Exploring the Culture of Educational Software: Is the software culturally neutral?

Localization of educational technology for developing Nations

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Abstract

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The focus of this research on software content and culture will extend across four domains: Policy, Education, Program evaluation and Asset-based development. A key question is whether or not policy that incorporates local knowledge, culture and language in its development stages is more likely to succeed locally than a policy that has neglected to take all these into consideration. It is important to study what culture dominates educational software development, and what these effects are on a developing nations' educational process, especially if the content is not being localized. Is this culture intended or accidental and is it more important to focus on the product, i.e., software, than the mode of production, i.e., the computer.

First I will analyze current Canadian policy development, using case studies of policy implementation of the SchoolNet project. Then I will compare the research with what is being done in Thailand as far as Large Scale Change (LSC) in the school environment by using the Chen model for program/policy evaluation and Kretzman and McKnight's's asset-based community development model. The next step in the analysis will be to explore how Canadian ICT policies compare to Thai policies and where both countries are presently technologically situated. It is hoped the that results of the research could have implications on how ICTs are implemented into schools as well as the content that is developed to go along with the new technologies. The asset-based approach to educational policy implementation that takes into account local needs is in my opinion key if we do not want to see a homogenization of education around the world.

Acknowledgement and Dedications

I would like to take this opportunity to thank all the great men who I interviewed in Southeast Asia, who were courteous enough to invite me into their schools, offices and homes to share their knowledge and wisdom on education and technology in Vietnam, Cambodia, Laos, and Thailand. Thanks to: Do Lenh Dien - Principal of the Hanoi Amsterdam High School; Dr. Tran Minh Tuan - Director of Information Infrastructure and ICT industry Division Hanoi; Dr. Prof. Le Cong Hoa, - Vice Rector Hanoi University of Technology; Dr. Prof. Ha Manh Thu – Vice Director Hanoi University of Technology; Chukmol Uddam – Deputy Head of Department of Computer Science - Institute of Technology du Cambodge; Supote Prasertsri – Education Program Specialist – United Nations Educational, Scientific and Cultural Organization; Dr. Phoeurng Sackona – Director Institute de Technologie du Cambodge; Dr. Om Romny – Deputy Director – Institute of Technology of Cambodia; Dr. Im Chhay Hieng – Chief Bureau of information – Ministry of Education, Youth and Sport Cambodia; Ouam Sengchandavong – Deputy Director General – Ministry of Education; Dept. of Planning and Cooperation Laos PDR, and last but not least Dr. Suwat Suktrisul – Director of the Office of the Basic Education Commission Thailand.

I need to send out a great appreciation to the RAND non-profit institution that studies and analyzes policy in the private and public sector. Their article on Sexual Orientation and U.S. Military Personnel Policy: Options and Assessment, served as a backbone to this thesis. The study was written by roughly 20 authors and was supervised by Bernard Rostker and Scott Harris.

Much love to my thesis advisor, Dr. Bryn Holmes, who constantly pushed me forward every day and told me that I could always do better than I thought possible. She was an amazing source of information and inspiration and I was blessed to be able to work with her. Her support was phenomenal. Thank you Bryn.

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Table of Contents page

Tables and Figures

Introduction

> *The urgency of action regarding the achievement of basic education for all is based on the view that, as we enter the twenty-first century, the denial of anyone's right to education – be they child, youth or adult, be they male or female, be they rich or poor - is fundamentally unacceptable. This urgency has become even more imperative due to the impact of globalization and the rapidly expanding role of knowledge, information and communication at the interface between society, economy, culture and technology* (UNESCO – 31C/5 Draft programme and Budget 2002-2003; p. 37, para. 01004).

The increasing use of information technology in education around the globe has raised important questions about the relationship between culture and technology. Is the use of technology (such as televisions, computers, cell phones, software) in education culturally neutral or is there a *culture of the computer* that affects both teachers and learners? This question has interested researchers from the very emergence of the field of ICT in education to the recent globalization of the Internet (Benon 1986; Sheppard, C., & Scholtz, J 1999; Marcus, A., & Gould, E. W. 2000).

When educational policies are implemented into core curricula in developing nations, the *culture* of educational software, especially when imported, is mainly from abroad and professes foreign learning perspective. If research suggests that this is the case, will culturally sensitive ICT curriculum materials be more effective in educational environments? Are the initiatives that Thailand is taking towards developing a local knowledge base and skill set enough to protect their culture from homogenization of education? If yes, can the policies of Thailand serve as a model for other developing nations in the region?

If foreign software and hardware companies are developing online and educational curricula for export without considering the culture that will be receiving the materials, what are the implications for the local users? Will there be a short circuit in the methodology of the teachers and of the students who are the receptors of the new learning packages and programs or will their cultural learning methodologies be at risk?

> *More than ever before, education is at the heart of these relationships and is central to all efforts to ensure that knowledge societies are grounded upon considerations of equity, respect for cultural diversity and the protection of the common good.* (UNESCO – 31C/5 Draft programme and Budget 2002-2003; p. 37, para. 01004)

The quote above suggests that if we as a global village do not seriously take into consideration the implications of culture on knowledge then we risk creating an unequally educated and colonized society. I would argue that such a statement implies the necessity to research the culture of computer software in terms of its role in building, storing and sharing knowledge.

Research on the topic of whether technology is culturally neutral now spans several generations. Davies (1988) stated that the creation of a technology does not occur in a vacuum but instead encompasses social and cultural phenomena. Some years later, Gorski (2001) echoes these concerns calling for specific resources such as Web sites, CD-ROMs to be examined to consider if they contribute to education equity or supporting stereotypes.

Layton (1993) believed that tools and machines reflect the values of the culture in which they are designed and Weizenbaum (1984) also argues that technology can be seen as acting as transmitters of the Western culture in which they were created rather than being neutral instruments free of cultural context. Researchers since, have, therefore, been interested in how different types of learners (often grouped by ethnicity, racial identity, linguistic differences, and/or gender) interact with IT (Turkle, 1994; Chisholme, 1996).

Durie (1997) conducted a study of technology in a Maori context within the New Zealand school system and believes that technology cannot be isolated from its social and environmental context. Chisholm, Carey, and Hernandez, (2002) ask whether there is a level playing field when information technology skills are delivered in a pluralistic society. In conducting research of tacit knowledge of children in rural Alaska with Yup'ik Inuit student researchers (Grigorenko *et al.*, 2001) found that rural Yup'ik students outperformed students from an Alaskan regional center on a test of practical knowledge. They believed this to be due to an initiative where Yup'ik elders, researchers, and teachers have come together to integrate into the school's math curriculum both practical

and cultural knowledge (Lipka et *al.* 2001). In teaching the mathematical topics of perimeter, area, and physical proof, for example, the elders used practices of constructing a fish rack, and incorporated a rectangular structure used to dry salmon (Lipka & Mohatt, 1998).

According to Layton (1993), this type of the influence of culture on the computer can be explored when technology is transferred across cultures.

> *Values - technical, social, political, environmental, aesthetic or ethical - do not stand out on the surface of, say, a telephone hand piece or hairdryer. When technology is viewed from the perspective of transfer from the cultural context of origin to a different cultural context however, values are uncovered (p. 32).*

Identifying a good setting to examine the transfer of educational technologies across cultures is not always easy but with the recent boom of the Asian economies and the belief that technological skills can bring prosperity, Vietnam, Laos, Cambodia, and Thailand have all been implementing policies to bring computers into the classroom. Although the rapid boom has slowed, countries in the region look to educational technology as one way to continue to create conditions of the recent high growth. If Thailand develops innovative ways to localize content, it might be advantageous for other Southeast Asian countries to adopt the same approach. They might wish to examine Thai polices and then they might, saving time, money and research, for example, review Thai software and localize relevant programs, thus *leapfrogging.*

Next, identifying an angle to study the transfer of technology is important for a small-scale study like this one. Policy design, I believe, holds a variety of components that can aid in assessing the success or failure of the importation of information and communication technology. Thus a study of the types of policies implemented in South East Asia with reference to the use of computers in education may allow us to examine fundamental questions concerning the potential culture of the computer. Of importance, is the question: "will the policy's original mandate be met and will the objectives be obtained in the desired manner"? If they are not, what are the discrepancies between the initial policy and the new morphed policy on the ground? Another component to keep in mind is what policy instrument one is using, if they are using a policy instrument at all.

> *Some policy change is more difficult than others. The less clear-cut the issue, the harder it is to change the society that surrounds it. Individuals must understand the implications of the policies to their lives before they feel it necessary to change a law that may never affect them. This is a complex task that may fail because of an unwillingness to comply or, more likely, some failure of capacity to do so* (McDonnell and Elmore, 1987).

I have inserted this quote to give another perspective to the whole concept of policy development and implementation. It is very important to understand that even with the best intentions and plans, policy does not always have as much impact on the lives of people as we would hope. Many times what we feel is best for the community ends up not having the desired impact. That is why it is absolutely important to take the necessary steps to ensure that policy makers have communicated with community members to confirm the need and the potential for success.

This research-based thesis seeks, therefore, to explore the question of whether, there is a culture of computer software, and if so what are the implications of this culture? If there is a prevailing digital culture, how does this affect the country that is accepting the technology? The literature will explore the works of Kretzman and McKnight's (1993) asset-based community development, Hess' (1999) community organizing and Chen's (2004) program and policy analysis to compare and contrast Canada ICT educational initiatives with Thailand's ICT educational initiatives to decipher how each country can inform the other on development and the protection of culture. The goal is to understand the cultural influences that software has on other countries and how the development of local content with reference to external content can create assets within countries that can be developed locally and by the communities that absorb them.

The objective is to lay out the information about each countries' initiatives so as to better understand where they are in terms of development to later discuss how to recommend certain policy and program steps to take to assure that low level as well as top level partners in implementation have been referenced and consulted for their ideas on the new program, software or curriculum implementation.

It is necessary to bridge the literature in this thesis to the need for stronger analysis of policy implementation. It is important to analyze the successes of ICT implementation in Thai schools to show Thailand's growth economically, technologically and culturally so

that they can be applied to neighboring countries that wish to develop as well. Another aspect of implementation to keep in mind is the scope of the change. Should policy change everything about the classroom or simply how implementation works with technology? What if there has been no technology beforehand? One must then start from scratch and the implementation has a potential double impact. On one hand, there is a system of teaching that most likely has been in effect for a while and therefore the adversity to change could be high. On the other, because of a desire to improve their students' education, teachers could very well be open to the potential of a new teaching aid, provided there is training and extra funds available for them to properly do so.

> *Another important aspect is to manage the size of the targeted group. If the policy is intended for a communal level, the adoption and implementation of the policy is much more simple, however, if the policy is on a National (Thailand) or Regional (Southeast Asia) level, there are more factors that need to be considered, more people to be consulted. The less change required, in general are the more successful policies* (Mazmanian and Sabatier, 1983).

As my thesis discusses government changes that affect the community levels, there are two groups to consider. The governmental agencies develop and implement the policies but the community is in reality the force that will keep the policy alive. That is why it is essential to have developers who understand both the large-scale change mentality and the small group mentality to be able to manage both groups and attempt to get both sides of the story told.

My thesis thus attempts to address a number of critical concerns around ICT implementation initiatives in relation to populations in developing nations, in particular, Thailand. I will draw from a growing body of research into educational policy. Specifically, I will examine what policies have been implemented and how they are working on the ground level, their effect on community social and educational life. I particularly wish to explore:

> (1) Solutions that recognize the pivotal position of teachers and young people in working together on policy;
>
> (2) Issues of software localization - before implementation into educational environments through the use of asset-based development models; and
>
> (3) The potential to develop local IT curricula or use exported models as scaffolds to later localize appropriately.

This introduction presents the concept of the culture of computer software and how that culture in turn impacts educational implementation policy on many levels, supporting the need to develop theories on localizing technologies. If we are to truly learn from each other, then Canadian experience with its multicultural schools and curriculums in its educational system will be a valued asset and worth exploring. Canada's development of SchoolNet and Aboriginal educational content will also inform how developing nations can work on localizing software to represent local cultural values without sacrificing development.

Accordingly, the Thai knowledge may be informative for nations in Southeast Asia that wish to also develop the use of IT in their academic environments. If this thesis seeks to do anything, it hopes to promote the need to develop more localized technologies for schools and ministries through the cooperation of nations and the sharing of information. In the next few pages, I hope to give you background on each country as well as information about where they are in their ICT development, in implementation, and in academic environments. How can developed nations inform the use of technology in developing nations without sacrificing the host culture? Moreover, what is the responsibility of the organizations that are creating the tools, software and curriculum that are being exported?

Thesis Road Map

Chapter 1 - Background, looks at the background of Thai and Canadian cultures to establish the context of where both cultures are presently situated in their government and educational policies.

Chapter 2 - the Literature Review, will demonstrate what ICT initiatives each of these two countries have taken to implement ICT into their educational institutions. This chapter also discusses relevant context, such as what access to technology the average citizen has.

Chapter 3 - Methodology and Data Analysis, will look at the nature of the policy instruments that I have chosen to analyze. I will be focusing on four particular theories,

A) Hess (1999) Comprehensive Community Initiatives (CCIs)

B) Kretzman & McKnight (1993) Asset-Based Community Development (ABCD)

C) Chen (2004) Practical Program Evaluation – Assessing and improving implementation

D) Squires (2003) Case Studies on Curriculum and Local culture.

Chapter 4 – Tables and Cross-Cultural Comparison – this is the Data Analysis section, and is developed largely as a graphical section to visually encapsulate and represent the initiatives that have been taken by both countries to develop their ICT technologies in schools, as well as what tools are available to each country.

Chapter 5 – Low Cost Open Source Initiatives, looks at two very important initiatives in the localization of content and the protection and empowerment of cultures around the world: the Linux Terminal Server Project and the Edubuntu initiatives, that are part of the free software revolution as well as minimal cost technology implementation that is very pertinent to any country that does not have a lot of funds to allocate to ICT implementation in educational environments.

Chapter 6 – The Recommendation section will lay out 15 recommendations to better localize content through following certain steps to better understand the communities that your policies are effecting.

Chapter 7 - the Discussion section, will deal with current policies that have localized content and are presently working. It is a section where I will analyze with a more personal angle the research that I have set forth.

Chapter 8 - Culture of the Computer, discusses what attempts Thailand in particular has made to adapt imported technologies to their own culture. I analyze software programs that are being used as well as the concept of the computer having its pre-determined culture.

Chapter 9 – Cultural Diversity on the Internet addresses fundamental issues of culture and language on the Internet and presents some very effective initiatives that are being taken by UNESCO to diversify the languages that are being used on the Internet.

Chapter 10 - my Conclusion, will state of where I feel this thesis will take me in the future as well as what I have most taken from this educational experience. It is also a time to reflect upon the conclusions that have been made through the proposed research and what I have found. I hope that you enjoy the reading and will be moved.

Chapter 1: Background

Development and implementation of policy occurs in all domains of work around the world. Some are created to help change the top levels of management to be more effective, as well as some by top management to reach the ground level to increase productivity, employee satisfaction or a plethora of other issues any organization may be facing.

In my research, I will be focusing on large system change (LSC) - in this instance educational environments – the effects of the implementation on the communities and the need to encourage assets-based community development to take the necessary measures to protect local culture, language and learning methodologies. In this instance, the large systems will be the ministries of education and school boards in Thailand and Canada. I will focus on the implementation of ICTs in the schools and the desired versus actual effects. I will do so by analyzing the public domain research and cross-reference with my own personal reflections from visits made to Thailand in the winter of 2006.

My research took place in a very prosperous Thailand: a Thailand that has had more than a decade to recover from the crash of the Asian tigers in 1997, and which was progressing faster than any other Southeast Asian country with the exception of Singapore.

Thailand throughout history has been placed next to some very dangerous wars, and civil strife including, prominently: the Vietnam War and the Khmer rouge Toul Sleng – 'killing fields' of Pol Pot. I visited Thailand in July 1997 and the difference in what I saw in 2006 was astounding. The increase in infrastructure and the reduced level of poverty upon my return 10 years later were astounding. The downtown core of Bangkok was no longer even recognizable with massive shopping centers, tramways and subways. Hewison (2002) describes the chaotic sense of change as follows:

> *Thailand's economic performance from 1957 to 1996 was remarkable, with uninterrupted, sometimes very rapid, growth. The decade to 1997 witnessed an unprecedented economic boom that came to a crunching and dramatic halt in July 1997, with the beginning of the Asian economic crisis, the impact of which is still being played out. Despite the crisis, Thailand's economic development has amounted to a capitalist revolution that has been more thorough than many would*

have thought possible even two or three decades ago. Thai society has been dragged from its agricultural past and plunged into an industrial present (p.225).

The timing of my research could not have been better. It had been 10 years since the crash of the Asian tiger, yet the country was quickly developing its ICT educational infrastructure and rapidly becoming a developed nation. I believe that research undertaken now will be valuable as the country is progressing fast, and is well placed to protect its culture while still benefiting from the knowledge of nations like Canada, USA and Japan. Thailand is an enviable position of needing partnerships as much as needing funding. Thailand is also ideally placed to share knowledge with many regions around it as well as to inform nations like Canada on how to better develop software that could eventually be sold into local markets.

Thai Context

Thailand is a country in Southeast Asia with roughly 64,8 million people. The economy of Thailand is export-dependent, with exports accounting for 60% of GDP. Thailand is the second largest economy in Southeast Asia, after Indonesia, a position it has held for many years. Thailand's recovery from the 1997-98 Asian financial crisis relied on exports. Exports – commodities include: textiles and footwear, fishery products, rice, rubber, jewelry, automobiles, computers and electrical appliances [1]

A new constitution was passed in 1997 reflecting the rights of the people in political participation and also the right to voice public opinion on major issues. It is stated in section 81 of the constitution that the State will *improve education to be in harmony with economic and social change.* The new constitution guarantees that (section 43) all subjects in the Kingdom of Thailand have the right and duty to receive an education for at least 12 years, free of charge – which is very similar to the rights and access Canadian youth have to education. The constitution also states that (section 30, 69 and 42) that all

[1] http://www.nationmaster.com/encyclopedia/Economy-of-Thailand

subjects have access to education, training and academic freedom, as well as fair access to education for young children, women and the elderly (Sections 53,55 & 80).[2]

Most importantly and most relevant to this thesis, Section 46 stipulates that "*the conservation and restoration of local wisdom*" is of utmost importance in the thriving of a healthy Thailand. This clause serves to underpin initiatives by the Ministry of Education to try and get to develop asset-based community development as a part of the governmental mandate to protect what local knowledge already exists.

The main issue of contention and difficulty in implementing reforms is the wide difference in culture and socio-economic status of provinces in Thailand. Excluding Bangkok Metropolis, Thailand has 75 provinces, each having a governor, and each province is divided into districts, sub-districts and tambons (villages). This division of the territory makes it more difficult to have a consistent and cohesive policy that can be used for all communities.

Since 2000, Thailand has made a concerted effort to implement IT into its government agencies in all levels of work such as the development of public databases and information networks. There are several government plans to initiate public databases in agriculture, health, law, regulations, energy, weather, tourism, land, sea and air transportation. This development started in 1992, but it was only in May 1997 that a large budget was approved for IT projects as part of National development.

ICT in Thailand's schools

In this dissertation I will also be focusing on Thailand's Education for all Policy, Thailand's Hub for Integrated National Knowledge (THINK) as well as their pilot project for ICT integration to try and apply their successful model to the rest of the Southeast Asian region (excluding Singapore). This policy paper will help to develop the potential for a community-based, national policy model for the ASEAN (Association of Southeast Asian Nations) countries by applying the Kretzman's and Mcknight's (1993) Asset-Based Community Development model. I will then compare the THINK project to the SchoolNet program in Canada. It is important to start the research in Thailand - the most

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[2] (10-3-06) http://sn.mhs2.go.th/ebook/pdf/education03/pdf.pdf

developed of the ASEAN countries - to focus on its accomplishments and later see how it is applicable to other nations that surround such as Vietnam, Cambodia, and Laos.

The following are some basic educational statistics regarding education n Thailand:

- Average years of schooling of adults: 6.5
- Duration of compulsory education: 9 years
- Education spending (% of GDP): 5.2%
- Literacy > Total population: 92.6 %
- School life expectancy > Total: 10.8 years
- Spending on teaching materials: 3.2
- Students whose mothers have secondary education > Age 13: 9% (Nation Master.com, (n.d.) Retrieved (March 19th,2007)[3]

In 2002, the Royal Thai government created the Ministry of ICT. The use of Information and communication technologies (ICTs) in Thai schools is classified as including broadcasting media, printing media, and non-traditional media such as the computer and the Internet.

Canadian Context

Canada is a country in North America and presently has a population of 33,315,611 people. Canada is made up of 10 provinces and 3 territories and has a very multicultural population. Canada is one of the world's wealthiest nations, a member of the Organization for Economic Co-operation and Development (OECD) and Group of Eight (G8). As with other first world nations, the Canadian economy is dominated by the service industry, which employs about three quarters of Canadian workers. Canada is unusual among developed countries in the importance of the primary sector, with the logging and oil industries being two of Canada's most important. Canada also has a sizeable manufacturing sector, centered in Southern Ontario, with the automobile industry especially important. In Canada's huge landmass, the second largest in the world after Russia, a wide array of natural resources are present. Different resources are centered in different parts of Canada.

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[3] http://www.nationmaster.com/country/th-thailand/edu-education

The Confederation Act of 1867 constitutes a major part of Canada's constitution. The Act encompasses the creation of a federal dominion and defines much of the operation of the Government of Canada, including its federal structure, the House of Commons, the Senate, the justice system, and the taxation system. The *Constitution Act, 1982* is a part of the Constitution of Canada. The Act was introduced as part of Canada's process of "patriating" the constitution and its system of governance.

The Canadian Charter of Rights and Freedoms was published in 1982 as a document that was to inform Canadians of their rights under this new Constitution Act, 1982. Section Twenty-three of the *Canadian Charter of Rights and Freedoms* is the section that constitutionally guarantees minority language educational rights to French-speaking communities outside Quebec, and, to a lesser extent, English-speaking minorities in Quebec.

23.1) Citizens of Canada

(2) Citizens of Canada of whom any child has received or is receiving primary or secondary school instruction in English or French in Canada, have the right to have all their children receive primary and secondary school instruction in the same language. (Canadian Charter of Rights 1982; p.21)

As in the Charter 46 of the Thai constitution, the Canadian charter, as we have seen above, has taken the steps necessary to protect language, and, as language has a direct correlation to culture, in turn it can be interpreted that the charter protects culture. The proposed thesis discusses the culture of computer software and the need to protect developing nations from imported cultures.

Canada directly tries to protect its culture by developing programs, laws and institutions that reflect the life and times of Canadians through the Canadian Broadcasting Corporation (CBC), the National Film Board of Canada (NFB), and the Canadian Radio-television and Telecommunications Commission (CRTC) that is set up to ensure air-time to Canadian creators and Canadian content on CBC and CTV, two Canadian television networks.

Both Canada and Thailand are taking steps to protect the identity of their people and the cultures that surround them. Part of that process involves the role of respective ministries of education who determine local curricular content. It is hoped that this thesis will be

useful for any policy developers at the educational level for some of these institutions to see the need to develop content that is relevant to their educational institutional needs.

Basic education information:

- Average years of schooling of adults: 11.6
- Duration of compulsory education: 11 years
- Education spending (% of GDP): 5.2%
- Literacy > Total population: 99 %
- School life expectancy > Total: 14.8 years
- Students whose mothers have secondary education > Age 13: 60%

(Nation Master.com (n.d.) Retrieved (March 19th, 2007)[4]

Public education

Education in Canada is provided, funded and overseen by federal, provincial, and local governments and the curriculum is overseen by each of the provinces. Each Territory and province is responsible for their education systems and their school boards. Attendance is mandatory for all students up until they 16 years of age and most schools (unless private) are public tax-supported schools.

Since the adoption of section 23 of the Constitution Act, 1982, education in both English and French has been available in most places across Canada (if the population of children speaking the minority language justifies it). Canadian provinces and territories have jurisdiction over their education systems policy is developed by each province according to their needs. The federal government has an indirect and direct role as they provide the fiscal support to each province and help develop the information infrastructure available to all public institutions. The institutions that directly influence educational policy in Canada are Industry Canada and Human Resource Development Canada, which support partnerships between the federal and provincial governments: for example, the connecting Canadians initiative that incorporate SchoolNet and LibraryNet as well as Community access program.

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[4] http://www.nationmaster.com/country/ca-canada/edu-education).

Chapter 2: Literature Review

ICT in schools in Canada and Thailand

The aim of this Chapter is to examine the role of policy and ICT implementation in Thai schools with a comparative reference to the SchoolNet project in Canada and recommendations for other countries in South East Asia.

The literature review will focus on the present initiatives that are being worked on in Thailand and Canada so as to better apply the four theories from the methodology section. The documents that I have read were from School boards, public domain websites and, in my opinion, really great books. This section will help the reader to draw conclusions as how to better localize content through the community centered approaches discussed in this thesis.

First I will explore the initiatives in Thai schools with regard to the implementation of ICT in the classrooms. Then I will compare these to recent programs in Canada.

I will examine current literature on community organizing including: Kretzman and McKnights' (1993) asset-based community development; Squires' (2003) work on curriculum and local culture; and the Action Change model taken from Chen's (2004) theoretical work on program analysis. These theories will be used to examine how curricula and policies that have taken into account local cultural values tend to have higher success rates. Their findings might be, I will argue, applied to the need to localize exported software to the nations to which they are being sent. I also wish to highlight the importance of the input of teachers and students when developing policies that will be affecting their lives in their schools.

