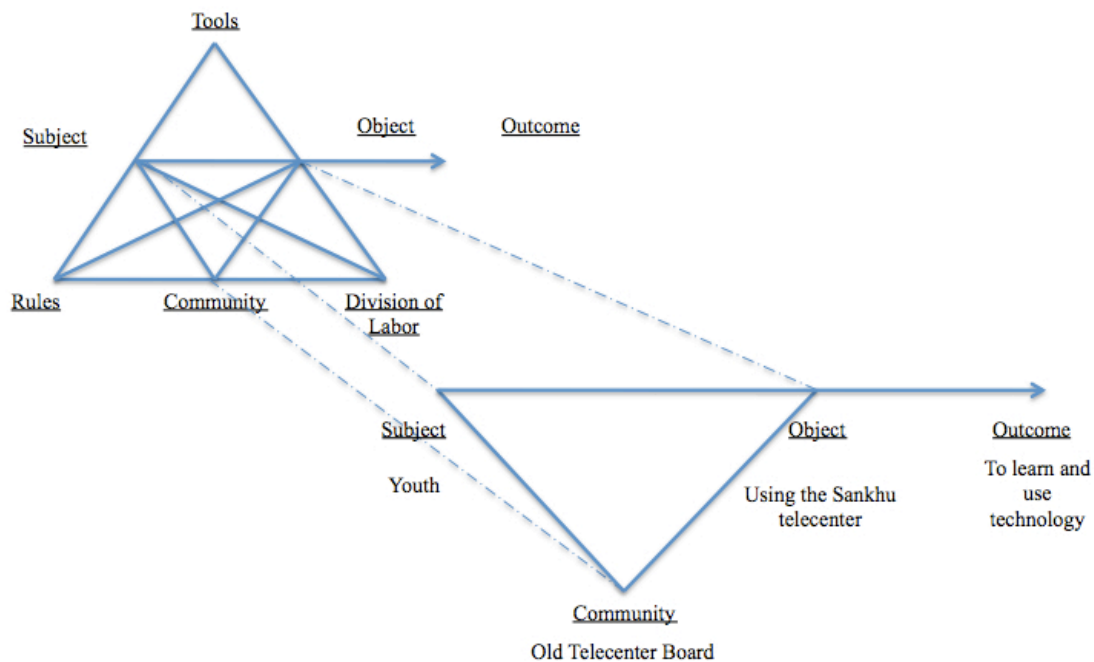


Figure 4: Major Tension 2 - Old Telecenter Board Tension

The Sankhu telecenter was initially created in 2004 with financial support from HLCIT. The initial governing board consisted of elder men in the community as a response to HLCIT's request for community leadership for the telecenter. Just as Wood (2006) discovered that elders locked up books in villages as a symbol of control and prestige, the initial Sankhu telecenter board took on the same approach. Previous visits to the telecenter revealed that much of the telecenter equipment was locked up and inaccessible for youth. In an interview with a youth telecenter leader, I asked who in the past has made it difficult for the center to operate. She said the following:

Yes. The old board, who is usually the elder political leaders. And sometimes even those that don't do anything. They always want to say something. They always like to disturb us. I have suffered lots of times. If I had lots of support, I could go so far, but I don't.

According to this respondent, board members did not make decisions in the best interest of the telecenter. They only cared about their political advancement within the community; and as a result, sustainability of the telecenter was jeopardized by many poor decisions. The female youth respondent continued to explain that cameras and other equipment, although intended for youth to use in the telecenter, were often locked up and controlled by the elders. Such findings parallel Wood's experience and were also confirmed by the director of the HLCIT.

Sankhu youth went through a telecenter reorganization in 2006 and successfully created a governing board consisting of only youth (aged between 16 and 26). Equal representation of gender was also a major stipulation. In my comparison to other telecenters, the Sankhu

telecenter appears to run much smoother, now that a youth board that is equal in gender representation governs it.

Lack of awareness on benefits of technology tension. Figure 5 shows where the Lack of Awareness of Benefits of Technology Tension was extrapolated from the Activity Theory Triangle.

