

UNIVERSITY OF SOUTHERN QUEENSLAND

**EVALUATING THE CONTRIBUTION OF COMMUNITY
INFORMATICS TO RURAL DEVELOPMENT: THE CASE OF
MALAYSIA'S RURAL INTERNET CENTRES**

**A dissertation submitted by
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ABSTRACT

Telecentres in Malaysia were a policy response from the Malaysia government to address the digital divide between urban and rural communities. In the first instance, the main goal of the rural internet centres (RIC) program was to enhance rural access to information and communications technologies (ICTs) and to build human capital in ICT knowledge and skills in rural communities. The main goal of RIC program was extended over time and the RICs in each community were seen as a means for developing economic activity in rural communities through local entrepreneurship. The adoption of ICTs in rural regions may further enhance the effectiveness of RICs to the local communities. Social and economic benefits have been identified as important outcomes (perceived benefits). The objective of this study is to evaluate the perceived affects of RIC program on quality of rural life (QoRL). This study assesses the perceptions of stakeholders (RIC end-users and program managers) in regard to the impact of the RIC program on human capital of rural communities in Malaysia. The research questions were translated into three specific testable hypotheses. Despite that, the main research problem is, "Can rural internet centres be an effective tool in bridging the digital divide for rural communities and improving rural quality of life?." Thus this study is not evaluating if the divide is closing, however, it is evaluating if people perceived there is an improvement in their digital skills due to their use of RIC services.

This study is an evaluation of the RIC program in Malaysia, using a program logic framework to identify and evaluate inputs, outputs and outcomes of RIC program from multiple key stakeholder perspectives. Community informatics, end-user computing and social capital provided the theoretical lens for the program logic evaluation of the RIC program. An online survey of RIC users across 42 RICs was the main data collection method used to determine RIC users' perceptions and level of satisfaction with the services provided by RICs. And furthermore whether there is evidence of outcomes from the use of RIC services which could result in enhanced human capital. The main data collection phase was supplemented by a series of interviews with program managers and RIC managers from different regions and locations, some non-users and members of local RIC management committees. Finally some general observations about how RICs were operating were made during site visits to 11 RICs conduct interviews. The results of statistical analysis of the quantitative survey data and narratives determined from a content analysis of the interviews (qualitative) along with some RIC site observations (qualitative) are presented and discussed. The program logic framework of (1) inputs and outputs and (2) outcomes was used to guide these analyses in order to evaluate the RIC program. The quantitative and qualitative data collected for each stage of program logic framework were analysed, interpreted and triangulated in determining the key findings of this study.

There is generally strong support for the benefits of the RICs in building human capital, including improving job prospects and business opportunities for rural communities in Malaysia. The key findings also show that RICs are strongly associated with enhanced social capital although the causation effects may run both ways. The results are used to propose a model of the effects of community

informatics, noting that many of the potential benefits may be intangible. Theoretically, this study has shown that the RIC improved the individual community QoRL with the use of ICT applications and services. Meanwhile, this thesis developed a comprehensive theoretical framework drawn from community informatics, end user computing and social capital theories to evaluate the RIC program. This is a new empirical contribution to the growing literature on the relationship between community informatics and social capital. The majority previous empirical studies on social capital have been conducted in sociology, whereas there is dearth of empirical studies which have evaluated the contribution of community informatics and social capital in telecentre programs; especially in developing countries such as Malaysia. Furthermore, there are few if any previous studies have evaluated an entire telecentre program such as the RIC program using program logic theory.

The research gap is whether the people perceive that there is an improvement in human and social capital as a result of the RICs. Thus these contribute to perceived effectiveness of the RIC program and improve in digital knowledge and skills in rural Malaysia. Hence, the contribution to practice is to build social capital policy while emphasise more on human capital approach in rural Malaysia. With the improvement on RIC program in Malaysia, i.e.; inputs, outputs and outcomes, this will leads to improvement on ICT for rural development. Therefore, this study makes a contribution primarily to the field of community informatics, drawing concepts from social capital, economic development, quality of rural life and rural development with reference to local rural communities in Malaysia.

CERTIFICATION OF THESIS

I certify that the ideas, analysis, results and conclusions reported in this thesis are entirely my own effort, except where otherwise acknowledged. This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no previously published or written by another person except where due reference is made in the thesis itself.

