In today’s digital environment, it is broadly agreed that having access to information and communication technologies (ICT) has had a beneficial impact in economic advancement and societal growth. In the last decade a consensus has emerged that ICTs also have the potential to help developing countries be competitive in the global economy. The significance of ICTs in development (ICTD) is suggested in a recent World Bank observation: “Mobile communication has arguably had a bigger impact on humankind in a shorter period of time than any other invention in human history (World Bank, 2012a).

In recent years, Vietnam has made good progress in reducing gender disparities and ranks rather favorably in the Gender Development Index (World Bank, 2006), however, the gender issues are still critical in the ethnic minority communities. Many studies show that very few ethnic minority girls are able to make transition from primary to lower secondary school (UNICEF, 2008; World Bank, 2006). The main obstacle keeping the girls from attending school is poverty although other constraints such as pressure and expectations from their families to contribute to the household income deters girls from opportunities to education that do not exist for the boys.

In developing countries, ICT use has been significant. ICTs allow individuals, even in remote places, to access information and to request specific information ranging from weather advisories and government records to commercial market prices. The number of communities getting connected online is growing: farmers can get access to real-time information on weather and vital agricultural news; entrepreneurs can do banking online or sell items across the globe; small enterprises are using ICTs to conduct business and to cut costs; students use ICTs to get information on employment and to be better prepared for job markets, etc. Experts suggest
that the potential role ICTs play in community development is significant in both social and economic situations (United Nations, 2009). ICTs are one of the crucial tools in providing and exchanging information, and promoting rural and community development. Their employment has been deemed a crucial step in bridging the gap between the “developed” and “less developed” worlds (ITU, 2011).

This paper presents findings of an ICTD project that was implemented in the Northern Mountainous Area (NMA) of Vietnam. In 2009 and 2010 I traveled to Thai Nguyen, Vietnam to evaluate the project. I was interested in the impact and effectiveness of the project and to see if there was a possibility for a scale-up operation. The of the NMA initiative was to use the project sites as learning centers to create non-formal education modules on topics such as nutrition, women’s health and childcare for rural women in the region. Based on the findings at two sites of the project, the paper examines the challenges as well as opportunities when deploying ICT for development projects in geographically challenging communities in developing nations.

**The Thai Nguyen Telecenter Project**

ICTs are deployed as essential components in a number of poverty reduction, gender empowerment and youth development programs globally. Initiatives that integrate ICTs in education have been recognized as important efforts toward the achievement of the Millennium Development Goals (MDGs) (UNDP, 2002). Recognizing the potential of ICTs, national and international agencies have incorporated ICT schemes in development projects.

There have been many projects on the use ICTs in – and its impact on development. When it comes to planning and implementing ICTD projects, questions of impact and benefits come mind. If we assume ICTs are beneficial to some, can the disadvantaged population also benefit from them? Specifically, how can ICTs help rural poor women get better access to knowledge and information? What can be done to increase the benefits and provide education to the disadvantaged population, especially those in remote communities by applying these ICTs? What were – and should be – the objectives of these ICT development projects? These were my questions when I visited the sites in Northern Vietnam.

Thai Nguyen province is about 80 km north of the country’s capital, Hanoi, and in the heart of the Northern Mountainous Area (NMA). The NMA covers an area of 110,000 km² or 34% area of the country. It has a
population of about 17 million people; approximately 60% of them are the ethnic minority. In this area, 35 out of Vietnam’s 53 ethnic minority groups reside. Due to the remote and unfavorable conditions, the NMA is considered to be the poorest and the most disadvantaged region of Vietnam. The ethnic minorities account for more than 40% of all poor people in Vietnam, despite representing only 14% of the country’s population (Baulch et al. 2009; Colle and Van Dien, 2013).

Economic and educational opportunities in this region are severely limited by various conditions. Among them is the scarcity of access to learning resources caused by inadequate transportation, communication, and facilities such as schools and libraries (Swinkels and Turks, 2006; ADB, 2002). This further contributes to the inequality in the ethnic community and has put many ethnic minority children, especially girls, at a disadvantage. Research shows that poverty among the ethnic groups in Vietnam is a chronic problem and the ethnic minority youths remain disadvantaged in every level of education, from primary to lower secondary level – and especially in making transition to upper secondary education or higher, an important factor required to enter the labor market (Giacchiono-Baker, 2007).