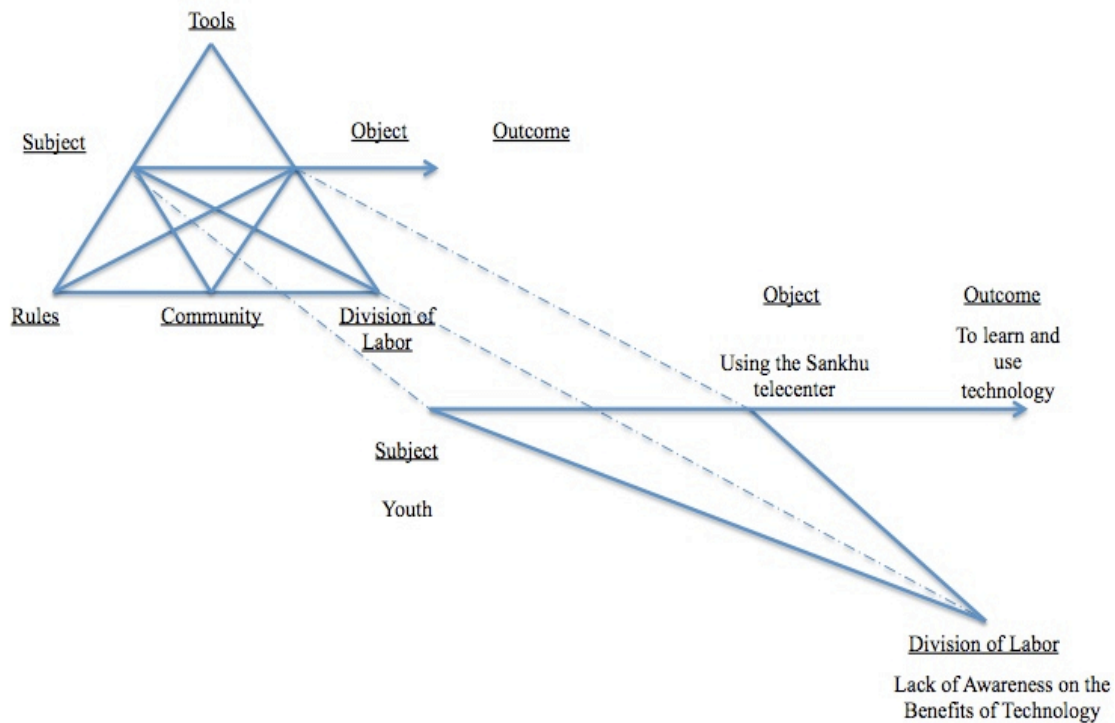


Figure 5: Major Tension 3 - Lack of Awareness on Benefits of Technology Tension

Another major source of tension the Sankhu telecenter faced was the lack of awareness on benefits technology can bring to the lives of villagers. It is important to note that the data in this section comes from the interview with the Vice Chairman of HLCIT. Since he has a macro view of telecenters in Nepal and he has significantly more experience with technology than those in the local communities, the Vice Chairman's vantage point on this issue is significantly more valid than those on the ground utilizing the services of the telecenters. As a result, the researcher, with the support of the expert panel, moved this tension from minor to major, despite the low frequencies in the data.

During an interview of elder women, one respondent stated, "After we learn how to use computers, what will we do next?" It is clear that although there seems to be an awareness of various technologies, there still seemed to be a disconnect between what the technologies are and the impact they may have on the lives of the community. Ultimately, many villagers still view technology as a mythical product.

Lack of funding tension. The figure below shows where the Lack of Funding Tension was extrapolated from the Activity Theory Triangle.

