Empowering Youth in Resource Poor Community in Kenya through ICT Training

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Abstract

This thesis contributes to the area of Information and Communication for Development and emphases on bridging the digital divide between developed and developing society. Particularly, this project focuses on the empowerment of youth in resource poor community through ICT training.

This thesis conducts a one month field study in Kenya and applies case study method. The aim of the thesis is to evaluate the outcome of Craft Silicon Computer Training Bus project from two perspective, individual empowerment and economic empowerment. Then, practical suggestions are proposed for improvement.

Individual empowerment refers to the students’ attitude and skills gained during the training. The economic empowerment indicates employment promotion in ICT-related industry. The case target is Craft Silicon Computer Training Bus project which provides ICT training to youth living in Kibera slum in Nairobi, Kenya. The evaluation framework of this thesis combines the core indicators of computer training outcomes which proposed by Daniel A. W, et al and the pathway model which proposed by O’Donnell, et al.

After the evaluation, practicing suggestions are provided to improve the training program regarding provide high quality training and promote employment opportunities simultaneously. Firstly, the result of this thesis could help Craft Silicon Foundation to recognize the pros and cons of this project and to improve the training. Secondly, the participants of the training could benefit from the improvement and achieve a better study result. Finally, other training programs could learn from the experience of Craft Silicon Computer Bus Project and improve their own programs.

Keywords
ICT Empowerment, ICT Training, Outcome Evaluation
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Chapter 1 Introduction

1.1 Research Area

In contemporary society, Information and communication technology (ICT) is necessary in people’s daily life and it is vital for human development. It has been recognized as a tool at the center of human existence. Alcantara defines ICT as a set of activities that “facilitate, by electronic means, the capturing, storage, processing, transmission, and display of information”. (Alcantara, 2001) However, information and telecommunication technology also has a downside. Not all people have the equal opportunity to access and benefit from the technology, which leads to the so called “Digital Divide”. The Organization for Economic Co-operation and Development (OECD) defines the term “digital divide” as “the gap between individuals, households, businesses, and geographic areas at different socio-economic levels with regard to both their opportunities to access ICTs and to their use of the Internet for a wide variety of activities”. (OECD, 2001) ICT not only offers opportunities for young people to get information, to learn, but also provides opportunities for youth to develop skills and to get a job. However, it is important to acknowledge that many young people, especially those who are living in many developing countries and resource poor communities, lack of equal opportunity to access to these new technologies. Furthermore, those youth do not have equal opportunity to acquire ICT-related skills nor to benefit from ICT-generated employment opportunities. Therefore, they are in the depth of the digital divide and they are “vulnerable to global market changes” (Manacorda & Petrongolo, 1999).

In the first decade of 21st century, a revolution has occurred in Africa due to the use of ICT. As the diffusion of mobile phone and Internet, most countries in Africa are experiencing rapid increases in the use of and access to ICTs. Nevertheless, as a consequence of poverty and other global problems, Africa still has a quite low rate of Internet connectivity and usage compared with other continents. In sub-Saharan Africa, 71.8% of urban dwellers live in slums, the highest proportion in the world. The Slums are defined by United Nations Human Settlements Program (UNHABITAT) as “an urban area with a lack of basic services such as sanitation, potable water, and electricity”. The slums are substandard housing, overcrowding, unhealthy and hazardous locations, insecure tenure and social exclusion. (Ramin, 2009) Therefore, the people live in the slums in Africa are the most vulnerable and disadvantaged group. People living in slums have little opportunity to access to and use the ICTs. They are in the depth of the digital divide.

The research area of this thesis belongs to the category of Information and Communication for Development (ICT4D). ICT4D is a general term that is used to define “the applications of ICTs for the socioeconomically disadvantaged groups” (Tas, 2011). In other words, the ICT4D is applying information technologies for poverty reduction purposes which could help to bridge the digital divide in developing countries.

On the other hand, ICTs have reshaped labor markets around the world. In the knowledge and information era, continuous education and training is the only way for job security. Especially, in order to generate more employment opportunities, ICT trainings should not only teach ICT-related skills but also combine and integrate other soft skills into the training. (Yigitcanlar & Baum, 2009).
The UN Youth Employment Network is an initiative of the UN. It cooperated with the World Bank and the International Labor Office, proposed a series of recommendations to promote youth employment. It draws attention to promote youth employment by tapping the potential of ICT and it proposes 7 specific means for the governments. The first recommendation for governments is to provide opportunities for young people to acquire ICT literacy, technical skills in ICT, and to look to ICT industries to provide employment or entrepreneurial opportunities for young people (Curtain, 2002).

Empowerment is a concept that links “individual strengths and competencies, natural helping systems and proactive behavior to social policy and social change” (Rappaport J., 1984). That is to say, empowerment links the individual and his or her well-being to the social and political environment. Education, especially technical education, could empower advantaged people. It is essential to improve capacities and promote employment opportunities. People could get empowered not only from economic perspective, but also personal and social empowerment such as enhanced confidence levels and social status (Huyer, 2003).

As discussed above, it is vital to empower disadvantaged youth through ICT training, especially in resource poor community in Africa. This thesis mainly focuses on the empowerment of ICT training for youth in resource poor communities in Kenya.

1.2 Problem Formulation

Previous research indicated that ICTs offer opportunities to young people to learn and develop skills and develop employment.

However, just because the ICT is available does not mean everyone has the equal opportunity to get the training and develop skills in it. Many young people especially those who live in remote and resources poor communities do not have equal opportunities to access necessary information and training. Therefore, they cannot keep up with technological revolution. On the other hand, unskilled and semi-skilled employment opportunities are decreased in knowledge economy, youth live in those resource-poor communities are left behind and become vulnerable (Hull, 2003). The multi-dimensional class structure of modern society creates structural inequalities. As a consequence, it leads to the digital divide, to the gaps in access, usage or skills, benefit, and participation in ICTs. People who are endowed with large amount of economic, political, or cultural capital are much more likely to have access to ICTs than people with low income, little social relationships, poor education level and skills. Furthermore, compared with people living in resource poor communities, they are more capable to use ICTs, to benefit from this usage, and to be supported in political participation by ICTs. (Fuchs & Horak, 2008)

On the other hand, youth live in resource poor communities may have more difficulty to get a job in ICT-related position than those positions in other sectors. There are several reasons. Firstly, youth in resource poor communities are not able to access to information on the types and variety of career options available in the information society. Secondly, there can be a misperception that very advanced levels of training and education are required by employers the information society. Thus, youth may perceive that the ICT skills are too difficult to them and become fear of learning. Finally, the career paths and opportunities in ICT-related employment can change and develop much more quickly than in other sectors due to the rapid technological developments and evolutions. In other words, if ICT training programs fail to keep track of the changes in business and industry, they are
out-of-date and trainees could not get benefit from the training. Therefore, it is vital to develop adequate linkages between education and training interventions and local employers in order to provide high quality training and promote more youth employment in ICT-related industry. (O’Donnell, Ellen, Duggan, & Dunne, 2003).

In 2001, the European Commission funded a two-year study to identify and develop a model and guidelines of good practice for interventions aimed at assisting disadvantaged people such as youth in remote and resource poor communities into employment using IT (O’Donnell, Ellen, Duggan, & Dunne, 2003). This guideline could be used to evaluate the outcomes of ICT training program from the perspective of capacity building and employment promotion.

This thesis focuses on how youth in resource poor community in Kenya could be empowered through ICT training. A case study approach is conducted. The case target is Craft Silicon Computer Training Bus project, which is providing basic ICT skills training to youth in slums in Nairobi, Kenya. The outcomes of the training program are evaluated following the guidelines of pathway model proposed by O’Donnell et al in order to propose practical suggestions for program development.

1.3 Research Question

- What are the outcomes of the training project considering individual empowerment and economic empowerment?
- How to improve the project in order to provide high quality training and promote employment for youth?

1.4 Aim and Significance

The aim of the thesis is to evaluate the outcome of Craft Silicon Computer Training Bus project from two perspective, individual empowerment and economic empowerment. Then, practical suggestions are proposed for improvement.

The expected result of this project is significant for the training provider, Craft Silicon Foundation, the training participants and also other similar training centers. Firstly, this project will help Craft Silicon Foundation to recognize the advantages and disadvantages of this project in order to improve the quality of the training. Secondly, the participants of the training will benefit from the improvement and achieve a better study result. Finally, other training programs could learn from the experience of Craft Silicon Computer Bus Project and improve their own programs.

This project is supported by The Swedish Program for ICT in Developing Regions (Spider) (SpiderCenter). Spider is a resource center for ICT for Development in many developing countries and is based at the Department of Computer and Systems Sciences (DSV) at Stockholm University in Sweden. The vision of Spider organization is “an interconnected world built in the spirit of digital solidarity for future generations”. The mission of Spider organization is “to support the innovative use of ICT for development and poverty reduction through synergistic partnerships, while strengthening the global ICT4D knowledge base through networking, brokering, and open sharing of information”. Spider organization focuses on crosscutting issues in three main areas, such as thematic areas, crosscutting ICT issues, crosscutting development issues. This thesis project focuses on the topic of youth empowerment, which belongs to the crosscutting development issues. The result of this thesis also contributes to the research of Spider organization.
1.5 Structure of the Thesis

The Chapter 2 introduces the extended background relevant to the research. Chapter 3 states the scientific methodology applied in the research, including data collection method and data analysis method. Chapter 4 presents the empirical data collected in the study. Chapter 5 analyzes the result of the study. Chapter 6 covers three key subsections: summary of the paper, suggestions for improvement and recommendations for future research.
Chapter 2 Extend Background

2.1 Digital Divide

Organization for Economic Co-operation and Development (OECD) defines the term “digital divide” as “the gap between individuals, households, businesses, and geographic areas at different socio-economic levels with regard to both their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of activities” (OECD, 2001).

Van Dijk and Hacker (Van Dijk & Hacker, 2003) argue that there are four types of barriers to access:

- Mental access: lack of elementary digital experience.
- Material access: lack of computers and network connections.
- Skill access: lack of ICT related skills.
- Usage access: lack of meaningful usage opportunities.

Norris describes the digital divide as a multidimensional phenomenon consists of three distinct aspects, global divide, social divide and democratic divide. The “global divide” indicated the inequity of ICT access and usage between developed and developing countries. The “social divide” refers to the gap between information rich and poor areas in each country. And lastly within the online community, the “democratic divide” refers to those people who do not have equal chance to use the digital resources and ICT. As a consequence, they do not have equal opportunities to engage and participate in social, cultural and economic activities. (Norris, 2001)

In developing countries where the majority of people lack electricity and have not even made a telephone call, the prospect of pervasive information and telecommunication technology is far less than virtual. In terms of skill access and usage access, the digital divide is wide and deep. Despite recent progress, Africa remains far behind the developed world in terms of Internet connectivity and usage. Table 2.1 presents an actual Internet usage statistic for Africa (Africa Internet Usage and Population Stats, data from 2011). An Internet user in this statistical analysis refers to the person who is available to connect to the Internet and he or she also has basic knowledge to use the Internet (Internet World Stats, 2011).