Initiatives in Thai Schools to support the use of ICTs

In the following section I will examine the technology initiatives in Thai schools, whether the computers are functioning properly and whether it is possible to assume that these students have access to computer technology outside of school to be able to continue their work at home or in a local Internet café or Telecenter.

In Thailand, the Office of the Basic Education Commission (OBEC) is responsible for all policy development plans, academic standards and core curricula for basic education (grades 1-12). The OBEC is currently trying to implement an educational reform that gives quality education and equality of access, with an emphasis on low-income populations and rural areas. Schools in remote areas are poorly equipped with the basics, including electricity and proper classroom setups (desks and blackboards), aspects of reform that thus often come before the use of ICTs and hiring well-trained teachers. The dropout rate in rural schools is significantly higher than in urban areas.

According to the policies of the current Ministry of Education, Thailand's Hub for Integrated National Knowledge (THINK) has specific goals to accomplish within the next three years.

The THINK initiative seeks to aid all students to access and exploit ICT technology, acquire ICT skills for better academic achievement consistent with the curriculum standards that are set out bi-annually through the OBEC.

All schools will have access to the Internet (primary schools by 2007, secondary schools by 2005, and colleges & Universities by 2004).

1. Every school has an effective LAN system (institutions with more than 400 computers will have GIGABIT network, others will have fast Ethernet with speed not less than100Mbps
2. All educational institutions make use of ICT tools in their instruction to develop students' learning, as well as websites to provide educational services
3. At least one computer lab in each district to give support to primary and secondary schools
4. Availability of electronic instructional media (at least 1,000 e-books per year and adequate courseware for all key learning areas)
5. Nation-wide establishment of courseware development centers and e-libraries to support instruction
6. Promotion of the use of ICT in educational administration and management and in delivery of educational services
7. All teachers and educational personnel will receive appropriate training in the use of ICT in teaching and learning, in administration and provision of educational services what is appropriate training?
8. Conduct research and development in the application of ICT for educational purposes (at least 100 projects per year.)

With these goals in mind, the Thai government is hoping to give all people the same access to information technology.

"By 2010, all schools will be able to connect with the IT network; and computers or IT will be used as part of the teaching-learning process at all levels. The expected portion of usage should increase by 30 between 2006 and 2010" (Office of the Education Council, Thailand, 2004 p. 110).

There are underlying reasons for ICT push in Thai schools. Thailand claims to be the largest manufacturing base of computer hard disk drives (HDD). The credit is attributed to Thailand's being competitive in cost, having a highly skilled labor pool, a booming domestic market, its central location in Asia as well as the establishment of the Ministry of Information and Communication Technology (MICT), the Software Industry Promotion Agency (SIPA) and the National Electronics and Computer Technology Center (NECTEC) Software Park. NECTEC is a center of excellence combining corporate with academic institutions with an aim to broaden knowledge and enhance the skills of Thai IT professionals through various educational activities. Such activities include: training of teachers; development of content; networking of educational administration systems; increase of ICT usage; and development of ICT infrastructure.

Thailand has made concerted efforts since 2002 to develop content for its educational facilities and technology initiatives. Their efforts are important to examine as they are leaders in the region (excluding the more financially stable Singapore and Japan) as to how developing nations can protect their culture and leapfrog unnecessary steps, while still remaining competitive in a global IT market. The Ministry of Education has implemented several projects that include information technology.

In 2002, the MOE (Ministry of Education) implemented several projects regarding the development of materials and other technologies for education to be used at the level of basic education. Among these were

1) Project on development of teaching materials and other technologies for education for 8 group subject groups; Thai language, Mathematics, Science, Social Studies, Religion and Culture, Health Education and Physical Education, Art, Career and Technology Related Education and Foreign Languages as based on the 2002 Core Curriculum for Basic education; and
2) Project on assessment and evaluation of selected materials and other technologies for education produced by the private sector.

As for the development of software, media and learning content, the MOE allocated a budget for the fiscal year 2002 of 150,501,960 Baht or about 3,762,549 dollars in order to carry out the following six tasks:

a. To procure legal software;
b. To encourage teachers and educational personnel to produce software that aid the teaching-learning process;
c. To encourage educational institutions, learning centers and learning sources to develop websites so as to exchange knowledge;
d. To establish multimedia centers;
e. To develop a standardized database system;
f. To encourage through competition, the development of multimedia and software that aid the teaching-learning process.

(Education in Thailand (2002-2003) Office of the National Education commission; p. 13, Chap 1. P.1)[5].

Access to technology in the Southeast Asian context

> *Telecenters tend to be in the public sector, operated by governmental bodies or nongovernmental organizations (NGO's). Generally they serve a low-income clientele and have community development mission. Typically, telecenters offer a broad range of communication services related to the needs of the community, some of which are free or subsidized by external bodies such as governments or NGO's (Colle, 2002; p.4).*

The concept of the Telecenter is a sound idea, and supported by the International Development Research Centre (IDRC), a Canadian run research center. The following goal revolve around improving access to technology in developing nations:

- Improve their own financial strength, technical know-how, and management abilities to serve more people in better ways
- Develop and share new social enterprise models, training methods and community services, for telecentres and networks to adapt and use easily
- Share information and learning on key issues like business planning, fundraising, outreach, and community development. (IDRC. (n.d.) Retrieved March 19th, 2007)[6]

There are presently some Telecenter initiatives in Cambodia through the IDRC that focuses on developing "e-community" pilots in 2 Cambodian Villages: Krong Kep and

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[5] (10-3-06) http://sn.mhs2.go.th/ebook/pdf/education03/pdf.pdf

[6] http://www.idrc.ca/en/ev-67966-201-1-DO_TOPIC.html

Kamchay Mear; Community-Driven Universal Access Solutions in Cambodia (cUAPc): Pilots to Policy Research. These "e-communities are collaborations between government, NGO's, academia and business in Cambodia to mainstream universal access to ICTs. The policy research focuses on developing ICT readiness in the community. The findings will be shared with neighboring countries such as Myanmar, Laos and Vietnam and international communities will have access to the findings. The objectives of the policy are very much in line with the Asset-Based Development model that will be discussed in the next chapter.

cUAPc Objectives:

- Establish and nurture two pilot e-communities, one in the rural locality of Krong Kep municipality and the other at Kamchay Mear
- Build capacities in local communities, academic institutions, NGOs and government in the area of research on ICTs for development
- Build the capacity of local organizations, agencies and key people to mainstream ICT's into community institution building
- Support the evolution of a community-driven entity to manage and ensure the provision of ICT-based services for all sectors of the community
- Build the capacity of local organizations, agencies and key people to undertake
- Participatory research, including participatory rural appraisal in ICT-related needs assessment, and in service delivery and enterprise development; and in monitoring the impact of technology access in communities
- Ensure the participation of women both as beneficiaries and as actors in the management of ICT-based services and to integrate gender analysis in all research aspects of the project
- Build the capacities of Cambodian institutions to address issues in a systematic way for research publication.
- Build a national level multi-stakeholder constituency (including Ministries, major institutes and NGOs working in the ICT sector) favorable to the evolution of a progressive and innovative Universal Access Policy focused on all poor communities, and hopefully to influence ICT policy in Cambodia, and specifically to mainstream a multi-dimensional approach to universal access policy (IDRC. (n.d.) Retrieved April 15th, 2007).[7]

The IDRCs cUAPc Website displays the objectives and the mandate, but is neglecting to discuss the type of software used. The Telecenter.org movement is a collaborative investment program that is supported by Microsoft, the IDRC and the Confédération

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[7] http://www.idrc.ca/en/ev-93387-201-1-DO_TOPIC.html (April 15th, 2007)

Suisse. Even though the computers will come with Microsoft proprietary software, communities will only need to install Linux operating systems over the present operating system and will have access to free open source software. This open source software is available through the Internet and/or CD disks. The initiatives are set up to focus on the need of the community to become connected to the Internet. It is important, however, to also focus on the development of educational software that reflects local educational trends and modules that represents local cultural references.

The Jhai Foundation in Laos along with support from the IDRC is also developing in five remote villages of the Hin Heup District sustainable wireless IT centers. The Jhai foundation will provide project management and support through experienced Lao personnel. The goal is to create rugged computer with low power requirements that are linked to a wireless network. The Interface will be a Linux desktop environment (KDE) that will allow the localization of software language for use by rural Lao people. This is made possibly by the fact the Linux is open source and therefore everyone has access to the scripting language. Villager have stated that they will be using the tools to:

> *"Establish a valley-wide local market, build businesses supplying the market towns of Hin Heup, Phon Hong, and Vientiane, and communicate with family members and business associates in Laos and overseas. Centers will be staffed by "youth IT entrepreneurs,"*[8]

So far Thailand has proven to be completely committed to the development of its ICT infrastructure in education as well as localizing content so as to make the necessary steps to protect the local wisdom and knowledge. This and other initiatives make Thailand a potential model for other countries situated in Southeast Asia. Countries such as Laos and Cambodia may leapfrog policies developed by Thailand that were costly and possibly unnecessary so as to better their infrastructure and ICT initiatives. Each country would have to eventually re-localize to a model that could help them with relative social issues of climate, geography and possibly financial resources for development.

What about the issue of successful ICT implementation across the board, in both rural and urban areas? Many rural areas still have no access to regulated electricity outside of

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[8] http://www.idrc.ca/en/ev-22769-201-1-DO_TOPIC.html (April 15th 2007)

their schools, and even the schools that do, may not have proper access to technical support to develop and maintain the introduction of computers, especially LINUX. As well, the schools may not have the proper rooms to support the computers, possibly due to dust and heat. Therefore how does a National policy cover all its citizens without falling behind because its rural areas are not yet up to speed? Using examples from SchoolNet and the GrassRoots initiative – that have focused on the development of ICT in schools in rural and Aboriginal settings – I will suggest in the discussion section, where one can start to empower such communities.

Initiatives in Canadian Schools to support the use of ICTs

History of SchoolNet

Canada's SchoolNet, an initiative of the federal government, is designed to invest money into the connectivity to the Internet of all schools and libraries under federal jurisdiction, including First Nations schools. The goal of SchoolNet is to stimulate the use of the Internet in a learning environment, with the aims of harnessing technology use for all Canadian learners.

The SchoolNet program is federally controlled and has the goal of connecting Canada's schools and libraries to the Internet; increase access to equipment (Computers for schools); increase knowledge of ICT use in schools; facilitate the growth of knowledge that students have; develop teachers ICT knowledge through vocational training and on the spot projects, and learnware applications (GrassRoots, Network of Innovative Schools, the SchoolNet Multimedia Learnware and Public Access Application Programs).

On March 30th, 1999, through collaborations with ministries of education, school boards, education associations, schools, teachers, students, parents and the private sector, Canada became the first country in the world to connect its schools and public libraries to the Internet. More than 400,000 computers are connected in Canadian school classrooms and over 270,000 computers have been delivered to schools and libraries.

Another initiative by SchoolNet takes into consideration the First Nation peoples of Canada attempts to localize and develop information technologies that reflect specific

cultural values. The SchoolNet GrassRoots Program is a unique program designed for teachers to promote and facilitate the effective integration and use of information and communications technologies (ICT) in the classroom. Students in both elementary and high school are encouraged to develop collaborative ICT skills in the classroom. As well GrassRoots program focuses on training learners and educators to be effective creators of pedagogically relevant Canadian content through the creation of over 20,000 online collaborative classroom projects.[9]

GrassRoots projects are initiated, designed and implemented by teachers and students and are curriculum relevant. The GrassRoots Program, in collaboration with provincial, territorial and corporate partners, offers funding to schools for the creation of innovative, Internet-based interactive learning projects that:

- Foster the acquisition of academic, employability and computer skills in Canadian youth;
- Integrate information and communications technology into learning;
- Build unique and relevant Canadian content on the Internet; and
- Facilitate increased connectivity and training opportunities. (Kitagawa, 2001; p. 8)

This initiative suggests to me that the Canadian government is open to the need to incorporate local knowledge into the development of their online curriculums.

The SchoolNet initiative also works with Industry Canada to promote broadband access for Northern communities that have been the most neglected communities in Canada first and foremost due to their geographical location and secondly due to the cultural difference between European Canada and Aboriginal Canada.

> *Expanding broadband services will contribute to the sustainability of our northern and remote communities, and will help ensure that Canadian families and businesses can have a prosperous economic and social future, in particular through improved access to telehealth, e-business, and distance learning services," said Minister Rock. "It will also bring the Government of Canada one great step closer to ensuring broadband access is available to all Canadian communities* (Industry Canada: www.ic.gc.ca (Oct. 5th, 2003) Retrieved March 17th 2007).[10]

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9 http://schoolnet.ca/home/e/resources/browse_results.asp?SECTION=0&SUBJECT=16&LangID=1&SEARCH=index.asp

10 http://www.infrastructure.gc.ca/ip-pi/csif-fcis/news-nouvelles/2003/20031005rankininlet_e.shtml

The funding came in October 2003, and it was a welcomed initiative from Industry Canada that supports the investment in the North that are absolutely necessary if our Aboriginal people are to have the same access to technology as their Non-Aboriginal Canadian brothers and sisters.

> *This funding demonstrates the Government of Canada's commitment to economic development in the North," said Minister Nault. "Providing greater access to the Internet will not only open new lines of communication for northern and Aboriginal communities, it will enable other Canadians to communicate more easily with the North. Improved Internet access will also bring new technologies and business opportunities to northern Canada, which will enhance the quality of life for all* (Robert Nault - Industry Canada: www.ic.gc.ca (Oct. 5th, 2003) Retrieved March 17th 2007)[11]

Similarly in Canada, SchoolNet has had a variety of case studies done on the implementation and success of ICT in the classroom with similar localization of content, particularly with provinces like Quebec that have strong convictions about the protection of their language and culture. The SchoolNet GrassRoots programs focuses on similar implementations as the Thai initiative where much of the software is created with an asset-based concern for its success and livelihood.

Some initiatives include:

- Internet-based interactive learning projects that are designed by teachers and students;
- Curriculum relevant content development;
- Foster the acquisition of academic employability and computer skills in Canadian youth;
- Integrate Information and Communication Technology into learning
- Build unique and relevant Canadian content on the Internet; and
- Facilitate increased connectivity and training opportunities.

The SchoolNet projects like the Thai initiatives try to protect local cultures by involving the people (teachers and students) most affected by the change in the process of implementation by studying with them the impact of integration of ICT in curriculum on

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[11] http://www.infrastructure.gc.ca/ip-pi/csif-fcis/news-nouvelles/2003/20031005rankininlet_e.shtml

learning and teaching; diversity of activities involved in implementing a project; innovations by teachers in integrating ICT-based learning in the classroom; and Student/teacher reflections on the Internet and its uses in education. (Kitagawa, 2001; p.3)[12]

> *When teachers and students carry out GrassRoots projects, they connect with each other in ways that empower individuals, build community capacity and lay the groundwork for a global community. GrassRoots projects enhance students' and teachers' connectedness in the knowledge economy in all of its various forms, including connections between physically present and long distance project team members, connections between information sources and connections between real life events and the electronic recording of those events. Such high touch/high tech connectedness greatly expands teaching and learning horizons because the whole world becomes a potential resource for gathering and interpreting data, sharing and processing information, growing knowledge, building collaborative alliances and generating useful and broadly applicable insights. This in the stuff of innovation. (Kitagawa 2001; p.3)*

This section is set up so that we can understand where two very different cultures are coming from so as to better analyze them in the methodology section. Each culture is aware of the need to develop their ICT sectors and are making amazing strides to do so. The analysis of Thailand and Canada in this section is an example of how to proceed when researching a country – especially if you are a policy implementer who is not from the community – to have a better understanding of where the local citizens may be coming from when they are asked to contribute to the development of the policy.

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[12] http://198.103.246.111/grassroots/e/resources/toolkit/CaseStudy2k/page2.asp

Chapter 3: Methodology, Findings & Analysis of Policy documents

It is my goal to set forth several theories, demonstrate how they influence the data analysis and understand how they can be applied in varying degrees to cultures from around the world to make recommendations.

In this section I will be looking into the theories of asset-based community development, program analysis and policy development and their implications for ICT and education. I will analyze how the localization of educational software technology during the development of any implementation policy is a valuable tool to help people thrive in their attempts to improve their communities.

Mandates, inducement, capacity building and system changing are all methods of establishing order within a policy, and a good implementer knows how to explain this to a community. When developers are approaching new communities with new ideas, they must conduct grounded research as to the needs and assets of the community so that they can explain to all citizens involved of their intentions with the new policy. In this section, I will analyze some theories on how to understand communities and their assets so as to better understand how to work with them and develop their new policy.

Organizational change and its relation to policy implementation

Implementation can be defined as: "The carrying out of a basic policy decision, usually incorporated in a statute but which can also take the form of important executive orders or court decision. Ideally, that decision identifies the problem(s) to be addressed, stipulates the objective(s) to be pursued, and in a variety of ways, 'structures' the implementation process" (Mazmanian & Sabatier, 1983, p.20). Usually there are two steps to a policy implementation: adoption and implementation. Large-scale organizations in this case MOEYS and OBEC need to be aware of the potential policies, so as to analyze and approve them and then further develop them, as do communities of practice such as a school or a neighborhood. After adoption has occurred, it is feasible to implement the proposed policy and determine whether it does work within the boundaries of the community or large-scale organization.

Implementation researchers (e.g., Elmore, 1978, 1980; Goggin, 1987; McLaughlin, 1987, 1990; Mazmanian and Sabatier, 1983) relate to how new policy is implemented and n turn impacts organizational change. If the implementation of any policy is poorly understood by the people and/or organizations that it is affecting, then it does not matter how thorough an analysis on the policy exists. It will not instigate the change needed. Language, cultural relevance and societal norms must be built into the policy for it to be a success.

It seems that, even though no one policy can be defined perfectly and its steps replicated exactly, there are some common threads when dealing with policy implementation that can be considered best practice.

- First, if the policy maker understands that change does not come easy, they will approach the policy implementation with grace and patience. (McLaughlin, 1990)
- Secondly, if the policy makers understand that even though they feel that this mandate is the perfect mandate for the organization or the people involved, they cannot force any change on anyone, and must understand that the policy must find a home at the lower levels without pressure (McLaughlin, 1990).
- Third, there are some rules of engagement that exist that can allow for the policy to make it down to the ground level without having changed itself too much in the process (Mazmanian and Sabatier, 1981).

If a policy has taken into account the need for sustainability and has understood that without the participation and training of the local population the project cannot remain afloat, then when the policy makers, in this instance foreign educators, withdraw themselves physically from the training and other aspects of the implementation the policy can stay afloat. After all the technical infrastructure has been established, the bulk of the funds needed are to pay teachers, technical support, new purchase of software and localization of software to the cultural context. If this transfer is successful, then the local people can benefit by having access to ICT in the classroom as well as producing a new generation of technically savvy students that have skills for the workplace and their country. They will own the means of productions and this is a very empowering place to be for a country that is still developing. All of this works only with the compliance of all people involved, with a desire to improve the current policy.

Nature of policy instruments

McDonnell and Elmore (1987) argue that there are four generic classes of policy instruments. The four resources outlined and placed into context below provide support for the argument that development is only successful if the local participants make it so. I believe that without community support and cultural local relevance that most projects are at risk of failing after external programmers and implementers withdraw their funding and technical support. To avoid such costly experiences, I believe that following certain steps in the referencing of the clienteles needs is necessary to prevent squandering of already precious educational resources. Here I elaborate on the four classes of policy instruments in McDonnell and Elmore's (1987) model in light of conditions in Thailand.

(1). *Mandates, which are the rules that govern the actions of individuals and agencies, intended to produce compliance*:

Instruments in this instance would be the previous rules of engagement within the ministries of education, plus the reality of existence of the teachers on the ground. These rules must be taken into account when trying to adopt new rules that will usurp the old ones. We need the support of all adults involved in this and if we do not, then somewhere along the chain of command and line of implementation we will have failed policy. Especially with a top down culture like Thailand where adults are revered.

(2). *Inducements, the transfer of funds to individuals or agencies in return for certain agreed-upon action*:

There has to be some incentives for the ministries to spend the extra money on the technical needs of implementing ICT in the classroom i.e. computers, proper rooms for the computers, air conditioning for the room, teacher training, technical training, software purchasing and then paying the software engineers to localize the content so as to be effective in the classroom. Another concern for policy makers is whether or not the teachers will do this extra work without demanding more pay. This may be more difficult for a country like Laos, that does not have as high a GDP as Thailand and cannot allow for to much redirection of national resources.

(3). *Capacity building, the transfer of funds for investment in material, intellectual, or human resources*:

If after all these needs have been addressed there is still an intellectual and economic benefit that comes out of the implementation, then it is more likely to be approved by the agents that lend money, such as the International Monetary Fund or the World Bank, or private companies such as Microsoft or local Internet suppliers. There has to be some sort of benefit for people or it is harder to convince them to change.

(4). *System-changing, the transfer of official authority among individuals and agencies to change the system through which public goals and services are delivered:*

Once a policy has proven to be effective and the community can support it, then it would be the responsible move of the government to hand over more local control and maintain contact through an impartial agent who verifies the expenditures and the life line of the policy implementation.

With this model as reference, a community organization can input their needs and wants, verify them and make sure that they are thoroughly analyzing each step of the implementation and comparing and contrasting them to their needs versus their expectations.

Models of change

> *People tend to work with 3 different models in this field, and they tend to think their model is the only one that works. One is the* ***collaborative model****, where you bring all the different stakeholders together under the assumption that they all have some common interest at heart, and they all want to do the right thing, and they'll come together and do it and everybody will be happy. Then there's the* ***professional planners model****, where you bring together experts and planners to analyze the problem and come up with solutions. And because it's all so logical and rational, everybody is going to agree to it and march off to do what's right. Then you've got the* ***conflict model****, where the assumption is that the haves and the have-nots possess diametrically opposed interests, and if the have-nots are ever going to get anything from the haves, it will only be through conflict and struggle...But very few people realize you need all three models to make change. And if I could go back and start over... I'd have been much clearer up front about the importance of using all three models, and reconciling them (Johnson, O. Quoted in Walsh 1997, p.38).*

In the previous quote, Otis Johnson From the Chatham-Savannah Youth Futures Authority, discusses how comprehensive community initiatives (CCIs) are the result of a combination of a variety of local actors, community-based and government agency-based organizations who work together on projects to develop treatments to social problems in a less fragmented way than in the past; as well as a combination of various model for community change. CCIs strive to increase the capacity of service providers and development providers by increasing linkages between the community and external actors that influence the proposed policy programs.

In the following diagram, Ganz (1998) proposes the fundamental layout of how a program is controlled by the community and by the external participants is a viable source of local knowledge and information.

Ganz, a former organizing director with over 30 years of experience and currently at the Kennedy School at Harvard, has developed a method for distinguishing four categories of interventions which appear over and over again in the practitioner literature: service delivery, community development, professional advocacy and community organizing (Ganz, 1998). Ganz (op. cit) uses two bases, each with two dimensions, about change practices to create these four categories. The first basis regards the location of control of the program: internal to the community or external to the community. The second basis regards the product the program creates: a tangible benefit or service or an advocacy role whereby some claim for change is made on others.

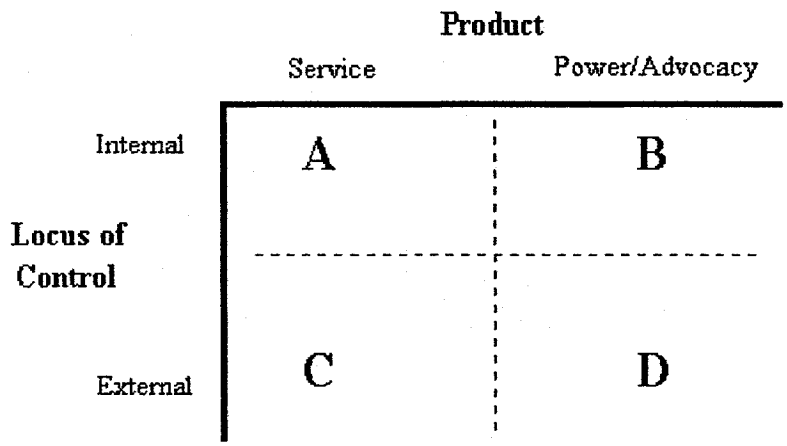


Figure 3.1: Ganz's Traditional Change Model

In **box A** are local service and development programs controlled by the community, such as community development corporations (CDCs), service centers and cultural groups overseen by community boards. In **box B** we find community organizing: efforts by residents and issue groups to influence institutions or decision making bodies which have an impact on the lives of the groups' members. Social service programs are located in **box C**, distinguished from box A because they are controlled by external actors (the government or non-resident boards). Finally, professional advocacy or reform campaigns which are not controlled by community participation are located in **box D** (e.g., legal defense funds) (Hess, 1999; p. 7).

If we were to place Thailand and Canada into the grid above both countries would fairly resemble each other and be as follows:

A: Local services and development programs: Schools & teachers that implement the new technology in their classroom, any technical support available to the school as well as the main communicator (school board official or local representative) between the school and the school board

B: Parents, teachers, and students who are involved in the progress of the school either with parent teacher meetings, organizing outings and meeting to develop local content to engage their children and students. A good example of this involvement is the Meanprasatwittaya School, that has child-centered constructivist learning that involves all school personnel as well as parents (Fredrickson, T. Bangkok Post "Ahead of the Pack", 2004).[13]

C: Here we would have to put either the THINK project or The SchoolNet projects, two projects that are involving community but come from an external source, in this case the Ministry of Education and Industry Canada respectively.

D: Here would be any organization fighting for teachers and student rights, Aboriginal organizations maintaining the need for relevant localized content or NGOs that participate in the empowerment of the community.