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LIST OF ABBREVIATIONS

BCT	Basic Computer Training
BDD	Bridging Digital Divide
BOC	Bonding Capital
BRC	Bridging Capital
CI	Community Informatics
DST	Digital Story Telling
E	Employment
EB	Economic Benefits
Ed	Education
ED	Economic Development
EG	Electronic Government
Email	Electronic Mail
EP	Electronic Procurement
EPU	Economic Planning Unit
ES	Electronic Services
EUC	End User Computing
FB	Face Book
GEW	Global Entrepreneurship Week
I	Income
IC	Information Centres
ICT	Information and Communications Technology
IT	Information Technology
ITU	International Telecommunication Union
LCA	Local Community Association
MEWC	Ministry of Energy, Water & Communication
MICC	Ministry of Information, Communication & Culture
MMDG	Malaysian Millennium Development Goals
MP	Malaysian Plan
MQoL	Malaysian Quality of Life
MRRD	Ministry of Rural Regional Development
MSP	Multi Stakeholder Partnership
PB	Perceived Benefits
PID	<i>“Pusat Internet Desa”</i>
PMR	Certificate of Lower Secondary Examination
PPPs	Public-Private Partnerships
QoRL	Quality of Rural Life
RIC	Rural Internet Centre
SC	Social Capital
SEC	Social Entrepreneurs Club
SMI	Small and Medium Industry
SPM	Certificate of Malaysian Education Examination
SS	Services Satisfaction
STPM	Certificate of Malaysian Higher Education Examination
UK	United Kingdom
US	United States
USP	Universal Service Provider
WG	Warisan Global Sdn. Bhd.
YM	YahooMessenger

CHAPTER 1: INTRODUCTION

1.0 Background

This study evaluates the impacts of rural Information and Communication Technology (ICT) initiatives on the quality of rural life in Malaysia, particularly focussing on human and social capital (SC). The focus is on the Rural Internet Centre (RIC) program. Rural ICT centres (community telecentres) provide applications of ICT to enable community processes and achieve community objectives including overcoming “digital divides” both within and between communities (Gurstein, 2000). The study draws on the research domains of community informatics (ICT and community development), rural development and public policy analysis in examining the perceived contributions of such centres in Malaysia to human and social capital, thereby potentially improving the quality of rural life.

Malaysia could be considered to be either developed or developing, or both, depending on the region, with wide disparities in economic and social outcomes. In particular, Malaysia faces the dilemma of ensuring its regional and global competitiveness in ICT while at the same time ensuring equitable ICT access in rural areas. According to Mohammad (1998), the country “realised that the present development strategy focused on land, labour and capital [which are factors of production] will not help the country achieve the goal of Vision 2020. Thus, Malaysia decided to make the Information and Communication Technologies...the dynamic for growth”. Hence there are large-scale projects such as the Multimedia Super Corridor (MSC), a government-driven initiative to develop a Malaysian “Silicon Valley” aimed at developing a national IT sector, and the Internet Desa (Rural Internet) program to install Internet centres in rural areas to develop local skills and competencies which leverage IT.

Malaysia has been reported by the United Nations Development Programme (UNDP) (2010) as one of the few developing countries that has rapidly growing ICT services and industries and which is in a good position to transform into a knowledge-based economy. Under the Ninth Malaysian Plan (9MP), the focus was to expand communication networks across the country and a budget of RM101 million was

allocated for the establishment of telecentres (10th MP, 2010). ICT has been an integral part of development, particularly in the rural areas of Malaysia, and has been applied to balance the development between urban and rural areas.

Furthermore, promoting the use of ICT has been identified as an important tool to eradicate poverty, especially in rural areas (Greenberg, 2005). Telecentres use computers and the Internet to help communities enter the information age and to embrace the knowledge economy (Telecentre.org, 2006) and from 2001 until 2010 many telecentre projects have been implemented in Malaysia, including Rural Internet Centres. For this study, an RIC is one of a variety of public access points that can also be regarded as a community technology centre or telecentre. These points constitute the “actual” community ICT (Williams, 2005).

As a means of encouraging the wider diffusion of ICT applications and use across the various sectors of the Malaysian population, the government designed and formulated various policies to increase the adoption of computer applications among rural communities to improve efficiency, productivity and overall economic competitiveness across the Malaysian population, including the rural sectors (7th MP, 1996). Table 1.1: Malaysian Plan (1990-2015) explains the initiatives to encourage the adoption and utilisation of ICT in accordance with the Malaysian Plans (1990 to 2015).

Table 1.1: Malaysian Plan (1990-2015)

6th Malaysian Plan (1990-1995)	7th Malaysian Plan (1996-2000)	8th Malaysian Plan (2001-2005)	9th Malaysian Plan (2006-2010)	10th Malaysian Plan (2011)-2015)
The government introduced basic IT infrastructure to establish a sophisticated network of facilities and services.	The government introduced a number of programmes and projects to encourage the wider diffusion and application of computer applications across the country.	Programmes and projects were introduced to encourage a wider uptake of computing technology among communities across the urban parts of the country, but are also targeted at people residing in rural areas.	At the rural level, programmes such as the Internet Desa (also known as RICs) were introduced to minimise the digital divide between communities residing in rural parts of the country.	Internet centres in rural communities will be established as community and business centres. These centres will serve as a community hubs and play an important role in ensuring that rural communities are virtually connected to the world.