<table>
<thead>
<tr>
<th>AFRICA REGION</th>
<th>Population (2011 Est.)</th>
<th>Pop. % of World</th>
<th>Internet Users, 31-Dec-11</th>
<th>Penetration (% Population)</th>
<th>Users % World</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total for Africa</td>
<td>1,037,524,058</td>
<td>15.00%</td>
<td>139,875,242</td>
<td>13.50%</td>
<td>6.20%</td>
</tr>
<tr>
<td>Rest of World</td>
<td>5,892,531,096</td>
<td>85.00%</td>
<td>2,127,358,500</td>
<td>36.10%</td>
<td>93.80%</td>
</tr>
<tr>
<td>WORLD TOTAL</td>
<td>6,930,055,154</td>
<td>100.00%</td>
<td>2,267,233,742</td>
<td>32.70%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Table 2.1 Internet usage in Africa and on the globe 2006

Although Africa makes up 15% of the world population, only 6.2% of all Internet users live in Africa. The data in the table indicates that the digital divide is a severe problem in African countries. Most of African countries are excluded from the contemporary digital age.
Christian Fuchs and Eva Horak discussed 6 potential strategies for dealing with the global digital divide. The sixth one is an integrated strategy, which encourage the redistribution of resources such as wealth, educational and health programs. It also suggests government provide public and free access to computers and technologies. Furthermore, developed countries are encouraged to offer open source technologies, and computers to the developing countries or resource poor areas. (Fuchs & Horak, 2008). Also, in some of the developing countries, governments and non-government organizations (NGOs) have been working on a wide range of ICT initiatives to bridge the digital divide. These initiatives includes but not limited to:

- Provide public ICT access through libraries and other community centers.
- Provide ICT skill training programs
- Provide ICT access and training to disadvantaged groups including people with disability.
- Provide free computer training resources through libraries and other community centers
- Establish computer reuse schemes to provide affordable computers to people in resource poor communities. (Yigitcanlar & Baum, 2006)

### 2.2 Introduction of ICT situation in resource poor community in Kenya

#### 2.2.1 ICT Situation in Kenya

Kenya is an East African country. It attained its independence from British rule in 1963. During that period, the economy relied on the export of agricultural produce. The main produce is coffee and tea. Even today the economy still focuses on the agricultural industry, forming one-third of the GDP (CIA World Fact Book - Kenya, 2008).

- **Education System**
  Kenya has an 8-4-4 education system. Primary schooling takes eight years. Secondary school takes for years. After graduating from secondary school, students continue a four years study of first degree at university which mainly focuses on Mathematics, English, and vocational subjects. The vocational education is appropriate for those students who do not continue on with secondary education, those who are interested in self-employed, and those who would look for a job in the non-formal sector. In 2003, the country introduced universal, free, non-compulsory access to primary education. As the result, the number of students increased 1.3 million immediately. This growth has created an accumulating demand for access to secondary education and the further education such as vocational education and university education as well (Farrell, 2007).

- **ICT Status in Kenya**
  Computers were introduced to Kenya in the 1970s and the Internet became available in 1993 (Ford, 2007). Till December 31, 2011, there are 10.5 million Internet users in Kenya, which is 25.5% of the population. In Kenya, cyber cafes are the major Internet service providers. Most Internet users access Internet in cyber cafes. There are over 30 Internet Service Providers in Kenya and it becomes more and more. However, the access to Internet is still limited, especially in remote and resource poor areas (Internet World Stats, 2011).

  Few people in Kenya have a computer at home. There are several reasons. On the one hand, people especially those who are living in resource poor area could not afford a computer. On the other hand,
the limited rural electrification, and frequent power disruptions encumbers the provision and implementation of ICT infrastructures.

Kenya government established a National ICT Strategy for Education and Training which paid much attention to the importance of ICT in its Education Sector Support Program. The Ministry of Education has taken steps to support the implementation of the strategy. It also cooperates with various institutions and agencies. In addition, there are many other organizations not involved directly with the Ministry of Education that continue to be active in implementing and supporting projects involving ICT in education (Farrell, 2007).

- ICT Policy

Kenya government established a National ICT Policy in January 2006 that aims to “improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services.” There are a number of sections in the national policy, including information technology, broadcasting, telecommunications, and postal services. In the Information Technology section, objectives and strategies for ICT and education are proposed. Among the objectives, one indicates that the government will encourage “the use of ICT in schools, colleges, universities and other educational institutions in the country so as to improve the quality of teaching and learning.” (Ministry of Information and Communications, 2006).

In 2005, the Ministry of Education developed a Kenya Education Sector Support Program (KESSP). It points out the importance and necessity to use ICTs as tools to facilitate and improve traditional teaching and learning process. (Ministry of Education, Science and Technology, 2006) Kenya Vision 2030 is the nation’s new development blueprint for 2008 to 2030 which aims at making Kenya a newly industrializing, “middle income country providing high quality life for all its citizens by the year 2030”. The Kenyan government has underscored universal access to ICTs as a major objective of Vision 2030 (National Economic and Social Council of Kenya, 2007).

2.2.2 Digital Divide in Kibera Slum

The field study of this thesis is conducted in Kibera Slum in Nairobi, the capital of Kenya.

Kibera is the largest slum in Nairobi, and the second largest urban slum in Africa. The 2009 Kenya Census reported that the population in Kibera is 170,070. However, many major media and even the UN put Kibera’s population at 1 million, but without any sources. (Map Kibera) In fact, it is still unclear that how many people are living in Kibera. It is quite difficult to count. Nevertheless, it is obvious that Kibera is overcrowded no matter 170,070 or 1 million residents are living there. During the field study in Kibera, I found that the living conditions in Kibera are extremely poor, and most of its residents are suffering from severe poverty. They are lacking access to basic services, including electricity and running water.

In Kibera Slum, youth are isolated from the information age. Due to the poverty and the poor infrastructures, just getting online is a challenge in Kibera and computers are not affordable for most youth. According to Conradie and Jacobs (Conradie & Jacobs, 2003), there are many technical and social issues that lead to the digital divide in resource poor communities. Those problems apply to the situation of Kibera slum, including:

- The lack of electric power.
- The lack of supporting communication infrastructure.
- The lack of ICT skills.
- The lack of ICT applications
• The lack of sustainable career path opportunities.
• The scarcity of technical staff.
• High unemployment rate.
• High cost of hardware/software.

Due to the problems above, youth in Kibera Slum lack of access to ICT and lack of ICT skills, finally leads to the high unemployment rate of youth in Kibera.

Kibera is near the industrial area of Nairobi where up to 50% of the available workforce is employed (usually in fairly unskilled jobs). (Kibera UK - The Gap Year Company) However, there is still an unemployment rate of 50%. Particularly, the youth unemployment rate is up to 80%. (Slum-people of kibera) This is why the training and teaching of skills is very important.

2.3 ICT Empowerment for Youth

Empowerment is recognized as one of the three “pillars” of poverty reduction. The World Bank has embedded the notion of empowerment within many of its development initiatives (World Bank, 2000).

Empowerment is understood by different researchers in different ways. Distinct theories of empowerment have been developed for the processes that occur at different levels such as the individual, group and organizational levels. Rappaport defined empowerment as a concept that links “individual strengths and competencies, natural helping systems and proactive behavior to social policy and social change” (Rappaport, 1984). Conger and Kanungo argued that empowerment is both a process and an outcome. It not only refers to a specific initiative but also refers to the effect of the initiative (Conger & Kanungo, 1988).

Some researchers utilize a more economics-based frame and they focus on empowerment of the individual or household. The empowerment level is assessed in terms of improved income. That economic empowerment can be simply defined as “being able to engage freely in economic activity” levels (UNDP, 1993). On the other hand, from psychology and management point of view, empowerment links a person’s mental health to his or her well-being in the social and political environment (Perkins & Zimmerman, 1995).

As Zimmerman notes, different empowerment processes are at work and empowerment takes different forms within these various contexts. Therefore, a single global measure of empowerment may be neither possible nor desirable (Zimmerman, 1995).

This thesis focus on empowerment for youth through ICT training from two perspectives: individual empowerment and economic empowerment.

2.3.1 Individual Empowerment

Since the mid 1960s researchers and development organizations have acknowledged that individual empowerment is important because it increases the well-being of individuals and households (Godoy, et al., 2006). Empowerment increases the subject’s feelings of self-efficacy (Hardy & O’Sullivan, 1998). Compeau and Higgins define the construct of computer self-efficacy as an individual judgment of one’s capability to use a computer (Compeau & Higgins, 1995). Computer self-efficacy plays a significant role in helping the individual to more easily acquire many of the skills associated with effective computer use (Marakas, Yi, & Johnson, 1998).
Training has been suggested as an important means of improving computer self-efficacy. Marakas et al. (1998) illustrate the significance of computer training programs on performance and computer self-efficacy. The ICT Impact Report analyzes the impact of ICT on learners including motivation and skills, independent learning, and teamwork. (Balanskat, Blamire, & Kefala, 2006).

Many researchers evaluated the outcomes of an ICT training program and concluded how trainees get empowered during the training. The ICT innovations for poverty reduction project was developed under UNESCO’s crosscutting theme on the reduction of poverty in order to develop ICT models that empower people living in poverty. One of the conclusions of the research is that ICT skills have direct and practical links to aspects of empowerment such as literacy, voice and expression, and access to information. Firstly, ICTs lend people to group work and projects. During the training, both social and technical skills are improved simultaneously. Secondly, ICT skills are directly and practically linked to literacy and expression. Thirdly, for many poor participants, mastering the computer means appropriating as their own the most prestigious modern technologies, signifiers of modernity that they previously felt to be completely unreachable. Finally, this engagement with ICTs has a sometimes dramatic impact on participants’ social standing in their homes or community. (Slater & Tacchi, 2004).