Hess's Comprehensive Community Initiatives (CCIs)

The next model we will be exploring is Hess' (1999) interpretation of community organizing. His approach is much more holistic as it takes into account both the large institutions as well as the smaller community groups.

Hess (1999) explores three CCIs and how they impact and influence each other. Then he goes on to develop a model for community change entitled the social change model. As well as a model for CCIs, Hess (1999) explored the theory of Community Development Corporations (CDC) that are non-profit corporations with community boards and, often, members of institutions external to the community such as banks, government officials or foundations who provide expertise. In our case, these organizations would be ministry of education officials, policy developers and paid consultants.

[13] http://www.bangkokpost.net/education/site2004/cvfb1004.htm

In general, there are four features of programs the CCI movement promotes:

1. **CCIs coordinate existing institutions serving the community:**

Generally, the emphasis is on coordinating community development corporations (CDCs) and community-based service providers, but local government agencies are often also included. This coordination attempts both to relate the services these institutions provide in a more logical fashion across the life span of participants and to confront social problems with a comprehensive treatment of services. Coordination uses information about opportunities in the community and planning for services and programs which social science indicates will have "synergistic" effects (an efficient use of resources for reducing more than one social problem such as an after school program which reduces crime and increases literacy). Coordination, however, also strives to assure that more areas in individuals' and communities' lives — including the social, economic, community and political arenas — are being touched by the programs.

2. **CCIs increase the capacity of community institutions:**

Often this is done through improving local institutions' credibility with and access to outsiders and power brokers. Sometimes this also includes identifying policies that might prevent the coordination or combination of service providers. In theory, by increasing the capacity of institutions and increasing the number and kind of programs they provide, CCIs vastly expand both the number of residents affected by local initiatives and the areas of their lives that are included.

3. **CCIs attempt to increase both the social capital in a community and the participation of residents in the planning and management of the CCI:**

This includes many references to empowerment, and, very rarely, a reference to politics. As will be seen below, whereas most projects labeled CCIs rely on a form of community planning or community building to gain community input or to develop new leadership, only a few incorporate community organizing.

4. **CCIs differ from some of the other practices outlined above in their formation and governance:**

CCIs, like some CDCs, attempt to bring together many diverse non-resident players. Partnering, expanding the definition of who the stakeholders are in a community, not only derives from the view that poor communities do not have enough power to change existing institutions, but also from the view that the community must be reinterpreted to power brokers in the larger community (Brown, 1996). Through their convening role, foundations and CCIs pitch the benefits of the area undergoing the intervention (or subject matter for issue-based CCIs) to those who previously could not comprehend how to interact with the community. Thus, CCIs develop new resources and partners for collaborations. Some believe that these collaborations can then be the source of future

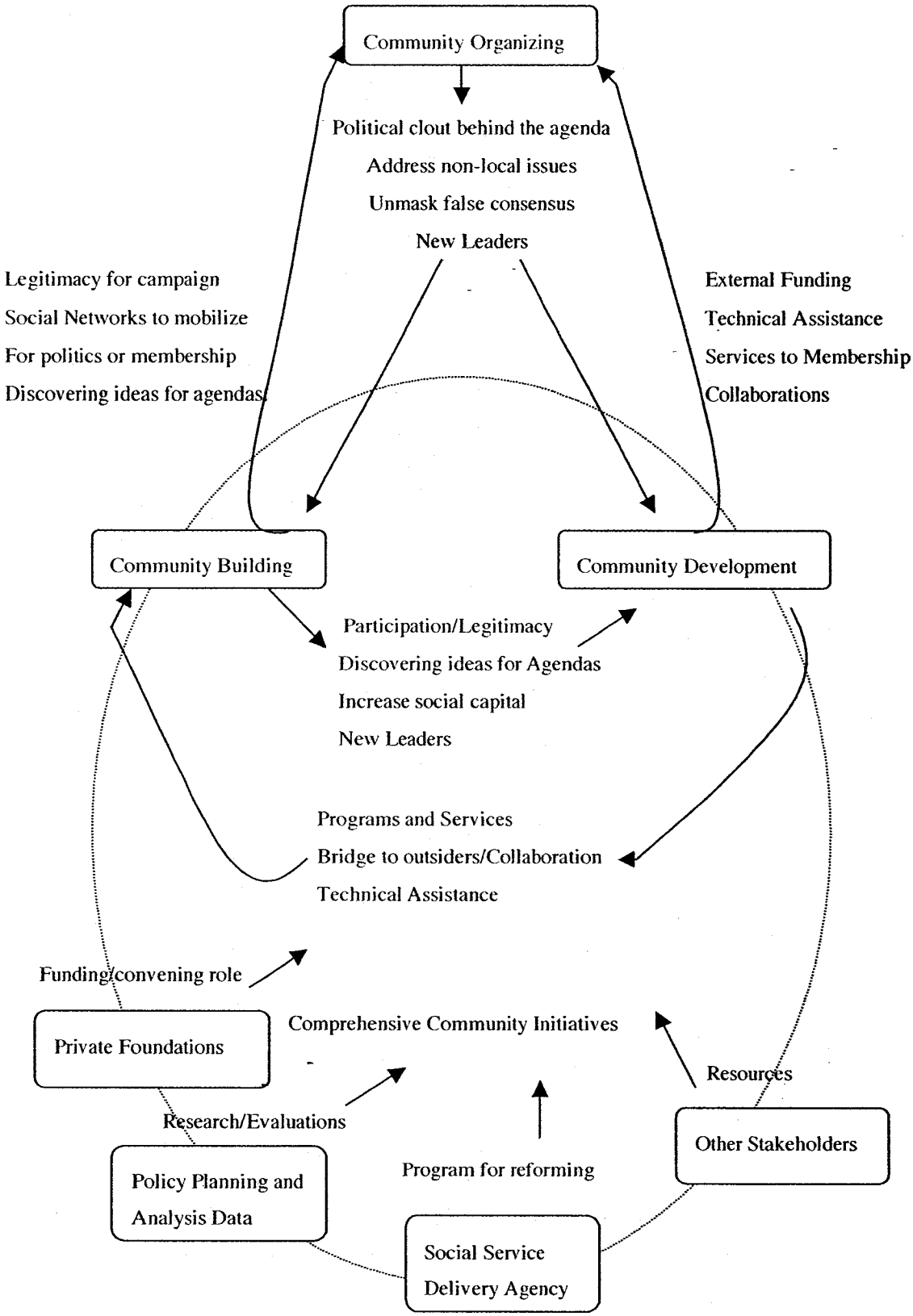
relations for solving other more elusive problems such as racism (Kingsley, McNeely and Gibson, 1997; Hess, 1999; p. 30).

Even though these theories come from a Western theoretical viewpoint, I believe that they can serve to explore the formal and informal institutions that exist within each culture and community. The CCI movement is a way to increase social capital by empowering local citizens to plan the new projects that revolve around their community or at least have a strong front when it comes to presenting their needs as a community to an outside policy mechanism.

Many times communities are surprised local institutions that were informally functioning on a daily basis were not given enough consideration or fully acknowledged. The partnering of various groups, in our case, communities as well as the communities physical and regional neighbors is a good way to give support and create a power structure that is capable of standing up to larger organizations that may not listen to individual citizen's complaints.

The following diagram is a visual representation of how Hess (1999) perceives the CCI movement to work. It gives an idea of how the flow of information is "supposed" to go if CCI is properly applied.

Figure 3.2: Comprehensive Community Initiatives



Hess's (1999) also discusses how without the support from community members the projects, no matter how well intended will fail.

Hess (1999) has identified five characteristic features of community organizing:

1. **Local, democratic control** – The involvement of local residents in determining goals and objectives (not necessarily the implementation thereof) in a participatory manner is a defining feature of community organizing.
2. **Power is based on participation of mass-based constituency** – Success is predicated on widespread participation as a means to establish power and exert influence. As a result, community organizing often relies on the media and public information channels to develop broad involvement.
3. **Leadership development is central** – Ongoing development of skilled and effective leaders fosters widespread participation, and serves as a mechanism for exercising democratic control.
4. **Permanence and growth of the organization is paramount** – Without a sustained base of participants, as well as ongoing efforts to develop and grow the organization, the long-term sustainability of community organizing is severely hampered.
5. **Contestation at the institutional level** – Community organizing seeks to challenge, confront, and ultimately change the societal institutions, systems, and norms that are not responsive to the interests and needs of the community. (Hess, 1999; p.18).

In these characteristics, Hess is identifying important steps to take if community organizing is to be successful. If we were to apply his rules to Thailand we might see the following:

1. Local democratic control: Community members would be consulted before the development of the policy to make sure that there is a participatory approach to the education of their children. Ideas would be thrown around about what IT project could be used i.e., do a website on being Thai, or teach children about mathematics using local food growing techniques
2. Power is based on participation of mass-based constituency: If the community is not entirely sure about the project or has not heard about it, it would be generous and helpful if the local government and school board could help advertise community meetings for policy discussion, or have elders in the community develop ideas on how to gather the population, all the while keeping in context the need for mass-media to play a role to get the younger generations excited about the project.

3. Leadership development is central: Once there have been several community meetings, it is safe to elect members of the community who best speak for their fellow neighbors. This is also a good time to start developing your technical support systems.
4. Permanence and growth of the organization is paramount: This is the hardest part, especially in poor communities where time is preciously devoted to making enough money to feed the family. In a country like Thailand, the government and the King are thoroughly involved with the ICT revolution and may be able to allocate funds to the head of the community to encourage involvement, in turn creating jobs. This is a little bit more difficult in a neighboring country like Laos that is still very poor. The growth of the organization will be based on the goodwill of the community members and the availability of time for the community members.
5. Contestation at the institutional level: The goal of this process is to get the top branches of government and policy development to start respecting the knowledge and know how of the communities that they are serving. In societies like Thailand and Laos it might be more difficult to challenge the status quo, but if the four other steps are followed carefully, the need to challenge the status quo is absorbed by the changes that the community development creates.

Once these steps have been followed, it is necessary to look at a few other points and references that Hess deems important in the community development process. Hess feels that there are five bases that make up a community within itself and to better understand how that community will react to community development it is important to understand the strengths and weaknesses. To help distinguish among these community practices (organizing, building, developing), I will use the following five bases: primary values of the practice, conception of public interest, power, nature of social capital and nature of civic engagement which are explained in full in the table below.

Table 3.1. Comparing community organizing, building and developing against the bases.

Bases	Organizing	Building	Developing	CCI
Primary Value	Participation	Leadership	Expertise	Expertise and Leadership
Nature of Public Interest in a Community	Conflicting	Communal	Singular	Communal and Singular
Power	Agenda Setting	Agenda Planning	Pluralist	Pluralist and Agenda Planning
Nature of Social Capital	Political	Internal	Collaborative	Collaborative (weaker on Internal)
Nature of Civic Engagement	Political Activism	Engaged Citizenry	Policy Making	Policy Making (weaker on Engaged Citizenry)

I will outline what each dimension of Table 1 means. Each of the following five bases are factors that make community organizing possible and without looking at these factors before continuing implementation, one will run into roadblocks along the way because community members were not consulted and therefore the public interest is not served and a power struggle ensues. Community **organizing** is an approach that requires the participation of members from the community. It is conflicting in nature as community members all have different ideas of how the community is to be organized. Community **building** usually needs a good leader to obtain planned objectives. The building approach takes into consideration that the leader will take a communal approach to the organization of its citizens. Community **development** is an approach where an expert comes from outside the community and lends expertise to its citizens to improve the community. It is a collaborative effort that requires the citizenry to participate and adopt new policies or it will not succeed after the departure of the expert. The bases explore the different stages that a community must take if they wish to engage in community organization. All three approaches to organizing have their own pros and cons and can be used in various situations that call for a particular approach.

The five bases are as follows:

Primary Value:

The primary value community development embodies is expertise. As collaborative projects between residents of a community and external funders, community development projects exist to provide services and products to a community based upon their ability to manage tight budgets, assess the needs for and feasibility of community projects and adroitly assemble a "complex combinations of resources to make projects work" (Rohe, 1998; p. 184). In community organizing the goal is to control the future of the community through a permanent, politically powerful, organized body of resident participants. Leadership means taking responsibility for tasks that need to be done. "Unless the executive committee, the board of directors, the officers, in our case teachers – in short, leadership – undertake these tasks for the community, chaos will reign."

Conception of Public Interest:

A community's public interests can be viewed as belonging to a single organism. A unitary body, the community's interest can be identified and treated with expert knowledge. Alternatively, communities can be seen as a set of individuals who voluntarily work together on interests common to those concerned. Interests can however, be conceived as conflicting: subsets of the community may hold interests in conflict with other subsets. Constituents engaged in organizing are demanding a greater say in both government policy-making and the impacts that market forces have on their community.

Power:

Community organizing engages power at the second level: attempting to mobilize resources to increase control over agendas. Organizing strives to change the "rules" of decision making so the resource mobilization-bias in the agenda setting process favors their community. Power gives the community access to planning and setting their own agendas. This gives the community options on how to proceed with the local initiatives.

Social Capital:

Change activists who believe that social capital relations in distressed communities are damaged and if repaired could help communities to fix self their problems are asking how to rebuild social capital. There are various forms of social capital (that are also discussed in Kretzman and McKnights ABCD theory).

- Internal (social capital as the relations within a definition of community, the primary definition often given for social capital),
- Collaborative (bridging social capital, forming relations across communities)
- Political (when increasing the social capital of one network has an impact on the social capital of other networks which might prove undesirable).

Civic engagement:

The relationship that community members have with each other: Community organizers recognize four different roles that residents can be encouraged to play: Client, Political activist, Policy Makers, and Engaged Citizens. By using residents as policy makers they become engaged on the board of advisors and can influence the policy to be implemented.

Social Capital and Civic Engagement:

Organizing longer-term goal is to expand the interest of members to include broader issues. This allows the group to move on to issues which are inclusive of new members' interests and are more sophisticated that the easy, early "wins" with which membership based organizing drives start (Hess, 1999; p. 17).

Challenges to Hess theory in the Thai Context

Hess's (1999) theory is very well rounded but it does not necessarily apply to communities that do not have a social system that allows them the resources to undertake all the community participation necessary to provide in depth local resources to develop curricula appropriate to local use.

First Resources: Sympathetic local government officials may not have the resources to do what the community members demand and the initiatives, even if they have the best intentions, may be the first to be cut when there is government spending is cut.

Higher Level Support Second: Very often community development needs the support of local or national government, which is a direct contradiction to the idea that the community should be directly in charge of its development. An example could be community members deciding that the curriculums taught in the schools are irrelevant and need to be changed, but need the guaranteed support of the government to be able to move forward and start developing local content that reflects their ideas of schooling in their community.

Thirdly National Curriculum: The idea that content should be localized would in this instance be a national program. That being said, it is hard then to not separate the community members from the professionals that are directly going to create the curriculums and therefore there is a split between the power base that exists within the group: those who speak for the community and those who ultimately make the last decision about the product.

Community building theory itself has flaws that are discussed in Hess's (1999) research thus rendering it not always the most ideal approach to empower local knowledge.

- Local initiatives can be used as code words by authorities to "legitimate the withdrawal of external support for the community". Some observes note that asset-based development is very close to the idea that the poor are expected to pull themselves up by their bootstraps (Cohen, 1999; David, 1999; from Hess, 1999; p.25)
- Many of the problems faced by local communities were not created by the community and cannot be solved through local action (Dreier 1998).
- Consensus, (the identification of communal interests) can mask real differences and the fact that interests are not just different, but can be competing (Hess 1999).

That being said, not all communities will benefit from Hess's approach and therefore it is best for communities to have access to other initiatives that may suit their communities better. In the next approach, I will be looking at a theory that uncovers assets that a community was not aware that it possessed and develops their social bridging and bonding capital.

Kretzman and McKnights' Asset-Based Community Development (ABCD)

The thinking behind Kretzman and McKnight's Asset-Based Community Development work runs along the following lines: If we are in a very poor community that lives from day to day surviving off of what is available, and if there is no school around for miles, what can we do? If we cannot send the kids to school, then let's send the school to the kids. If we teach the elders and young to read and write, and then teach them that their neighboring community also has a form of communication similar to theirs, i.e. telephones, radios, telecenters or wind up laptops; there can be the possibility of networking between communities, developing regional assets and increasing capacity to economic growth. Maybe, even maybe, these communities would actually learn that their, for example, coffee, is worth more than what they are being paid through collective action they can increase their living standards by increasing their knowledge of their commodity.

Underpinning ABCD lies in its premise that communities can drive the development process themselves by identifying and mobilizing existing (but often unrecognized)

assets, and thereby responding to and creating local economic opportunity. McKnight and Kretzman (1992, pp 345) propose a number of steps to facilitate the process in its early stages:

- Collecting stories about community successes and identifying the capacities of communities that contributed to its success;
- Organizing a core group to carry the process forward;
- Mapping completely the capacities and assets of individuals, associations, and local institutions;
- Mobilizing the community's assets fully for economic development and information sharing purposes;
- Convening as broadly representative group as possible for the purpose of building a community vision and plan; (McKnight & Kretzman, 1992, p. 345) and
- Leveraging activities, investments and resources from outside the community to support asset-based, locally defined development. (Mathie 2002)

Methods of ABCD

The Asset Based Community Development assesses the assets within the community and relies on the next six guidelines to obtain information from citizens. These guidelines are ways to decipher what the community already has so that it is possible to start the process of implicating the members of the community in the policy development

Tool 1: Individual Assets Inventory

Capacity/asset inventories of individuals can be used in many ways. One important use is for economic purposes to create new enterprises, to connect skilled residents to employers, for new employment, and to identify market gaps through consumer spending data. Capacity/asset inventories can also be used for community building purposes to create an "individual skills bank," to institute a "learning exchange," to connect residents to local associations for care and mutual aid, and to mobilize cultural and artistic skills.

Tool 2: Associational Assets Inventory

Associations offer them a great power of organized relationships that can be mobilized for action. They are characterized by consensus, care, and citizens' power. Unfortunately, associations are usually not fully recognized as resources/assets to community building.

Tool 3: Institutional Assets Inventory

Institutions are formalized and structured organizations that do not typically rely on voluntary commitment of the individuals involved. Traditional community institutions might include schools, churches, hospitals, clinics, county government, law enforcement, fire and rescue, human service agencies, etc.

Tool 4: Natural Resources Inventory

Natural resources are an important asset to communities. Communities were organized around and near natural resource assets. These assets play an important role in a county's future.

Tool 5: Economic Linkages and Business Assets Inventory

Local businesses are assets. For example, banks are a source of local investment capital. More generally, businesses provide a variety of goods and services to local residents; they provide jobs; they pay taxes; and they often are links to larger regional and national economies. These businesses also have "backward linkages" throughout the local economy. By hiring local residents and purchasing non-labor supplies and inputs from other local vendors and businesses, they create additional economic activity

Tool 6: Previous Efforts Inventory

Most communities have participated in previous community processes or activities that may have included: community planning, economic development, program and service development, community visioning and other community involvement activities. The results of these experiences are important assets because of the information collected and the experiences shared by community individuals. When this collected information and these experiences are documented, they will provide an important component when mapping community assets.

ABCD applications in the Canadiana and Thai context

Thailand

I wish to practically apply the ABCD method to a situation that I saw when I was in Thailand. Koh Lanta is a small island community in the Southern beach areas of Thailand, not far from the more famous resort of Krabi. Here, on a very small island, Thailand's Ministry of Education has successfully implemented technology into schools, two elementary schools, and one high school. What may have been overlooked in the process is how the technology was to survive in some of the harsher Southeast Asian weather conditions. When I visited the school, the principal kindly brought me to the computer room that had been for some time been shut down. I asked him to explain why

this situation was thus. He responded to me that there was no technical support on the island. As well as not having a way to protect the computers from heat and dust, he said he had not been given the tools to maintain this great project. He even asked me, thinking that as a foreigner I may have more sway, to bring this situation to the attention of the Ministry of Education, Youth and Sport (MOEYS), to which I had to sadly decline. If an ABCD had been done, it might have been apparent to the MOEYS that if this implementation was to survive, it needed some support from local resources such as carpenters and air conditioning or fan companies, as well as some training for local people in computer and electrical maintenance, a skill set that only increases the productivity of Thailand in the long run.

These policies are noteworthy and for the most part working, but there have been some discrepancies in what is desired and what is attainable. I would argue that giving a school some computers, putting them in a room and expecting students and teachers to use them is not an appropriate way to implement ICT. The primary school in the small town of Saladan, Koh Lanta, Thailand is a perfect example of policy implementation that is taking a top-down approach. The computers have been given to the school, are in a dusty, hot room, and they are not working. The teachers do not know how to fix them and they are no longer working due to the impact of heat and dust in the hard drive. Had there been discussions with the teachers in the school, there could have been some initiative taken to better protect the computers and prepare the teachers to handle the situation.

An official taking an Asset-Based Community Development approach could have asked a few questions borrowed from Mathie (2002) of the local mayor, elders, teachers and possibly technicians before implementation such as:

1. **How do we construct shared meaning and vision for this change**? In this instance it could mean, how do we get citizens to understand the importance of computer technology for their children? Do we offer courses to adults also?
2. **How do we facilitate the process that encourages pride in past successes, minimizes power relations and results in community members engaging in the commitment to implement computers into the schools**? In this instance, we could try to show examples of successful infrastructure overhauls such as new streets or electricity in new neighborhoods and how this has increased overall satisfaction for community members. The transfer of that satisfaction to educational initiatives may be a way to encourage commitment to implementation.

3. **How do we locate the energy for change in our community by focusing on our strengths and not on our weaknesses?** In this instance, there could be the focus on how the computers successfully came to the school, instead of how they are not working. Showing the locals what they already have could improve moral and help mobilize change, the change here being fairly minimal. Once the computers are up and running again, then the discussion of local content can be brought up.

4. **What is our available social capital?** In this instance, Koh Lanta is an island and has a lot of community members who already know each other. There is a strong Muslim majority and the Mosque can be a powerful force in exercising change for their community. Strong family values that are encouraged in Islam, as well as the concept of always feeding the hungry makes it easier to develop bonding social capital and potentially increase it to bridging social capital.

5. **What are the conditions that strengthen and weaken our social capital?** At the time that I was there, the Tsunami has just hit and devastated half of the island. In response to this, the community - during tourist season - was having festivals and fundraisers to support the building of new homes and boats. This use of bridging social capital showed that a variety of different communities could get together on an issue and change things. The same might be said for implementation of educational tools in the classrooms.

6. **How do we legitimize the strengths of our participants through locally controlled community driven change?** I think that here it would be important to suggest that teachers, local leaders and national leaders could play a role in legitimizing the strengths of new implementations. It is also important to note that if IT training in schools is increased, then the potential of the students to make a living increases and the family could therefore potentially increase their living standards, and give their children access to more skills.

7. **How do we avoid being dependent on external funding and supports?** I cannot directly inform this question, but the sure use of local social capital and education of local people is a good way to ensure sustainability of any implementation. If one creates an electrical system in a community but trains no one to maintain it, there will be constant dependence outside the community. However, if the ministry of post and telecommunication overhauls the infrastructure, taking the time to train 2-3 locals in electrical maintenance this could empower the community to become independent of outside support.

8. **How do we stimulate collaborative group capacity building for economic, and in this case technological development?** I cannot say for sure how it would work in Koh Lanta, but it would be very important to get the opinions of a wide variety of community members on how they feel the collaboration should work. Should it not work in favor of some citizens, then possibly putting them in charge of other aspects on the capacity building giving them a feel for the process and participate in the growth of the community will possibly aid in the desire to participate. It is very important to not to generalize how each community works

in this situation, to each their own and to the top to understand how to manage this diverging opinions.

9. **What are the external circumstances that influence our development?** There are a variety of factors in this instance influencing the technical issue in Koh Lanta. First off, it is an island with a small population in the South of Thailand, with no major export. The possibility that the school principles and teachers also do not know how to interact with the government leaves them feeling incompetent in their presence *(Mathie, 2002; p.4-5 Table.1).*

Had some of these questions been looked at before the implementation began, then the local community possibly would not be stuck in the position of not being able to take advantage of opportunities for their youth, due to a computers room that do not work, with no technician to fix the problem and little opportunity to implement the computer into the everyday curriculum.

Canada

Now I would like to apply ABCD approach to Aboriginal education in Canada. The SchoolNet project developed took the initiatives to "hook up" all schools and libraries to the Internet and has made concerted efforts to incorporate Aboriginal communities in the process. The is effort has been one of connecting communities to one another and developing distance education packages for the computers, but how successful have they been? Have the community elders been consulted?

> *"Aboriginal people are mostly excluded from this authority network. They are under-represented in every education system role. Many existing methods for involving parents and community members—developed for the non-Aboriginal community—do not work for Aboriginal parents and communities. The education system's complexity makes it very difficult for those outside the system to provide meaningful input t"(BC Human Rights Commission 2001; p.13).*

That being said SchoolNet is trying to develop localized content that reflects the current needs of the students that it serves. The importance of allocating funds from the government to broadband Internet installations like SchoolNet or CAP (*computer access points)* sites, is crucial to the success of online education in any isolated community. The more the students in these communities use the technology not only for game play, the more empowered they become in using and understanding the technology and the

easier it will be to implement effectively.

The First Nations SchoolNet program's mandate is to connect First Nations schools to the Internet by providing and maintaining computers and providing subsidies for access. A collaborative initiative from Industry Canada, SchoolNet is now a partnership with the First Nations Education Steering Committee (FNESC) and the First Nations Schools Association. There are six regional groups that administer the First Nations SchoolNet program. [For more information visit http://www.schoolnet.ca/aboriginal/]

FNESC will work towards:

- Ensuring an adequate number of computers per school on a minimum pro rata of one computer for 20 students. However, we will work towards much lower ratios.
- Assisting and establishing connectivity service standards for First Nations schools;
- Ensuring adequate help desk services available by telephone; and,
- Encouraging First Nations schools to develop their own website and
- To become more involved in the development of Aboriginal web-based content.