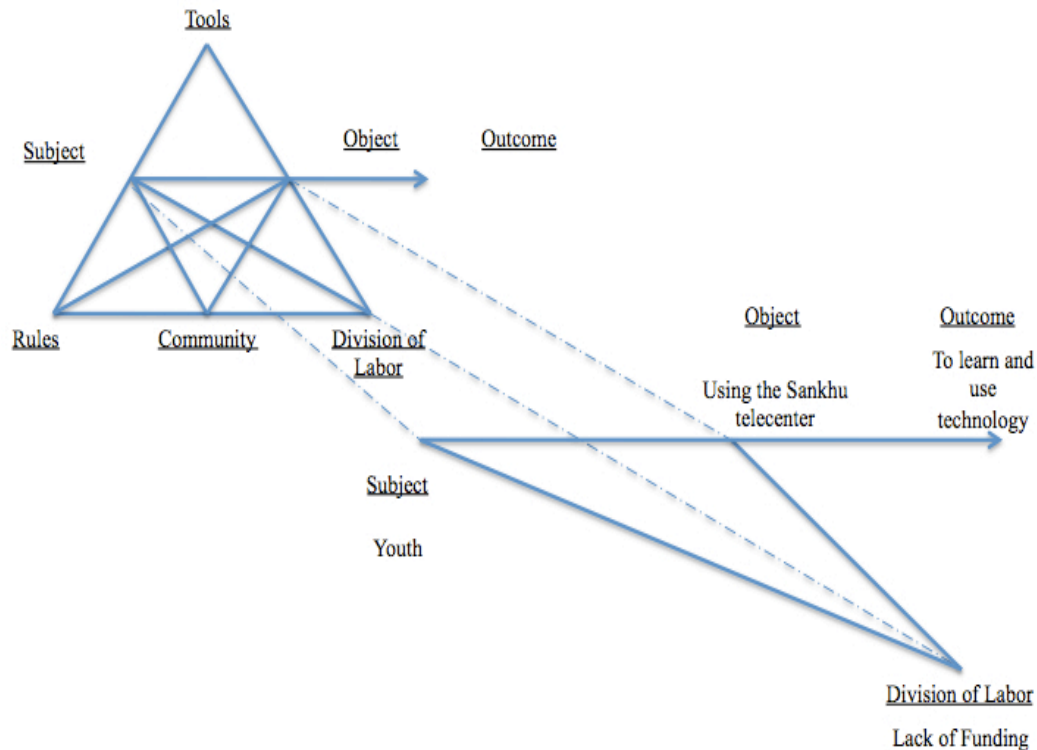


Figure 6: Major Tension 4 - Lack of Funding Tension

Funding for telecenters has been a major source of tension ever since the beginning of the telecenter movement. HLCIT funds the telecenters for two years. After the two-year period, telecenters must fend for themselves to come up the necessary funding for running the center. As a result, this problematic funding model limits the 80 telecenters ability to survive. The Vice Chairman of HLCIT stated,

But then again, this model, as I must admit, is a problematic model. You cannot realistically expect telecenters to fend for themselves after two years. So what happens is that after two years support, the expectation that the telecenters need to support themselves is not a realistic expectation. It is too short of a window to create a critical mass of users.

The primary researcher, with ten years of experience working with telecenters in Nepal, has observed this major tension in all other telecenters. With the average daily wage of Nepal being \$1USD per day, long term funding is near impossible.

Moderate Tensions

Computer training tension. The figure below shows where the Computer Training Tension was extrapolated from the Activity Theory Triangle.