Source: Adapted from Osman (2005) & EPU (2011)

According to the 8th Malaysian Plan report (2001), the launching of the RIC pilot programme incorporated the development of ICT infrastructure facilities at local post offices in the pilot locations and the launch of the official website which provided users with information about government services and regional activities as well as free access to the Internet and email. This aligns with the study scope and timing and so focus was on the goals of the 9th Malaysian Plan.

The 9th Malaysian Plan (2006) led to the establishment of the RICs, which were expected to provide IT skills training and knowledge acquisition programs to rural communities in Malaysia, especially for women, the elderly and youth. This program was initiated, in accordance with the Sixth National Policy Objective under the Communications and Multimedia Act 1998, in April 2000 by the Ministry of Energy, Water and Communication (MEWC), later the Ministry of Information, Communication and Culture (MICC) of Malaysia, with the main objective of 'bridging the digital divide', which refers to the regional (rural/urban) differences in computer skills and use. Under the 10th Malaysian Plan (from 2011), the Internet centres in rural areas will be transformed into community and business centres. Hence, the 10th MP is moving into the next level of ICT development with the aim to balance the development between urban and rural community. The aims of the RIC programme, especially in relation to bridging the digital divide are in accord with Malaysia's National IT Agenda, which included the development of an e-community as one of its strategic thrust areas whereby geographically dispersed communities would be able to interact and communicate via electronic means.

1.1 The Policy Problem

Development agencies in the area of communication are concerned about increasing gaps between the information haves and have-nots. This gap is known as the information gap or digital divide, which not only exists between the rich and the poor, but also between urban and rural communities (Bala et al., 2002). Hudson (1998) argues that the gap between urban and rural areas is far more significant since about 80 percent of the population in the poorest countries live in rural areas.

Most telecommunication infrastructures in developing countries are found in urban areas and are non-existent in rural areas in some countries. If these gaps are not addressed, they will contribute to poverty. Thus, at the international level, the United Nations and the International Telecommunication Union (ITU) have been providing rural communities with access to ICT services and facilities (Barr, 1998, ITU, 2011a, UNCTAD, 2011).

The rural population in Malaysia tends to be poor and marginalised. In comparison to urban areas, the accessibility and availability of ICT is significantly lower in the rural areas (ADB, 2004, Sheng, 2011). Even if the infrastructure is available, rural dwellers often cannot afford to purchase communications equipment such as computers or pay for connectivity to the Internet. Further, even if there are funds available to purchase equipment and connectivity, a lack of awareness regarding the use of these technologies has greatly contributed to the growing rural-urban digital divide (ADB, 2004).

As in many other countries, both developing and developed, Malaysia's ICT infrastructure development is concentrated primarily in its cities and towns (UN, 2001, Steyn et al., 2011). ICT infrastructure distribution on a geographical basis has largely reflected regional differences in economic development and population density with the predominantly rural states of Sabah and Sarawak, for example, falling far short of the national average (MEWC, 1998). In terms of the distribution of personal computers penetration, the concentration is in the urban areas, primarily Selangor, Federal Territories and Penang, which contribute to more than 65 percent of computer density in Malaysia (MEWC, 1998, Haji Mat Zin, 2004, MCMC, 2009). In addition to this urban-rural divide, the pace of infrastructure development has not been uniform across all urban areas. Among the country's cities and towns, infrastructure providers have also favoured particular areas, though this aspect is not explicitly considered in the thesis.

Related specifically to the scope of the present study are the data on household use of the Internet by strata (see Figure 1 in APPENDIX 1). Overall, the data show that households in urban areas use the Internet more than those in rural areas. The data also show a wide gap between those household Internet users in the Urban and those household Internet users in the rural areas. This results in a digital divide between

urban and rural areas in Malaysia (MCMC, 2008). Also relevant to this study are data on household use of the Internet by states (see Figure 2 in APPENDIX 1). A comparison of the 14 states shows the disparities within the country and the ongoing dilemma of ensuring equitable ICT access in rural areas (MCMC, 2008). Differences in human capital possibly result from these disparities. According to the World Bank (2010), 28 percent of the rural population (% of total population) in Malaysia live in rural areas.

1.1.1 Public policy related to community e-centres and telecentres

Malaysia is one of the first countries to enact a comprehensive set of communications and multimedia laws to provide a framework for the development of communications. Under the Communications and Multimedia Act (CMA) 1998, the sixth national policy objective stated that the universal service provision (USP) of affordable communication services would provide financial support for communities. The Malaysian Communications and Multimedia Commission (MCMC) administer the collection and the fund. The USP funding is derived from the seventh, eighth and ninth Malaysia Plans (ESCAP, 2006). The funding for community e-centres (CECs) is the source of funding for the RIC program. It was hoped that the RIC initiative would help to promote and improve the implementation of rural community ICT services and thereby contribute to the reduction of poverty among the rural people of Asia and the Pacific (ESCAP, 2006).