(First Nations SchoolNet. (n.d.) Retrieved March 19th, 2007) [14]

I will now compare the objectives of the First Nations SchoolNet initiative to the tools used in ABCD:

SchoolNet First Nation Objectives

- Providing First Nations schools with telecommunications infrastructure.
- Promoting the effective use of information and communications technologies in the classroom.
- Offering skills development opportunities to teachers and students.
- Accelerating the development of stronger communities, people and economies. SchoolNet is focused on extending connectivity to First Nations schools that have not yet been connected to the Internet. FNESC, with the assistance of an advisory committee of First Nations representatives from different schools and stakeholders, intends to identify the barriers preventing access to the internet and work with schools and communities to develop skills needed to access relevant information through the "Information Highway"(First Nations SchoolNet. (n.d.) Retrieved March 19th, 2007)[15]

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[14] http://www.fnesc.ca/schoolnet/program_schoolnet_whats.php

[15] http://www.fnesc.ca/schoolnet/program_schoolnet_whats.php

Tool 1: Individual Assets Inventory: Here we have strong social capital as Aboriginals traditionally have strong ties to their families, elders and members of their community. The skill set within for example the Mohawk community is strong as they are considered very skilled ironworkers and trades people. Many of the community members now have higher education and can come back to the community to train other members. A lot of traditional knowledge and wisdom can be passed on from member to member as informal educational institutions.

Tool 2: Associational Assets Inventory: Citizen power in Aboriginal communities is very strong, no better demonstration of that is when the Mohawk Iroquois community decided to protect their sacred burial grounds from being turned into a golf course. They banded together to create a strong community of practice. The community centers as well as activist communities supporting the First Nations movements to educate themselves.

Tool 3: Institutional Assets Inventory: The traditional sources of finance are still developing but there is support from the Federal and Provincial government for Aboriginal education and development. The Cree and Katimavik school board is also a formal institution that supports the development of local online educational content.

Tool 4: Natural Resources Inventory: Unfortunately many Aboriginal communities have been denied rights to claim access to the natural resources around them. The resources that are available to them are the knowledge of the elders and their experiences in residential school. Their past experiences are valuable in the development of new content for Aboriginal schools both virtual and real.

Tool 5: Economic Linkages and Business Assets Inventory: A very good example of how economic linkage works for Aboriginal communities is through Chief Louie Clarence who is an elder of the Osoyoos Indian Band in British Columbia. Under his direction, the Band has become a multi-faceted corporation that owns and manages numerous successful businesses. In addition to the businesses, the band is enjoying socio-economic development that is vastly improving the community's social, educational and health needs. Under his leadership, there is virtually zero unemployment. The band continues to increase its revenue each year and decrease its need for social assistance. Chief Louis created and manages eight businesses, including, a golf course, a construction company that builds both on and off reserve commercial and residential projects, a forestry company that logs 30,000 cubic meters annually, the largest privately owned vineyard in Canada, a convenience store, and a residential and agricultural leasing company.[16] Chief Clarence goes around giving talks about how Aboriginal communities can empower themselves economically and give a

[16] http://www.naaf.ca/html/c_louis_e.html (12-0-07)

chance to their children that was not give to them. This creates independence from the state and creates bridging social capital between bands.

Tool 6: Previous Efforts Inventory: It is important for Aboriginal communities to move away from social spending programs that focus on the weaknesses of their communities and start to develop economic strategies that develop the capital of each band.. When this occurs, it gives the band members strength and capacity to develop curriculum and fund their own schools. That being said, it is important to analyze the previous implementation of community development to see where the policies were strong and where they need to be improved(McKnight and Kretzman,1992).

What are some of the other initiatives that have been taking place in Canada to encourage the community members, especially elders to participate in the development of localized content; as well as to gain access to power in the development of policy?

Nunavut Research Institute

The Nunavut research institute is associated with the Nunavut artic college, the Canadian technology network and the Natural Sciences and Engineering Council of Canada. In partnership with the Igloolik Research center, the 2 organizations develop objectives for education in the far North such as provide leadership in developing, facilitating, and promoting traditional knowledge, science, research and technology as a resource for the well-being of people in Nunavut.

These goals are:

1. To promote the use of traditional knowledge;

2. To promote the development and application of appropriate technology;

3. To help communities identify research needs;

4. To support research projects initiated by Nunavut-based organizations and agencies;

5. To encourage the training and hiring of local researchers;

6. To act as a research resource centre; and

7. To promote awareness of scientific research conducted in Nunavut.[17]

[17] http://pooka.nunanet.com/~research/- 19-03-07

These seven points are already a good indication of things that we have to start considering when making online educational packages. It is a starting point for we would need more information as how to properly implement these ideas. The seven steps are very similar to the ABCD approach as it takes into account the skills that are already in the community.

> *A key issue in the creation of meaningful learning environments is the design of authentic learning tasks. For Indigenous learners, this means drawing on community knowledge, real life experience and personal viewpoints. Tasks are open-ended so learners can draw on relevant background knowledge and experience and thereby validate cultural knowledge. In the assessment tasks, similar flexibility is allowed for students to investigate areas of interests, or to draw on cultural and community experiences. The integration of academic learning skills with experiential learning is a powerful motivational approach, acknowledged in the literature (Branch, 1997; Byrnes, 1993).*

Therefore it is the responsibility of staff at organizations that develop the material for the online/computer content curriculum - to research these and other topics that will be of relevance to them. This does not mean they cannot learn about management or accounting, but putting it into a context that they live in will actually engage them more in the subject to be learned.

A Case study of the Keewayntook Internet High School

This school is a completely online Internet High School created for Aboriginal youth who live in small isolated First Nation communities in Ontario. In the past, these students had to leave their small communities, being bused in from all over to attend schools that were traditional Canadian high schools (the same experience as residential schools) and were not specifically focused on the special needs of First Nation students. For students who want to remain in their communities and stay with their families the option to do so is essential. For these students the Internet is the mode of conducting classes and program delivery: it is the first program to use this method in Ontario. The students from each community meet up and take a face-to-face course together as well as do online course work. The classes take place in a variety of places, either in a schoolhouse that is locally situated, a renovated house or other buildings. A teacher is present during the class time and acts as a mentor and there is also a Classroom Assistant (CA) available for computer and Internet support.

The students spend roughly six hours in class on their computers and have the teacher available to them during that time. Marks are determined by how good the work is. The student has to send in 1 assignment per week. No assignment, no mark. Due to Ministry regulations, late and absent students are recorded on their permanent record, just like in regular high schools. The credit system is set up the same as any Ontario High School where they get 1 or half credit per class, and need 30 credits to graduate. Usually a student takes four classes per semester, however, if they are weak in a subject they are permitted to take three classes per semester. They have compulsory classes such as English, Math, History, Language, and Career studies with electives such as computer studies, Native studies, Art and Family studies.

If students wish to use this degree in the future to attend University they must have completed the compulsory classes at the grade12 level. The school spends a lot of time to help First Nation students improve in courses that traditionally students in the North have had difficulty with such as English, Math and Science skills.

Margaret Fiddler has worked on the WAHSA distance education center project for a very long time now and is responsible for much of its development. She believes that "two-way, asynchronous, online program delivery is a stable model where the potential is barely tapped. KIHS was developed to achieve this potential"(McMullen, B., & Rohrbach, A., 2003). The following list is what Mrs. Fiddler uses to develop learning modules that reflect local Aboriginal context for learning:

- *Identify and describe in a local context First Nations Values for making educational decisions.*
- *Develop concrete examples of values in use for educational processes.*
- *Develop an inventory of First Nation educational assets at the school, community and educational authority levels.*
- *Develop a menu of second and third level services to be provided.*
- *Set up a delivery arrangement with associated costs and evaluation processes.*
- *Implement services and ongoing evaluation*

If any of this is to change "Aboriginal children and youth need see themselves reflected in curriculum. Aboriginal children and youth feel a sense of place and belonging in the school system. Aboriginal children and youth see their people represented in the school system. Aboriginal parents are a vital part of their children's education. Aboriginal communities share control over the education of their children. Aboriginal children and youth no longer face discrimination or harassment on a daily basis. Non-Aboriginal Canadians understand their

country's history regarding Aboriginal people and respect the unique status of Aboriginal people (Hughes, 1993; p.12)

Mrs. Fiddler's initiatives are true to the ABCD model that focuses on what the community has to offer to the program and not what the program has to offer to the community. As well the last quote is very pertinent to what needs to be done culturally in Canada not only for Aboriginal students but also for Non-Aboriginal students to better understand a culture, which is fundamentally part of who they are, even if they don't know it.

Now that we have looked at ABCD as one of the main theories that espouses to protect local locally based assets through the development of these assets through community organizing, it is important to look at some of the drawbacks to this model so that we can try and see where it is actually going to succeed in economically developing and poorly infrastructured environments that may be adverse to change.

Challenges to ABCD

There are several factors that have to be taken into consideration when trying to develop social capital in an area, especially when trying to see where the community's strengths lie. A few important aspects to look at are how much the government supports the initiatives of the communities; how much funding can come into the community as well as the vulnerability context in which the poor find themselves. If there is no food to go around, then the concept of sharing ones food gets a bit more complicated. It is important to take stock of how the local households deal with economic shock and what are the larger institutions that are influencing the livelihood of the involved community.

> **Fostering an endogenous process**: *One of the cardinal principles of ABCD is that it should be a community-driven process. What then should the role be of the external agency? Facilitator? Networker?* (McKnight and Kretzman, 1992).

What happens if that external influence is corrupt and embezzles international funds into their own pocket or other national programs? How can a community such as Koh Lanta gage whether or not the governments or NGO's support their initiatives?

> **Fostering inclusive participation**: *While ABCD is, in principle, an inclusive process in which the contributions of all are valued and appreciated, this may be more challenging in communities where social hierarchy excludes or marginalizes some groups* (McKnight and Kretzman,1992).

This is could be true of Southeast Asian Ancestor worshipping cultures where the elders are always the first to make the decisions but may not necessarily understand the youth and their current needs, particularly educational needs. Of particular concern for ABCD are the voices of women and lower caste or lower class groups. The responsibility of the implementer using ABCD then would be to communicate with the higher power in the group and share ideas that come from the marginalized groups. This does not always work, but it is a way for an intermediary to start the ball rolling.

> **Fostering community leadership**: *Because ABCD is community driven, and the role of external agency is at arm's length, leadership to sustain a strength-based approach like ABCD becomes a central issue. As it unfolds in different settings, it will be important to learn about the qualities of essential leadership both in terms of the particular individuals involved and the nature of leadership itself* (McKnight and Kretzman, 1992).

Is it going to be one person who speaks for the entire group or a committee that represents a variety of community members?

> **Selecting enabling environments**: *The external environment will influence the capacity of communities to realize their potential. The degree to which regulatory environments and local institutions are fair and responsive, and the degree to which norms of trust and reciprocity extend beyond the associational level are important considerations for the introduction of ABCD* McKnight and Kretzman, 1992).

It is better to have the meetings in the community hall or at the home of one of the local leaders? Will having it at the local community space be neutral enough or not for fair decision-making?

> **Handling the fluidity of associations**: *Over time, and dependent on changes in social and economic circumstances, the form and function of associations and informal networks will change. Users of ABCD strategy need to understand how these patterns have evolved historically and the effect the ABCD process on social relationships and patterns of associations and networks* (McKnight and Kretzman, 1992).

The hierarchical nature of interaction in communities can play a role in how decisions are made. It is important to also consider cultural values and not intrude on a way of life

that may have existed for a very long time. The importance of listening to the people, their desires and what they have as issues with their communities, neighbors, family members and children, will make the transition easier on every one involved.

Now that we have tried to look at the challenges to ABCD, it is imperative that these steps be considered seriously. This is so because without considering local context for change or social capital, an implementer is doing exactly what this thesis espouses not to do; push one cultural concept of what community interaction should be on another community that may not share the same social, spiritual, political and economic values.

Chen Program evaluation model

> *Resistance is also a function of habit and relationship. People become comfortable with their view of the world, their ways of doing things, and their relationships with others. Change, however well justified, threatens all of this. Thus employees are likely to resist change because it pushes them out of their 'comfort zone' (Fiorelli & Margolis, 1993. p.2).*

Now that we have explored the need to have local contexts influencing policies that are to be implemented, it would be good to explore the concept of policy implementation and how it works on its own. In this thesis, I have chosen to use the conceptual framework created by Huey-Tsyh Chen (2004) as a model for effective implementation of program theory. With the rubrics provided, I will analyze the articles found in the public domain from the Ministry of Thailand and Laos and compare/contrast with what I saw in each country as well as how this compares to initiatives that have taken place here in Canada. I will attempt to graphically represent what the ministry is attempting to do as well as provide a visual support to what I saw myself. I will use Chen's (2004) program theory – action model – to set forth a series of recommendations that utilize the information that was thoroughly researched.

The Action Model

An action model is a systematic plan for arranging staff, resources, settings and support organizations in order to reach a target population and deliver intervention services (Chen 2004). In the case of this thesis, the target populations are the academic environments, as well as the students and teachers using the implementations and service interventions.

The main intervention would then be the protection of culture in the development of IT in school curriculum.

The action model specifies the major activities a program needs to carry out: ensuring an environment for the program that is supportive (or at least not hostile), recruiting appropriate target group members to receive the intervention (students and teachers), hiring and training program staff (that hopefully are discovered through Asset based community development research), structuring a model of service delivery (confirming that the local infrastructure can support IT implementation), designing an organization to coordinate efforts, and so on (Chen 2004).

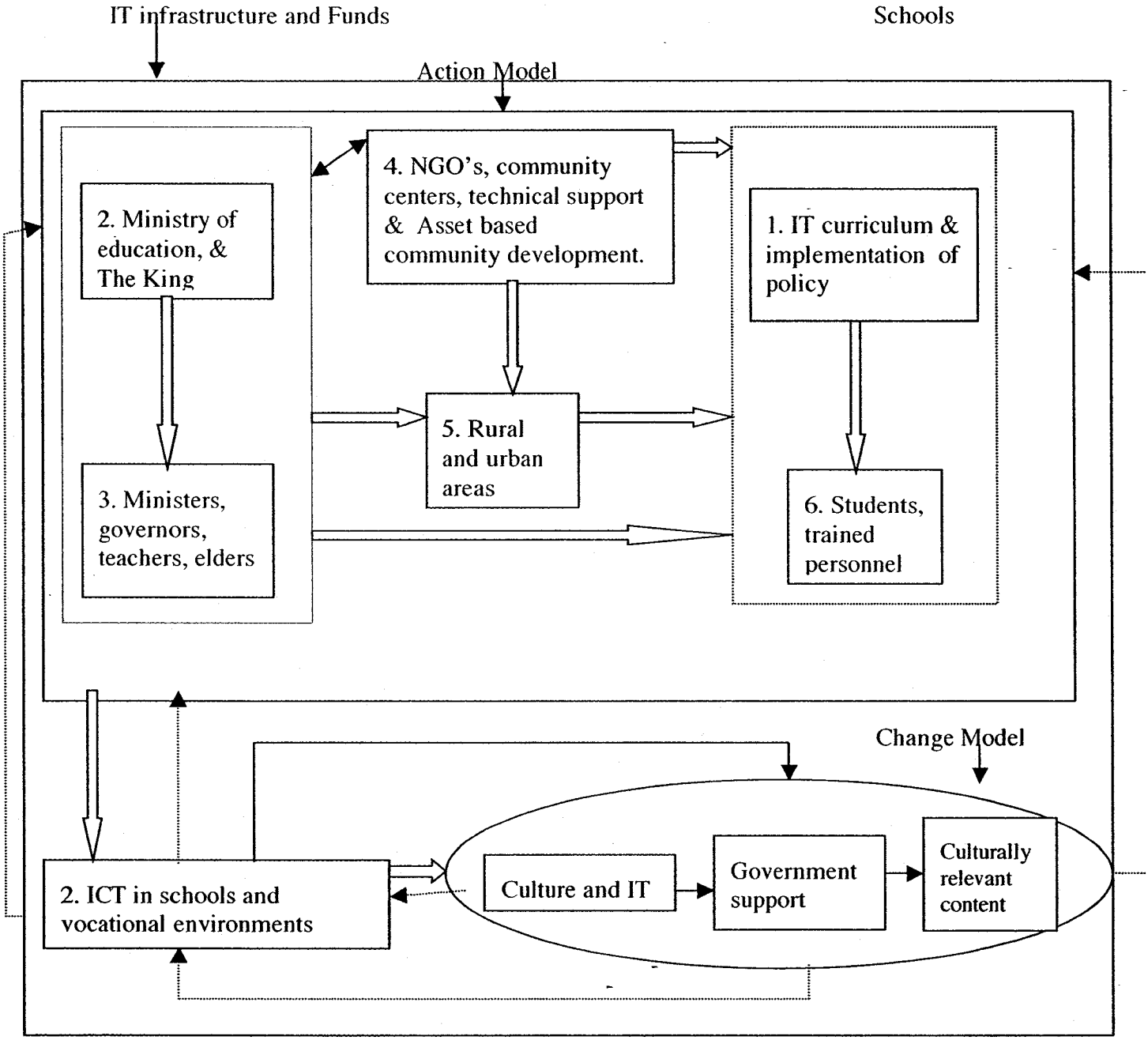
There are 6 points that need to be addressed when implementing an action model:

1. Intervention and Service Delivery protocol
2. Implementing organizations: Assess, Enhance, and Ensure its Capabilities
3. Program Implementers: Recruit, Train, and Maintain both Competency and Commitment
4. Associate Organizations/Community Partners: Establish Collaborations
5. Ecological Context: Seek its Support
6. Target Population: Identify, Recruit, Screen, Serve.

In the figure 3.3 below, the large square around the program represent its boundary. Everything within the large square is part of the program; all that is outside the square is "environment," providing the program with the necessary resources and support (in other words, its inputs), or, perhaps, working against implementation of the program. A program generally starts with the acquisition of resources for the environment, and if an ABCD was use, then the resources are from a very local perspective. Solid arrows joining an action model to a change model indicate that strictly speaking whatever effect the program has on the outcomes is not due to the implementation of intervention alone but to a joint effect of the implementation of intervention and the implementation of other factors in the action model. Evaluation feedbacks are represented in dotted arrows. The evaluation feedback in the figure comprises information about how the action model was implemented in the field, such as whether the program reached the right target population (Chen 2004).

Figure 3.3: An Action Change Model for Thailand

The original model can be found in Appendix A.



By comparing and contrasting Thailand and Canada to see the difference in implementation and then using information learned from Thailand to apply to a neighboring developing Nation, Laos, I will attempt to see if the same types of implementation in Thailand can work or not in a Laotian cultural context.

I seek to compare and contrast Thailand and Canada to see the difference in implementation and then using information learned from Thailand I plan to apply the results to a neighboring developing nation, Laos. I will attempt to see if the same types of implementation in Thailand can work or not in a Laotian cultural context.

1. Intervention and service delivery protocol:

> *Intervention protocol is a curriculum or prospectus stating the exact nature, content, and activities of an intervention – in other words, the details of its orienting perspective and it operating procedures. Service delivery protocol refers to the particular steps to be taken in order to deliver the intervention in the field. The service delivery protocol has four concerns: client processing procedures, or how clients move from intake to screening to assessment to service delivery; division of labor in service delivery, or who is responsible for doing what; settings, which may be formal (e.g., at a program's office) and or informal (e.g., in a clients home); and communication channels (face-to-face, telephone, mail, etc.)(Chen2004, p24-28).*

In the Thai situation, we could say that the Thailand's Hub for Integrated National Knowledge (THINK) along with the support of the MOE is developing IT curriculum for their schools as well developing infrastructure in isolated rural areas. The same can be said for the SchoolNet initiative that is developing the Northern cities of Canada and trying to give access to Aboriginals in their own cultural context. So if the initiatives have had success in Thailand, is it possible that Laos can communicate with the ministries to make try and adapt some of the initiatives to their cultural and educational context?

2. Implementing Organizations:

> *Assess, Enhance, and Ensure its capabilities. A program relies on an organization or organizations to allocate resources; coordinate activities; and recruit, train, and supervise implementers and other staff. How well a program is implemented may be related to how well the organization is structured. Initially it is important to ensure that the implementing organization has the capacity to implement the program, and strategies exist that can be helpful in determining this (Chen2004, p24-28).*

As Canada has a government that relies heavily on the taxation of its people to support its various projects, it is safe to say that the implementing organizations are already entrenched in the culture and the values of the people. We may hear people bemoan the tax increases but they usually understand that tax is funneled back into the society. So how does this apply to a country such as Laos that does not have a very high percentage of people working and able to put money into the system? How is a country supposed to

support itself through community development without the financial stability to do so? Must they depend on external donations and support?

3. Program implementers:

> *Recruit, Train and Maintain both Competency and Commitment: The implementers qualifications and competency, commitment, enthusiasm, and other attributes can have a direct effect on the quality of the intervention delivered to clients, and thus the effectiveness of the program in large part depends on them. Under the action model it is important for a program to have a plan for ensuring competency and commitment among program implementers, using strategies such as training, communication, and performance monitoring and feedback (Chen2004, p24-28).*

Just like in Canada, it would be much more effective if an Inuit elder develop with the Canadian government, distance and online curriculum that reflects the realities of their cultural experiences as Inuit Canadians. Success generally relies on the relevance to people's lives and experiences and therefore the same logic could apply to any country that is developing its infrastructure and content for ICT in school environments.

4. Associate Organizations/Community Partners:

> *Establish Collaborations: Programs often may benefit from, or even require, cooperation or collaboration between the implementing organization and other organizations. If linkage or partnership with these useful groups is not properly established, implementation of such programs may be hindered. Under the action model, it is important to create feasible strategies for establishing and fostering relationships with associate organizations and community partners (Chen2004, p24-28).*

This section is almost the same situation as with the ABCD's where it is important to treat as an asset the social capital available to any implementation of any policy. If, for example, a Canadian school wants to have Intranet but does not have the immediate resources, then a request to the school board and then the ministry of education should suffice to eventually get the dossier considered. However, in a poor country like Laos, that does not have the financial backing that Thailand has, it could be a bit harder to convince the governments to allocate funds for ICT when they are trying to allocate funds for employment and basic education.

5. Ecological Context:

> *Seek its support: Ecological context is the portion of the environment that directly interacts with the program. Some programs have a special need for contextual support, meaning the involvement of a supportive environment in the program's work. Micro-level contextual support comprises social, psychological, and material supports that clients need in order to allow their continued participation in intervention programs (Chen2004, p24-28).*

Each province including Canada, Thailand and Laos have their own specific needs when it comes to terrain, available infrastructure and what is needed to improve the current situation. That being said, social, psychological and material supports may not always be available or in other cases might really hinder the implementation process by making it hard to sustain the project. This could particularly be true in countries like Laos where the poverty level is high and resources are low.

6. Target population:

> *Identify, Recruit, Screen, Serve: Concerning target population, three assumptions that often figure in evaluation are the presence of validity established eligibility criteria, the feasibility of reaching eligible people and effectively serving them, and the willingness of potential clients to become committed to or cooperative with (or at least agreeable to joining) the program. Identification of actual needs is vital, and information from assessment can suggest whether a client needs services in addition to the central intervention. Client readiness being the extent to which and individual's mental and physical state permits his or her acceptance of and intervention. Mental readiness of a client is the degree of motivation of his or her willingness to recognize a problem or deficiency, or the degree of motivation to accept an intervention (Chen2004, p24-28).*

In my opinion this is the most important step in the action model, because without the support of the people most affected by the policy, there will be no success after the funding agencies pull out.

Asset assessment is a good way to get a feel for the community, what they feel they are strong at and how they feel the current policy will impact their lives. This is the safest way to make sure that the actual needs of the clients are being met. If the community is

participating the entire way through the development of the policy, then they are more likely to accept the intervention.

Figure 3.4: An Action Change model for Canada

The original model can be found in Appendix A.