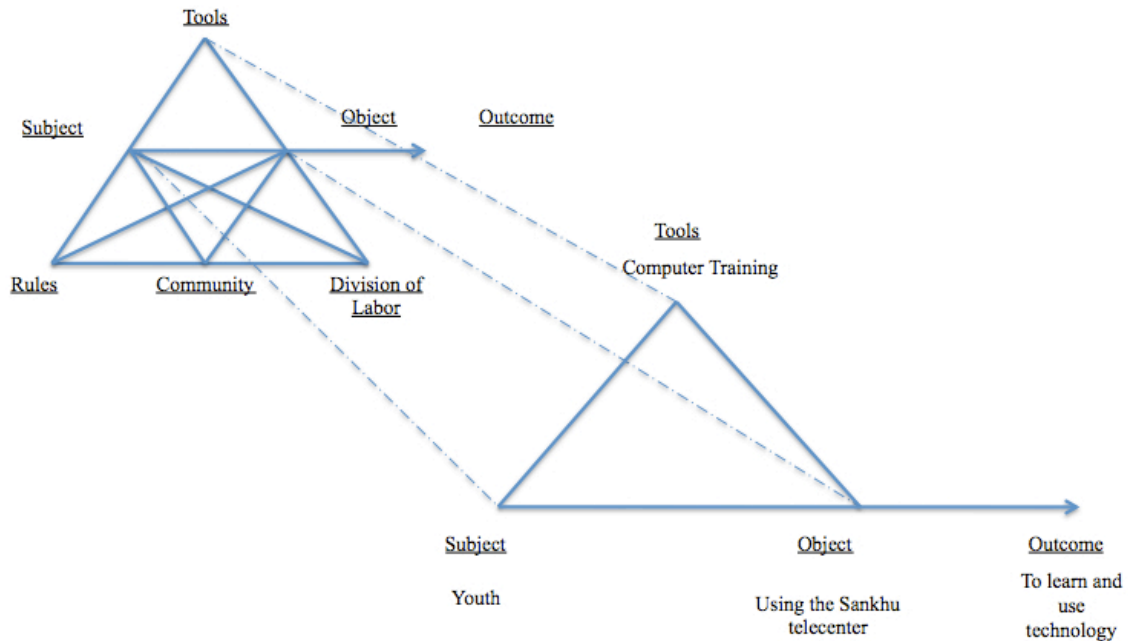


Figure 7: Moderate Tension 1 - Computer Training Tension

Computer training has been an identified need for the Sankhu telecenter since its inception in 2004. Beyond the need for more training, the Sankhu leaders identified a secondary need: a need for localizing learning content. The Sankhu telecenter attempted to engage with a community that has never been exposed to computer terminology. While the terms office, files, and folders, are quite common in the Western or developed world, they are foreign to those in the villages of Nepal. During computer training classes, telecenter leaders even needed to localize the content by telling the villagers, “these are not files or folders. These are houses (computers), rooms (hard drives), and cupboards (folders). You must store things in the proper places.”

This finding puts into perspective the global need for not just providing more training, but providing training that is appropriate and relevant to the local people.

Lack of time tension. The figure below shows where the Lack of Time Tension was extrapolated from the Activity Theory Triangle.

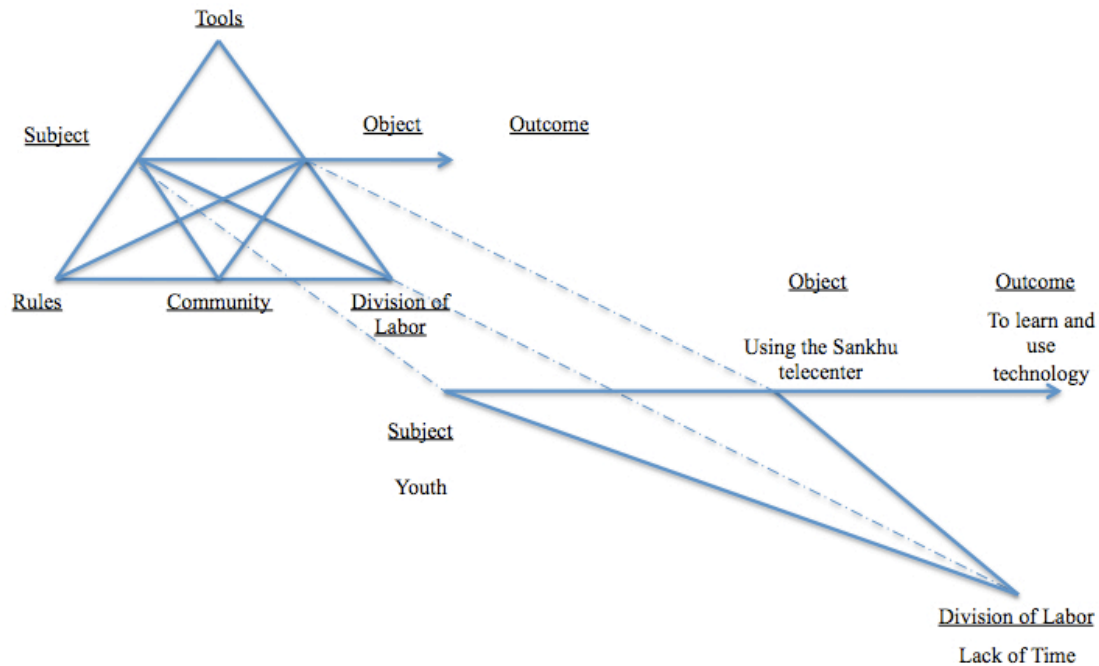


Figure 8: Moderate Tension 2 - Lack of Time Tension

In Sankhu, as in much of Nepal, farming takes up the majority of villagers' time each day. Women have duties that take up their time from morning to evening. Children and youth, in addition to attending school, labor in the fields to harvest crops. Ultimately, there is very little time available for community members to learn and use technology. There is also compelling evidence during late afternoon and evening visits to the telecenter where more boys attend than girls. Typically, boys are relieved of more home duties and have an easier time gaining permission to visit the telecenters by their fathers. As Nepal springboards into the 21st Century, gender norms have evolved dramatically. Gender equality is being realized throughout Nepal.