A study of the digital divide in Malaysia categorised existing CEC projects into three types of approaches: top-down, down-up, and top-down-up approach (ESCAP, 2006). The RIC program is in the top-down category. The program was initiated by the government and planning and implementation are mainly by government agencies, with some or minimal involvement by community or private sector organisation (ESCAP, 2006). Table 1.1: Summary of major critical elements in the top-down approach summarises the elements of this approach in relation to the RIC program.

**Table 1.1: Summary of major critical elements in the top-down approach
(adapted from ESCAP, 2006)**

Critical element	Top-down approach
Site selection	Practitioner's knowledge (the government agency that determines the location of the project)
Identification of needs	Baseline study
Meeting the needs	Possible solutions/choice of technologies available
Funding	Before the project

The RIC leverages on this multi-stakeholder partnership (MSP) model that links to this top-down approach. This multi-stakeholder partnership in RIC context includes the public sector (MICC), the private sector (Warisan Global Sdn. Bhd.) and the rural local community. The decision making comes from the top management, mainly the MICC and Warisan Global. While the final decision is disseminate to the local community.

1.2 Research Problem

According to Jhunjhunwala, Ramachandran and Bandyopadhyay (2004), most developing countries are concerned about the divide and about falling behind developed countries. Furthermore in developing countries such as Malaysia, a digital divide exists between urban and rural communities. Telecentre programs have been one such policy response by developing countries in seeking to bridge the digital divide in rural communities. However telecentre programs in rural communities have been problematic and difficult to maintain and sustain in the long term (Proenza et al., 2001). A telecentre program strives to deliver the simple interface between ICTs and the internet and offer communications services. It also becomes the centre for the delivery of rural development support services within its community catchment area, and some provide access to social and economic development. Accessibility is also a problem encountered due to differential access of skills and usage widen by this problem. Social access is a neglected phenomenon certain marginalised groups, rather than all groups. Differential usage is normally answered to be the user's choice rather than considered in the community development policies (Zulkefli and Sulaiman, 2013). Most ICT projects run into unexpected difficulties because they constantly focus on providing technical access rather than access to the social networks and social resources that are essential to achieve the expected results.

Harris (2001), Sumbwanyambe (2011), Telecentre.org (2012) and Miller (2013) have argued that one approach to the problems of the digital divide has been the community telecentre; specifically and therefore, public money has been invested in facilities. To date though, there are only limited evaluations of community telecentres and similar programs to determine whether the expenditure is actually leading to a bridging of the digital divide. The current research poses the following question: “Can Rural Internet Centres be an effective tool in bridging the digital divide for rural communities and improving rural quality of life?.” This research investigates current RICs in order to assess the perceived benefits and, where possible, make recommendations as to possible futures for the program. The study does not evaluate whether the divide is closing, but focuses on whether people perceive that there is an improvement in human and social capital as a result of the RICs. While in previous research individual telecentres have been evaluated, this study has systematically and holistically evaluated a telecentre program from multiple perspectives using a program logic framework.

1.2.1 Research objectives

There are two main objectives to be achieved in this research: to examine the perceived effects of the Rural Internet Centre program on quality of rural life (QoRL), and to evaluate the perceived effectiveness of RIC as a means for facilitating rural development in terms of QoRL improvement. This is examined through a literature review, site studies, surveys and interviews, within a program logic framework as shown in Figure 1.1: The RIC theoretical framework – hypotheses testing.

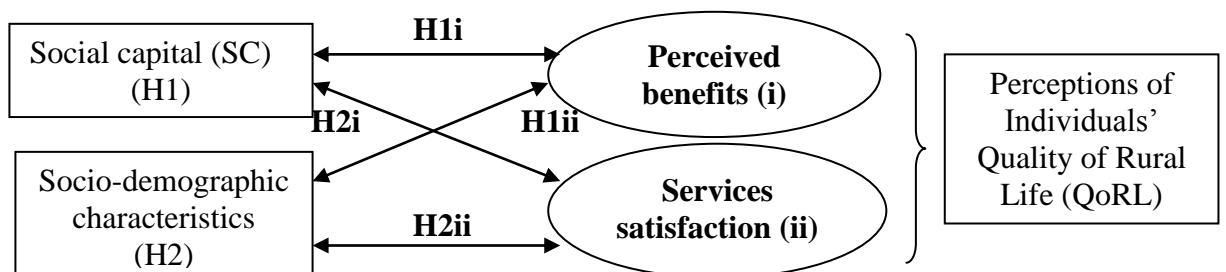


Figure 1.1: The RIC theoretical framework – hypotheses testing

The Socio-demographic characteristics are antecedents and may thus be considered as independent variables to perceived benefits and services satisfaction. But social capital does not always precede benefits and satisfaction and cannot be considered as independent and dependent respectively. Social capital is considered to be correlated with perceived benefits and services satisfaction (see Figure 1.1). These are the constructs for hypotheses testing and thus may not entirely consistent with the theoretical framework developed in Chapter 2 as some of the variables are not hypothesized, however are measured using other methods.