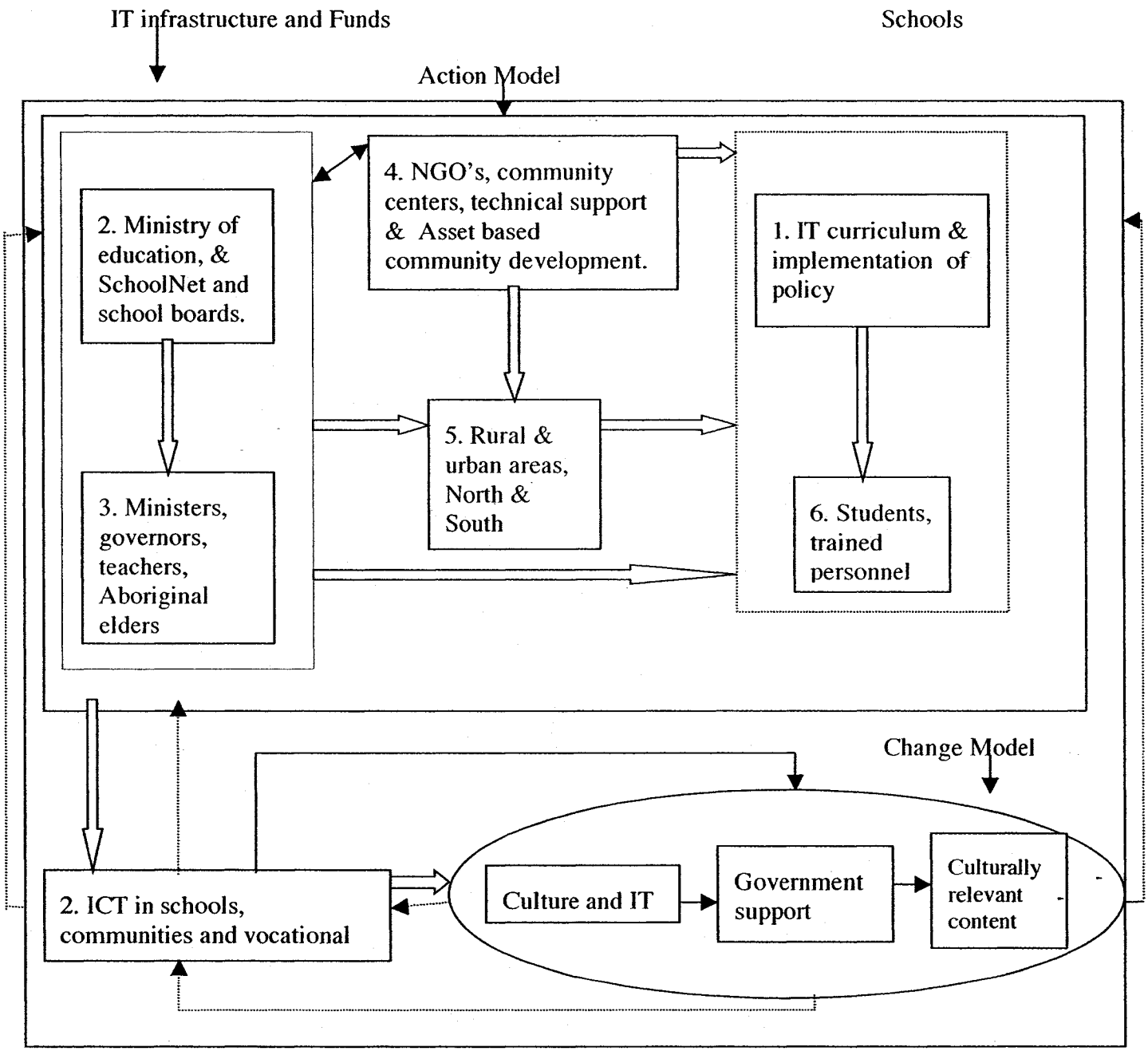


Figure 3.4 is an example of how Chen's (2004) theory can apply to the SchoolNet program. It is important to put both Thailand and Canada through the action model as it shows that both countries have similar structures and goals and that if a policy developer was simply looking at this particular program model he would not see the need to localize the content as both countries have very similar processes during implementation and that implementation is alike and therefore may not need extra consideration such as cultural values of the software and computer.

Squire's Curriculum and Local culture

> *This ambivalence about the role of the teacher in the implementation of curricular and instructional innovations pervades the educational literature, and models for education reform have often reflected this contradiction (Squire et al. 2003, p. 470).*
>
> *If technology users are ultimately also remakers of technology, then we can expect that teachers would reshape curricula as situations dictate. As professionals, teachers are not only justified in adapting curriculum to local constraints, but also in an ideal position to repurpose curriculum. The teachers typically better understand their students' needs and how to conform the curriculum to the day-to-day realities of their particular school and classroom than does a designer (Leuhmann, 2001; McLaughlin, 1976).*

The methods used in Squires' Designed curriculum article (2004) focus on the need to adapt curriculum to how the teachers are implementing it and not try to develop 'teacher-proof curriculum' so that we can understand and predict their next moves. The intention of the research is to analyze how four different teachers in four different learning environments implement his technology-rich, project based curriculum and how they adapt it to their classrooms. Using this as a method in my thesis is useful as I see it as a case study on a smaller scale on how the assets and ideas of the lower levels of implementation are absolutely necessary as they are the ones implementing directly in the classroom. Squire adds, "Our interpretations suggest that contextualizing the curriculum is ultimately a local phenomenon that arises as a result of a number of factors, including students' needs, students' goals, teachers' goals, local constraints, and teacher's pedagogical values" (p.468).

They examined four entirely different classroom settings: middle school, two high schools and one university. They were so divergent that a qualitative approach to

research was used as it allowed for the uniqueness of each case to be fully explored. The online curriculum was the ActiveInk Network e-learning portal where teachers, students and parents can explore interdisciplinary projects that promote critical thinking skills. They set up issues within the project and students either adopted or rejected them based on the relevance to their lives, in this case all four cases rejected questions on the ozone as they did not feel it relevant to their immediate lives.

The methods used in the project were:

1. Cross-case comparison. In this case it was comparing four case studies. In this thesis it could easily be comparing Canadian and Thai experience, Thai and Laotian experience or even Thai rural and Thai urban experience.
2. Observation: The researchers focused on (a) what practices emerged (b) what types of collaborations occurred (c) what role the technology served (d) students' ownership over the various projects (e) students' perceptions of the projects (f) the quality of the students' final projects (g) students' learning (h) the role of the teacher (i) the role of the contextual factors in influencing curricular adoption.

Some observations made were:

1. Failure to make local connections: Students not being able to understand the projects goals as they were not relevant to their everyday experience as well as having an impact on the ozone layer was related to this project.
2. Failure to detect and understand the project goals: two of the cases study groups admitted to never really knowing what the point of the project was, even after having gone through all levels.
3. Students interest in driving the investigation: in one case study a teacher let the students pick the questions that they could answer and most students skipped the chemistry questions and went straight to the community building questions, this same class the did not work well individualistically. The students focused more on how the community would react to chemical situations instead of how an individual would do so alone in the lab time questions. Therefore, though still

working on scientific questions they did so in a very different way that the program intended.

When this was done, they discovered that there were three types of classrooms that had developed overall due to factors such as teachers experience with technology; pedagogical styles and preexisting school and classroom culture:

- **Collaborative Community of Inquiry**: Students consistently asked each other for help during the exercise even though it was a solitary experience at the computer. By the end of the unit, the entire class voted to scrap the individual presentations and work as a whole unit. A lot of collaboration and communication happened in this classroom. These classrooms tended to have teachers that were much more constructivist, allowing students to discover and give meaning to their own experience.
- **Individualistic, Grade Seeking Cultures**: These were the students who completed the project to get the reward at the end of the experience. Very little collaboration and discussion happened in these classrooms. This was also based on the teachers' expectations on the students. These classrooms tended to have teachers that expected their students to finish all required steps in the project.
- **Libertarian, Antiauthoritarian, Political Culture:** This classroom did not even make the project mandatory and let the students use it as a support for the projects that were of more interest to them, seeing if the students would naturally gravitate towards the technology out of sheer curiosity. The students quizzed later did not have a high level of success in this section, but excelled in subjects that interested them more and collaboration was seen a lot in these types of groups. The students intertwined a lot of their own political ideas with the scientific ideas of the project, which had not happened in any other case study.

Some of the conclusions on Squire's research were very interesting. He states that:

> *"We found that teachers assimilated the ActiveInk curriculum into their classroom culture. Each of the teachers picked out tools and resources that were seen as valuable, matched their strengths, were consistent with*

> *their pedagogical beliefs, and were perceived as potentially engaging for the students. Each of these teachers reconfigured the curriculum in unique ways, and in general, the more they adapted the curriculum to their local needs, the more the students engaged with the curriculum in a manner consistent with how it was designed" (Squire 2003; p. 483).*

This supports the main argument of my thesis that each classroom has a culture and that teachers and students are great judges for what works for them in a learning environment. With this knowledge at hand and the fact that a variety of learning styles were used to attain the same goals, localizing has validity. The lack of local content Squire found meant that the students did not anchor learning in productive ways. He found that the most successful and effective instantiations involved teachers taking the tools, resources and challenges he provided them and rearranged and adapted them to local needs. Squire argues that, consistent with Randi & Como (1997)

> *... researchers need to respect and support teachers implementation practices, acknowledging their experiences and expertise as strengths rather than liabilities to be circumscribed (Squire et AL. 2001 p. 484)*

This makes the argument that elders and parents in villages and small rural Tambons in Thailand have as much to say about the education of their children and the implementation of technology and how it could be useful for their community, after all, they know what is best for them in the long run.

Chapter 4 – Tables – Cross Cultural Comparison

The following tables will seek to demarcate where implementation of policy has the desired effects on the ground level and where these policies can be improved. The thesis, in the future, hopes to be used as a guide for other Southeast Asian countries, and thus I have undertaken to provide a series of recommendations for others wishing to follow the initiatives taken by Thailand, in implementing technology in education while protecting local culture.

The tables below are a visual representation of what has been done in each country, and what each places has access to. It is a visual way to represent that each country has its own values, want much the same thing for their respective citizens. If this is the case, and Canada is a very active participant in the development of under-developed nations, then it seems that using a similar diagram, that places the accomplishments, or assets of each country can inform on what some of the next steps could possibly be.

Reference:

Table 4.1: Compares the various initiatives taken in Canada, Thailand and Laos

Table 4.2: Compares the various tools available to Canada, Thailand and Laos

Table 4.3: Displays visually Thailand's National Education Plan

Table 4.4: Displays visually Thailand's National Education Act

Table 4.1: Initiatives in Developed/Developing Nations

Represents how developed nations can inform developing nations. Comparing and contrasting their successes and their failures can help in the development of infrastructures, policies and curriculum.

Developed Nation	Less Developed Nation	Developing Nation
Canada – SchoolNet initiative	Thailand – THINK initiative	Laos - Telecommunications Master Plan (2003-2015) + Jhai Foundation
The infrastructures of SchoolNet environments include different components of ICT that make up the underlying foundation of a connected school. ICT infrastructure is within the control of the education system and includes: • ICT vision, strategy, governance and operational processes; • Hardware and software (e.g. number and type of computers in the schools); • Connections to service providers (e.g. broadband/bandwidth); • Online courses and curricula; IT staff (e.g. IT staff with technical and curriculum knowledge); Operating and • maintenance capability; and Training programs.	The National Education Act of 1999 paved the way for major actions to be taken to promote the use of technology in education such as: 1. Establishment of organizations; 2. Development of policies and plans; 3. Development of infrastructure and networking systems; 4. Development of materials and other technologies for education; and 5. Development of educational personnel and learners. The National Education Network (EDNET) Project that is covers a period from 2002-2005 also has a 5 point plan for IT development:	In 1996 the Science, Technology and Environmental Agency was given a mandate to develop a national plan for IT. The result was the "Lao National Plan on Information Technology: Master Plan up to year 2000" that outlined 3 main projects: 1. the creation of a Lao code page; 2. software standards; and 3. a government Intranet. The plan ended in 2000 without realizing these goals. After the 2000 drop out the Ministry of Communication, Transport, Post and Construction (MCTPC) with support from Japanese investors developed the Telecommunications Master Plan for the period 2003-2015 with the Ministry of Education (MOE) developed a 3 phase plan for IT development in education. The focus goes as follows:

Developed Nation	Less Developed Nation	Developing Nation
Canada – SchoolNet initiative	Thailand – THINK initiative	Laos - Telecommunications Master Plan (2003-2015) + Jhai Foundation
The SchoolNet National Advisory Board has identified key theme areas where action is required to achieve our objectives. Five themes are considered to be priorities. Another four are regarded as also being important. (SchoolNet National Advisory Board, 2001). The five priority themes are: • Appropriate broadband connectivity and on-going renewal and support. • Advancing and sharing of innovative practices in networked-based learning. • Research on the impact of ICT use within learning and with teachers and learners. • Facilitating development and sharing of content (promotion of learnware market). • Human resource capacity building The four themes considered to also be important are: • Equity of access to multimedia learning environments. • Promoting Internet use. • Identifying benchmarks and standards/goals for jurisdiction to reach. • Knowledge management (collective intelligence).	1. Plan for development of IT infrastructure; 2. Plan for development of eLibrary and E-Learning centers; 3. Plan for production of electronic media for teaching and learning; 4. Plan for development of human resources for ICT; and 5. Plan for research and development in international connectivity. This plan was possible by a large infrastructure overhaul in 2003 where electricity and telephone systems were expanded over 56% of primary schools, all secondary schools and all higher education institutions. By 2004, the ministry of Industry expects to increase this percentage from 56% to 80% of all schools in Thailand. Under the networking system called EdNET, the SchoolNet (basic education level) and the UniNet (higher education level) were able to link more institutions together. As of April 2004, the SchoolNet (http://www.school.net.th) was able to serve 4,794 basic education institutions. In 2003, the information superhighway called "UniNet" (http://www.uni.net.th) was able to connect 145 universities and provided 38 distance-learning classrooms. (Office of the Education Council, Thailand,	• The establishment of a ministerial intranet system with links to provincial offices and the National University of Laos; • The incorporation of ICT content into the secondary and tertiary curriculum; The promotion of distance learning and e-learning through ICT. (UNESCO meta survey on the use of technology in education) The Jhai foundation and schools online established the first Internet learning center (ILC) in a rural secondary school in the area of Phonmee. Computers were set up in a renovated classroom. • 40 Teachers received computer training; • Serves the communities needs by opening after school hours; • Jhai foundation now setting up 3 more ILCs in other parts of the country • Working on refurbishing computers to donate to 7 other wireless locations in rural areas. ASEAN and UNESCO have launched regional ICT in education projects with the goals of: • Strengthening ICT in schools; test various models of ICT-based

	2004) The ratio of computers per head of students in Thailand is quite low, especially in the elementary school levels. In Primary schools it is a ration of 1:125, High Schools 1:54 and Vocational education 1:23 (Ministry of education, 2004).	teaching Improve access to educational resources through an ASEAN SchoolNet.

Table 4.2: Tools available for Developing/Developed nations

This graph demonstrates the available tools that each country has, in a more relative way it shows us the asset base that exists within each cultural context.

Developed Nation	Less Developed Nation	Developing Nation
Canada – Available tools	Thailand – Available tools	Laos – Available tools
Computer access points: A CAP Network consists of a grouping of CAP Sites (urban and/or rural) that share a common interest and purpose, and that are committed to work together in pursuit of common objectives with other partners. may be: 1. Library Boards; 2. School Boards; 3. Boards of Trade; 4. Economic Development Boards; 5. Municipalities; 6. Community Free Nets; 7. Human Resources and Social Development Canada (HRSDC); 8. Industry Canada and other federal and provincial departments and agencies. By combining strengths, assets and resources from all their partners and participants, Community Resource Networks can address local and regional issues and concerns that they must deal with in Canada's new knowledge-based economy. These collaborative efforts are a cost-effective way to help a community access the tools and gain the skills it needs. (CAP Network structure)	Thailand had 25 radio stations devoted to educational purposes. Operated by: 1. Chulalongkorn University; 2. Kasetsart University; 3. Thammasat University; and 4. Rajamangala Institute of Technology (RIT) As far as educational TV there are a few agencies that that offer educational programming. 1. The Educational Technology Center: This center develops educational programming for grades 3-9, as well as grades 7-12, and is broadcasted on channel 11 under the administration of the Department of Public Relations. RIT and Sukothaithemmathirat Open University (SOU) also produce televised teaching programs. RIT broadcasts through the C-Band Satellite and SOU broadcasts via the Ku-band satellite with the support of the Distance learning Foundation (DLF) through channel 11. Programming may be viewed from anywhere in the world by consulting the following website: www.dfl.ac.th .	The Center of International Cooperation and Computerization of Japan along with UNESCO has established an IT training center. Located in the Science, Technology and Environment Agency (STEA) the center provides: 1. System administration; 2. Advanced IT courses to Laotian engineers; 3. Basic IT skills development training; 4. General training in IT utilization to government officials (www.stea.gov.la/English.STEAWeb.htm). Some Constraints on Laos as a developing nation: 1. Lack of a co-coordinated ICT Master Plan; 2. Lack of ICT infrastructure as the current structure does no allow for high speed information access; 3. Lack of knowledge base for ICT. The government of Laos, including the MOE, lacks the necessary ICT expertise to formulate and implement national ICT plan;

Developed Nation	Less Developed Nation	Developing Nation
Canada – Available tools	Thailand – Available tools	Laos – Available tools
First Nations SchoolNet A program is to connect First Nations schools to the Internet by providing and maintaining computers and providing subsidies for access. A collaborative initiative from Industry Canada, SchoolNet is in a partnership with the First Nations Education Steering Committee and the First Nations Schools Association. You can find out more about them here: http://www.schoolnet.ca/aboriginal/ FNESC will work towards: • Ensuring an adequate number of computers per school on a minimum pro rata of one computer for 20 students. However, we will work towards much lower ratios. • Assisting and establishing connectivity service standards for First Nations schools; • Ensuring adequate help desk services available by telephone; and, • Encouraging First Nations schools to develop their own website and • To become more involved in the development of Aboriginal web-based content.	2. The Ministry of Agriculture and Cooperative, the Ministry of Health , the Ministry of the Interior and the Ministry of Tourism all broadcast through channel 11 with respective educational shows that represent a Thai cultural perspective. The Distance Learning Foundation (The Wang Klaikangwon School, Hua Hin Model: Distance Education Via Satellite Broadcast and Flexible learning): Funded by his Majesty the King with cooperation of the Office of Basic Education Commission (OBEC), the TOT Corporation Public Company Limited , the Ministry of Financial Affairs, and the United Nations. The DFL presently broadcasts educational TV via satellite through 14 channels, 12 of which are entirely devoted to teaching programs at the basic education level. The DFL is set up so students all over the Nation even rural areas have access to the same quality education as children and youth in urban areas. The DFL also airs educational programs in English, French, German, Japanese and Chinese, and cover topics such as culture, music, health, environment, innovation, technology and agriculture. (Office of the Education Council, Thailand, 2004 p. 121	4. Lack of Financial resources. Laos is one of the least-developed nations ranking 135th out of 175 countries in the UNDP 2003 Human development Index. 39% of the population lives in poverty; 5. Lack of awareness: The potential for ICT implementation in Laos are still not very well understood and the government is not clear on how ICT could benefit the population as a whole. Laos's opportunities to implement ICT in the short term lie in their ability to promote vocational, technical and continuing education. The rising demand from Laotians who are returning from studies in Thailand will inform the government of the need to develop stronger ICT plans for Laos future. These Laotians with IT expertise from Thailand are the future of IT in Laos.

Table 4.3: Thailand's National Education Plan

Thailand has a National Education Plan for 2002-2016 prepared by the Office of Education Council (OEC) which focuses on human-centered development with the hopes of giving Thai students fuller educations that caters to their academic, physical and spiritual growth. This chart is a visual representation of the background section on Thailand

The *National Education Plan* stipulates 3 objectives and 11 policy guidelines for implementation as follows:

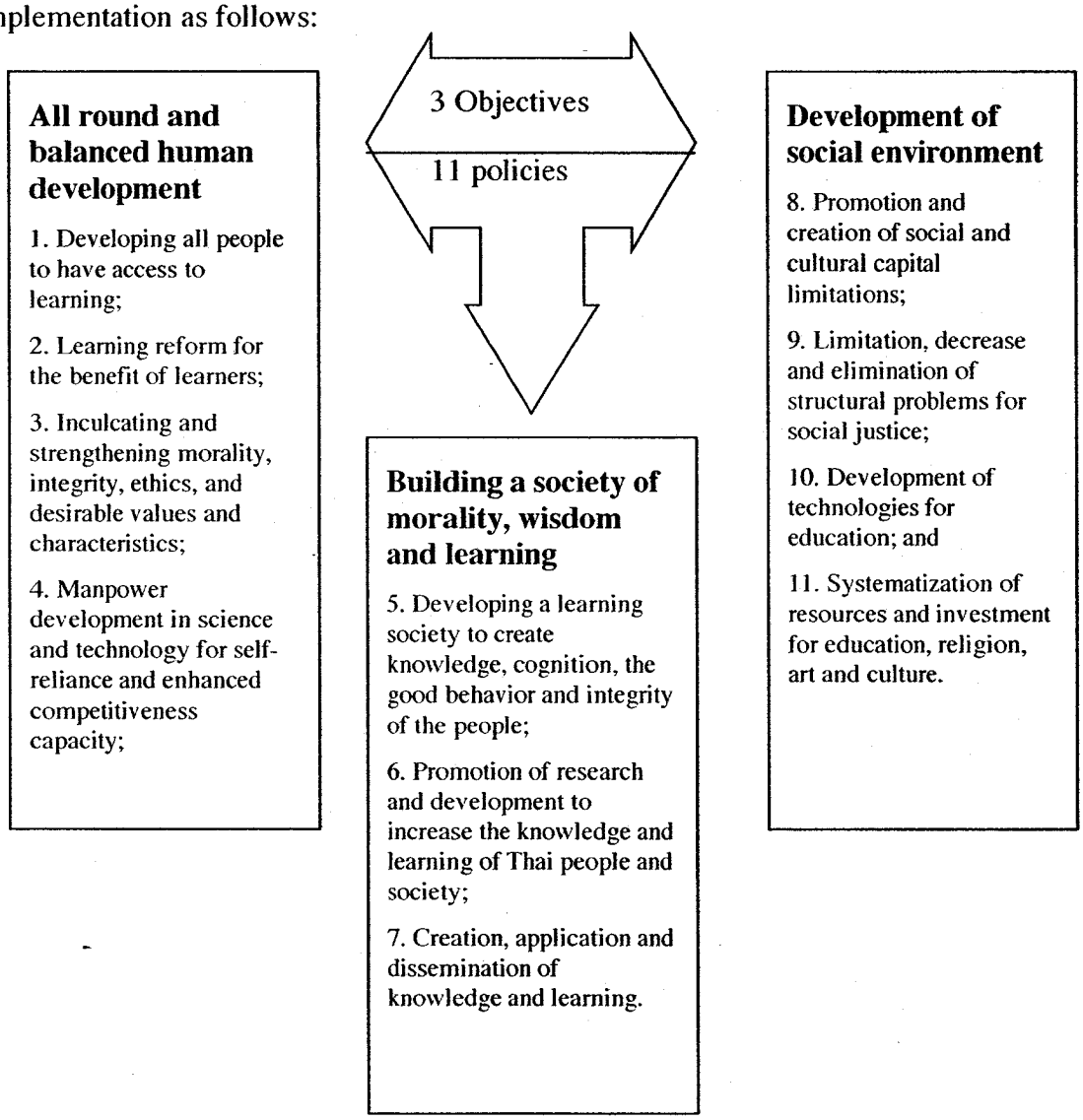


Table 4.4: Thailand's National Education Act

In August1999, Thailand passed the National Education Act which includes 9 chapters prescribing the following objectives and principles; educational rights and duties; educational system; National education guidelines; educational administration and management; teachers, faculty staff and educational personnel; resources and investment for education and technologies for education. The act was amended in 2002 to remove issues of religious affairs and placed them under the custody of the *Ministry of Culture.*

	1999 National Education Act	**Amended National Education Act 2002**
1. Name of the Ministry	- The Ministry of Education, Religion and Culture	- The Ministry of Education
2. Responsibility of the Ministry	- Overseeing all levels and types of education, religion, art and culture	- Promoting and overseeing all levels and types of education.
3. Administrative structure of the Ministry	(1) National Council of Education. Religion and Culture; (2) Commission of Basic Education; (3) Commission of Higher Education; (4) Commission of Religion and Culture	(2) National Council of education; (3) Commission of Basic Education; (4) Commission of Higher Education; (5) Commission of Vocational Education.

Chapter 5 - Low Cost Open Source Initiatives

It is very important to address the issue of the problems of a top-down approach to policy development. For even though the Ministry of Education may have a clear idea of what it wants - the actual reality of this policy on the ground level with the teachers does not always match the expectations from the top.

> There are many, as always, who are not satisfied by the way the Ministry has implemented this reform. Whereas in the 1980s many felt the training was too centralized, this time many feel it has been too decentralized, that is, left too much in the hands of school teams, who may not have the knowledge and skills necessary to successfully make the transition. (Bracken, 2005; p.34)

Teachers are struggling with policies from the top that seem great on paper, but in reality are hindering productive and pro-active education, with classrooms that are overcrowded and not enough support for the new way of grading.

> At the end of 2002, the Minister of Education enacted further changes to the Education Act, which really defined the vision of how the education system should operate. The Ministry of Education would publish an annual strategic plan. School boards would then develop their own strategic plans, taking into account the Ministry plan. Schools, then, through their governing boards, would develop and evaluate their educational projects and success plans, taking into account the Ministry and school board strategic plans. The role of the Ministry and school boards then, while real and vital, became more descriptive than prescriptive. (Bracken, 2005; p.22)

The roles of the governing boards and the parents are strong, yet the voices of the teachers are still being dismissed and not taken into account. They have expectations of their performance that they have not been prepared for.

Implementation of new reforms and curriculum

> *Much of the literature defines successful implementation as compliance with statutory directives (or whatever higher-level directives are being implemented), as therein lies one of my major frustrations with the field. Compliance with directives, or narrowly conceived policy "goals" does not necessarily insure a better policy outcome. Small acts of non-compliance may produce better outcomes than rigid adherence to policy directives (Schneider, A, 1999; p.3).*

Schneider (1999) points to a dilemma of how a policy may be designed to be effective, but in reality end up being ineffective because the expectations are not within the realm of a teacher's ability in the classroom. So when dealing with developing and implementing policy and potentially curriculum within another cultures context, it is very important to get the OBEC (Thailand's Office of the Basic Education Commission) & MOEYS (Ministry of Education, Youth and Sports) perspective as well as those of the people that are going to be influenced by these new policies, the teachers and administrators of the schools, as well as the technological support systems that exist for maintenance, and programming.

Another concern while implementing policy is the importance of not overwhelming the people involved at the grass root levels with new innovations that may initially hinder the implementation of policy and hinder the progress of the students.

Thus no policy implementation is straightforward and many need to be re-evaluated and re-implemented with the help from the educators and then from other key stakeholders.