Daniel A. W, et al. concluded the potential impact of ICT training on participants. Those impacts could also be applied as the indicators to evaluate the outcome of an ICT training program. The core indicators of ICT training outcomes are student attitudes, student skills, systemic outcomes and long-term outcomes. Student attitude refers to student motivation and attitudes towards the teacher, training method, training content etc. Skills that obtained from the training include the ICT skills and other soft skills. Such skills are computer literacy, communication skills, team working, entrepreneurship skills, information management, civic engagement, and problem solving, etc. Systemic education indicators includes such as enrollment rates, pass rates and dropout rates. Long-term indicators refer to the social and economic impact, such as higher life satisfaction, more possibility to get a well paid job, and the increase of economic competitiveness and access to the global economy. (Wagner, Day, James, Kozma, Miller, & Unwin, 2005).

This thesis evaluated ICT training program by using the core outcome indicators proposed by Daniel A. W, et al.

2.3.2 Economic Empowerment

Information and Communications Technologies (ICTs) have reshaped labor markets round the world. Social inequality and the digital divide have increased no matter within or between countries. The number of unskilled, semi-skilled and entry levels jobs in a wide variety of sectors have declined. As a consequence, youth unemployment rate is increased. In most countries, the rate of youth unemployment is above the national unemployment. In the knowledge era continuous education and training is the only way for job security. Those ICT trainings provide youth more opportunities to get a job in ICT-related industry. (Yigitcanlar & Baum, 2009).

The UN Youth Employment Network, an initiative of the UN, cooperates with the World Bank and the International Labor Office. They proposed a series of recommendations in relation to youth employment to governments. Five principles were proposed to identify best practice initiatives using ICT to generate youth employment.

- Encouraging youth entrepreneurship to promote youth employment.
- Promoting public-private partnerships to create ICT-related employment.
• Encouraging young people of acquired ICT skills to assist local development agencies and operators to deliver services to those most in need.
• Using ICT to help bridge the gap between young people’s opportunities for self-employment in the informal economy and the high growth sectors of the world economy.
• Using ICT to generate employment for young people relates to the importance of their participation in the design and implementation of ICT-based initiatives. (Curtain, 2002).

According to the discussion above, it is clear that there is an extensive potential for ICTs to generate and promote employment for youth. However, promoting youth employment and employability requires important integrated effort that includes actions in the areas of ICT skills education, skills development, employment position supply and support for youth entrepreneurship, particularly in the knowledge intensive sectors. (Curtain, 2002) Therefore, it is essential to develop adequate connection between ICT education and training interventions with local employers in order to provide high quality ICT training and promote employment in ICT-related industry.

In 2001, the European Commission funded a two-year study to identify and develop a model and guidelines of good practice for interventions aimed at assisting disadvantaged people into employment using IT. The research identifies a model of a pathway approach to employment (O’Donnell, Ellen, Duggan, & Dunne, 2003).

The pathway approach defines and recognizes the full set of socio-economic barriers and restraints to youth employment. A series of relevant interventions and supports are put in place during the whole process of the training. It addresses the various needs of trainees and the employers which enables the trainees to make the transition from disadvantage to employment.

The pathway approach defines the five main interventions, including Contacting and motivating participants, Developing skills, Ensuring support for social and cultural needs, Providing employment and career guidance services and Developing employment progression measures.

• Contacting and motivating participants:
  Ensure that effective outreach mechanisms are in place. The target groups for instance, the youth living in resource poor communities, are facilitated in every possible way to be aware of and receptive to opportunities.

• Developing skills:
  Ensure the high quality of the training. It ensures that the skills that are taught to students are accredited and targeted at identified job opportunities. Vocational skills and soft skills such as literacy and communication are improved simultaneously with ICT skills.

• Ensuring support for social and cultural needs:
  Acknowledge and respect cultural and other forms of diversity. Ensure that all participants are empowered to become active citizens and increasing their capacity to participate in decision-making.

• Providing employment and career guidance services:
  Provide employment and career guidance services for training participants. Ensure that the information is delivered in a client-friendly and flexible manner. Quality information on local employment and education and training opportunities are provided. The training program should be able to support progression and career development.

• Developing employment progression measures:
Support training participants when they are seeking for a job in order to ensure the promotion of youth employment. Specific actions include regular assessment of progress, evaluation of learning outcomes, personal planning support.

(O’Donnell, Ellen, Duggan, & Dunne, 2003)

The pathway model provides good practice that combines good pedagogy with an understanding of the needs of disadvantaged students as well as guidelines for promoting employment through ICT training.

2.4 Research Framework

The main work of this thesis is to evaluate a training project which provides ICT training to youth in Kibera Slum in order to get insight understanding about how youth could be empowered through ICT training.

Evaluation is vital to organization which helps to assess the current or past performance of a project, to improve the project. Furthermore, the result of evaluation could point out the direction for future planning in order to fulfill the organizational objectives. The purpose of evaluation is to provide information and guidelines for decision-making, strategic planning, and the improvement of the project in the future. Project evaluation helps you understand the progress, effectiveness, the advantages and disadvantages of a project (Zarinpoush, 2006).

The major benefit of an evaluation process is that the program staff receives information that helps them modify the computer education program for the next stage of development. Computer education programs that are under development can undergo revision and modification as the staff discovers what aspects of the programs work best in a particular setting. With an evaluation process, the teachers and administrators can see the progress they are making as the computer education program is implemented (Billings, 1986).

2.4.1 Outcome Evaluation

There are different types of evaluation. Usually, evaluations are described as being formative or summative (Billings, 1986).

A summative evaluation typically yields final information about the result of the program. A summative report will document the program's implementation at the end of a trial period or evaluate a program's degree of success after it has been refined. A formative evaluation is typically designed to give the program planners and implementers an idea of how well their program is working. This can and should take place while the program or research project is underway and is concerned with evaluating how the intervention is meeting its performance goals.

Zarinpoush divides evaluations into four types: formative, process, summative, and outcome. The formative and summative evaluation is similar with the definition of Billings’. The outcome evaluation assesses the achievement of the project resulting from the completion of the project, including to what extent it has achieved its intended effects and what objectives are not achieved. It focuses on immediate, intermediate, or final outcomes.

In this thesis, the outcome evaluation was conducted to assess the outcome of the ICT training program. As introduced above, this thesis emphasizes on ICT empowerment from two points of view: individual empowerment and economic empowerment. The evaluation framework combines the core indicators of computer training outcomes which proposed by Daniel A. W, et al (Wagner, Day, James,

### 2.4.2 Evaluation Framework of this thesis

This thesis focuses on the empowerment for youth through ICT training from two perspectives, individual empowerment and economic empowerment.

The evaluation framework combines the core indicators of computer training outcomes which proposed by Daniel A. W, et al (Wagner, Day, James, Kozma, Miller, & Unwin, 2005) and the pathway model which proposed by O’Donnell, et al (O’Donnell, Ellen, Duggan, & Dunne, 2003). The core indicators of computer training outcomes include: student attitudes, student skills and long-term outcomes. The pathway model defines five main interventions, including contacting and motivating participants, developing skills, ensuring support for social and cultural needs, providing employment and career guidance services, and developing employment progression measures.

As illustrated above, the outcomes of the program are divided into two categories, individual empowerment and economic empowerment. Both of the core indicators framework and the pathway model introduced above could be used to evaluate the individual empowerment and economic empowerment. However, the outcome indicators emphasize on the individual empowerment and the pathway model emphasizes on economic empowerment. Therefore, this thesis mainly follows the evaluation framework of the pathway model. The individual empowerment is evaluated following the

![](evaluation_framework.png)

*Figure2. 1 Evaluation Framework*
first two interventions of pathway model which are “Contacting and Motivating participants” and “Developing Skills” combined with the outcome indicators of student attitude and skills obtained. The economic empowerment is evaluated following the next three interventions of pathway model which are “Ensuring support for social and cultural needs”, “Providing employment and career guidance services” and “Developing employment progression measures” combined with “Long-term outcomes” of the core indicators framework.
Chapter 3 Method

3.1 Choice of Method—Case Study

This thesis intends to understand how ICT training could empower youth in resource poor community in Kenya. In order to get richness of experiences and undertake an in-depth investigation, single case study method was followed.

According to Yin, a case study is a story about individuals, organizations, processes, programs, institutions, and even events. Those stories or those cases are something unique, special, or interesting. The case study provides deep understanding of the case by capturing the detailed information of the case. It is useful to assess the success and challenge of a project. (Yin, 2003)

Case studies are appropriate when there is a unique or interesting story to be told. The method of case study is often conducted to answer questions such as what happened in the program and why it happened. There is no universally acceptable number of cases and a case study research could be based on a single case or many cases (Yin, 2003). This is because the validity of the case study has more to do with the “plausibility and cogency of the logical reasoning” (Walsham, 1993) and less with the number of cases. In order to increase the validity of case studies, De Vaus suggest researchers should select cases strategically rather than simply raise the number of cases (De Vaus, 2001). Therefore, a single case study approach is conducted in this thesis.

Compared with other methods, case studies could provide much more detailed information. In conducting case studies, multiple methods including qualitative method and quantitative method could be applied in order to provide the complete story. (Neale, Thapa, & Boyce, 2006). There are also a few limitations of case study. Firstly, case studies lack rigor. In many cases, case study researchers have not been systematic in their data collection. The qualitative method such as interviews and observations may be subjective and there is also a bias between the real opinion of research participants and the understanding of the researcher. Furthermore, a common complaint about case studies is that it is difficult to generalize from one case to another. The limited number of selected cases may not typical and representative, therefore, the conclusions that are drawn from one case may not apply to other cases. Due to these reasons, when conducting case studies, the over generalization of conclusions should also be avoided. (Neale, Thapa, & Boyce, 2006).

3.2 Case of the Project

In this thesis, the case of the project is Craft Silicon Computer Training Bus in Nairobi, Kenya.

According to Neale, cases might be selected because they are highly effective, not effective, representative, typical, or of special interest (Neale, Thapa, & Boyce, 2006). The thesis focuses on the ICT empowerment for youth in resource poor communities in Kenya. Moreover, the thesis mainly research on empowerment from two perspectives: individual empowerment and economic empowerment. The Craft Silicon Computer Training Bus project is selected for several reasons:

First of all, it is an ICT training program mainly for youth living in several slums in Nairobi, the capital of Kenya. Secondly, this project not only focuses on ICT skills provision, but also emphasizes on employment promotion. Thirdly, compared with traditional training program, this computer
training bus proposes a new business model which could overcome some difficulties that traditional training programs may encounter. Finally, this project has been running for 2 years and has a pretty good outcome. Evaluating this project will help it to improve and also provide practice guidelines for other training program.

The information of the Craft Silicon Computer Training Bus is introduced in Chapter 4.