In 2006, Cornell University and Thai Nguyen University of Agriculture and Forestry (TUAF), a component of Thai Nguyen University, launched an ICT for Development initiative in the NMA. The goal was to provide TUAF students and the disadvantaged youth in the region ICT training, resources and education at a computer facility at TUAF. Being the pilot program in the region, the project was to pioneer the approach on how ICT can be used to enhance student education, improve employment opportunities for the disadvantage youth, and stimulate economic growth in the NMA.

Supported by VIA Technologies and the APEC Education Foundation, seven computer centers were established: one main computer teaching facility at TUAF and six community-based telecenters in the communes, four in Thai Nguyen province, one in Bac Kan and one in Tuyen Quang provinces. The telecenter was designed as a public facility where people in the community could use computers, get information from the Internet, print materials, fax documents and use other telecommuting services. While radio, film, and video make up earlier generations of ICTs, it is the benefits of computers and networks that have driven the interest of national and international agencies toward telecenters as a tool for community development. All six telecenters were locally operated by their respective communities; training, research and content support were provided by TUAF.
The Field Research

Between 2009 and 2010 I made several trips to the region. Due to the harsh terrain I was advised to confine my work to two communes, Tien Hoi and On Luong. Both communes were located in Thai Nguyen province. I stayed a few kilometers from the commune’s cultural meeting halls, where the telecenters were located. My research was divided into two phases. This paper focuses on the first phase of the research. During these trips my primary goals were to get acquainted with the area and gather basic information on these sites. Some of findings are summarized as follows:

<table>
<thead>
<tr>
<th>Commune</th>
<th>Population</th>
<th>Agriculture</th>
<th>Ethnic minority</th>
<th>Poverty household rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tien Hoi</td>
<td>5,982</td>
<td>82%</td>
<td>28%</td>
<td>32%</td>
</tr>
<tr>
<td>On Luong</td>
<td>3,384</td>
<td>80%</td>
<td>81%</td>
<td>56%</td>
</tr>
</tbody>
</table>

(Source of Data: TUAF, 2005)

<table>
<thead>
<tr>
<th>Commune</th>
<th>Total population</th>
<th>Total youth (persons)</th>
<th>% youth</th>
<th>Rate of poor youth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tien Hoi</td>
<td>5,982</td>
<td>977</td>
<td>20.1%</td>
<td>13.9%</td>
</tr>
<tr>
<td>On Luong</td>
<td>3,384</td>
<td>438</td>
<td>15.7%</td>
<td>63.2%</td>
</tr>
</tbody>
</table>

Table 3
Education Background of Youths in the Communes

<table>
<thead>
<tr>
<th>Commune</th>
<th>Primary</th>
<th>Secondary</th>
<th>High school</th>
<th>College</th>
<th>Illiteracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tien Hoi</td>
<td>5.3%</td>
<td>47%</td>
<td>47%</td>
<td>1.7%</td>
<td>0%</td>
</tr>
<tr>
<td>On Luong</td>
<td>3.3%</td>
<td>56%</td>
<td>39%</td>
<td>1.6%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Table 4

Computer Skills of Youths in the Selected Communes

<table>
<thead>
<tr>
<th>Commune</th>
<th>Able to operate basic skills</th>
<th>Not able to use computers</th>
<th>Want to learn computer</th>
<th>Don't want to learn computer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tien Hoi</td>
<td>28.1%</td>
<td>71.9%</td>
<td>93.0%</td>
<td>7.0%</td>
</tr>
<tr>
<td>On Luong</td>
<td>14.7%</td>
<td>85.3%</td>
<td>91.8%</td>
<td>8.2%</td>
</tr>
</tbody>
</table>

Table 5

Status of Communication Facilities (% Households)

<table>
<thead>
<tr>
<th>Commune</th>
<th>Telephone</th>
<th>Radio</th>
<th>TV</th>
<th>Computer</th>
<th>Computer with internet</th>
<th>Access to power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tien Hoi</td>
<td>16.1%</td>
<td>26%</td>
<td>93%</td>
<td>&lt;4%</td>
<td>2%</td>
<td>100%</td>
</tr>
<tr>
<td>On Luong</td>
<td>2.6%</td>
<td>52%</td>
<td>81%</td>
<td>0.15%</td>
<td>0%</td>
<td>99.6%</td>
</tr>
</tbody>
</table>