1.2.2 General research question

The general question posed in this research is: How do Rural Internet Centre users and stakeholders perceive the affect of RICs on quality of rural life? Answering this question requires an examination of the ways in which the advent of the centres has affected employment, income, education and social capital levels in the study sites. The following sub-questions assist in the examination:

- RQ (a):** Are RIC users (community) satisfied with the RIC services?
- RQ (b):** Do RIC users (community) perceive an increase in income, employment opportunities and level of education (knowledge and skills)?
- RQ (c):** Do RIC users (community) perceive an increase in social capital?

Not all RIC users are the same; therefore, there is a need for some detailed analyses, considering a range of demographic factors and social context.

1.2.3 Hypotheses

This study investigates how a range of variables, namely; age, gender, current income, level of education and employment status, RIC locations, economic benefits, bonding and bridging capital, local community association, perceived benefits and service satisfaction, may correlate to perceptions. Table 1.2: Constructs measured identified the components for every variable tested for the purpose of this study. The independent variables tested in the hypotheses were the socio-demographic and social capital characteristics that measured the differences: refers to H1, H2i and H2ii. Thus, the socio-demographic characteristics (H2i and H2ii) to test whether there is a different perceptions of perceived benefits and service satisfaction.

Table 1.2: Constructs measured

Dependant variables (contributions)	Independent variables (characteristics)
(1) Perceived benefits (economic benefits & social capital)	(1) Age groups
(2) Service satisfaction (computing, communication, information, training & education, basic office, info-mediation services and speed & reliability of RIC Internet access)	(2) Gender categories
	(3) Household current income
	(4) Education, knowledge & skill
	(5) Employment status
	(6) Bonding and bridging capital (within & outside RIC)
	(7) Local community association (informal ties/contacts)
	(8) Location/regions

The hypotheses generated from the general research question are expressed in the following statements:

- 1) Hypothesis 1i (H1i): *Social capital will positively determine perceived benefits*
Hypothesis 1ii (H1ii): *Social capital will positively determine services satisfaction*

This will be examined in more detail through the three elements of social capital:

- (a) Bonding capital
 - (b) Bridging capital
 - (c) Local community association.
- 2) Hypothesis 2i (H2i): *Socio-demographic characteristics will determine differences in perceptions of benefits based on:*
 - (a) Age
 - (b) Gender
 - (c) Income
 - (d) Education level
 - (e) Employment status
 - (f) Location
 - 3) Hypothesis 2ii (H2ii): *Socio-demographic characteristics will determine differences in services satisfaction based on:*
 - (a) Age
 - (b) Gender
 - (c) Income
 - (d) Education level
 - (e) Employment status
 - (f) Location.

1.3 Contributions of this Study

The contributions of the study lie in several areas. First, this study provides empirical evidence of the perceived effectiveness or otherwise of community programs to improve digital knowledge and skills in regional Malaysia through RICs. Second, this study empirically contributes to research on rural development and, in particular, develops the empirical studies of building social capital (as one of the variables in this study) through community informatics. Finally, there are possible implications for the findings to be applied in program improvement, as noted above.

1.4 Study Regions and Sites

By 2006, 42 RICs had been implemented in thirteen states in the country regions of Malaysia (MEWC, 2006) (see

Figure 1.2: RICs in every region/state and APPENDIX 2 for details). The program was well established at the time of the field work with strong government support in terms of financial backing, facilities and stakeholder participation, providing a stable research environment. The Ministry of Energy, Water and Communications, Malaysia Post Berhad and Warisan Global (WG) (a private company) are responsible for the project. The Malaysian Government aimed to set up 240 centres by 2010 to eventually reach an estimated 2.8 million members in rural communities. The managers of the RICs are full-time employees, but the RIC management committees, drawn from the local communities, are volunteers. The researcher has background knowledge of the region, and the agencies involved in the program have agreed to provide assistance and data for this research.