3.3 Data Collection Method

Case studies typically rely on multiple sources of information and methods to provide as complete a picture as possible. Research may be categorized into two distinct types: qualitative and quantitative. The former concentrates on words and observations to express reality and attempts to describe people in natural situations. In contrast, the quantitative approach grows out of a strong academic tradition that places considerable trust in numbers that represent opinions or concepts (Amaratunga, Baldry, Sarshar, & Newton, 2002).

There is a strong suggestion within the research community that research, both quantitative and qualitative, is best thought of as complementary and should therefore be mixed in research of many kinds (Das, 1983). Therefore, in this thesis, both qualitative research method and quantitative research method are applied. All the data was collected during the field study in Nairobi, Kenya in February 2012.

3.3.1 Qualitative Research

- Observation:
  Participant observation is appropriate for collecting data on naturally occurring behaviors in their usual contexts (Mack, Woodsong, M.Macqeen, Guest, & Namey, 2005).

  During the field research in Kenya, the author:
  
  Participated in the computer training provided by Craft Silicon Computer Training Bus Project;
  Discussed with students and helped them to solve problems they had during the training;
  Visited the advance training center in Craft Silicon Campus and attended the courses there.

- Group Discussion
  Focus groups are effective in eliciting data on the cultural norms of a group and in generating broad overviews of issues of concern to the cultural groups or subgroups represented (Mack, Woodsong, M.Macqeen, Guest, & Namey, 2005).

  The author organized group discussion with 4 students discussing the questions on the questionnaire that was sent to them.

- Interview
  In-depth interviews are optimal for collecting data on individuals’ personal histories, perspectives, and experiences, particularly when sensitive topics are being explored (Mack, Woodsong, M.Macqeen, Guest, & Namey, 2005).

  The interviews are all face-to-face interview and were conducted in English. The interviews are:
Informal interview with Sr Mary Geason, the Director of Mukuru Promotion Center. The interview mainly focuses on the problems they met when providing computer training and the reason of close down.

Formal interview with Monica, the personnel of Global Relations. The interview is recorded. The interview is about the problems they met when providing computer training and the reason of close down.

Formal interview with the teacher of Craft Silicon Computer Training Bus Project. The interview is recorded. It emphasizes on the business model and pedagogy of the training and the suggestions to improve it. See interview questions in Appendix B.

Informal interview and E-mail interview with Alex Chege, the Project Manager of Craft Silicon Computer Training Bus Project. The interview is about the information of trainees, business model of the project and the outcome the project. See interview questions in Appendix C.

The interview questions of the interview to training teacher and project manager are designed following the guideline of pathway model which is introduced in Chapter 2.

3.3.2 Quantitative Research

The quantitative method used in this thesis is questionnaire. Questionnaires were sent to trainees of the Craft Silicon Computer Training Bus Project. All participants are students in Kibera slum.

The questions are designed following the core outcome indicators which are introduced in Chapter 2. The questions are divided into three categories, including basic information of the trainees, attitude towards the training, skills learnt during the training, suggestions to the training. There are 18 questions in the questionnaire in total, and all of them are open-ended questions.

In the quantitative research, 46 questionnaires were sent on the course and all of the 46 participants returned the questionnaires.

3.4 Data Analysis Method

These are steps in data analysis:

- Firstly, analyzing quantitative data using statistic method.
- Secondly, dividing the quantitative and qualitative data into five categories following the guideline of pathway model which is introduced in Chapter 2.
- Thirdly, evaluating the outcomes of the project following the evaluation framework proposed in section 2.4.2.

3.5 Validity and Reliability

Joppe states that validity determines “whether the research truly measures that which it was intended to measure or how truthful the research results are”. The concept of reliability indicates that the experiment, test, or any measuring procedure should be repeatable. Joppe defines reliability as the extent to which a study yields the same result on repeated trials. Lincoln and Guba states that: “Since
there can be no validity without reliability, a demonstration of the former validity is sufficient to establish the latter reliability. (Golafshani, 2003)

To insure the validity and reliability of the thesis, the questions in questionnaires that sent to training participants are quite simple to ensure everyone understands the questions. When answering the questions, the participants could ask any questions regarding the questionnaire to avoid misunderstanding. To increase the validity of the research, the participants were suggested to give brief explanations to their answers instead of a simple yes or no answer.

In the qualitative research, the interviewers are the project manager and the trainer. They know the project well. The interview questions were sent to them before the interviews and during the interviews, more relevant questions were asked to avoid misunderstanding and get deeper insight about the project. The interview questions to project manager and trainer are similar, and their answers could confirm the others’. Most of the interview questions are about the objective fact of the project in order to reduce the bias in interpreting the interviewees’ answers.

### 3.6 Ethical Issues

Ethics could be defined as the “method, procedure, or perspective for deciding how to act and for analyzing complex problems and issues”. (Resnik) There are several important requirements for ethical protections including the principle of voluntary participation, the requirement of informed consent, confidentiality. (Ethics in Research)

First of all, the participants of the research are voluntary. The relevant information about the research including the aim and the procedures were fully introduced to all participants before the data collection procedure. All participants are agreed to participate. The project manager is also free to drop out at any time in subsequent phases of the study.

Secondly, all participants are informed that the result of the research is only for the master thesis. The official data which is provided by project manager is not confidential but it is authorized only for research uses.

Thirdly, the research result will be provided to the Craft Silicon Foundation. To protect the privacy of training participants, the identifying information will not be published to anyone else. Only analyzed data will be provided to the Craft Silicon Foundation.
Chapter 4 Results

This chapter introduces the empirical data collected during the research, including qualitative and quantitative data.

4.1 Introduction of Craft Silicon Computer Training Bus

The method of this thesis is single case study and the case target is Craft Silicon Computer Training Bus project.

The Craft Silicon Computer Training Bus project is a project of Craft Silicon Foundation. The Craft Silicon Foundation is a registered Kenyan Based Non Profit making Organization and is set up by Craft Silicon limited as a corporate social responsibility project (Craft Silicon Foundation). Craft Silicon is a global software company, delivering enterprise level software to serve the financial vertical across the globe. The head office is located in Nairobi, Kenya and there are two other offices in India and the U.S.A. Craft silicon with its rich domain in banking and a workforce enriched with computer knowledge has embarked on reaching out to society through Craft Silicon Foundation Program.

Craft Silicon Foundation was founded with the main objective of promoting universal computer literacy across low income communities and groups mainly from slum areas, to enable them use computer knowledge to seize opportunities that will make them self reliant and promote development in such areas. The foundation provides free training in Information Technology to the needy members of the community, working people and school children through its mobile computer bus. This is part of a campaign for promoting literacy, scientific, cultural and social improvement of all classes of the society as a means of promoting development, peace and harmony.

4.2 Business Model

4.2.1 Objectives of the Project

The project manager Alex introduced the mission, vision and objectives of the project during the interview.

- The vision of the project
  To achieve universal computer literacy across all sectors of the society by bridging digital divide among local communities.

- The mission of the project
  Empower communities through information technology by creating opportunities and working towards a more computer literate society.

- The objectives of the project
  The broad objective is to develop manpower resource that will utilize the growth and expansion in the ICT sector and especially the arrival of high speed internet through fiber Optic cable. Specifically, the idea of the project came as a result of the need to achieve the following:
To provide free and high quality of computer training to bridge digital divide in Slums and Marginalized Communities.

To use innovative methodologies and techniques in enhancing the livelihoods of communities and empowering the youths.

To use a Mobility Concept (Bus) in order to reach more people in wild and remote areas.

To open up marginalized areas and communities through technology.

4.2.2 Business Strategy

Craft Silicon Foundation is a Non Profit making Organization. The main strategy for the computer training bus project is to provide free computer trainings to youth living in slums. According to Alex, “Students in slums are quite poor and they cannot afford the high expense of attending computer training. Therefore, we decided to provide free training for them. Every student who is interested in computer has the equal opportunity to participate.”

The mobility concept is a new idea compared with the traditional training centers. The Craft Silicon Computer Training Bus project provides computer training on their special bus which has special computer tables firmly fitted inside. The bus goes to different slums in Nairobi to provide computer training. Target areas include Kibera, Mathare, Kangemi, Kawangware and Mukuru Slums.

4.2.3 Infrastructure

- Computers inside the bus

![Computer inside the bus](image)

Computers are firmly fitted to withstand the shock of a moving bus. There are 18 computers on the bus. The computers are equipped with Intel Pentium Dual-Core CPU E5800 (2M Cache, 3.2 Ghz Clock Speed, 800MHz FSB Speed). The RAM of the computers is 2GB and the hard disc capacity is 300 GB. The Operation System of the computers is Microsoft Windows XP Professional, Version 2002, Service Pack 3.

According to the training teacher, “High resolution LCD monitors with N-computing modules guarantees advanced and efficient deployment of it resources that consume less power but as well deliver quality performance in respect to training and internet access.”

- Solar power system
The computers and other accessories are powered by solar. Four solar panels generate enough power which is stored in batteries inside the bus. The stored power is converted from direct current to alternating current through a special converter. The converted power is able to power the facility for more than 8 hours into the night. The concept of solar installation falls under craft silicon foundation policy of pursuing green sources of energy and reducing carbon emission into the atmosphere.

According to the project manager, “The shortage of electricity is the main difficulty to provide computer training in slums. Therefore we applied solar power system on our training bus.” He also explained the pros and cons of solar power system.

The advantages of solar system include: Cheap and environmental friendly, Reliable in remote parts of the country, Ideal for Kenya weather condition, Cheap to maintain. The disadvantages of solar system include: High cost of installation, Affected by cloudy weather.

- White board
There is a white board in front of the bus that facilitates graphical illustrations during training.

### 4.2.4 Training Pedagogy

- Duration of the training
The course runs for duration of two months. The training is provided two days every week, and every session lasts for 2 hours.

- Training content
The main content of this computer training is about the operation of Window XP Operation System and the basic skills of software package Microsoft Office 2007 including MS Word, MS Power Point, MS Excel and MS Access. The training content is designed by Microsoft.

Training content of MS Word includes: Introduction to MS Word 2007, Create a document in Word, Editing documents in Word, Character formatting, Paragraph options, Create and use tables, Work with graphics, etc.

Training content of MS Power Point includes: Introduction to MS Power Point 2007, Building a template from scratch, Create a presentation, Insert new slides, Insert pictures and graphics, Insert and edit SmartArt, Object linking and embedding, etc.

Training content of MS Excel includes: Introduction to MS Excel 2007, Enter and edit data, Calculations, Multiple worksheets, Basic formatting, Basic formulas, Create and edit charts, etc.
Training content of MS Access includes: Introduction to MS Access 2007 objects, Designing a database, Building tables, Modifying tables, Creating relationships, Query basics, Finding specific data using queries, Creating calculations inside queries, etc.