Minor Tensions

Connectivity tension. The figure below shows where the Connectivity Tension was extrapolated from the Activity Theory Triangle.

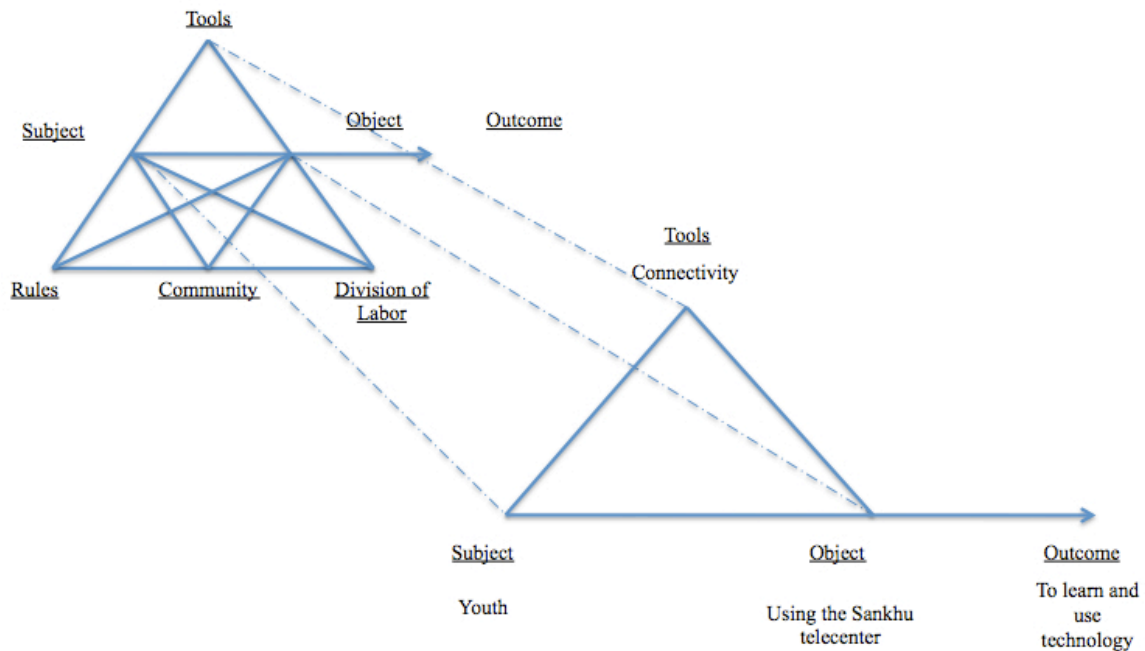


Figure 9: Minor Tension 1 - Connectivity Tension

Internet bandwidth is a major obstacle in Nepal. In 2009, a typical telecenter has only one computer that potentially can connect to the Internet. Internet is connected through telephone dial-up. When I asked the youth groups about their frustration with Internet, they typically respond in the following fashion:

*Jeff: Is everyone frustrated with the slow Internet?
All respondents: Of course (laughing)*

The laughing indicates a sense of acceptance and normalcy. Although the connections are spotty at best, the youth are optimistic and work through such challenges, knowing that it is not only the current state of technology in Nepal, it is the only access they have. Since the principal investigators' initial involvement in 2004, Internet connectivity has improved, despite the low rate. Sankhu telecenter was one of the first centers to acquire high speed Internet. It is important to note that Internet speeds in Nepal are rated at about 1 megabyte per second.

Electricity tension. The figure below shows where the Electricity Tension was extrapolated from the Activity Theory Triangle.