If a policy does not reflect the needs of the individual communities, then it is up to the implementers to bring the policy up to speed with the existing culture so as to make the change smoother, drawing on the strengths of that culture. The need for ground level participants to feel that their concerns are being heard, that the policy reflects their self interest as well as their organizational culture is of absolute necessity for an effective implementation to occur. If the participants feel that the procedure is fair and that they are somehow not being 'taken for a ride', compliance is much higher and therefore the need for pressure is less, and support for the new policy is higher. It is absolutely necessary that the new policy be proposed and discussed by people who are already on the inside of the organizational culture, as they feel that they will reflect their lifestyle, their culture and their concerns. An outsider may come into the policy process, but, they need to be constantly sounding out the people who are attached to the organizational culture, and listening to their advice all the way through the implementation. If they do not do this then the participants may feel that the policy is inconsistent with their lives. (Tyler & Lind, 1992; pp 115-191).

Tyler and Lind lay out four key factors that promote the idea of procedural fairness:

- Voice, the feeling that ones voice can be heard;
- Trust, a feeling that the decision maker is trying to be fair;
- Standing, a feeling that one has been treated respectfully by policy makers, and;
- Neutrality, a belief that policies have been driven by fact and not emotion.

When these four components have been respected, even an outsider may come into the organizational culture, such as myself from the West and work with the people to implement educational policy.

It is important to pay great attention to this concept, because if an organizational culture has established itself as a functioning whole, an outsider may very well be perceived as threatening the very survival of the community. If a community in rural Thailand does not understand how they may benefit by the introduction of the computer into their community, say for Internet research on crop rotation or seed selection, then they will undeniably reject the policy as useless and the basic adoption phase will have failed.

Initiative A: Build on the Linux Terminal Server Project

My first recommendation for classroom use is the K12 Linux Terminal Server Project (LTSP). This project is developed so that computer technology can be set up in a classroom with ease and at a very low cost. The LTSP is based on the concept that technology should be free to access and very low cost to set up.

Exhibit 5.1: K12LTSP explained

K12LTSP is based on RedHat Fedora Linux and the LTSP terminal server packages. It's easy to install and configure. It's distributed under the GNU General Public License. That means it's free and it's based on Open Source software.

Once installed K12LTSP lets you boot diskless workstations from an applications server. You can use old PC's as diskless clients or buy new ones for under $200 each.[18]

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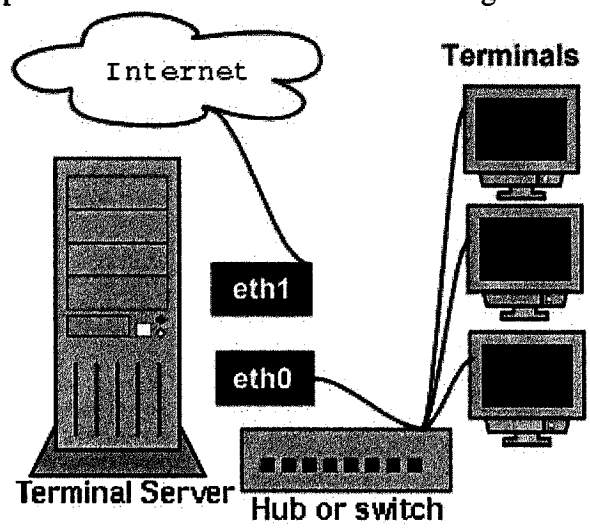
[18] http://www.k12ltsp.org/

Figure 5.1: Visual representation of how the LTSP could be set up

A default K12LTSP installation uses two Ethernet cards: eth0 and eth1. One card connects the server to your school network. The other card creates a private network for terminals (thin-clients). Your server and eth1 act as a gateway for the terminals to the Internet and the rest of your network. eth1 is configured to get its IP address via DHCP. A private DHCP server runs on eth0 to give IP numbers to terminals. This configuration is flexible in that you can easily have multiple LTSP servers in your building all sharing the same default configuration. Servers are "plug and play" with little or no configuration required. It only takes about 20 minutes to be up and running.

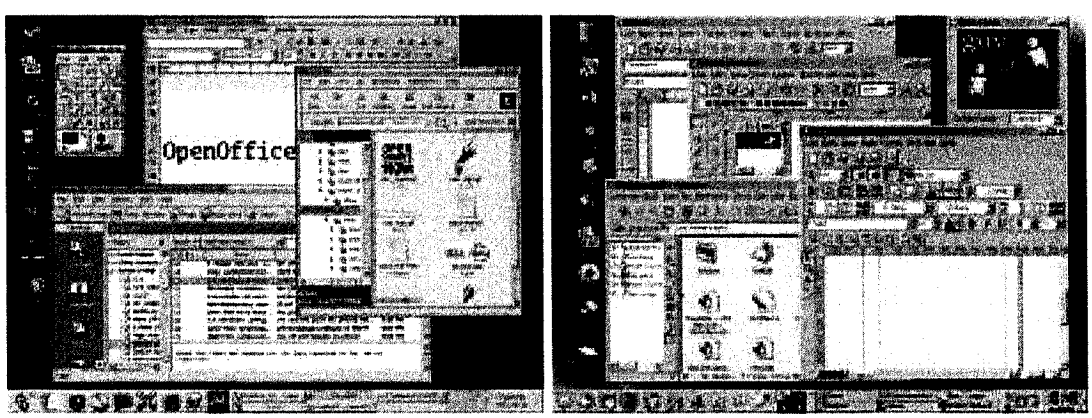


K12LTSP is based on Fedora Core 5 with a full set of familiar GUI tools for configuring your server. You have the choice of KDE or GNOME desktops and many applications.

Linux Terminal Server project example

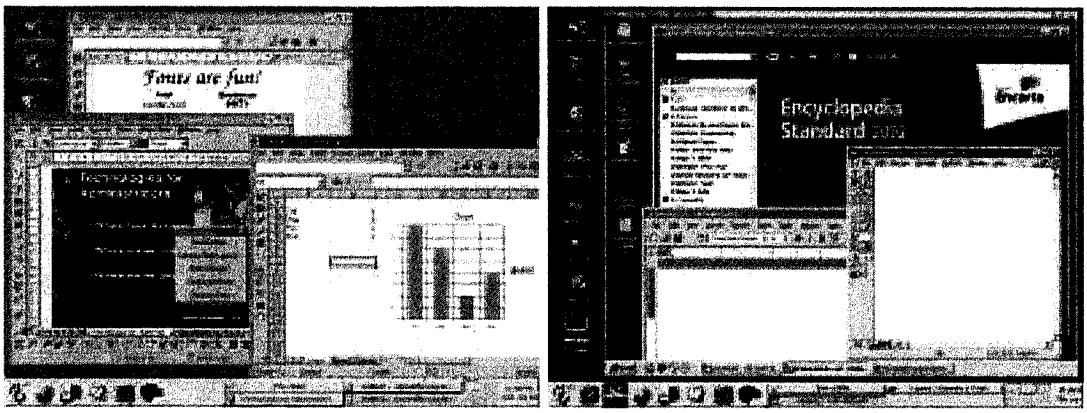
All applications run on the terminal server. Workstations are "thin." They have no software or hard drives. Thin-clients are perfect for schools because they are easy to install and require little maintenance. They are reliable and immune to malicious tampering and viruses. [19]

Software Included in the K12LTSP/K12Linux Distribution:



[19] http://www.k12ltsp.org/

Gnome Desktop: http://www.gnome.org/ KDE Desktop: http://www.kde.org/



Open Office: http://www.openoffice.org/ -rdesktop running Windows2000 Terminal Service Session: http://www.rdesktop.org/

All these programs are freeware that require some technical know-how but are an ideal option for countries that are developing their infrastructure and do not have a lot of money to spend on Hardware and Software. A key point about the terminals is the school only needs to protect the main computer from heat and dust and can be isolated in a small air-conditioned room, alleviating the high costs of having to cool down entire classrooms in tropical climates. The other desktop screens can be in another room that the students are in. The fact that there is just one main computer also prevents the tampering that normally happens by students. Even though this tampering is part of the development of children's curiosity with technology it adds to the amount of maintenance that teachers might have to do.

> K12LTSP, an offshoot of the Linux Terminal Server Project is an auto-install Red Hat-based terminal server package. The terminal server can run dozens of outdated PCs, Internet appliances, or cheap, diskless workstations that are "immune to viruses and mischievous student tampering," according to the project's recent press release.

The mission of K12EdCom.org is to develop the current ideals of open Courseware for elementary and high schools. Open Courseware is curriculum and learning material published under the Creative Commons License. Everything published on this web site is

free to use and redistribute. Read the full license details here:

http://creativecommons.org/licenses/by-sa/2.0/

For further information on these innovative approaches to technology and education please check out the following websites:

http://www.debian.org/, http://www.schoolforge.net/, http://www.linux.org/, &

http://www.linux-foundation.org/en/Main_Page

Initiative B: Ubuntu philosophy

Ubuntu is a community driven project to create an operating system and a full set of applications using free and open source software. At the center of the Ubuntu Philosophy of Software Freedom are these core philosophical ideals:

1. Every computer user should have the freedom to run, copy, distribute, study, share, change and improve their software for any purpose, without paying licensing fees;

2. Every computer user should be able to use their software in the language of their choice;

3. Every computer user should be given every opportunity to use software, even if they work under a disability.

(Savage, 2006. Edubuntu.com, Retrieved (March 19th, 2007)[20]

Edubuntu operating systems

I have put UBUNTU in this thesis to introduce the Edubuntu project. "Ubuntu" is an ancient African word, meaning "humanity to others". The Edubuntu initiative aims to bring the open source concept of Ubuntu to schools by creating software that reflects current school environments in developed countries. The current version of Edubuntu is aimed at classroom use. Edubuntu is a complete Linux-based operating system, freely available with community-based support. The great thing about Ubuntu is that you get all scripting information entirely free and therefore it is ideal for countries, rich or poor, that wish to localize foreign software, as they have access to all the information pertaining to

[20] https://help.ubuntu.com/community/HowToCookEdubuntu/Chapters/Philosophy

Ubuntu's software. It is entirely developed for the community to take it and appropriate it for their local computing and educational needs. It is a program that runs off of a bootable CD so that there is no need to install the program directly onto your hard-drive. This is good for computers that are small and do not have a lot of Random Access Memory (RAM) to run the program directly off the hard-drive. It also gives the user the opportunity to try it out before installing it. It is free of charge, and all you need to do is burn a copy from the ISO that is downloaded to your desktop. This new portable form of technology is part of the creative commons and does not keep any of the important scripting information solely to Edubuntu. In my opinion, it would be a good idea to bring the technology to the vocational schools in countries such as Laos and have skilled IT personnel develop their knowledge of the open source movement to share it with their people. Edubuntu can run on any computer, and therefore the Microsoft computers that are being donated through the IDRC telecenter projects are perfectly suited for Edubuntu.

The Edubuntu Manifesto

The team behind Edubuntu makes the following public commitment to its users:

- **Edubuntu will always be free of charge,** and there is no extra fee for the "enterprise edition", we make our very best work available to everyone on the same free terms.
- Edubuntu includes the very best in **translations and accessibility infrastructure** that the Free Software community has to offer, to make Edubuntu usable by as many people as possible.
- Edubuntu is released regularly and predictably; a **new release is made every six months.** You can use the current stable release or the current development release. Each release is supported with security updates for at least 18 months.
- Edubuntu is entirely **committed to the principles of free and open source software development;** we encourage people to use free and open source software, improve it and pass it on. (Retrieved April 03, 2007, (n.d.) http://www.edubuntu.org/)

For the convenience of the user that is not well versed in technical language, Edubuntu has developed video installation trainings. Unfortunately for now it is only in English: http://www.learningelectric.com/edubuntu.html, but what it means is that you do not have to be a Linux genius to install the Edubuntu software.

You can follow the directives and have Edubuntu running on computers in no time. The

Edubuntu uses many platforms but one in particular that is important to this thesis is the Linux Terminal Server Project (LTSP), which allows you to boot thin clients from an Edubuntu LTSP server. A *thin client* is a low-cost computing device in a *client-server* environment whose main or sole function is to process keyboard input and screen output and which accesses most or all application programs and data from a central server via a network. For educational environments, LTSP lowers hardware costs by enabling the use of older machines as thin clients, as well as reduced administration overhead by having only to install and maintain the software on the server. When a workstation fails, it can simply be replaced without data loss or reinstallation of the operating system because the terminal server is separated from the terminals that the students use.

The importance of this type of initiative is that is gives access to people all over the world to software that can be used in their own cultural context as well as give countries like Laos a chance to get ahead technologically as they do not need to purchase rights, and do not have to purchase the program for each individual computer. A country would only need to do is download the program and have specialized IT staff localize it to their culture, then reproduce the alternative versions of Edubuntu and distribute to the schools. The IT specialist would submit the alternative version back to Edubuntu and then the software is available to any one interested in Laos learning objectives and software layout. It seems so simple and empowering, I don't understand why it has not taken more of a forefront in development and education.

Chapter 6 - Recommendations

Now we move forward to address head on the issues of how to develop and implement policy that takes into account the cultural values and needs of the community serving it all the while serving the mandate of the company that was hired to do a job, the job of policy development, implementation and maintenance. These recommendations are based on the recommendations given in a paper on Sexual Orientation and U.S. Military Personnel Policy: Options and Assessment, by RAND that is a non-profit institution that addresses issues of policy in the public and private Sectors. (Zellman, G.L. et AL., 1993; pp. 380-391)

Recommendation 6.1: Design locally contextualized implementation policy

How might the MOEYS of Thailand implement a policy that is based on previous policy development in the West concerning ICT and education? How can they appropriate knowledge and skill sets from the West and use them to leapfrog unnecessary steps so as to maximize their capacity during implementation? How can they adopt policy that is centered on Western cultural bias and still obtain the most out of the policy? The nature of the educational systems as well as the organizational culture that exists in Thailand can lead us to take several courses of action.

I recommend that after communities have been approached and the idea of the policy implementation has been accepted, it is important that the change in policy happen as smoothly and as fast as possible so as to not drag along the process of change. The simplest and most understandable messages should be sent to the people on the ground level so that they may understand what is expected of them and how they may proceed to make the change. This is a good time to begin discussion between the implementer and the community of practice that has been developed using the ABCD method of community organizing. Using technical policy terms with every person involved will probably just hinder the process and therefore an elected official should be the go-between that describes all technical information to the rest of the community.

Recommendation 6.2: Make the policy simple

If you try and bring computers into the classroom without the full participation of the teachers, nothing will ever get done. If the implementers heed the importance of the position that the teachers hold then it will be much easier to get them to act. Giving teachers tangible responsibilities that help to improve the efficiency and speed of the project will undoubtedly increase the likelihood of success.

Teachers should be part of all levels of the decision-making processes so as to give the implementers a better idea of what is working and what is not working. There must, however, be checkpoints within the institution to make sure that the intentions of the teachers are to improve the students' academic experience and not just to make their work easier. If teachers are to be part of the solution, they must understand the positions of decision makers and the work that they must do to deal with all the requests made by said teachers. The more complicated the requests from the teachers, the less likely they will be accepted, therefore it is good to inform the teachers that small steps must be taken and taken slowly.

Recommendation 6.3: Act quickly

Policy, as stated before, needs to be implemented as quickly as possible.

- First, because waiting makes people anxious and if they cannot see the benefit of the policy right away, they tend to get dissuaded from the implementation and the policy loses some of the wind in its sails. Once the change has happened and people see that it may be positive, the policy is accepted by the general public and has a much easier time finding a home on the ground level.
- Second, any waiting period gives time for people who are against the new policy, (there are always people against a new policy) to garner strength within the community to raise opposition to it being implemented. This can give time for opposition to give the illusion to the population that there are a lot of problems with these new ideas. In the case of ICT and education, one could say that it is possible that the introduction of computers in school will erode a very traditional way of life and therefore is antithesis to the culture it is trying to influence.

- Third, if the change is fast and pervasive, it will signal commitment to the new policy that will show everyone that this is not just a passing idea but a real idea that has value in their community. This allows for the implementers to block any one who would come along to say that the policy is unworkable within their organizational culture.

Recommendation 6.4: Build sanctions and enforcement mechanisms

To ensure that there is compliance with the mandate it is absolutely necessary that some mechanisms be put into place. These mechanisms will lead to a code of professional behavior and give more sway to the validity of the policy. In this instance there can be a code for asset-based community development that pays attention to how the implementation will add to an already impressive list of assets. There should also be a code of conduct encouraging dialogue and supporting any criticism of the software – cultural or technical.

In a hierarchical system such as Thailand's it is important to remind the community that rigorous reports must be submitted during the entire process of implementation (Elmore, 1978). This way, the people at the top feel that there is still a form of control and they know what is going on, and the people at the bottom take responsibility for their actions and feel ownership over the entire process. This form of ownership also ensures that the policy continues to be implemented properly, and potentially grows on its own in unexpected ways. All good policy should have room to grow.

If there are problems with the policy, say, that girls are still being ignored in the classroom by their teachers when it comes to effective training on the computer, and there is no counter-action for this type of behavior it sends a message that the policy and its code of conduct are not to be taken seriously and any new attempts to bring other policy that revolves around education and gender will be disregarded or not taken as seriously. This type of problem demonstrates that a code of conduct alone cannot bring about change. It is rather just a part of the jigsaw puzzle that makes up the implementation process. It is important to pay great attention to the targets and goals of the policy so as to know if it is necessary to implement pressure on the group being influenced.

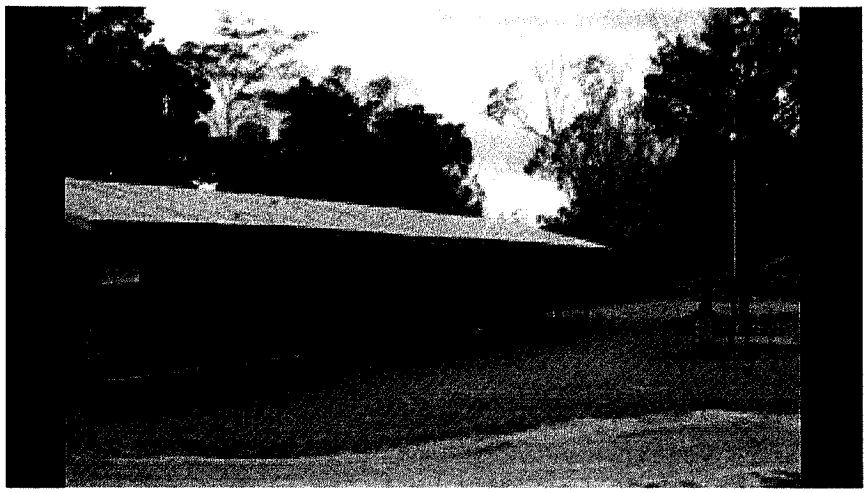
Recommendation 6.5: Ensure Leadership support at all levels (sustainability)

Teachers can and must become a major driving force for change. Without the support and care of teachers, most policies will not be successful if they are dealing with the education of their students. Policies on how many students per classroom, hours worked or days off are more likely to be part of pressure tactics as they are about direct relationships with the teachers and administration, who in turn are dealing with the Ministries. The teachers are the lifeline of the classroom and will be the ones on the ground who will help the policy find a home.

Teachers are always required by parents and administration to perform at very high levels, no matter the status of their schools or their working environments. In Southeast Asia, I saw teachers working in wooden shacks still teaching their students how to read and write, in classrooms that most Canadian teachers would find absolutely unacceptable.

Image 6.1: Inside Rural Lao Classroom in Tadlo Province in the South of Laos

Image 6.2: Outside Rural Lao School in Tadlo Province in the South of Laos



These teachers are desperate for support from the top and are willing to open their curriculums to new and innovative ideas about how to better teach and how to give better opportunities to their students. Without the support of these teachers, no ICT policy can be effective.

If students do not believe that their teachers support the new policy, this will reflect in the lack of enthusiasm for the use of the computers. If teachers do not believe that their superiors support the policy then it will never even have a real chance to make it down to the students with vigor. At the top, the ministries must reaffirm their commitment to the new policies and use a variety of means to do so, either through pay incentives (when possible), new curriculum ideas or even media to support their ideas. Leaders need to send strong signals from the top, signals of optimal success and the how the financial future of Thailand rests on their students getting this ICT education. If teachers feel that they are contributing to the greater good of their communities and even more so their country, they will support innovative policies.

If one it to take a behaviorist approach to a policy implementation, then it is safe to say that when teachers follow the new protocol they can be rewarded. It is also very important to show the people at the bottom of the implementation process that they are being treated fairly and are given access to as much information as possible to reduce any anxiety that they are being taken for a ride, possibly feeling that they should be paid more for their work or so on.

Recommendation 6.6: Signaling commitment

Some of the most important people responsible for the effective implementation of policy in education are the middle-level leaders, in this case administration, who are the voice and bartering for the higher-level leaders, in this case those in the Ministries and the bottom level leaders, the teachers. Unless the seriousness of the policy is conveyed to the administration by the top official, the policy will end up completely warped when it reaches its home on the bottom. If this is not done consistently throughout the nation, then it not unlikely to see different versions of the initial policy all over the country, in various forms in different schools. If the middle administrators also do asset-based community development research in their communities, they will have a better idea what skill sets and assets the community has to barter with.

Recommendation 6.7: Identifying rewards

If the monitoring process from the top officials is made explicit to the middle management, and that the middle management knows that they are being supervised, then it is explicit that there be reward systems set up for the following of this new policy.

Although this may seem behaviorist in nature, when dealing with such large system change (LSC), it is impossible to have a more constructivist approach that leaves each institution the freedom to do as they please with the new policy: however if many people have been consulted then a constructivist approach is present. This is not say that once there has been successful implementation of ICT and curriculum has been developed, with the proper technical support available, that the teachers may not add their own teaching methodologies to the policy or that they may not adapt it to their culture. What may be effective teaching in Bangkok, may not be effective teaching in Koh Lanta.

The rewards must extend to all levels of power in the educational process, from the administrators, to the teachers to the students', so that all people involved feel that they can benefit from the new policy. Tyler and Lind(1992), present advice about the limits of outcome incentives to ensure compliance. They feel that instead of physical rewards that lead to encourage certain behaviors over others, it is just as effective to give all levels of implementation a voice, so that a student may approach a teacher and explain why certain approaches are not working, so that the teachers may continue the chain to the

administration and so on and so on. If people feel that they are being treated in a just manner, that their rights are not being usurped, fairness is incorporated into the policy. For this communication model to be effective, it would have to be made part of the culture, so that the young can express themselves freely to their elders without being reprimanded.

The implementation leader must clarify the complaint process and ensure that complaints are actively addressed. This will dissuade any one person from wasting time with nonsense or people who are just bemoaning the process of change. The set up for this exchange of ideas will depend on each individual community as only they know the threshold of how open students are likely to be and what solutions are most useful.

Recommendation 6.8: Strengthening local context for change

If there are no people in the community who are trained and motivated to address and solve implementation problems then the policy will most likely not find a home. In our situation, if there are no educators with experience or at least training to handle new policy that deals with computer implementation, then we can almost be guaranteed failure. It is important that if there are no skilled workers in educational technology available, training sessions must happen beforehand. It does not benefit the community at all if an outsider is brought in to be the main implementer and then leaves after a year of successful policy. Once a few members of the community have been trained, it is important with their help to develop monitoring criteria to maintain the quality of the policy implementation and that these criteria must be widely communicated to the rest of the community. This action will also create new jobs within that community, and economic growth is always a positive offshoot of any new policy, even if it was not the original mandate.

Recommendation 6.9: Increase leadership capacity

Don't worry, be happy isn't just a simple state of mind. It is a very important aspect of any leaders approach, when dealing with any other person at lower levels who have concerns about the implementation process and how it affects their lives. This is not say that they must be patronized and pushed aside, but a key aspect of being a leader in

policy implementation is to take away any anxieties that subordinates may feel. The subordinates must feel that there is a sense of procedural justice for them.

A good leader will, to create this aura of calm, will absorb a lot of the anxieties of their subordinates and create and environment where people can speak freely (Schein, 1987; Tyler & Lind; 1992). In the case of a Thai classroom, maybe teachers can create environments where students constructively discuss how they feel about using the computers, or can be asked how they enjoy or don't enjoy the new software that has been brought in to learn with. That way any feelings of anxiety that the students feel are alleviated through the discussion process. In turn, the administration has a lot more information about the communities reactions to the new policies and then can go to the ministries and inform them of the opened a dialogue that has been established. Each culture could take a different approach, as Laos is much more communist and is not necessarily known for its criticisms of any orders that come from the top. Maybe even in those instances, the need for reduction of anxiety is much less, because the students are taught to obey and rarely question their superiors. This attitude goes straight up the chain of command, almost as in a military situation.

It is also important to convey to middle ground personnel that they are capable and skilled enough to aid in the implementation process, therefore empowering them in their feelings of efficacy. If it is made clear that what is expected is a behavior change and not an attitude change or vice versa then it is easier for personnel to conform. To clarify that statement, it is important for the schools to understand that they need to change the way they interact in the classroom, as now that there is a new tool to use, they can do this.

Recommendation 6.10: Conduct training

Training of leaders should be designed to create "fixers"—people who both care about successful implementation and have the skills necessary to anticipate and identify implementation problems and to make adjustments to improve the implementation process (Levin & Ferman, 1986;).

This approach however is more of a behavioral approach, one that has seen more success in the past. A more sensitivity training approach attempts to change attitudes more than behaviors, is more costly and takes much more time and skill. During any type of

training the use of discretion is important. People have to feel that they, after their training, can correct any mishaps that may occur during and after the implementation process. This cannot happen though if there has not been a strict code of conduct. So for example, if a school is having a real hard time getting their students involved in the use of the computer and they just don't want to participate, it should be at the discretion of the teacher to try and inspire them as they see fit. It is also important at this point in the juncture to involve the students in the development of content as it may lead to some good ideas of what inspires them but implementers must be careful not to put the responsibility to make worthwhile content on the shoulders of the students.