- **Teaching method**
  Due to the shortage of computers on the bus, two students share a computer and work in peers. The training emphasizes on practice instead of theory. The teacher introduces knowledge first and then assign practice task for students. Students work in peers and could discuss with others to solve the questions. Finally, the teacher will explain the correct solutions and answer students’ questions.

  According to the teacher, “Most of students don’t have a computer at home, so they don’t have enough time to practice. During the course, I will give them more time to practice and solve the problem by themselves.”

- **The training teachers**
  The computer Bus has 3 qualified trainers who are employed by the Craft Silicon Foundation. The foundation also has relationship with different NGOs to accommodate volunteers and interns.

- **Advanced training**
  After the first stage training on the computer training bus, top students are selected to receive advanced training in Craft Silicon Campus.

  Craft Silicon Campus is a training center located near the office of Craft Silicon Limited. Specialized and advanced ICT skills are training in the training center, including design and edit of digital media, web design, programming etc.

- **Examination and Certificate**
  In the first stage of training in the bus, there is a final examination for the whole course. The examination includes two parts, theory part and practice part. The theory part contains several short answer questions and the practice part is designed to examine the skills of software operation and problem solving. The examination is designed by Microsoft. Students who pass the examination could get a certificate issued by Craft Silicon Foundation. According to the statistic data, 85% of the students passed the exams and got certificates. At the moment, there is no other chance given to those who failed the examination.

  There is also a final examination for the second stage of training in the training campus. The examination is designed by Craft Silicon Foundation. Students who pass the examination could get another advanced certificate issued by Craft Silicon Foundation.

### 4.3 Information of Trainees

The basic statistics data of trainees is provided by the project manager.

- **Total number of graduates**

<table>
<thead>
<tr>
<th>Total number of graduates</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>5500</td>
<td>3806</td>
<td>1694</td>
</tr>
</tbody>
</table>

*Table 4.1 Total number of graduations*
Table 4.1 and Figure 4.3 depict the total number of graduated trainees. The total amount of graduates is 5500 among which 69% (3806) is male and 31% (1694) is female. It is obvious that male trainees are almost twice than female trainees.

The project manager pointed out that girls do have equal opportunities to participate in the training. There are several possible reasons that why male trainees are much more than female trainees. Firstly, maybe there are fewer girls than boys in Kibera Slum. Secondly, girls may be not interested in computer training. Thirdly, there may be some culture issues related to gender equality.

This thesis does not talk about gender issue, since the Craft Silicon computer bus project is pretty young. In the beginning phase, it is more significant for the training provider to enhance training quality and promote more employment opportunities for youth in the slums. Nevertheless, the gender equality is also an important issue in the research area of ICT empowerment. The gender issue is proposed as a suggestion for future studies.

- **Current Student**

<table>
<thead>
<tr>
<th>Number of Current Students</th>
<th>Number of Students per Class</th>
<th>Number of Sessions per day</th>
<th>Total number of Classes</th>
<th>Age of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>36</td>
<td>4</td>
<td>18</td>
<td>18-23</td>
</tr>
</tbody>
</table>

Table 4.2 Current Students

The number of applicants of the training exceeds the available places by far. Therefore, the project selects applicants according to the following criteria:

Factors that influence include poverty levels – bright youths from humble background;

Academic Levels – Youths who graduated from high school

Social Challenges – Special groups

### 4.4 Information of the Research Participants

There are 46 students of computer training bus in Kibera Slum that participated in the research. The statistic information is illustrated below including the number, age, education level of participants, where did they get to know the training project, if they have their own computer or laptop and if they have participated in other ICT training before.
Table 4.3 Number of participants

<table>
<thead>
<tr>
<th>Number of participants</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>23</td>
<td>23</td>
</tr>
</tbody>
</table>

Figure 4.4 Number of participants

Table 4.3 and Figure 4.4 present the number of trainees that answered the questionnaires. The questionnaires were sent to all students in Kibera without any selection. Totally 46 feedbacks were received and half of them are given by females and the other half are given by males. Actually, it is a coincident that the number of female participants is the same with the number of male. Nevertheless, it helps to avoid the bias of gender issues. As states above, the equity between men and women is a vital issue. However this project emphasizes on ICT empowerment for youth no matter they are boys or girls.

Table 4.4 Age of participants

<table>
<thead>
<tr>
<th>Age</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>19</td>
<td>16</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>21</td>
<td>3</td>
</tr>
<tr>
<td>22</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>2</td>
</tr>
<tr>
<td>25</td>
<td>1</td>
</tr>
<tr>
<td>26</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 4.5 Age of participants

As shown in Table 4.4 and Figure 4.5, most of the participants are between 17-21 years old.
- **Education level**

<table>
<thead>
<tr>
<th>Education level</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>College</td>
<td>3</td>
</tr>
<tr>
<td>High school</td>
<td>36</td>
</tr>
<tr>
<td>Secondary school</td>
<td>7</td>
</tr>
</tbody>
</table>

*Table 4.5 Age of participants*

As illustrated in Table 4.5 and Figure 4.6, most of trainees (78%) are high school students and 15% of them are studying in secondary school. All of the students are living in or near the Kibera slum and they are studying in the schools nearby. According to the project manager and training teacher, one of the basic requirements to participate in the computer training bus project is that the youth should at least studying in a secondary school. It because that in order to understand the computer technology basic English and mathematic skills are necessary. That knowledge is taught in secondary school.

- **Resource of knowing the training project**

<table>
<thead>
<tr>
<th>Resource of knowing the training project</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hear from Friends</td>
<td>18</td>
</tr>
<tr>
<td>Hear from graduated trainee</td>
<td>8</td>
</tr>
<tr>
<td>Hear from Parents</td>
<td>7</td>
</tr>
<tr>
<td>Hear in School</td>
<td>4</td>
</tr>
<tr>
<td>Come across</td>
<td>6</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
</tr>
</tbody>
</table>

*Table 4.6 Resource of knowing the training project*
Trainees heard about the computer training through different ways. 18 students hear from their friends and 8 students learned from the previous trainees that participated the training before. The Craft Silicon computer training project cooperates with local organizations like schools, churches, local NGOs to promote the computer training project. Therefore, many trainees got to know this project from other sources.

- **Computer possession**

<table>
<thead>
<tr>
<th>Own a Computer or Laptop</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>43</td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
</tr>
</tbody>
</table>

As discussed in the former section, people living Kibera slum are suffering severe poverty and they do not afford to buy a computer. The data in Table 4.7 confirms this information. Among the 46 research participants, only three of them own a laptop or a computer.

Since most of the youth do not have a computer, they do not have enough opportunity to practice what they have learned during the training. Many students mentioned that sometimes they practice in cyber cafés or some churches. However, most of times they do not practice after the training, so they really value the practicing time on the course and seize every possible chance to practice.
• Experience of other ICT training before

<table>
<thead>
<tr>
<th>Previous training experience</th>
<th>Yes</th>
<th>Non</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>3</td>
<td>43</td>
</tr>
</tbody>
</table>

Table 4. 8 Experience of other training

![Experience of other ICT training](image)

Figure 4. 9 Experience of other training

4.5 Individual Empowerment

The indicators to assess the individual empowerment are set according to core outcome indicators proposed by Daniel A. W, et al including student attitude and skills obtained (Wagner, Day, James, Kozma, Miller, & Unwin, 2005).

4.5.1 Student attitude

• Reasons for participating in the ICT training

The NO.4 question of the questionnaire is “Why are you interested in computer training?” It is an open-ended question. Students gave different answers to this question; however, many of them shared the similar opinions. Most of them agreed that we are living in a technology age, one should learn new technologies in order to catch up the pace of the world. Around 29 students mentioned that “I will get a good job with ICT skills”. Many students relate computer skills with their future career. For instance, one student wrote “I am interested in computer training because I want to be an accountant in the future.” 15 students mentioned the concept of “computer literacy”. For instance, one student answered “to be computer literate is so important today, since almost everything is computerized.” Among them, 3 students also mentioned the “Kenya vision 2030”.

The question NO.5 is “Why did you choose this training program?” 33 students pointed out because it is free of charge. 10 Students wrote that it is near home. Furthermore, during the group discuses, some students mentioned that “I had no computer skills before attended this course. This course teaches me basic knowledge of software and it is quite useful.”

• Attitude toward the teacher

Question NO.11 is “Are you satisfied with the teacher?” All of the students are satisfied with the teacher. Students appraised the teacher as clever, easy going, experienced and skilled. Some students
said, “he explains clearly and easily to understand.” Other student also mentioned that, “he encourages us to solve problem ourselves.”

- Attitude toward the training content

The NO.9 question is “Is the course difficult for you? E.g. which software is difficult for you”. Most of students (32) answered “No”. Some students thought Excel is a little bit difficult, since it require mathematik knowledge. However, students who think it is difficult also mentioned that they will study hard and practice more to overcome the difficulties. During the group discussion, one student said, “sometimes the course is difficult, but we could discuss with others and if no one understand it, the teacher will explain again.”

- Attitude toward the training

Since the training is free of charge now, the question NO.16 asks “will you still participate in the training, if the training is charged?” Only 2 students answered “No”. However, most of the students added that they will attend the training only because the tuition fee is affordable.

Question NO.15 ask students if they will recommend other friends to join in the training. All students said they would like to recommend this project to friends. They have several reasons such as “everyone should learn ICT skills”, “I was also recommended by my friend who is graduated from this course”, “The course is interesting and I really learned a lot, so I want to tell my friend to come here too.” etc.

4.5.2 Skills gained from the training

- Computer skills

Question 8 asks the software that they have learn during the course. All students mentioned Ms Office. 11 students also mentioned Operation System.

Question 12 is “Do you feel you have more computer skills now than at the beginning of the course?” All students answered “Yes”. Some students explained that because they knew almost nothing about computer before the training, but now they could operate the computer and use some softwares as well.

Question NO.10 is “What skills do you think you should have been taught but was not during your training?” 13 students answered “Internet searching”. 4 students mentioned “web design”. 2 students think “video editing” is important. Furthermore, one student also mentioned “information security”.

Question 17 is related to the advanced training. Students are asked “Would you like to take an advanced course after this training program?” Two students answered “No”. Many students noted the subject they want to learn in advanced level. The author listed several options, such as web design, programming, and information security. 24 students chose web design while 18 students chose programming. There are also 6 students interested in information security. Furthermore, some students added other subjects that they want to learn, including system design, media design and accounting.
The advanced skills that participants interested in

Figure 4. 10 The advanced skills that participants interested in

Figure 4.10 presents the computer skills that participants are interested to learn in they could continue to study in the advanced stage. The top 3 skills that interest students are web design, programming and information security. In the group discussion, students were asked “what do you think a web designer/ programmer/ information security person does?” However, students just heard those job positions frequently. They are not clear about what are they and what skills are required.