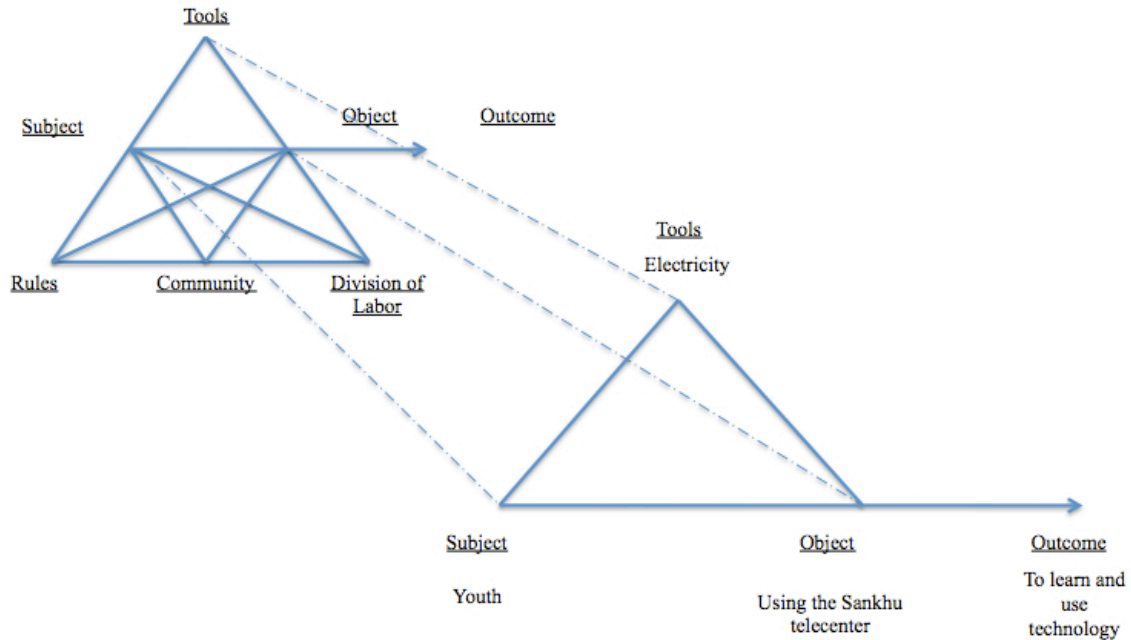


Figure 10: Minor Tension 2 - Electricity

Nepal's electrical infrastructure faces geographical challenges. Running electric lines across Himalayan mountaintops is costly and tasking. Additionally, lack of sufficient power generators forced much of the country to be handicapped with rolling blackouts. During the spring of 2009, when one of the three hydro-generators broke, the entire country faced blackouts averaging 14-18 hours per day. This lasted for several months. When asked about the effects of blackouts, also referred to as load shedding, one youth responded, "Of course it affects us. It affects our ability to come to the center." A female youth during the group interview of 23-26 year olds stated, "Yes at the time when there was shedding, I wanted to come. But I could not come. And I feel so bored. It was about 16 hours a day! I felt like the world was going to collapse!"

Location of center tension. The figure below shows where the Location of Center Tension was extrapolated from the Activity Theory Triangle.