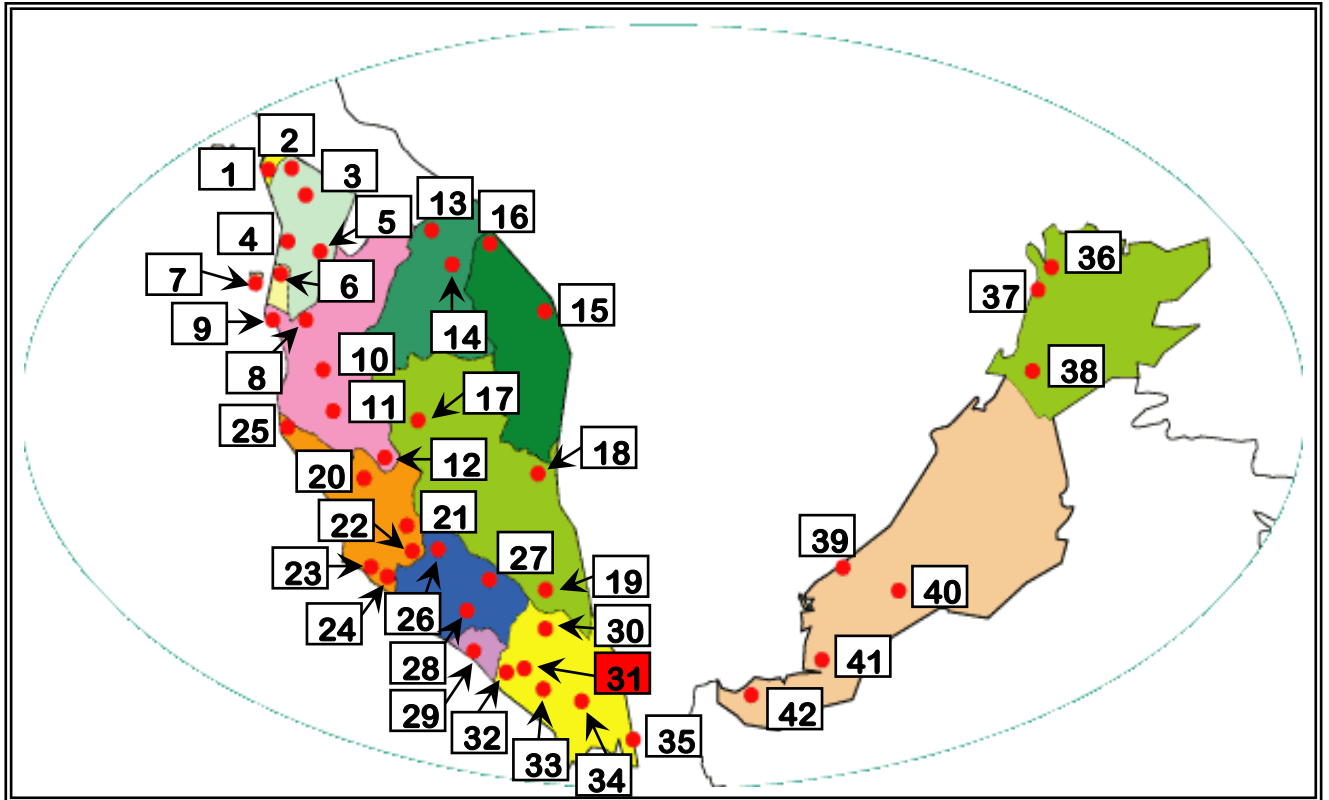


Figure 1.2: RICs in every region/state

The Peninsular consists of eleven states selected for the data collection which were grouped into four regions (excluding Kuala Lumpur and Putrajaya as federal territories), while East Malaysia consists of one region (Borneo) and two states (Sabah and Sarawak, also Labuan as a federal territory).

1.5 Program Objectives and Management

The RICs ICT infrastructure could provide economies of scale to stimulate network building and consequent spill-over benefits. Furthermore, RICs provide access to ICT which may lead to education, employment and business opportunities. RICs also provide a link between ICT growth and economic growth that benefits the poor. Therefore, the RICs can play an important role in enabling the rural poor to gain as many ICT benefits as possible.

The RIC program objectives were to bridge the digital divides between and within communities; hence, to enhance ICT knowledge and skills, to create ICT awareness

among the community and to improve the quality of rural life. The program had four main objectives:

- (1) To increase the rate of ICT literacy and awareness among targeted rural and underserved communities.
- (2) To compensate for low PC and Internet penetration especially in rural areas.
- (3) To provide the digital opportunity to the rural community.
- (4) To serve approximately 2.8 million of the rural population by 2008 (above 17 years old)-(MEWC, 2006).

However, this research was focussed on narrowing the digital skills within rural communities, with the use of RICs to improve the people quality of rural life and this was in relation to these goals. Hence, this study was not testing the number (4) objective.