Table 1 provides basic background information about the two communes. In general, the living standards in Tien Hoi were better than in On Luong. Although no one owned a car, there were visibly more motorbikes in Tien Hoi, whereas the majority of the people in On Luong travelled by bicycles. Tien Hoi is located closer to a main road that leads to Thai Nguyen City, the capital of the province, where both Thai Nguyen University of Agriculture and Forestry and Thai Nguyen University were located. Tien Hoi also benefited from having a better infrastructure (roads, telephone lines and power supply). The ethnic minority make-ups of the two communes were significantly different: 28% of population in Tien Hoi identified themselves as members of ethnic minority groups, whereas 81% of the population of On Luong indicated that they were the ethnic minority. The poverty rate in Tien Hoi was 32%, whereas the poverty rate in On Luong was almost twice as much, 56%.

Tables 2 and 3 provide information on the youth population at these sites. The youths in Tien Hoi were much better off than the youths in On Luong, only 14% of them were considered ‘poor’ whereas close to 65% of
young people in On Luong were poor. In terms of education, close to 50% (47%) of the youths in Tien Hoi completed high school education (grades 10-12), close to 47% completed secondary education (grades 6-9). In both communes less 2% of the youths were able to attend college.

Table 4 provides general information on the computer skills of the youths. The percentage of young people who were able to operate a computer was quite low in both communes; Tien Hoi was a little better than On Luong. Overall, less than one-third of the youths were able to use a computer. That did not mean they did not know what a computer was or did not have a desire to learn. More than 90% of them indicated that they would like to learn how to use a computer or wanted to improve their skills.

Table 5 looks at the status communication facilities in these two communes. The percentage of people/households owning personal computers is extremely small, less than 4% at Tien Hoi (or about a few dozen households). There were only 0.15% of the households in On Luong owned personal computers, or two computers for the entire community of 3,400 people. The main source of communication (and entertainment) is television. The number of telephones (landline and mobile) were surprising low. This is because most people lived and worked in their commune and they rarely ventured away from their homes. In addition, the cost of having a telephone (especially a landline) was very high and the reception was not always good or available.

As time went on, I got to be quite familiar with the environment and ways of life in the communes. I observed and conducted in-depth interviews with the people in the community including the commune head and party officials, the telecenters operators and the community people who frequent the facility to get information about the day-to-day operation of the telecenter. I wanted to know how often people came to the center, what kind of service they used, what types of materials that the telecenters were providing, whether the information was available online or off-line, what features of the telecenter that worked and did not. I asked people (users and non-users) what they thought of the telecenter facility, if it had been good for their community, whether it had made any impact, or how it had benefited them and their communities.

At the telecenter in Tien Hoi, I observed that most people used the computers for emailing and browsing the Internet, although some had expressed that the service was slow and inconsistent. When asked if it
would be fair to charge some nominal fee for services (emailing, printing), one young man said that he would go to an Internet café down the road instead: “These Internet cafés are everywhere nowadays, and they are not that expensive – and the price would come with a nice, cold drink as well.”

Overall, the telecenters at Tien Hoi were quite dynamic and people seemed to grasp the concept of the Internet very quickly. One observed:

“I came here for some information about how to deal with my dead fish. I raise fish and they kept on dying. I didn’t know if it was the problem with my basin, or perhaps I wasn’t using the right amount of feed. I heard that there was some information from the off-line resources but it wasn’t useful. I then went on the Web and found a forum... So now I know what to do.”

Almost all of the users were men including a young telecenter operator, who did not get paid for his labor because he was also a government employee. He was the commune’s Cultural Affair Officer (CAO). The CAO is a person who is in charge of all communication at the commune. This person made sure that if there was something important, for example, a town hall meeting or a visit from some important official from the capital, everyone in his or her commune would be informed about it. In this part of Vietnam, the most popular form of communication was still the ubiquitous community loudspeakers.

At the On Luong facility, electrical service was infrequent and daily interruption was a common occurrence so most of materials were off-line resources. The young woman operator said that in the beginning she was able to charge small fees for some services (printing) but due to this persistent problem she was no longer able to do so. Also, it had deterred people from coming to the center. The location of the telecenter was also problematic to many people: those who lived nearer (a few kilometers) to a cultural meeting hall would frequent the place more often than those who lived farther away. Some people said that they had not heard of the telecenter, or they didn’t have time or “energy to ride 10 kilometers just for some outdated information.”