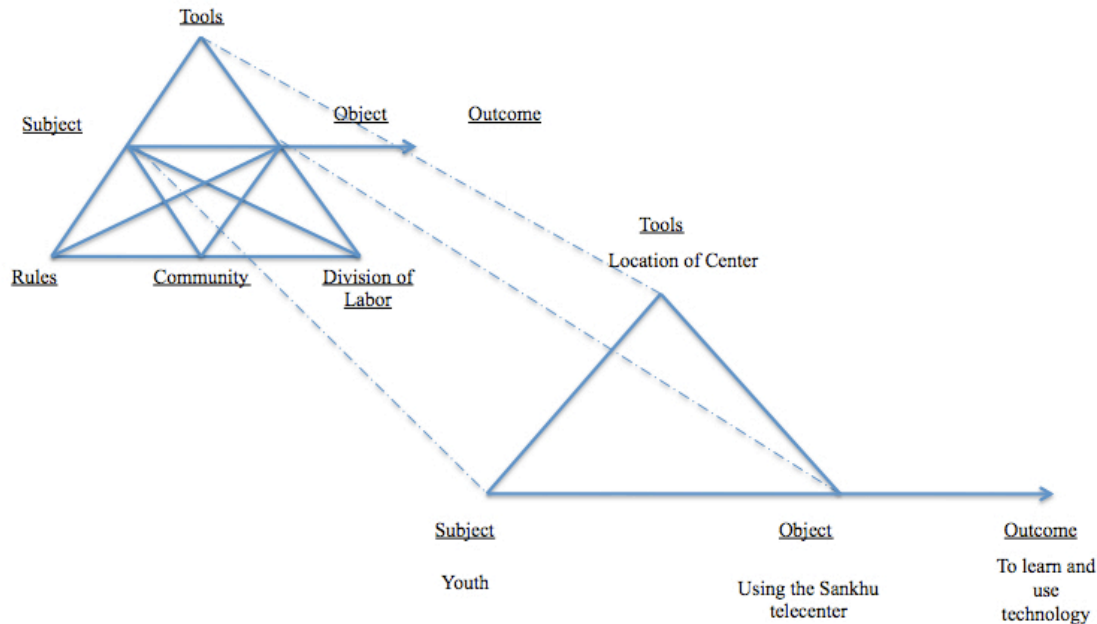


Figure 11: Minor Tension 3 - Location of Center

For the youth in Sankhu, the center's geographic location is important. Transportation challenges limit access to technology, especially due to Nepal's mountainous geographic setting. Roads and walking paths are often washed out. Very few people have access to motorized transportation, especially in rural areas. Western Nepal, for the most part, is only accessible by foot. However, for those that find value in using the telecenter, geographic obstacles can be overcome. Below is an account of a youth that travels five hours each way from a remote village to come to the Sankhu telecenter. He stated,

When I come to the telecenter to utilize computers that are here. I also use the telecom, which is the telephone. When I came to the telecenter at first I came here to learn how to use computers. This telecenter is important for us because I'm from quite far. My village is very remote. In my village some people do not know what is even a television. So I come here and get lots of information to share with my village. When I get more knowledge about the computer, I share the importance of computers and the benefits of computers to my village. So it is very hard for us.

Summary

The data presented in this study offers perspective and insight into the culture of telecenters in Sankhu. As Genzuk (2003) explained that ethnographic studies offer a written representation of a culture or selected aspects of a culture. Ethnographies inform human conduct and judgment in innumerable ways by pointing to the choices and restrictions that reside at the very heart of social

life (Van Maanen, 1988). This study offers both a glimpse into the inter-workings of the Sankhu telecenter and an analysis of the tensions that exist within the center.

CONCLUSIONS

The major tensions in this study are gender norms, old telecenter board, lack of awareness on benefits of technology, and funding. Moderate tensions are identified as difficulties in computer trainings and lack of time to learn technology. The minor tensions are Internet connectivity, lack of electricity and the location of the telecenter. Below are some conclusions drawn.

Females Have Fewer Rights and Less Access

Gender tensions permeate throughout Newari culture and dictate daily norms in Sankhu. This appears to be the greatest source of tension for this study. While youth are gaining more access to technology in 2009, males still have more access than females. Unlike the Bangladesh telecenters where women have gained profitable income generating skills through telecenters (McConnell, 2001), the Sankhu community has yet to realize the opportunities that telecenters can bring for women.

Poor Infrastructure

Poor technology infrastructure continues to impede technological progress. Nepal's mountainous landscape presents major infrastructure challenges. Electricity is nonexistent in rural regions of Nepal (Gregson & Upadhaya, 2000). In terms of connectivity, Nepal has leapfrogged into the 21st Century with a mass infusion of mobile phones. Mobile phone signal towers cover every district in Nepal. In fact, Internet access can be achieved using a USB device called a CDMI card. This device uses the SIM card from a mobile phone and uses its signal to connect to the Internet. In the case of Sankhu, high speed Internet was installed in 2009.

This leapfrogging into the 21st Century can also be seen in the use of technology hardware, as Nepalese use digital cameras, not ever having used film cameras before. In terms of electricity, the few electrical generation plants in Nepal already cannot generate enough electricity for the country. When one is down for maintenance, or when one is malfunctioning, the entire country is greatly affected. In the spring of 2009, rolling blackouts called load shedding were upwards of 16-20 hours per day. To see the real potential of telecenters in Nepal, Internet and electricity infrastructure needs major improvements.

Lack of Time to Learn And Use Technology

In Nepal, cultural norms dictate daily activities. Like most communities in Nepal, farming communities such as Sankhu struggle to find extra time for community members to indulge in activities that are considered luxurious. Attending school and learning technology are considered to be luxurious in most communities. In addition to a lack of financial support, a lack of time is a major source of tension. This is especially evident during harvest seasons when entire families work in the crop fields for the majority of the day. During harvest time, those children who have the luxury of attending school oftentimes miss school to work in the fields. Likewise, during harvest time, attendance at the telecenter is low.

There seems to be an interest for equity from the newly established government. The voice of women is beginning to be realized in the Nepali democracy. It would be interesting to see the ripple effect of such a policy and governmental movement trickle down to the daily lives of Nepali villagers. Perhaps, more girls will be able to freely access telecenters in Nepal's near future.