1.5.1 MICC settings

The major institutional stakeholder was the Ministry of Information, Communication and Culture of Malaysia (previously, the responsible ministry was the Ministry of Energy, Water and Communications). The MICC is the driver of the RIC program. In the first phase, the MICC set the target to achieve basic ICT literacy to targeted groups in rural communities. The second phase was to improve the rural communities' income by introducing and implementing Social Entrepreneurs Clubs (SECs) at each RIC. These SECs would encourage the development of local businesses which would then hopefully increase local income and employment. The third phase was for the RICs to become sustainable and independent. The MICC cooperates with a private company (Warisan Global Sdn Bhd), the Post Berhad, academics, the Economic Planning Unit (EPU), the RIC managers, the RIC management committees, and the local community.

1.5.2 Malaysia Post Berhad

Post office buildings were used for the activities of RICs as the post office is a strategic location for most rural communities and they play a central role in rural communities. The RIC is typically located in an annex building that is next to the post office. The RIC operation hours are similar to the hours of the post office. However, the management and operations of the RIC and post office are different

because of the distinct functions of these two entities. The management of the centre's operations and activities were largely given to the RIC managers and local rural communities. This creates opportunities for the locals to be employed and also provides the opportunity for the acquisition of IT-related skills and qualifications.

1.5.3 Warisan Global Sdn Bhd

Warisan Global is a private company that has worked with the MICC since 2008. WG operated under a contract with the MICC and monitored all 40 RICs. WG created an annual proposal plan for RICs and reported the results from RIC managers. WG's functions included training the RIC managers on capacity building, monitored the RIC activities based on regions, and planned an annual entrepreneurs' festival called Global Entrepreneurs' Week (GEW). Each RIC manager was given a document (manual) for the training and workshops. WG trained the RIC managers and the RIC managers in turn train their community members. This is called the training of trainer (TOT). WG used RIC 'buddies' to monitor the activities in each of the five regions of Malaysia. The five regions are the Northern, Eastern, Central, Southern and Borneo. Therefore the states were aggregated based on these regions (see Figure 3.6).

1.6 Methodology

The methodology used in this thesis was a combination of quantitative and qualitative techniques to collect and analyse data about the effects of RICs on perceptions of their impact on aspects of the QoRL in Malaysia. The research for this thesis was divided into three main stages. The first stage involved an extensive review of relevant literature, and other secondary data such as statistics and government official and managerial reports. This review examined:

- Previous studies of and theories about community informatics, social capital, economic growth, digital divide and quality of life
- The development of typologies to assist rural and community development in the rural areas of Malaysia, and
- Telecentres and the development of RICs in Malaysia.

The second stage involved the primary data collection for this research. The data were from an online questionnaire distributed to 42 RIC sites. From that, 210

respondents/RIC users answered the questionnaire. Finally, the third stage involved data collection through semi-structured interviews with the relevant Director from MICC, the Head of Community Development at WG and RIC managers, ex-users, non-users and management committee members. In addition, the researcher conducted general observation at 11 RICs during visits to the RIC. See.

Table 1.3: Summary of research program.

Table 1.3: Summary of research program

	Research method	Sample	Data	Objective
Stage 1	Literature review <i>Census from statistical department</i>	N/A	Secondary	Review of the literature and then development of an appropriate research design to answer the research issue and hypotheses.
Stage 2	Study 1 – Explanatory <i>Online survey</i>	210	Quantitative	Test conceptual models, answer hypotheses and perceptions of RIC users.
Stage 3	Study 2 – Exploratory <i>Structured interviews, observations</i>	25	Qualitative	Explore the RIC programs and the effects on QoRL.

1.7 Limitations/Delimitations of the Study

There was some delimitation of the scope of this study to ensure that it concentrates on the research questions and objective only. First, the social capital concept applied in this study is limited, drawn from the political science literature and only those aspects that relate to community informatics are considered. Second, only those elements of the quality of rural life that are likely to be influenced by RICs were considered. So for example, the potential health benefits of on-line communication were not considered as this was not yet a target area for the Programme. Finally, field work was limited by time and cost, prior to approaching communities to participate in the research program there was previous contact with the RIC manager in each RIC site or area. Attempts were made to select reasonably representative RIC managers in terms of their geographic locations and their cultural backgrounds. Four of the RICs are situated in the northern region, four in the eastern region, one is located in the southern region, and the other RICs are in the central region. Attempts were also made to compare the demographic characteristics of the communities with those of the entire region where possible so as to avoid any sampling bias.

The issues surrounding cross-cultural communication, with the potential to ask the wrong questions and misinterpret the results of the survey, were of considerable concern. The potential cross-cultural differences were the rural locations and regional areas in Malaysia. These issues were addressed by:

- ensured that a thorough literature review was carried out;
- carried out continued discussions with experienced Ministry officers and staff from WG throughout the design and administration of the survey; and
- conducted a face-to-face interviews with the RIC managers to provide background information and assist in the validation of the interpretation of the survey responses.