- Other skills

Question NO.13 is “What other skills have been improved during the training?” 25 students mentioned their communication skill is improved during the training since they always discuss with other students during the course. 21 students think the group working skill is improved because they work in peers to solve problems. 13 students mentioned that the mathematic skill is also improved especially when study Ms Excel. Furthermore, 8 students believe that their English skill is improved, since “the software are in English, I learnt a lot new words during the study”.

Figure 4. 11 Other skills improved during the training
4.6 Economic Empowerment

4.6.1 Employment promotion for graduated trainees

The project manager of Craft Silicon Computer Training Bus project provided statistic data of the employment status of the graduated trainees.

The skills and certificate has enabled 26 % of those who passed and got certificates secure employment and 12 % created employment through start up Macro businesses.

The Craft Silicon Foundation doesn’t keep track of all graduated trainees; therefore they don’t have more detailed information about the employment prompted by the training program.

4.6.2 Attitude of the research participants

The question NO.14 in the questionnaire is “Do you think computer skills will help you to find a good job?”

All of the students believe that computer skills will help them in future career. However, some students explained that “it is difficult to find a job in Kenya now. But at least you have more chance to get a job if you know how to use computers.”

Students noted the jobs that they want to do after the training. Many girls wrote that they want to be a secretary in company. Around 6 students want to be an accountant and they know MS Excel is important and useful for them. There are several other students want to be a doctor or nurse in the future. Furthermore, 2 students want to be a computer specialist such as programmer and computer teacher.

4.6.3 Attitude of the training teacher and project manager

Both of the training teacher and project manager agree that it is difficult for youth to find a job in Kenya. The project manager said, “We don’t have so much work positions for youth people, especially those who have few skills. Even a student is equipped with basic computer skills; it could not guarantee a good job.”

However, they all affirm the positive impact of ICT in employment promotion. The teacher said, “the advanced training in the training campus equipped students with specialized computer skills, which would help them to find a job in ICT related company.” The project manager added that, “we do not teach computer skills to students, we also encourage them to set up their own business. For example, some students may start a cyber café or open an online store.”
Chapter 5 Analysis

The Craft Silicon Computer Training Bus project proposes a new and creative business model. It provides free computer training to youth living in different slums in Nairobi, Kenya. Youth get empowered by participating in the training regarding two perspectives, individual empowerment and economic empowerment. This chapter evaluates the empirical data collected in case study.

Firstly, section 5.1 analyzed the advantages and disadvantages of the project’s business model.

Then section 5.2-5.6 analyzed the outcome of the project following the guidelines of pathway model. The pathway model is a model and guidelines of good practice for interventions aimed at assisting disadvantaged people into employment using IT. The pathway model is introduced in chapter 2. The pathway approach encompasses the following five main interventions:

- Contacting and motivating students;
- Developing skills;
- Ensuring support for social and cultural needs;
- Providing employment and career guidance services;

5.1 Evaluation of the Business Model

Traditional IT training project encounter many challenges and difficulties when providing IT trainings in developing countries, especially in extremely resource poor communities. There are a large amount of organizations providing IT trainings in resource poor communities in Nairobi, many of them failed only after one or two years due to different reasons. In this thesis, Sr Mary Geason, the Director of Mukuru Promotion Center and Monica, the personnel of Global Relations were interviewed. The Mukuru Promotion Center and Global Relations were providing IT trainings to people living in slums, but both of them were closed. In the interview they talked about the challenges and difficulties they met during their training project. Those difficulties include the following:

- The lack of electric power
  The shortage of electric power is common problem in Nairobi, not only in the slums. During my one month living in Nairobi, the electric power cut almost every day and lasted at least 2 hours each time. When I visit the Global Relations they are suffering from the power cut. Monica told me the power cut had lasted for 2 days. The unstable electricity supply is the main problem in the training, since computer need electricity. Some big organization may have own generator in case of power cut. However, for most of the small organizations, generators are not affordable.

- The difficulty to reach remote area
  Traditional training centers provide training in classrooms. Due to the poor condition in slum, most of the training centers are not in the slum area. Therefore, youth living in the slums do not have equal opportunity to participate in the training. For instance, if they have to take a bus to the training center, many youth may give up the chance since they cannot afford the travel expense.

- The lack of sponsorship or funding
  Many training centers are operated by NGOs, which rely on the sponsorship or funding by other organizations or individuals. It is quite costly to operate a IT training center including the rent of the classroom, the salary of training teachers, the expense of computers and software. A lot of training
centers are closed due to the lack of funding. The Mukuru Promotion Center is a big organization; it closed the whole training center in 2012 due to the lack of funding. The Global Relations has a similar story.

That causes another problem. Since the training will be stopped as soon as the money is used up, many students have not graduated at that time. It is a waste of time and other resource. What’s worse, since there are many small training centers and some of them may just existed in a short period, definitely, the employer will not value the certificate offered by those small training centers. As a consequence, students may think IT training is meaningless since it could not help them to find a job.

- The dilemma of charging training fee

To overcome the problem that the project will not get sustainable financial support, many training center try to charge a certain amount of training fee. In the questionnaire, participants are asked “if the training is not free, will you still participate in it?” Most students answered “yes”. However, during the interview with the two closed projects, both of them pointed that students left when they decided to charge a small amount of money. “Many people cannot afford that small amount. And the rest are just not willing to participate in any training that is charged” said by Monica.

Many training center encounter the dilemma of charging. On the on hand, the tuition fee could guarantee the sustainability of the training. If the training is free, many students do not take it seriously. They are absent in many course and they give up easily. On the other hand, if it is charged, many students do not have equal opportunity to learn. It does not help to bridge the digital gap.

The Craft Silicon Computer Bus project proposed a new and creative business model. It could overcome some challenges that traditional training centers are facing.

- The lack of electric power

The computers on the bus are powered by solar power system. It overcomes the shortage of electricity power, which is the main challenge encountered by most of training centers in resource poor communities.

The advantages of solar system include: Cheap and environmental friendly, Reliable in remote parts of the country, Ideal for Kenya weather condition, Cheap to maintain. However, there are some disadvantages of solar power system. The disadvantages of solar system include: High cost of installation, Affected by cloudy weather.

- The difficulty to reach remote area

The mobility of the bus enables it to provide trainings in remote and resource poor communities, such as the slums. It offers youth in those communities with opportunities to access to ICT and to obtain ICT skills. Due to the short distance between the training location and the community, the money for local transportation is saved. Moreover, the bus goes to different slums to provide trainings, which provides more opportunities for learning compared with traditional training centers.

- The lack of sponsorship or funding

The project is financed by Craft Silicon Limited. It guaranteed the sustainability of the training project. The mobility concept and the solar power system helped to reduce lots of cost. Therefore, the training is free of charge for trainees. It offers equal opportunities for disadvantage youth in resource poor communities.

On the other hand, there are also some risks regarding the business model.
Firstly, due to the poor road condition, in the rainy season, it may be difficult for the bus to go to the slums. Secondly, the space in the bus is quite limited and only 18 computers are equipped in the bus. It is a challenge for the project to improve the bus and provide more places.

5.2 Contacting and Motivating Trainees

This intervention ensures that effective outreach mechanisms are in place and that the target groups are facilitated in every possible way to be aware of and receptive to opportunities.

5.2.1 Reaching out to target groups

In general, outreach strategies involved direct contact with potential participants or with other agencies that have such contact.

What have been done by Craft Silicon Computer Training Bus project:

- The Craft Silicon Foundation has relationship with local communities like NGOs, churches and disseminates the information of the training project within their networks. If people are interested in the training project, they could get information from the local communities or make a phone call to Craft Silicon Foundation directly.
- Advertising through local media, poster and door to door introducing activities.
- The computer training bus is colorful and stands out on the street which is an efficient advertisement for the project. The bus just stops by the roadside of the main road in the slum area. Many trainees got to know this training bus project when they walked by. What’s more, the bus is easily found.
- The computer training bus provides free Internet access to slum communities. Every community member is given an opportunity of accessing internet for certain duration of time. Although the training is mainly target on youth, everyone living in the slum could benefit from this Internet service. It is convenient for people who need Internet. Moreover, it also provides opportunities for people living in slums to access to the rich information provided on Internet and get connected with the world outside the slums.
- Everyone who is interested in the computer training is welcome to ask any questions to the training teacher. The teacher answers questions carefully and patiently. Students who are interested in the training could lesson to one course before they decide to participate in the training.

Other successful strategies are suggested:

- When answering peoples questions about the training, language should be kept simple. When the teacher is trying to explain the course content and other information about the training, it should be kept in mind that the students may know nothing about computer. Therefore, the teacher should use simple words to describe the course, especially, IT jargon should be avoided. Furthermore, the training teacher should try to stimulate students’ interest in learning computer technology.
- Graduated trainees should also be involved in promoting the project. Graduated students particularly those who had achieved careers in IT should be involved in promoting the project. They are the role models for the potential trainees. Firstly, they could provide suggestions and share experience to the current students that how to improve the computer skills. Secondly, graduated trainees that found a good job in IT related industry could share
information to others about what skills are necessary in order to find a job and also share information about IT companies and IT industry.

- Holding open days in a local community centre that includes an IT taster session and focuses on the benefits of IT.

The vision of the Craft Silicon Computer Training Bus project is to achieve universal computer literacy across all sectors of the society by bridging digital divide among local communities. Indubitable, providing computer training to people living in slums is essential and vital to fill in the digital gap, attentions should also be paid to spread and promote the importance and benefit of information technology in our daily life. With the open day session, more and more people will realize that information technology is very important in modern society, basic IT skill is compulsory in most of the industries. And also, they will realize that they could be empowered by information and technology. As a consequence, more and more people will be interested in information technology, which contributes to the reduction of the digital gap.

5.2.2 Motivating participants

For the Craft Silicon Computer Training Bus project, empirical data indicates that most of participants are aware of the importance of learning ICT skills. They are interested in and motivated to participate in the training. As the outcomes of the training, participants have gained computer self-efficacy. Furthermore, they are willing to share and recommend others to join in the training. The reasons why they will recommend others are similar with the reason why they join in the training. Trainees that are motivated during the training could also motivate other potential trainees.