Recommendation 6.11: Provide Guidance

It is impossible that, even though you may think you have completely covered all bases, a policy implementer must leave room for improvement and error. There will be areas of concern that were not even addressed in the pre and production phase that will come as the policy is being adopted in introduced into its new home. This does not mean, however, that there cannot be a code of conduct that is established at the beginning that will help the bottom level implementers to use as reference. It can come in the form of FAQ (Frequently Asked Questions) or in a help line or help option in a program. There can also be documents that are given out that the beginning of the implementation which cover a variety of issues concerning ICT as well as social science issues related to say gender and computers, effective online education and so on. For each community after evaluations have been done based on the literature chosen for that specific community i.e., ABCD or CCI; the appropriate adjustments may be made that were overlooked in the initial policy.

Recommendation 6.12: Figure out own code of conduct for the implementation of ICT.

The goal of this thesis is to figure out how to implement technology effectively while still protecting the local culture by localizing the software and curriculums to the local wisdom and knowledge base. If we are to figure out a code of conduct it is important that the cultural values are established before hand to ensure that the code is within the

parameters that are acceptable to the community. What are some of the issues that need to be established to maintain a code of conduct?

Some rules of conduct could be as follows:

a) Acting in a manner respectful of the dignity of all participants;

b) Being honest, sincere, and honorable in their relationships with others;

c) Recognizing, acting on and promoting the value of the individuals and the community and for society in general;

d) Direct comments at the policy rather than the implementer;

e) Consistently display high curriculum standards and project a favorable image of the policy within the community;

f) Refrain from public criticism, including making derogatory or misleading statements of the curriculum development, unless they are founded in solid research and rhetoric;

g) Ensure that the policy analysis by community members being undertaken is suitable for the age, experience, abilities and education level of the participants and that they fully understand their responsibilities in contributing to a new ICT environment;

h) Regularly seek ways of increasing professional development and self-awareness in the policy development;

i) Treat opponents to the policy with due respect, and encourage other community members to act accordingly;

j) Be aware of the many pressures placed on policy implementer – especially if they come from outside the community – as they strive to balance the thoughts and opinions of a wide variety of people in a manner so as to allow optimum success;

k) Treat everyone fairly within the context of their activity, regardless of gender, place of origin, color, sexual orientation, religion, political belief or economic status;

l) Educate and ensure high standards of risk management are maintained.

m) Treat all other participants with due respect and encourage all officials to maintain a high standard of self-discipline.[21]

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[21] http://www.edu.gov.on.ca/eng/document/brochure/conduct/conduct.html

Recommendation 6.13: Create a monitoring structure

Now that I have laid out the importance of needing a code of conduct that allows a sustainable structure, how do you monitor that structure? It is important that the structure in context of Thailand' culture relate the hierarchical way of life that is in effect there already. As stated above it is important that the bottom level staff convey the views and behaviors of the students to the administration so as to have a flow of information and a feeling of empowerment. There should be monitoring reports that happen according to the semester systems that work within the school, such as two, three or four times a year. It is absolutely necessary that the reporting instrument is properly tested and tailored to each and every school so as to have the most efficient reports that are reflecting what is really happening and not just what the administration or Ministries may want to hear.

The bottom level implementers that are responsible for the reporting should be people who have been trained already to understand what ICT is, how it has worked previously and what complaints have existed before when there has been a new implementation in a school. It would be good also that these people already be tied somehow to the school so that they have a vested interest in its success.

Recommendation 6.14: Develop monitoring criteria

Few students in a hierarchical culture are ready or willing to discuss their dissatisfaction with an implementation, purely because they are not used to doing so. They may experience high anxiety or fear just being asked to discuss their feelings and thoughts about their experiences. It is important to develop monitoring criteria that are culturally relevant so as to not disrupt the cultural status quo. In Thailand it may come in the form of anonymous complaint system or an external auditor that comes in without any of the social taboos and issues that one community may face and work on improving a situation that may not be ideal. As discussed in the introduction, there is literature to support the culture of the computer, and as we all know, the Internet, for the most part dominated by the English language, thus potentially representing cultural norms from the West. Directly translating software and educational materials from a Western, most likely English context, into another language without taking into the context of the local

cultural norms, is in my opinion a form of cultural colonization and can make culturally relevant monitoring criteria more complicated.

Creating cross-cultural links is key to our growth as a civilization, yet while interaction with other civilizations offers opportunities for growth there are also worries of a uni-directional flow of knowledge. What I am trying to say is without culturally relevant curriculum, it will be hard to have culturally relevant monitoring systems as they will be based on the concepts of Western monitoring and not local monitoring.

Recommendation 6.15: Contextualizing Implementation

To understand implementation, one must understand the current definition of what it means.

> *Implementation means "putting in place" a plan, such as the plans found in statutes, guidelines from higher-level authorities, court rulings, or administrative directives to caseworkers. It means "adding to" and "filling in the details" of a blueprint. It means "carrying out" the actions that are specified or expected. Implementation involves fitting a design into a new or specific context and making the adaptations that are required to do this. The creation of new programs and organizations often if a central aspect of implementation." (Schneider, A, 1999; p.2)*

If this definition is so clear cut, why then, do so many noteworthy policies start off at the top of the organization in one form and end up at the bottom in a completely altered form? Is it the communication between the higher level of command and the lower levels? It is different visions?

Presently in Thailand, the policy is as follows:

1. By 2010, all schools will be connected through the national networking system that provides educational services and instructional support
2. By 2006, at least 10% of the classrooms nationwide will make use of ICT-enhanced instruction and the percentage will go up to 30% by 2010.
3. By 2010, 50% of the Thai workforce will have received appropriate training in ICT. (Education in Thailand (2002-2003) Office of the National Education commission; p. 13, Chap 1. P.1)

So far in the literature there has been no indication how the Ministries intend on carrying out such a task but there has been an international request for proposals for e-learning

development support. The Ministry of Education is asking for Instructional designers who can produce effective concepts and innovative approaches to enhance teaching and learning processes in online, hybrid, and face-to-face instruction. The package or participant is expected to perform the following:

a. Student registration module,

b. Instruction Module

c. Assessment Module

d. Teacher training Module

Nowhere in the proposal however is there mention of a culturally sensitive production of these modules, however, I assume that as the instructional designer is expected to move to Thailand, the work will inherently reflect the local cultural norms. Dr. Chaub Leechor, who is the advisor to the Pedagogical Technology, at the OBEC is responsible for this initiative.

rural Laotian communities and the children are not able to go to local schools to study as they stay home cultivating and roasting coffee for their families. It would be ideal for organizations such as the IDRC and UNESCO to implement Telecenters in the community gathering area, so that the entire community could benefit from an education. These telecenters can begin with simple radio technology and the one laptop[22] (which could be one laptop per community) so as to introduce technology to the entire community, especially the children. This would mean that electricity only need be set up in one area and not the entire community, thus reducing the pressure on government spending. When this technological connection is made, how are the children to benefit if they cannot even read? Even if they could read, how would the Internet, and educational technology - localized or not - apply to their lives? This has to be taken into consideration, especially since very few Laotian educational technology sites and programs have been created.

Image 7.1: Laotian children in Tadlo Province

Given the resources that poor countries can reasonably allocate to education, sometimes less than $20 per year per pupil, compared to approximately $7500 spent annually in the U.S.-even a doubled or redoubled national commitment to traditional education, augmented by external and private funding, does not get the job done. Moreover, experience strongly suggests that incrementally doing more of the same-building schools, hiring teachers, buying books and equipment-is a laudable but insufficient response to the problem of bringing true learning possibilities to the vast numbers of children in the developing world (Mission, One Laptop per child (OLPC) (n.d.) Retrieved (March 19th, 2007)[23]

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[22] http://www.laptop.org/

[23] *http://www.laptop.org/vision/mission/index.shtml*

Chapter 7 - Discussion

Nations that are still developing their basic infrastructures, especially in rural areas, are the hardest sell for the implementation of educational technologies and culturally relevant ICT. This is so because if the infrastructure is not in place to implement the appropriate technology, the argument for the localization of the technology falls on deaf ears as basic infrastructure and employment may be more pressing issues. That being said, to not give the same opportunity to each and every citizen is not only to the detriment of the community but also to the entire country. The importance of consulting local elders, skilled laborers, teachers and students is paramount when deciding whether or not the investment in the community has potential for success. If the minister of education has already done the work to localize software and technology to cultural references, the important step then would be to get the citizens of each community receiving the policy implementation to develop, adapt and understand the value of the technology to their everyday life.

In Southern Laos, my partner and I drove around on the back roads of Tadlo, a small region of coffee growing communities, researching what infrastructure existed. The economic poverty that we saw was immense, however the richness of culture, rituals, family and local history were astounding and the social bonding assets available were very obvious to us. One thing in particular that I noticed was that all along these small roads that were in horrendous states, were electrical wire lines. The infrastructure that was needed to implement the access to electricity for computers was there, but the local need for such electricity in the homes and community center was not being exploited. I believe that if the government had more money, the links would be made between the communities and the electricity. I also believe that these communities would benefit from infrastructure improvements that would lead to decreased workloads of daily activities. As with my previous example of Chief Clarences' Osoyoos Indian Band in Chapter 3 in the ABCD section, electricity would have to initially be subsidized for economic stability to be reached.

When electricity is implemented into the communities, how will this help the parents send their children to school? Many of the elementary schools are too far from the small

Let us imagine a scenario where through government initiatives more Telecenters could be developed. This could increase communications between the neighboring communities as local radio stations could be developed creating bridging social capital and empowering local communities. The community members could also communicate with neighbors to increase knowledge on, for example, local coffee growing and roasting processes and thereby increasing productivity and possibly lowering exploitation as communities start to organize. The Jhai foundation is presently working on developing such initiatives and they must be commended for their hard work.

Information and communication technologies are continually changing our world, and data exchange is becoming worldwide. However, the digital divide remains. This access inequality is also a linguistic inequality, as the languages used on the Web are not those most widely spoken. Accordingly, UNESCO is concerned with the protection of cultural and linguistic diversity as well as promoting language diversity on the Internet too. Hence, UNESCO 's goals are:

> *"To achieve worldwide access to e-contents in all languages, improve the linguistic capabilities of users and create and develop tools for multilingual access to the Internet."* (UNESCO Education, cultural and linguistic diversity in Education: Multiculturalism on the Internet. (n.d.) Retrieved March 19th 2007)[24]

On one hand I would argue that within any learning context, (including internal self motivated learning processes) the assumption is that the negotiation and reconciliation of meanings is a process of interpretation and a reflection of each and every cultural value that is held. Local knowledge and assets must be taken into consideration when developing any new policy that will in turn affect the local learning contexts. If, for instance, this policy is to bring in coffee-roasting machines, then the needs still must be established through community consultation.

Current policies that localize content

Just like the School Net initiative in Canada, the government of Thailand between 2003-2005 implemented a roll out of 250,000 computers in schools across Thailand so that there was a ratio of one computer to every 40 students, even in rural areas. This makes it an ideal time to study the underlying ICT policy. The incentive has, for example, created

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[24] http://portal.unesco.org/education/en/ev.php-URL_ID=52365&URL_DO=DO_TOPIC&URL_SECTION=201.html

a need for content development, and the result has been the importing of ICT hardware from US, Japan and Europe as well as content that comes from UK and Singapore. The developers are working on leapfrogging content development by localizing the influx so to adapt software and as much as possible hardware to the Thai curriculum and to local culture. Thus, Thailand and other neighboring countries of Southeast Asia are potentially perfect places to explore the immediate attempts to implement policy and at a deeper level understand the potential of technology to impact on culture.

This particular Thai initiative, that of online learning and content development is presently being overseen by Dr. Suwat Suktrisul, Director of the bureau of Technology for teaching and learning in the office of the Basic education commission of Thailand, Bangkok, whom I was fortunate enough to meet when doing research in Thailand. Mr. Suktrisul states that it is important to appropriate software from other countries, but that it is absolutely imperative that it becomes localized so that it helps students in Thailand to understand and better use the ICT technologies at their disposal. He mentioned that teachers like the e-learning initiatives and that they would like more interactive activities and more detailed contents to cover the Thai curriculum and an improvement in the network capacity in the schools. The teachers developed their own ways to introduce the content to their students based on their own ability and on their knowledge of the student's needs and capabilities. (Suktrisul & Morse, 2006; p.4)

Thailand is significantly ahead with regards to ICT implementation to all other countries visited on this trip. They are already producing content for distance educational classes. One initiative includes a recording of a class in Thailand that is directed via satellite to other schools through the medium of television. This has been extremely successful and will be continued in various other schools, when the funding is cleared.

The Distance learning via satellite project started in 1995, and is a realization of his majesty King Bhumibol Adulyadej's advocacy for life-long learning, especially for those living in remote, rural areas. The Distance Learning Foundation's rural distance Education program is diffused by means of satellite Tele-education broadcast. By 2005, the full cycle education has been transmitted to around 3,000 secondary schools and 7,000 of the total 30,000 elementary schools in Thailand. The hope is that students that cannot continue onto secondary school due to financial responsibilities can still learn

through television education, giving that they have a television in their homes.

Thailand is also taking initiatives to empower human knowledge development in the surrounding regions. In Nov. 2000, at the request of the Sasakawa Peace Foundation of Japan, 2 training courses were organized for Cambodia, Laos, Myanmar and Vietnam. The courses were developed to train technicians and operators on terms of distance learning technology and management. After the training courses each country received distance learning devices, including cameras, servers, and all post-production materials to create their own content. Laos has benefited from this generous gift as the courses reach many communities that are isolated through the production of televised and radio educational documentaries. For more information on this topic please go to the following website: http://www.dlfeschool.in.th/display/index.php as well as their Swedish partner: http://www.harnosand.se/nyhetsarkiv/arkiv/5.7f77cd1c111227b1cdc8000313.html

Chapter 8 - Culture of the Computer

As mentioned before, it is important to look at the culture of the computer so as to better understand what culture is being exported around the world. The importance of this analysis is paramount if we are to succeed in the protection and maintenance of world cultures and avoid a new form of colonization of the world's people as well as learn how to more effectively localize exported software. In critical pedagogy studies, Dr. Joe Kincheloe takes a look at the concepts of Neo-Colonial power in education and how it affects the students receiving the information (Kincheloe, 2005, p.40). If a book or system is constantly teaching you that success means that one model must be understood, internalized and reiterated, while other systems are being refuted, it teaches students that their modules and learning methods do not apply and therefore are not valid in a perceived Neo-Colonial Western world. It is imperative that we take into consideration then the need to be able to understand the various methodologies for learning as well as the culture of the exported computer so as to better create software and educational content that is relative to the local context and the people learning them.

Cultural adaptation of software and the computer

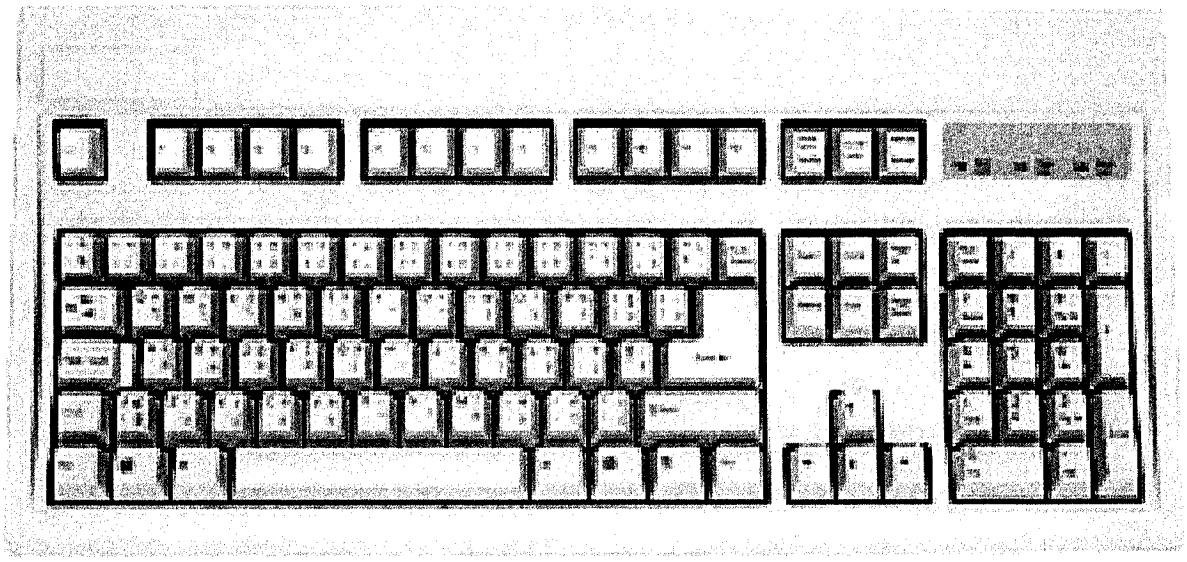
Tung and Cheung (1992) state that the mere transportation of Western educational technologies in the Asia-Pacific region may not be possible or desirable. In a paper on the use of national languages in computer education among countries in the Asia Pacific region, they discuss the implications of the advent of the computer into non-English speaking nations.

> *Historically, English in Roman script has been for communications with computers due to the fact that computers originated and flourished in English-speaking countries. Very little thought was given to overseas requirements in terms of language, cultural requirements and practices (p. 1478).*

That being said, language is not the only concern when dealing with making the computer culturally appropriate. The Thai language referred to as Slamese is said to have its origins in the Tal language family and belongs to the Austric language group. There have been theories that the language sparked somewhere between the regions of China

and Vietnam. The written component was introduced in 1283 by the third Sukothal period king Ramkamhaeng. The writing was based on Sanskrit, Pall and Indian Concepts. The Thai alphabet uses forty-four consonants and fifteen basic vowel characters. They are horizontally placed, from left to right, with no intervening spaces to form syllables, words and sentences.[25] With this information, software developers have been able to create programs that are reflecting more and more the Thai culture, however the keyboard is still in a Western layout and thought pattern. Is it advantageous to teach them the English keyboard? I believe that there are advantages, however the mere layout of the keyboard supports the concept that computer has a pre-ordained culture.

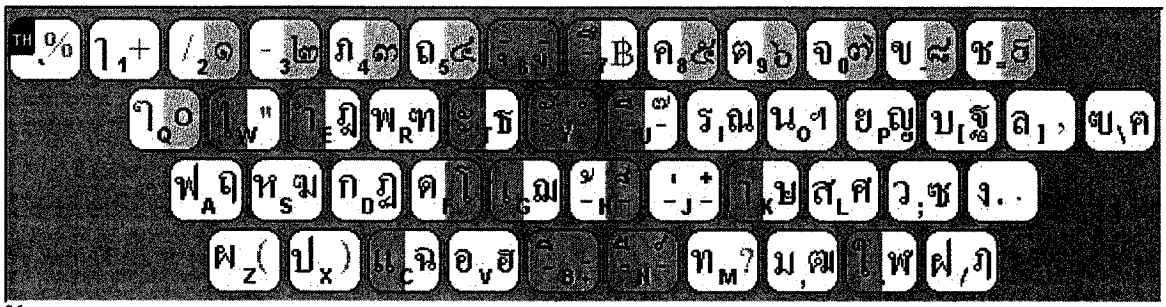
Image 8.1: Thai Keyboard



Below are 2 examples of localized keyboards as well as keyboard layout for Thai people.

[25] http://www.todaytranslations.com/index.asp-Q-Page-E-Thai-Language-History--99454463

Image 8.2: Thai Keyboard – closer look



[26]

English	1	2	3	4	5	6	7	8	9	0	-	=
Thai	Å	/	_	À	¶	Ø	Õ	¤	µ	¨	¢	ª
Thai + Shift	#	ñ	ò	ó	ô	Ù		õ	ö	÷	ø	ù

English	Q	W	E	R	T	Y	U	I	O	P	[	]
Thai	æ	ä	Ó	¾	Ð	Ñ	Ö	Ã	¹	Â	°	À
Thai + Shift	ð	"	®	±	·	Í	ê	³	Ï	-	°	'

English	A	S	D	F	G	H	J	K	L	;	'
Thai	¿	Ë	¡	´	à	é	è	Ò	Ê	Ç	§
Thai + Shift	Ä	¦	¯	â	¬	ç	ë	É	È	«	.

English	Z	X	C	V	B	N	M	,	.	/
Thai	¼	»	á	Í	Ô	×	·	Á	ã	½
Thai + Shift	(	)	©	Î	Ú	ì	↑	²	Ì	Æ

[27]

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[26] http://www.thai-language.com/?tab=2&ref=keyb

[27] http://www.into-asia.com/thai_language/thaifont/keyboard.php

Programs such as Thaimaster NT © are great ways to start the research into Thai digital culture, however, programs such as these are based on models that come from Windows NT © and are not originally from the local country. It would be a very interesting project to see how, without the influence of Western software models, Southeast Asian digital companies would create their software. *"To make your software relevant for Thailand, all of its components should be localized. This includes the user interface, online help, databases, graphics, and documentation. It is important that all components are correctly localized and rigorously tested to ensure the resulting Thai software is linguistically, culturally, cosmetically, and functionally correct."(globalizationpartners.com)*

A Thai localization company should have solid experience and a comprehensive localization methodology, which includes at a minimum:

1. Thai localization kit review, analysis, and preparation.
2. Thai glossary and terminology development.
3. Thai cultural correctness assessment.
4. Thai translation, editing, and proofreading of the user interface, help, and documentation content.
5. Thai graphics localization, dialog resizing, and screen capturing.
6. Thai software build capability.
7. Thai online quality assurance.
8. Thai usability, localization, and functionality testing.
9. Client review and approval. [28]

This being the case, the keyboards needed to make the computer more adapted to their culture could have to be made up of culturally relevant layouts that represent their language and not just have a western layout with Thai characters put on the left or right top corner. It is important in potential and eventual international work that the Thai students understand how the Western Keyboard works, but instead of it being the main keyboard language, it could be a secondary one. There could be a special course given, i.e., how to write with Western keyboards for international work.

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[28] http://www.globalizationpartners.com/translation_services/Thai/HTML/Thai_Software_Localization.html (March 14, 2007)

> *Local content faces intense competition because big content initiatives tend to push their external content onto local communities. In the same vein, more worrying perhaps, developing countries are being "invaded" by foreign ideas and values that may undermine or overwhelm local cultural heritage and economic livelihoods" (Batchelor 2002; p.4).*

This point is backed up by the fact that most cultures have adapted to the western keyboard, the traditional English form of displaying written text and the icons used in the programs.

> *Theoretically, collaborations among researcher-teachers and teacher-designers have a greater chance of successfully implementing innovative curriculum because they understand the underlying pedagogy behind the curriculum as well as the local needs and constraints (Carr, 1997 (5-22); Randi & Como, 1997).*

Policy implementation in Less Developed Nations

Most of the literature out there deals with implementation of technology in large scale organizations (LSO) (e.g. O'Toole, 1989; Langbein and Kerwin, 1985; Prottas, 1984; Wilms, 1982; Zetka, 1991; and Walsh, 1991) and it seems that there are similarities between each theory as implementation in these cases are more for large scale organization training than a cultural policies. When dealing with implementation of policy on a cultural level and in schools, we have to look at much deeper-seated traditions and norms, including race, gender, culture, religion, sexuality and family influence.

A large-scale organization, such as a ministry of education, needs to take all of these factors into consideration when trying to implement new policy. Strong leadership and an understanding of the culture that you are trying to influence are absolutely necessary to attempt to influence policies that already exist. It is also necessary to analyze what policies have been implemented, so as to measure which were successful and which ones failed and the reasons, cultural or technical as to why.

Understanding the people at the ground level and what threshold they have to change and how easy it would be to challenge those limits should also be taken into consideration, as it is most likely these citizens that will benefit from the policy.

To understand cultural adaptation to technology it is important to look at the research that has existed before. Cross-cultural ethnography needs to be placed in the context of the field of educational technology, sociology and anthropology. Discussions can be

analyzed as 'cultural dialogues' (Spindler & Spindler, 1987b). Using such a method of data collection allows the interpretation of systems within their own cultural framework (Fujita & Sano, 1988; 75). Tobin, Wu and Davidson (1989) further developed ethnographic techniques when they conducted a comparative study of pre-schools in China, Japan and the United States. They argued that schooling must be: 'Embedded in communities, nations, and cultures,' and thus such institutions, 'both reflect and affect social change' (Davidson, Tobin, Wu, 1989; p. 2).

This is particularly true in Southeast Asian countries because Laos PDR is nowhere near the development, research and implementation as Thailand and, therefore, they have different cultural needs when dealing with education. The Tobin, Wu and Davidson (1989) study focused, not only on the three cultures' schooling, but also on the three cultures as seen through their schools. I took this approach to culture when asking the key stakeholders of R&D, infrastructure and content development to reflect on what was needed particularly in their culture to bring about social change though ICT and later with policy implementation. Many of the men that I spoke to reinforced the need to build up the ICT infrastructure by first strengthening the present telecommunication infrastructure, then focus on how the new infrastructures could be used to implement ICT in the classrooms. The concepts of using cell phone technology to diffuse e-learning was not considered at this point, but all men were open to the ideas of localizing content so that it reflects the needs of their students and population in general.