While the operators at both communes were young and enthusiastic, their computer knowledge and operating skills were limited. When the project was first implemented in 2006, they were invited to TUAF in Thai Nguyen City for a few days for training. The training was on basic computer
operating skills such as turning on the computer, how to use a mouse, how to open and save a document, etc. The CAO young man expressed that he would like to have had more training on more complex issues such as how to deal with viruses, yet he didn’t know to acquire such skills. When I asked him what he would do in a case of a computer virus, he replied that he would call TUAF for technical support:

“It would take the tech a few days, sometimes more than two weeks to get to the commune. (TUAF is located in Thai Nguyen City, a few hours by motorbike to Tien Hoi, the nearest commune among six.) However, sometimes even the tech didn’t know what to do. Or they would fix a problem but as soon as they turned around and returned to Thai Nguyen City, it wouldn’t work again. Sometimes, a different problem would occur but I wouldn’t know”.

In summary, the challenges were:
• Old and outdated equipment
• Slow (or nonexistent) Internet connection
• Inadequate training for the telecenter operators and users
• Off-line materials needed updating
• Few households having computers

The potentials:
• Farmers were young (< 35 years) and quick learners
• People were motivated and enthusiastic
• High gender representation and interest: 60% women indicated interested in acquiring additional non-formal education
• Strong social network and local participation
• Vietnam government keen interest in supporting ICT for development

Discussion
In developing countries, ICT skills can be instrumental in alleviating poverty, improving lives and providing economic growth. However, for many disadvantaged people, especially those in marginalized areas, in order to have a long-term impact and sustainable development, ICT-based projects will require a different kind of design, strategies and implementation. For ICTs to be effective they should be tailored to, and meet needs of, the local community as defined by the people in the community. Each community is different, and community’s needs and learning styles are varied. Well-conceived, professionally implemented programs that are tied directly to
project objectives can make the difference between a project’s success and failure. To have a successful project it is important to take into account the local realities of the community. The context – and content – must be locally based and relevant and the project must be people centered.

While the “Final Report” in 2007 on the “ICT4D and Disadvantaged Populations in Vietnam’s Northern Mountainous Area” project was comprehensive and uplifting, by the time I visited the region two years later, the project was not able to sustain itself. The project fell short due to many issues. First, it was designed and implemented without thorough background research. Second, the contents and resources were not relevant to the local contexts. The data collected by TUAF were extensive with many hard numbers and statistics but they did not invest a lot of time asking people what their real needs were. The project did not involve the community or consider their needs in any stage of the process – design, planning, or implementation of the project. Again, even though TUAF boasted on having thousands of reference materials and electronic resources on topics relating rural life from agriculture and forestry to aquaculture and the environment, and socioeconomics and politics, very few of these resources were relevant to the community members when they sought information. Third, the project did not take infrastructure capability into account in the planning process. Deploying computers in the sub-tropical climate is a great challenge. In the summer, it is common for the temperature in this area to reach around 35C (95F) or higher. The high temperature coupled with an equally high level of humidity (75% – 100%) can cause premature failure of computer components. Furthermore, the region is surrounded by mountains and dirt roads, adding to the constraints of the upkeep of the equipment. The project also underestimated the issues of hardware and software maintenance, both in costs and support, judging from sporadic trips of tech support to these telecenters, which were few and far between.

Sustainability has always been a major challenge for many telecenters. Most begin with donor funds and then struggle to survive when donor funds decline or end. Although some telecenters use fees for services, subsidies, and contributions (including volunteer help) to cover their operating costs, no telecenter could be able to survive solely on charges paid by individuals. The telecenter operator at Tien Hoi commune could not ask for a fee because the Internet connection was slow and inconsistent. At On Luong, due to the erratic electricity availability, the place was closed and padlocked most of the time.
Another challenge for telecenters is their availability to women. Some women were intimidated by using the computers when the center is not deemed to be a hospitable environment for women. In some countries, as part of a strategy to attract women to participate in telecenter activities, the center requires that at least one woman be engaged in the management of each center that it supports (Rangaswamy, 2007). I noticed a remarkable difference on gender participation between the two telecenters. While the young man operator at Tien Hoi was nice and friendly, On Luong’s center attracted more female users because the center operator was a woman.