Almost all trainees believed that the IT skills gained during the training could help them to get a good job. However, the employment data indicates that only half of the graduates have found a job. There are two main reasons. First, due to the economic situation in Kenya, there are not enough job positions for youth; same situation in IT related industries. Second, this is a basic training project. After the training, trainees are equipped with basic IT skill which is enough for some simple work. If students want to apply some professional position such as software developer, web designer, an advanced training is needed. For this project, it is important to tell students that finding a job is vital but it is not the only reason to learn IT skills. This training could not guarantee a good job; however, people who have IT skills are more competitive than those who know nothing about computer. Moreover, the project could also motivate youth who have graduated from the training try to start a business by themselves.

5.2.3 Selecting participants

The pathway model points out that selection processes have to balance between ensuring that the right individuals for the IT intervention were recruited, and on the other hand, that the most disadvantaged individuals had a chance to be selected for the intervention.

In this case study, since the number of applicants exceeds the available places, the selection process is applied. The basic criterion for application is the educational level. Applicants who are studying in high school or above level are considered have the potential ability to understand the training content. This is because the use and operate of the computer software package require fundamental English and mathematic knowledge.

The selection process in this case also takes poverty level into consideration. It ensures that special group of youth have equal opportunities to learn computer skills.
5.3 Developing Skills

This intervention ensures quality training, ideally accredited, imparting relevant skills, and as far as possible, targeted at identified job opportunities. Vocational skills are accompanied by developing skills in areas such as literacy and communication.

5.3.1 Mix of soft and technology skills

Within a pathway approach in an information society context, three kinds of skills need to be developed: ICT skills, soft skills, and practical skills for employment.

- Developing ICT skills
  
  A core challenge for developing ICT skills is ensuring that the skills needs of the participants are balanced with the needs of local employers. On the one hand, skills courses need to be developed with the particular needs of the target group in mind. On the other hand, local employers often have specific needs for ICT skills and participants without these skills will not be confident that they will be able to find a job when the project ends.

  In this case, there are two stages of training. For the first stage training that most students are participated in, operating Windows XP Operation System and MS Office 2007 are the main content. MS Office is the basic software package that is used in every computerized companies. It is the essential skills for every IT related employee, especially for students who are willing to work as secretary and accountant. Therefore, students who have gained this skill are able to meet the ICT skill requirement of local employers. For the operation system, even though Windows 7 is widely using in companies today and Windows XP is quite different from Windows 7, people who have basic computer skills could adapt to the new generation of software quickly and easily.

  However, both of the students and training teacher agreed that other computer skills should be involved in the first stage training, especially the searching of Internet. Searching of Internet is considered as the basic ICT skills today. The Internet could enable youth to search useful information, communicate with others and learn by themselves. Therefore, searching Internet is recommended to be involved into this training program.

- Developing soft and practical skills
  
  Students need to be made aware of employers’ needs in relation to soft skills and practical skills and that these skills are just as necessary as IT skills to ensure sustainable employment in the information society.

  As the outcomes of the training, not only ICT skills but also other soft skills are improved.

  According to the empirical data, trainees perceive that their communication skills, teamwork and English skills, etc. are improved during the training. Firstly, trainees work in peers to solve practical problems, which could improve their team work. Secondly, students communicate each others during the course. Sometimes they communicate solutions with others, and sometimes they teach others how to solve the problem. During this process, technical knowledge is reinforced and at the same time, the communication skill and teaching/sharing skills are improved. Thirdly, the training method emphasizes on practicing and be task oriented. The students are learning by doing. Trial and error, success and failure are all important aspects of learning by doing. During the practice, students could learn how to solve problems with themselves.
The pathway model draws attention to practical skills provision as well. The practical skills offered by the projects included: how to conduct a job search; how to search for jobs on the Internet; how to write letters of application for employment; how to succeed in a job interview and mock interviews, creating CVs, customer services, and health and safety. In Due to the limited training duration, practical skills are not included in the training. In Craft Silicon Computer Training Bus project, due to the limited training duration, such practical skills are not included in the training. However, those skills are quite important for youth who are looking for jobs in ICT industry. Therefore, practical skills training is recommended to be involved in the training both in the first and advanced stage of training.

5.3.2 Industry certifications
Appropriate certification can help ensure progression routes, but it is important to ensure that local employers recognize and value the IT skills certification provided by education and training programs and that these are targeted at the needs of local employers.

In this case, there is a final examination after the whole training program. Students who pass the examination will get a certification issued by Craft Silicon Foundation. The training bus project was established just two years before; many local employers may not know this training program. Therefore, it is possible that they do not recognize and value the certification issued by Craft Silicon Foundation.

The training content and examination is designed by Microsoft. It is recommended that Craft Silicon Foundation could cooperate with Microsoft and issue certification that is authorized by Microsoft.

5.3.3 Selection of trainer
The choice of trainers is crucial in providing a supportive training environment.

In this case study, students are quite satisfied with the training teacher of this program. The teacher is considered has good communication skills, has ability to empathize with and be sensitive to the target group, and has good teaching skills. The training method he uses motivates trainees and help to improve the students’ soft skills.

5.4 Ensuring Support for Social and Cultural Needs
This intervention ensures that cultural and other forms of diversity are acknowledged and respected and that all participants are empowered to become active citizens through understanding their values, legitimizing prior knowledge and skills, providing information on citizens’ rights, and increasing their capacity to participate in decision-making.

5.4.1 Ensuring financial supports
Ensuring low cost training can be a particular challenge for professional IT certifications which are costly to deliver and support.

In the Craft Silicon Training Bus case, both first stage and advanced level training are free of charge. When asked “if the training is charged, will you still participated in it?” Students point out that they will participate if it is affordable. According to Monica, who worked in Global Relations, which is a NGO that provided ICT trainings to youth in Kibera and closed due to the shortage of funding, their
training was free at first, however, after they decided to charge a little for the training, most trainees are left.

Many traditional training centers encountered the financial problem and stopped providing training due to the lack of funding. The computer training bus project has a new business model which reduces the cost and ensures the sustainability of the project. It may overcome the difficulties that traditional training centers encountered.

Firstly, this is a corporate social responsibility project of Craft Silicon Limited. Which means the project received financial support from the company and does not rely heavily on sponsors or donation. Secondly, the training classroom is the bus. Due to the mobility of the bus, the operation cost of the project is reduced. Thirdly, the computers on the bus are powered by solar power system. Though solar system is costly to install, it is cheap for the long-term and cheap to maintain.

5.4.2 Ensuring learner support and building peer support networks

It is important to develop peer-support networks that can be maintained after education and training programs end. Such networks allow former students to share experiences and information about further IT skills training in employment.

When analyzed the strategies to reach out target group, the involvement of former trainees is suggested. In this part, former trainees also play an important role regarding the peer support networks. However, the computer training bus project does not keep track of graduated trainees. Therefore, enabling the peer support networks is the second reason to for the involvement of the former trainee.

5.5 Providing employment and career guidance services

Providing employment and career guidance services is a key element of the pathway approach. This is because ICT sector employment is fast moving, with new skills sets emerging as quickly as new applications and processes are developed. Career paths change quickly in information society employment as new opportunities emerge.

One of the objectives of the Craft Silicon Computer Training Bus project is to use innovative methodologies and techniques in enhancing the livelihoods of communities and empowering the youths. The project manager emphasizes that simply providing ICT skills training is not enough, they pay attention to promoting employment for youth in resource poor communities. However, according to the empirical data collected during the case study, the training mainly focuses on provision of technical skills, while the guideline service for employment is not provided sufficiently. This pathway model provides guidelines for how to provide sufficient employment and career guidance services for trainees.

Firstly, employment and career guidance services need to be delivered in a client-friendly and flexible manner. Good quality information on local employment opportunities and education and training opportunities should be provided. The UN Youth Employment Network proposed five principles to generate youth employment using ICT (Curtain, 2002). Youth with ICT skills could find a job in public-private ICT-related industry, local development agencies. Furthermore, youth could get employed through entrepreneurship and self-employment in the informal economy and the high
growth sectors of the world economy. Therefore, the Craft Silicon Foundation could provide employment and career guidance focusing on those areas.

Secondly, Web-based information is particularly useful for both career guidance and providing information on local employment opportunities and further training opportunities. It suggested that projects should train participants to search for career and employment information on the web and it is also a good way for participants to develop Internet skills.

5.6 Developing Employment Progression Measures

This intervention seeks to secure the actual movement into employment and to support participants therein. Several strategies are proposed in the following:

- Engaging the employers
  Networking approaches with local employers and local job centers were highlighted as a way forward. These relationships allowed local firms to become familiar with the type of training being delivered in these projects and thus they used the projects as a source of recruitment.

Craft Silicon Limited has relationships with many different companies and organizations. The company could recommend excellent trainees to its clients and partners. It helps to promote youth employment and at the same time it reinforces the relationship between Craft Silicon Limited and its partners.

- Providing work placement
  In the case of Craft Silicon Computer Training Bus project, top students who graduate from the first stage of training will be selected to participate in the advanced level training. After this training, some students will be recruited by Craft Silicon Limited.
Chapter 6 Discussion

6.1 Conclusion of the case study

Information and communication technology is absolutely necessary in our daily life and the technology has reshaped the labor market. Young people could get empowered through ICT trainings. On the one hand, both computer skills and other soft skills could be improved during the training. On the other hand, youth who have ICT skills are more possible to find a job in ICT-related industries.

Unfortunately, not all people have the equal opportunity to access and benefit from the technology, which exerts the existing “Digital Divide”. Many people are not able to access the technology and participate in ICT trainings, especially people living in resource poor communities. Those people are vulnerable and in the depth of digital divide. Therefore, it is necessary to research on ICT training projects in resource poor area in order to help people living there and bridge the digital divide. It is also an important objective of the research area of ICT for development.

This thesis conducts case study method to assess the empowerment of ICT training for youth in resource poor communities in Kenya from two perspectives: individual empowerment and economic empowerment. The empirical data was collected during the field study in Kenya.

The outcomes of the Craft Silicon Computer Training Bus project are evaluated following the guideline of pathway model. The key conclusions of the case study are:

6.1.1 The project proposes a new business model for computer training program.

The traditional computer training projects encounter many challenges and difficulties when providing trainings in developing countries, especially in extremely resource poor communities. The Craft Silicon Computer Training Bus project proposes a new business model for computer training program. It provides training on the bus that is equipped with computers inside. The project has the potential to overcome the challenges encountered by traditional computer training centers.

First of all, the mobility of the bus enables it to provide trainings in remote and resource poor communities, such as the slums. It offers youth in those communities with opportunities to access to ICT and to obtain ICT skills. Due to the short distance between the training location and the community, the money for local transportation is saved. Moreover, the bus goes to different slums to provide trainings, which provides more opportunities for learning compared with traditional training centers.