Chapter 9 – Cultural Diversity on the Internet

It is important to capacity build within a community to develop a bank of local knowledge and power so as to be able to have a platform when trying to influence policy implementation in the city, a town or village. The Center for Applied Rural Innovation (CARI) Institute of Agriculture and Natural Resources developed a community guide entitled "building on local assets and mobilizing for collective action" (Allen, J.C et al. 2002) that can be applied to a variety of community issues. [29] This institute uses the same theories of asset-based community development that focuses on the community's treasures and not their weaknesses. The cultural diversity that each community possesses is necessary to protect as it is our diversity that makes our human race so spectacular. Cultural diversity is what defines each individual and their ancestry that in turn defines identity.

The issue of cultural diversity on the Internet is being closely monitored by UNESCO and as they have seen fit, have developed a project to protect culture online by promoting a variety of languages on the Internet. UNESCO has researched the cultural divide between which cultures have access to more ICT then others and have attempted to make serious attempts to protect the cultures that are not being represented in the new technological revolution that is sweeping the world. I feel that this project is a great concrete example of how the culture of the computer exists and how it is important to represent the others that are not part of the 10% that are represented. If policy makers do not want to base their implementations on community development theories that may seem to basic or socialist or illegitimate to them, then the B@bel initiative is something that is more concrete and researched that may lend some sway to the need for localization.

> A language community which has not developed scientific and technical terminologies for their language, is inevitably forced to use another, perhaps foreign language to express these concepts. This process reinforces language and knowledge divides and can contribute to a decline in the perceived importance,

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[29] http://cari.unl.edu/publication.shtml

> marginalization and exclusion of local languages from the wider knowledge society (UNESCO (2007) Initiative B@bel. Retrieved (March 19th, 2007)[30]

UNESCO B@bel initiative to protect language on Internet

Initiative B@bel uses Information and Communication Technologies (ICTs) to support linguistic and cultural diversity, and to protect and preserve languages in danger of disappearance on the Internet.

> "It is estimated that about 20% of the world's languages have no written form. The emergence of multimedia technology, managing of digitized voice communication and innovations such as voice recognition and translation systems present new possibilities for the preservation of the rich heritage of these languages in today's digital environment (UNESCO (2007) Initiative B@bel. Retrieved (March 19th, 2007)[31]

It promotes multilingualism on the Internet in order to make content more accessible to a variety of world's people. Today, more than 90% of content on the Internet exists in only 12 languages, so many users of the 6 000 languages in the world are overlooked by this important communication medium. The "Initiative" puts emphasis on the need of completing all the steps to ensure the presence of a language in the digital world. Synergy and cooperation with other institutions and initiatives is capital to achieve longer-term results regarding multilingualism in the cyberspace.

Since access to information and knowledge is key to human development and quality of life, Initiative B@bel takes care to pay attention to countries that are developing or in the process of transition. By supporting their information needs and encouraging their participation in the digital environment we can contribute to their societal progress.

This strategy gathers activities that help to shape the development of a policy on multilingualism and universal access to information in cyberspace and provide a framework for an implementation of this policy at both national and regional levels in support of a peaceful democratic multicultural and multi-ethnic information society UNESCO (2007) Initiative B@bel. Retrieved (March 19th, 2007)[32]

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[30] www.unesco.org/webworld/babel

[31] www.unesco.org/webworld/babel

[32] www.unesco.org/webworld/babel

B@bel has the following objectives:

- Seeking a global consensus on equitable access to information through the development and promotion of a recommendation on the use of multilingualism and universal access to information in cyberspace;
- Encouraging the creation and adoption of compatible international norms and principles for more equitable access to information in different languages;
- Seeking a consensus on principles concerning the ownership (IPRs) and liability of translated works published on the Web;
- Encouraging the application of statutory duties by the public authorities to produce network resources and services in different languages at the national and/or regional levels;
- Encouraging the formulation of national policies for the preservation of minority languages,
- Developing language education strategies through the use of information and communication networks (formal, informal and life-long education);
- Implementing comparative surveys in Member States, particularly on the norms and principles for more equitable access to information in different languages adopted at the national and/or regional levels.

This strategy intends to support a selected number of concrete activities aimed at widening access to the use of information in all languages on the Internet. This last point is particularly poignant as it sums up the entire point of the thesis, that language materials and culturally relevant educational content be readily available to all citizens in all languages all over the world; even in the poorest countries. This strategy focuses on collecting and distributing information on the status of languages, linguistic tools, resources, case studies and best practices, institutions and policies and using this data to enhance policy and decision-making.

It includes the following activities:

- Development of an infrastructure (i.e. the UNESCO Observatory on the Information Society) for the collection, storage and diffusion of information on multilingual resources and services, including software produced in developing countries;

- Development and dissemination (on-line and off-line) of UNESCO international statistical surveys on the progressive use of languages on the Internet in collaboration with other organizations.

With organizations such as UNESCO looking out for cultural diversity in the digital world it should be obvious to policy makers that culture is a viable and living organism that needs to be protected from disappearing. The use of English language and thought patterns in Educational materials, distance education materials, online education materials and websites in general, we negate the existence of other cultures and their needs to learn in their own way relative to where they come from and how they interact in their society. (UNESCO (2007) Initiative B@bel. Retrieved (March 19th, 2007)[33]

This initiative has implications on the success of implementation of ICT technologies in developing nations as well as the localization of software by giving weight to the theories written in this document about protecting culture and language when developing educational software. If UNESCO deems it necessary to take initiatives to protect languages on the Internet, then it is safe to say that support in the form of financing or donations (computer hardware) from UN agencies has potential, especially if initiatives are attempting to educate local citizens with educational references that are similar to their culture. B@bel is a way to start the ball rolling, to get the average citizen thinking about how culture and language play into education and how the need to protect various cultures from absorption into English Western culture.

B@bel also gives us a database of languages and countries that are working towards the protection of these cultures. This is very useful when trying to develop partnerships with people to work on ABCD initiatives to localize technology.

[33] www.unesco.org/webworld/babel

Chapter 10 - Conclusions

Information and Communication Technologies are taking educational environments by storm all over the world. They are giving us new ways to learn and interact with information and knowledge that is truly unique and still much research is needed to see its full effects on the learners and the academic environments in which ICT is so very pervasive. The culture of the computer is a much-disputed theory, however, I feel that with the information laid out in this thesis, that it is at least a suitable topic for further research.

The exportation of culturally irrelevant materials is not a conscious attempt to circumvent other cultures but a continuation of a history of colonization that infers that there is some inherent wisdom to be learnt from the learning styles of the exporting country. Developing nations that are receiving generous donations from the international community must protect their local wisdom and knowledge base by working in partnerships to improve their infrastructure and educational facilities so that they are in a position to develop curriculums that reflect their cultural values and language. Policies must be developed with the local context in mind that encompass a multitude of voices from the ground level all the way to the top level.

Re-appraisal of the learning environment may also give us the space to introduce the concept that computers introduced into classrooms are not neutral, that it is possible that they bring with them a pre-conceived culture, at least through the software. In our classrooms, this is not so much an issue, I believe, because the computer and its software represent our cultural values as most of the software we use is from Canada, the States and sometimes Europe. I do however, think that it is potentially harmful to developing nations such as Laos that may receive our donated refurbished computers and software to learn with in ways that may not in any way reference their cultural and academic value system.

Exporting the computer and computer software is a very viable way for any country to make money, and this thesis does not attempt to dissuade any curriculum developers from doing so. What this thesis is setting out to do, is to demonstrate how important it is that the exporting companies and countries work in partnership with the receiving countries to develop culturally relevant resource material that can be used in a local learning contexts. The more the partners work together to improve the localized online curriculums then the more the demand for the materials will increase. Ideally, any country would be self-sufficient enough to be developing their own content, but until countries like Laos are financially stable enough to do so, they must depend on the generosity of neighboring countries like Thailand and International development agencies such as the IDRC, UNESCO and other smaller organizations.

From the point that the partnerships are created, it is important to decipher which tools are going to be used to analyze the needs of the communities receiving the new technologies and implementations. The theories discussed in this thesis are a way to give communities tools for developing ICT policies in education that reflect who they are and what they need for their people. The approaches such as Asset-Based Community Development and Comprehensive Community Initiatives are developed so that an external implementer can come from a specific cultural environment and learn how to work in a new one. If the developer decides to use any one of these community development approaches, s/he needs to encourage the full participation of the community so that the policy will survive after the departure of the foreign entity.

Initiatives such as Canada's First Nations School Net, Laos' Jhai Foundation and UNESCO's B@bel are direct outcomes for a need to develop local culture in education in the face of an ever pervasive Anglo-European knowledge based model of teaching and learning. These initiatives are a wonderful example of how to work with current Information Technology and adapt it to the needs of each individual community that is using it. They address the issue of dominant cultures and languages in the information society and provide alternatives to communities that do not wish to circumvent who they are in the name of getting educated in the ICT educational revolution.

I would like to conclude that even though I did not speak much of this in the thesis, freeware such as LINUX Terminal server project based classrooms, Edubuntu and a

variety of other free educational software exist as a way for certain very poor countries to start implementing technology in their classrooms. As most of the software is free and can be reprogrammed, it is ideal for the schools and ministries to use to start developing concepts of culturally relative content without spending too much money.

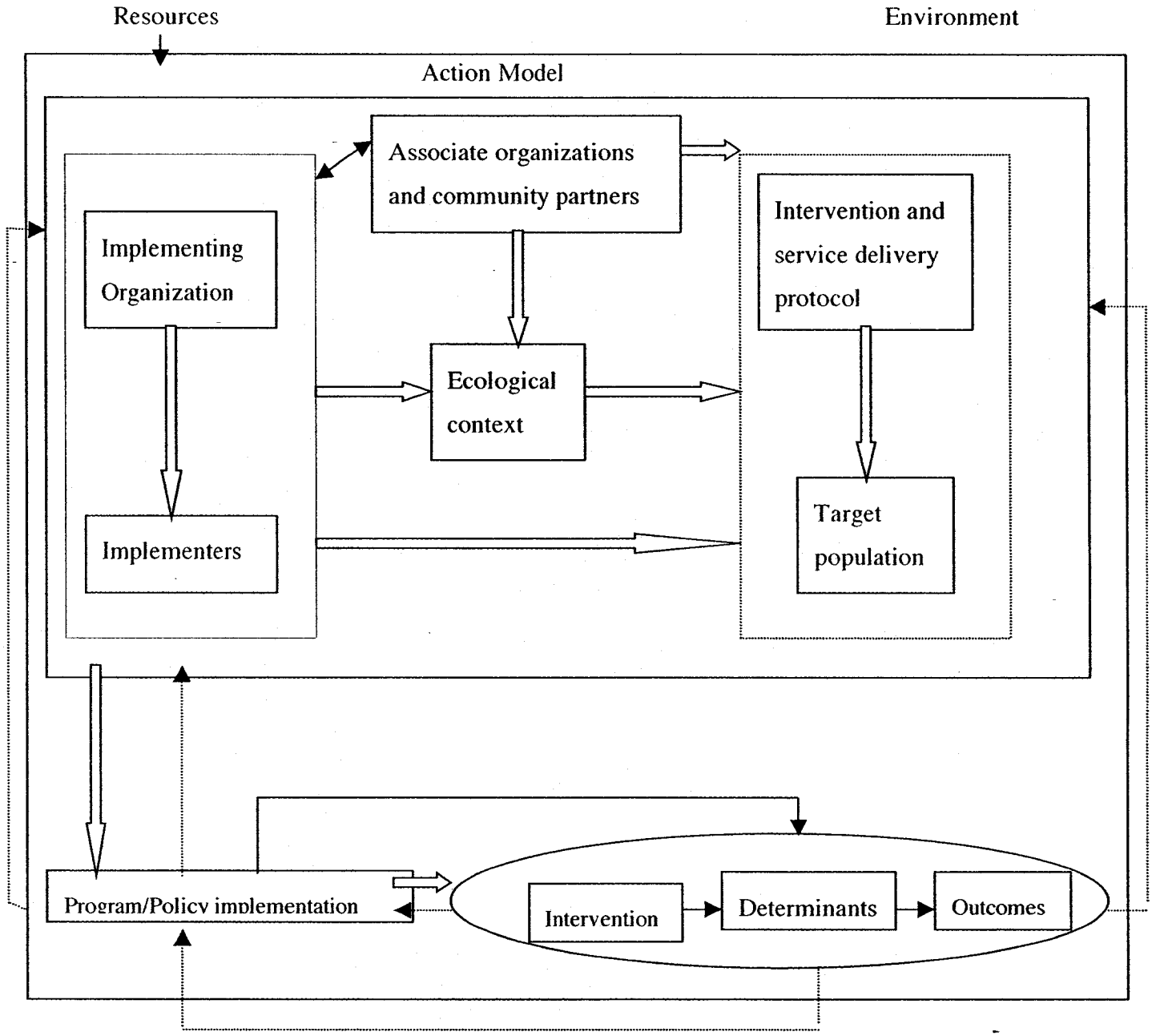
The LINUX classrooms are also much easier to control as one computer is the mainframe that feeds all the other computers information. If software needs to be updated or changed, the local technician would only have to change the main computers programming and the other ones would follow. A particularly interesting aspect of these types of classrooms are that the only computer that would need to be protected and kept cool would be the main computer as it would be the one with all the programming and processing. This server terminal does not even need its own room and can be in the administration office, which generally has air-conditioning. The other computers can be in the regular classrooms, even if these classrooms are hot. LINUX combined with the efforts of Edubuntu are starting a new wave of technology access that is hopefully going to take its rightful place in the developing world. The steps are there, but the need to for technical support structures, especially in the rural areas to be able to sustain the implementations still has to be fulfilled. I truly believe that after all this research that many people are taking this issue seriously and that soon we will see that culture sits at the forefront in the development of information and communication technologies in developing nations.

Looking forward...

I see this thesis as a document that is an asset-based assessment of policy development. It is not an attempt to belittle the work that international organizations are doing, but an attempt to demonstrate how their partnerships are absolutely necessary in the work that will be taking place in the future. I highly value the cultures of our children and their educational future is important to me. I think that to protect people and their culture is the best thing we can do as development agencies.

Thank you.

Annex A: Chen's Action Model for Practical program evaluation



1. Intervention and service delivery protocol:

Intervention protocol is a curriculum or prospectus stating the exact nature, content, and activities of an intervention – in other words, the details of its orienting perspective and it operating procedures. Service delivery protocol refers to the particular steps to be taken in order to deliver the intervention in the field. The service delivery protocol has four concerns: client processing procedures, or how clients move from intake to screening to assessment to service delivery; division of labor in service delivery, or who is responsible for doing what; settings, which may be formal (e.g., at a program's office) and or informal (e.g., in a clients home); and communication channels (face-to-face, telephone, mail, etc.).

2. Implementing Organizations:

Assess, Enhance, and Ensure its capabilities. A program relies on an organization or organizations to allocate resources; coordinate activities; and recruit, train, and supervise implementers and other staff. How well a program is implemented may be related to how well the organization is structured. Initially it is important to ensure that the implementing organization has the capacity to implement the program, and strategies exist that can be helpful in determining this.

3. Program implementers:

Recruit, Train and Maintain both Competency and commitment: The implementers qualifications and competency, commitment, enthusiasm, and other attributes can have a direct effect on the quality of the intervention delivered to clients, and thus the effectiveness of the program in large part depends on them. Under the action model it is important for a program to have a plan for ensuring competency and commitment among program implementers, using strategies such as training, communication, and performance monitoring and feedback.

4. Associate Organizations/Community Partners:

Establish Collaborations: Programs often may benefit from, or even require, cooperation or collaboration between the implementing organization and other organizations. If linkage or partnership with these useful groups is not properly established, implementation of such programs may be hindered. Under the action model, it is important to create feasible strategies for establishing and fostering relationships with associate organizations and community partners.

5. Ecological Context:

Seek its support: Ecological context is the portion of the environment that directly interacts with the program. Some programs have a special need for contextual support, meaning the involvement of a supportive environment in the program's work. Micro-level contextual support comprises social, psychological, and material supports that clients need in order to allow their continued participation in intervention programs.

6. Target population:

Identify, Recruit, Screen, Serve: Concerning target population, three assumptions that often figure in evaluation are the presence of validity established eligibility criteria, the feasibility of reaching eligible people and effectively serving them, and the willingness of potential clients to become committed to or cooperative with (or at least agreeable to joining) the program. Identification of actual needs is vital, and information from assessment can suggest whether a client needs services in addition to the central intervention. Client readiness being the extent to which and individual's mental and physical state permits his or her acceptance of and intervention. Mental readiness of a client is the degree of motivation of his or her willingness to recognize a problem or deficiency, or the degree of motivation to accept an intervention.

Annex B: Key Document Terms

The following terms are used often throughout this document. A brief interpretation is given for each term according to its use in this document.

Asset - "community treasures"; the positive strengths, qualities, merits, benefits, virtues, commodities and character imbedded in a community.

Capacity building - Capacity building encompasses the country's human, scientific, technological, organizational, institutional and resource capabilities. A fundamental goal of capacity building is to enhance the ability to evaluate and address the crucial questions related to policy choices and modes of implementation among development options, based on an understanding of environment potentials and limits and of needs perceived by the people of the country concerned".[34] The transfer of funds for investment in material, intellectual, or human resources (McDonnell and Elmore, 1987).

Client Server - describes the relationship between two computer programs in which one program, the client, makes a service request from another program, the server, which fulfills the request.[35]

Community - neighborhood, town, city, county, regions, area, tribe, culture, ethnic or faith-based group of people as identified by its members; a community of "good character" is caring, kind, trusting, fair, responsible and displays good citizenship.

Connectivity - A generic term for connecting devices to each other in order to transfer data back and forth. It often refers to network connections, which embraces bridges, routers, switches and gateways as well as backbone networks. It may also refer to connecting a home or office to the Internet or connecting a digital camera to a computer or printer.[36] The quality or condition of being connected or connective with technology or people.

Culture – the integrated pattern of human knowledge, belief, and behavior that depends upon the capacity for learning and transmitting knowledge to succeeding generations **b:** the customary beliefs, social forms, and material traits of a racial, religious, or social group; *also*: the characteristic features of everyday existence (as diversions or a way of life} shared by people in a place or time <popular *culture*> <southern *culture*> **c:** the set of shared attitudes, values, goals, and practices that characterizes an institution or organization <a corporate *culture* focused on the bottom line> [37]

Curriculum – A curriculum can be defined as the planned educational experiences offered by a school which can take place anywhere at any time. Categorize major conceptions of curriculum:" (a) curriculum as content or subject matter, (b) curriculum as

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[34] Capacity Building - Agenda 21's definition (Chapter 37, UNCED, 1992.)

[35] http://searchnetworking.techtarget.com/sDefinition/0,,sid7_gci211796,00.html (April 16th,2007)

[36] http://www.pcmag.com/encyclopedia_term/0,2542,t=connectivity&i=40241,00.asp (14.03.07)

[37] http://209.161.33.50/dictionary/Culture (March - 14th 2007)

a program of planned activities, (c) curriculum as intended learning outcomes, (d) curriculum as cultural reproduction, (e) curriculum as discrete tasks and concepts, (f) curriculum as an agenda for social reconstruction, and (g) curriculum as "currere" (interpretation of lived experience) Schubert (1986)."

"Curriculum construction is an ongoing social activity that is shaped by various contextual influences within and beyond the classroom and accomplished interactively, primarily be teachers and students. The curriculum is not a tangible product but the actual, day-to-day interactions of students, teachers, knowledge and milieu. The curriculum encompasses what others have called curriculum practice or the curriculum - in-use. Curriculum as product or object, the conventional view, is seen as one aspect of the context that shapes curriculum practice (Cornbleth 1990).

Educational technology – Educational Technology - also known variously as e-learning, instructional technology and learning technology - is the use of technology to support the learning process. Although the term can refer to all kinds of analogue technologies, e.g. photographs, film, video, audio recordings etc, it is usually used to talk specifically about digital computer technology.
Although technology is widely used in the administration and management of education (e.g. student records, marketing, procurement, finance etc) and in research, educational technology is only concerned with technology as it impacts upon the learning process, e.g. in delivering learning materials, facilitating communication and providing assessment and feedback.

Technology can benefit both traditional (i.e. face-to-face) and open and distance learning models. And perhaps it makes it easier to combine different models to provide a blended learning experience tailored to the individual's needs.[38]

ICT – Information and communication technologies (ICT) can transmit and/or receive communication signals and information content through electromagnetic signals between two or more entities (e.g. the teacher and student, one student and one "machine", or between two "machines"). ICTs could include: PCs, wireless devices, networked infrastructure, connected TVs, voice/data communications (e.g. telephone); television and broadcasting; and intranet, Internet and extranet.

ICT Infrastructure – Infrastructure reflects how connectivity and ICT integration is being managed within schools through technology and equipment, school based network systems and IT support. Infrastructure also represents the "potential" for connectivity and ICT integration within the school system. For instance, fiber-optic cable ready to be connected to schools reflects "potential" connectivity.

Implementation – "putting in place" a plan, such as the plans found in statutes, guidelines from higher-level authorities, court rulings, or administrative directives to caseworkers. It means "adding to" and "filling in the details" of a blueprint. It means, "carrying out" the actions that are specified or expected. Implementation involves fitting a design into a new or specific context and making the adaptations

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[38] http://edtech.twinisles.com/ (March - 14th 2007)

that are required to do this. The creation of new programs and organizations often if a central aspect of implementation." (Schneider, A, 1999; p.2)

"The carrying out of a basic policy decision usually incorporated in a statute but which can also take the form of important executive orders or court decision. Ideally, that decision identifies the problem(s) to be addressed, stipulated the objective(s) to be pursued, and in a variety of ways, 'structures' the implementation process." (Mazmanian and Sabatier, 1983, p.20)

Individual - person belonging to a community, group of relatives, or other people who have capabilities, abilities and gifts. Association - a formal or informal group of community people working together often as volunteers to generate collective action. (Examples: 4-H, Scouts, YMCA/YWCA, United Way, Red Cross, neighborhood association, county fair....)

Inducement - A reward for a specific behavior, designed to encourage that behavior. **also called** incentive.[39] The transfer of funds to individuals or agencies in return for certain agreed-upon action (McDonnell and Elmore, 1987).

Institution - a formalized and structured organization that does not typically rely on voluntary commitment of the individuals involved. (Examples: school, church, government agency, hospital, law enforcement, city council...)

Leapfrogging - describes the rapid change made by a society or a company to a higher level of development without going through the intermediate stages observed in other cases.

Localizing – taking culturally irrelevant materials; books, software, food, clothing... and adapting them to the local culture through either the bonding of the two or the use of the initial cultural model as a scaffold for the new local context.

Mandate - the rules that govern the actions of individuals and agencies, intended to produce compliance (McDonnell and Elmore, 1987). Command; order; authorization granted from one body to a subordinate body.[40]

Means of production - The raw materials, lands, and resources that are used in production. In a capitalist society, these are owned and controlled by the bourgeoisie.[41]

Mobilize - to accomplish community goals by energizing and activating community strengths and assets.

On-line and networked technologies - include all technologies that allow for interactive communication, such as e-mail, the Internet, networked systems, tele-teaching, and computer-mediated communication (CMC).

Open Source: Open source is a term coined in 1998 to remove the ambiguity in the

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[39] http://www.investorwords.com/2441/inducement.html (April 15th, 2007)

[40] http://www.english-test.net/toeic/vocabulary/words/281/toeic-definitions.php#mandate

[41] http://www.socialpolicy.ca/m.htm

English word "free". The Open Source Initiative described open source software in the Open Source Definition. Open source continues to enjoy growing success and wide recognition.

Policy – a definite course or method of action selected from among alternatives and in light of given conditions to guide and determine present and future decisions **b:** a high-level overall plan embracing the general goals and acceptable procedures especially of a governmental body.[42] A definite course or method of action selected (by government, institution, group or individual) from among alternatives and in the light of given conditions to guide and, usually, to determine present and future decisions. A specific decision or set of decisions designed to carry out such a course of action. Such a specific decision or set of decisions together with the related actions designed to implement them. A projected program consisting of desired objectives and the means to achieve them.[43]

Relationship - a bond that is formed through identifying, connecting and establishing a friendly alliance built on trust, strengths, and assets.

Server – is a computer or program that offers a service to another computer. Servers can host a variety of services, such as websites, databases, file storage and manages network services.

System changing - the transfer of official authority among individuals and agencies to change the system through which public goals and services are delivered (McDonnell and Elmore, 1987).

"Table" of people - made up of community individuals and representatives of community associations, institutions, and businesses who form the foundation for community work.

Technology – Technology is a broad concept that deals with a species' usage and knowledge of tools and crafts, and how it affects a species' ability to control and adapt to its environment. In human society, it is a consequence of science and engineering, although several technological advances predate the two concepts. "Technology" can refer to material objects of use to humanity, such as machines, hardware or utensils, but the concept can also encompass broader themes, including systems, methods of organization, and techniques. The term can either be applied generally or to specific areas: examples include "construction technology", "medical technology", or "state-of-the-art technology".[44]

Telecenters - "Telecenters tend to be in the public sector, operated by governmental bodies or nongovernmental organizations (NGO's). Generally they serve a low-income clientele and have community development mission. Typically, telecenters offer a broad range of communication services related to the needs of the community, some of which

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[42] http://209.161.33.50/dictionary/policy (March - 14th 2007)

[43] http://www.ilri.org/html/trainingMat/policy_X5547e/x5547e05.htm (March - 14th 07)

[44] http://en.wikipedia.org/wiki/Technology (March 14, 2007)

are free or subsidized by external bodies such as governments or NGO's." (Colle and Roman 2003)

Thin Client - A *thin client* is a low-cost computing device in a *client-server* environment whose main or sole function is to process keyboard input and screen output and which accesses most or all application programs and data from a central server via a network.

Web server – Offers hypertext transfer protocol services to one or more computers i.e., http://...

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