The involvement of gender participation in development projects is absolutely necessary. Girls and women need to be encouraged to participate in activities outside of their homes. Many of them are married and become mothers at a very young age (sometimes as young as 16). Not only has this deprived them from having a normal childhood as young women, they also are often shy from venturing anywhere else beyond the market or their homes. In recent years, Vietnam has made good progress in reducing gender disparities and ranks rather favorably in the Gender Development Index (World Bank, 2006), however, the gender issues are still critical in the ethnic minority communities. Many studies show that very few ethnic minority girls are able to make transition from primary to lower secondary school (UNICEF, 2008; World Bank, 2006). The main obstacle keeping the girls from attending school is poverty although other constraints such as pressure and expectations from their families to contribute to the household income deters girls from opportunities to education that do not exist for the boys. The rate of girls enrollment is 11% lower than boys and the across of all segments (primary and secondary schools), girls represent 70% of all dropouts (Do, 2001). Educational and economic opportunities for women and girls in remote regions are especially limited. In addition to the scarcity of access to learning, the persistent gender stereotyping in textbooks perpetuates and widens the gap of gender inequality (Asian Development Bank, 2002).

While the challenges were many, I saw the potentials as well. Although Vietnam is still considered a developing nation, much progress has been made in the last several years. The government is especially aggressive in targeting the ICT development to keep the country moving forward every year. The number of Internet users in 2005 was 10.7 million or about
13% population. In 2012 this number was 31 million, reaching about one third of the population (Internet World Stats, 2013). Vietnam is a country with a large young population (60% are under the age of 30 years old) with a dynamic work force and keen interest to learn. The community structure, especially in the countryside and rural areas, is based on close knit social and family relations, creating a lively and vibrant participation in community activities.

ICTs can (and should) be used to create non-formal education courses to provide learning skills to rural women in the region. It is important that these courses have appropriate local-based materials with relevant content to suit the information needs. During my interviews I learned that many women would like to acquire basic information on a variety of topic that many people in the urban areas would take for granted. These include topics such as basic personal care or self-help beauty tips, cooking and household products, or basic nutrition and childcare. Some ethnic women were interested in learning about customs and traditions of their heritage, fearing that one day these will disappear. These are important and relevant information essential to improve their daily lives.

Finally but not least important, universities can play a crucial role in supporting community development projects. Being a cornerstone of teaching and research institution, a university can add much to the surrounding communities’ cultural, material and intellectual life. University faculty and students can take part in community engagement through teaching, organizing lectures or workshops or service learning programs, or serving as mentors and resources for the community (Colle and Van Dien, 2013). However, the universities have to be realistic in their commitment in providing their assistance to the community to meet the goals and objectives of the community.

Conclusion

The findings of this ICT for Development initiative realize both the opportunities as well as challenges when implementing development projects in remote areas of developing countries. In the case of Vietnam, when it comes to ICT-based projects, the question is not only whether the disadvantaged population can benefit from ICTs, or has a desire to acquire
ICT skills, but how can these projects be more effective and sustainable. For the marginalized population to fully benefit from development initiatives, first and foremost, we have to take into consideration their object reality. The community’s needs, participation, and their extensive local system of knowledge have to be integrated into the design, planning and the implementation of the project. Second, the project has to be flexible and adaptable to the environment; a based-line infrastructure of support, training and maintaining ICTs in the area has to be clearly established. Furthermore, if the goal is to create a long-term impact and sustainable development project, the project has to go beyond the technologies. We have to focus on educational needs of the community and actively incorporate appropriate local-based materials to provide life-long learning goals that benefit all. This issue was addressed in regard to agricultural development by the World Bank, but its statement can well apply to other situations where ICTs are deployed.

It is important to begin any ICT-in-agriculture intervention by focusing on the need that the intervention is [proposed] to address – not the need for ICT – but the need for better and more timely market information, better access to financial services, timely and appropriate crop and disease management advice...... (World Bank, 2012b).

References

Education, ICT and Development in Rural Mountainous Vietnam


ICT Works Top 7 Reasons Why most ICTD projects fail
www.ictworks.org/2011/05/top-7-reasons-why-most-ictd-projects-fail/


Internet World Statistics,

http://www.beta.undp.org/content/dam/undp/library/Democratic%20Governance/OGC/c4d-effectiveness%20of%20UN-EN.pdf


VIA pc-1 Community Solutions VIA Opens pc-1 ICT Education Center at Key Vietnam University


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