Elders As Gatekeepers

The elder versus youth tension is a major tension presented in this study. Elders are the decision makers and gatekeepers of the community (Wood, 2006). As a result of this cultural rule, technology, a tool that many elders do not know how to use, becomes a pawn in the struggle for control. Furthermore, those who try to use technology are perceived as young people who are not wise enough to make major decisions in the village. The result is catastrophic in the struggle for telecenter sustainability. Those who control the telecenter are not understanding of three things: the benefits of technology, how to sustain and maintain a telecenter, and that elders can maintain control of a village while youth learn how to use technology (Rajalekshmi, 2007) This lends to an interesting dynamic that needs further development. More research needs to be done on how decision makers learn about the potentials of technology and how they provide more access to youth, despite their personal inability to engage with technology.

Funding Model for Telecenters Impede on Sustainability of Telecenter

The current funding model for telecenters was designed by HLCIT. This current funding model supports both the initial startup of telecenters and salary for one telecenter staff for one year (Bhattarai, 2009a). What the model does not account for includes:

- 1) Not all communities can take over and sustain funding.
- 2) Local communities may not have enough time to build capacity in one year to embrace technology as a significant tool in their lives.
- 3) One time startup costs are large when considered in the context of how much a Nepali family earns in one year. As a result, when hardware breaks, it is not possible for local communities to pay for repairing or replacing the broken part.

There is a need to provide more support on developing long-term sustainable models for telecenters. Although training on sustainability was not a consideration initially, this study yields an interesting conclusion on funding. When all participants have community buy in, there then needs to be consideration for one time cost items such as high speed Internet installation, equipment, and reoccurring cost items such as computer upgrades and replacements. Once these considerations are in place, the potential for sustainability increases.

Local Communities Are Not Aware of Benefits of Technology

The lack of awareness on the benefits of technology is a major tension in this study. Local communities have not had enough exposure to the current technology to understand the positive impact it can have on their lives. Although technology is beginning to penetrate its way into the families of local communities, it is still at its infancy stage. As a result, awareness building is a major obstacle for many telecenters (Bhattarai, 2009a). This study exposes the important need to build capacity for technology by involving local villagers in awareness opportunities. As explained by various respondents, many do not know how technology will fit into their lives even if they attend classes to learn the technical skills.

RECOMMENDATIONS

As quickly as technology is impacting life in Nepal, so must related research. In order to help inform decision makers, we must be sure that research is keeping up with the changing times. Below are recommendations based on the conclusions drawn.

Study other telecenters in Nepal for comparison. One limitation to this study is the fact that data collection took place in only one telecenter. There are approximately 80 telecenters in Nepal. These telecenters possess a variety of different characteristics, such as technological hardware and software, staffing, funding, local community, social norms, etc. A similar study of other telecenters is recommended. Furthermore, this study suggests a need for a future studies focusing on leadership of telecenters in Nepal.

Study other developing countries for comparison. Future studies in other developing countries similar to Nepal would also be beneficial to the field. Conditions in selecting other countries for study should include: geographic region, geographic terrain, culture, social norms, and historical norms. Additionally, technological access to hardware, software, and connectivity should be considered.

Study successful youth leaders who are recognized internationally, but not locally. This study unveiled several cases where youth leaders were recognized internationally for their work. Gaining international recognition is easier, especially in the 21st Century, through the use of technology. Although these isolated cases of success may appear to be phenomenological in nature, it would be beneficial to see if there are trends that emerge. Additionally, case studies on these phenomena would also contribute to the current body of related research knowledge.

Study the impact of Web 2.0 on youth in developing countries, specifically looking at social capital. Since connectivity has significantly improved in the last decade, it is recommended that a study be conducted on the expanse of social capital a community gains from using a telecenter. While monetary capital might be scarce in a country like Nepal, youth seem to be extremely connected online with others in and out of their community, as well as around the world.

Explore whether technology can influence gender equity. Explore the possibility of formally set times and opportunities for females to use the telecenter in an attempt to balance out gender inequalities.

Explore the need for localizing learning content. Connect with those who are conducting training in Nepal and explore the need for learning content to be localized in a comprehensible fashion for villagers.

In the comparative international education milieu, there begins to emerge a special interest group (SIG) called Information and Communication Technology for Development (ICT4D). Members of this SIG, along with a small group of researchers around the world, investigate ways technology impacts developing countries. This article adds knowledge to a growing body of researched evidence and hopes to also bring awareness to the need for such research to be conducted.

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