Secondly, the computers on the bus are powered by solar power system. It overcomes the shortage of electricity power, which is the main challenge encountered by most of training centers in resource poor communities.

Thirdly, the training is free of charge for trainees. It offers equal opportunities for disadvantage youth in resource poor communities.

The business model of this Craft Silicon Computer Training Bus project could be generalized and promoted to other remote and resource poor communities in order to bridge the digital divide in those communities.
6.1.2 The project achieved significant outcomes regarding individual empowerment.

The indicators for evaluating the individual empowerment are set according to the core outcome indicators provided by Daniel A. W, et al including the student attitude and the skills obtained during the training. The data is evaluated following the first two interventions proposed by pathway model.

The trainees are aware of the importance of ICT skills in order to find a good job in contemporary society. Therefore, they are motivated in the training. The computer training improves the computer self-efficacy of trainees. They perceive that both technical skills and soft skills such as communication skill, problem solving skill and team work are enhanced during the training. Most students become more confidence and positive to catch up the high speed of technology development.

Students are satisfied with the training content, the training teacher and the training method.

It is worth mentioning that there is a bias between the perceived improvement of skills and the improvement in fact. On the on hand, students may over confident about their study result. The exam is the best way to examine the result of the training. Even through all students are convinced that the computer skills are improved, 15% of students cannot pass the exam. The questions in the exam were not provided by the project manager due to confidential issues. However, the teacher said the exam is quite basic and not difficult. Furthermore, the improvement of soft skills such as communication skill, problem solving skill and team work are quite abstract and hard to be assessed.

On the other hand, students may underestimate the requirement of IT related jobs. This project does not provide sufficient information about employment in IT related industry. All students believe that the training will help them to find a good job. However, students are not clear about the requirement of those jobs, especially some professional positions such as research and development, web design and information security. This project only provides basic training of information technology. Students who are interested in IT professional positions should participate in an advanced training.

6.1.3 The interventions for economic empowerment of the project are not sufficient.

The economic empowerment of the project is evaluated following the last three guidelines of pathway model. The trainees perceive high possibility to get employed after the training. However, the statistics data shows that less than 40% of graduated trainees have found a job. The bias of the cognitive is resulted in trainees’ lack of knowledge about the labor market in ICT related industry and the needs of the employers.

The interventions for economic empowerment of the project are not sufficient. The main reason is the lack of linkage to employers. Therefore, it is necessary for the training project to develop adequate connection with local employers in the sector in order to promote youthemployment. Firstly, youth in resource poor communities are not able to access to information on the types and variety of career options available in the information society. Secondly, there can be a misperception that very advanced levels of training and education are required by employers the information society. Thus, youth may perceive that the ICT skills are too difficult to them and become fear of learning. Finally, the career paths and opportunities in ICT-related employment can change and develop much more quickly than in other sectors due to the rapid technological developments and evolutions. In other words, if ICT training programs fail to keep track of the changes in business and industry, they are out-of-date and trainees could not get benefit from the training. (O’Donnell, Ellen, Duggan, & Dunne, 2003).
Take the disadvantages of the Craft Silicon Computer Training Bus project, several suggestions for improvement are proposed in the following section.

### 6.2 Suggestions for Improvement

The above section discusses the advantages and disadvantages of the Craft Silicon Computer Training Bus project according to the evaluation result. In order to improve the project and enable it to be more sufficient in employment promotion, several suggestions are proposed as following:

- **Improve the training infrastructure.**
  Both of the training teachers and the project manager of the project mentioned the need to improve the infrastructure including the number of bus and the number of computers on the bus. The project manager introduced that there is an expansion program where 20 more buses will be invested in and distributed across the country.

  Moreover, even though working in peers helps improve team working skill, it is obvious that the trainees could have more opportunities to practice if computers are available for every student. It leads to higher efficiency and effectiveness of the training.

- **Provide practical skills training**
  Practical skills such as how to conduct a job search; how to search for jobs on the Internet; how to write letters of application for employment; how to succeed in a job interview and mock interviews, creating CVs, customer services, and health and safety should be taught during the training.

- **Provide employment and career guidance services**
  Good quality information on local employment opportunities and education and training opportunities should be provided during the training.

- **Improve the computer skills training content**
  Internet searching is highly recommended to be added in the training content. Nowadays, Internet searching is a basic and essential IT skill for employees in ICT-related industry. Youth could search useful information on Internet such as employment information or how to improve practical skills. If there is no enough time for training teacher to provide employment information and practical skills training on the course, the Internet searching skills is needed, since youth could search them and keep track of the latest information by themselves.

- **Keep track of graduated trainees**
  According to analysis in chapter 5, firstly, graduated trainees should be involved in promoting the project, particularly those who had achieved careers in IT. They are the role models for the potential trainees. Secondly, to ensure support for social and cultural needs, peer support network should be built, in which former students could share experiences and information about further IT skills training in employment.

  Therefore, it is quite importance for the project to keep track of the graduated trainees and encourage them to help other trainees.

### 6.3 Summary of the Thesis Project

The case study was conducted in February, 2012 in Nairobi, Kenya. In fact, the topic of the thesis was changed in Kenya. The original topic was about Empowering Women through ICT Training. Several
training centers that only provide ICT trainings to women were contacted before the case study. Those training centers include the Mukuru Promotion Center and the Global Relations. Unfortunately, after arriving in Kenya, I found that all these training centers were closed mainly due to the financial issues. The failure of those training centers indicates that the traditional training centers are encountering serious challenges and difficulties.

The Craft Silicon Computer Training Bus project was found occasionally. It is a quite interested project with new and creative business model. Also, it focuses on youth living in the slums which contributes to bridging the digital gap in resource poor communities and to reducing the problem of youth employment. Therefore, the topic of the thesis was changed in the empowerment of youth through ICT training.

The main disadvantage of the thesis is the time limitation. I kept touch with the project manager and got as much as information. However, the questionnaire which sent to the trainees is quite simple and not deep enough. Moreover, the time for observation is also too short.

The section 6.4 proposes several possible topics for the future study.

### 6.4 Recommendations for Future Study

This thesis conducts single case study to discover the empowerment of ICT training for youth in resource poor communities. The conclusion of this thesis is important for the Craft Silicon Computer Training Bus project and it provided guidelines for improvement.

The business model of this project is appropriate in Nairobi since it could solve the problem of lack of electric power and it could reach the remote areas. The model could be promoted in other communities which have similar conditions. However, due to the limitation of case study method, some of the conclusion may not apply for other cases. For instance, the improvement suggestions may not suitable for other cases, since different cases have different problems. Therefore, future studies could follow the same framework of this thesis and to evaluate other similar training projects which are aimed at empower trainees and also promote employment.

Another recommendation for future study is to keep track of the Craft Silicon Computer Training Bus project and to assess the empowerment of youth deeply. Due to the time limitation, in this project, I did not design a questionnaire or test to assess the real improvement of technical and soft skills. Researches could get deeper understanding of the project if he/she has enough time to follow up the whole period of the training, including every courses and the final exam. For future research, researchers could also assess the improvement of the project. A possible research question may be “whether the suggestions for improvement could help to improve the quality of the training and to promote employment?”

Finally, the ICT empowerment could be evaluated from other perspectives, such as gender equity. Same with youth, women in Africa is a disadvantaged group. Information and communication technology could also empower women. As discussed in Chapter 4, female students are much fewer the male students in total. There may be some culture and social reasons that related to the gender equity. This thesis does not talk about gender issues. However, it is an important direction for future studies, not only the gender issues in this case but also the ICT empowerment for women in general.
Reference


Appendices

Appendix A: Questionnaires for Trainees

1. Basic Information
Name:        Gender:        Age:        Education Level:

Occupation: (Are you student now or working)

Do you live close to Kibera? How long does it take you to Kibera? (By walk or bus)

2. Do you have your own computer or laptop?

3. Where did you hear about this training bus program?

4. Why are you interested in computer training?

5. Why did you choose this training program?

6. How long have you learnt here?

7. Have you participated in other computer training course before? If yes, what is it and how long have you been trained

8. What skills have you learnt during this training? E.g. softwares

9. Is the course difficult for you? E.g. which software is difficult for you

10. What skills do you think you should have been taught but was not during your training?
    e.g. some other softwares, searching internet etc

11. Are you satisfied with the teacher? Is he/she able to answer your questions and explain them clearly?

12. Do you feel you have more computer skills now than at the beginning of the course?

13. What other skills have been improved during the training? E.g. English, mathematics, communication skills, group working etc

14. Do you think computer skills will help you to find a good job? If yes, what kind of job that you want to do after the training?

15. Will you recommend your friends to participate in this training program? Why?

16. If you should pay for the training, would you still like to participate in it?

17. Would you like to take an advanced course after this training program?

If yes, what do you want to learn? E.g. programming, web design, information security etc.

18. Do you have any suggestions for improving this training program?
Appendix B: Interview Questions for Project Manager

1. Basic info of students, statistical analysis
2. When did the project start? How did this idea come up? Bus, solar power system, area
3. What is the difference between the computers on bus and the common ones?
4. What are the pros and cons of solar power system? Costly, difficult to fix, in rain season (no sun) etc.
5. Where is the funding from? Any other partners?
6. How many students are taking the training now? How many students have been trained so far?
7. How to select students? Applicants are more than the available places
8. What is the percentage of students that could pass the exam and get the certificate? If failed, do they have another chance?
9. Could the skills and the certificate help them to find a good job? Statically data?
10. Who are the teachers? Volunteers or get paid. Are they qualified?
11. Who designed the course and the exam?
12. Any volunteers working for this project?
13. Is it a long tern project? Any future plan, e.g. more buses, more areas etc.
14. What problems do you have now?
15. Any suggestions for improvement?
Appendix C: Interview Questions for Trainer

1. What skills are taught during the training program? E.g. softwares, operation system
2. Why do you think those skills are essential for student?
3. What skills are also important but are not included in this program? E.g. other softwares, searching internet
4. Do you think the course is difficult for some students, especially those who knew nothing before the training?
5. Do those courses emphasize on practice as well as theory?
   If the students don’t have their own computer, they have little chance to practice. Forget easily!
6. What is the form of the examination? Multiple choice, short answer, practice etc
7. How many students may fail in the exam? Do they have another chance or take the course again?
8. The students work in peers due to the lack of computers. Do you think peer work is a good idea?
9. Instead of tell them everything, do you it is more important to teach them how to learn and discover by themselves?
10. The softerwares in the computers are out of date. Do you think after the training, the students are able to learn new softwares themselves and catch up the fast speed of the information age?
11. Could those skills help students find a good job?
12. Do you have any suggestions to improve the training program?