1.8 Thesis Structure

This thesis comprises seven chapters. The background of telecentres, ICT and community development, the digital divide, and the concept of quality of life were reviewed in Chapter 2, together with theories on community informatics and social capital as they may relate to rural development. Relevant studies that have focused on telecentres in other developing countries are also discussed. In Chapter 3, details about the methodologies used for the surveys and analysis of the responses were described and discussed. In Chapter 4, the key findings from the initial interviews and surveys were reviewed and discussed. These findings were in relation to RIC inputs and outputs. The responses to the key stakeholder interviews and their analysis were presented in Chapter 5, and the RIC users' responses to the survey (findings regarding RIC outcomes) were also discussed. Chapter 6 discusses the results in the context of the program logic designed for the purpose of this study. In the final chapter (Chapter 7), the conclusions and implications of the study findings for the development of RICs in Malaysia were discussed, and recommendations are made for future research on this topic.

1.8.1 Definition of core terms

The following terms were used throughout this thesis for the purpose of this study:

(1) **Telecentre**- Pigg (2003) and Davies et al. (2003) defined telecentre as community technology to promote ICT as a tool which provide variety of activities, facilities and services for community members. In addition, telecentre is an accessible centre that

placed technology and connectivity within practical physical reach of community members; it must be conveniently located within the community, provide affordable computer and internet access at low or no cost (Prado and Janbek, 2013). A *telecentre* is a community centre where people use, access and perceive the benefits of the centre. It is a multi-purpose centre in which ICT is the overarching tool utilised by the users and indirectly the local community.

(2) ***Quality of rural life*** is a dimension similar to the concept of wellbeing and is a function of rural people's life circumstances which includes economic dimension and social networks. In addition, the quality of life in rural areas also has subjective wellbeing dimensions, determinants and policy designs on its specific domain (Cagliero et al., 2011). *Quality of rural life* is a composite of a number of factors, assessed by particular indicators. The main indicators relevant to this study are thought to be income, education level, strong and weak ties of social capital, employment and entrepreneurship.

(3) ***Community informatics*** "...is the application of ICT to enable and empower community processes. The objective of community informatics is to use ICT to enable the achievement of community objectives including overcoming "digital divide" both within and between countries...to support local economy development, social justice and political empowerment using the Internet... (Gurstein, 2007)" *Community informatics* is an approach and theory about the role of ICT in local economic and social development.

(4) ***Social capital*** is a theoretical concept, features as social organisation, bonding capital and bridging capital, thus, build relationships on human capital attributes (skills, knowledge). Community informatics contributes to and benefits from social capital. This is the result of community interaction and connections that are actively engaged in specific communities that could be found in rural communities (Williams and Durrance, 2008). *Social capital* is a multi-disciplinary concept, with variations in the disciplines of sociology, psychology, political science and public policy. Specifically to this study, social capital is the sum of community resources and behaviours that may enable and be enhanced by community informatics. There are three forms of social capital: 1) bonding capital, 2) bridging capital and 3) local community association. Bonding capital refers to links within each RIC community

(internally), whereas bridging capital refers to links to other than the RIC community or to other communities in other places (externally). Thus, local community association refers to community with strong associational life within a group or club and informal association through events/festivals that reflect a community's values and interests (community cohesiveness).

(5) ***Bridging the digital divide/gap*** describes “the fact that the world can be divided into people who do and people who don't have access to...and the capability to use...modern information technology, such as the Internet” (WhatIs.com, 2005). The digital divide exists between those in cities and those in rural areas. Therefore, to bridge the gap, the access improvement and skills development are essential especially at rural telecentres. *Bridging the digital divide/gap* is the main goal of the RIC program. As discussed earlier, the RIC goal is to bridge the digital divide between urban and rural communities. For this study, the goal is interpreted more specifically as improving digital skills between users and within RICs.

(6) ***Rural development*** is the overall development of rural areas to improve the quality of life of rural communities. Robert Chambers defined “as a strategy that enable a specific group of community to benefit for themselves more of what they want and need” (Agriinfo.in, 2011). *Rural development* here refers to improvement individual and local community quality of life. In this study it involves improving the quality of rural life through the initiative of the government to introduce and implement telecentres such as the RICs to the rural community. As an outcome, these people will not only develop themselves, but develop their community as well.

(7) ***The program logic model*** is a logical framework and a tool used most often by evaluators of programs to evaluate the effectiveness of a program. The model is a logical relationship between inputs, outputs and outcomes of a program (W.K. Kellogg, 2004). *The program logic model* is a mind map to enable program evaluation, based on expected causation, from state action through to program outcomes. For this study the focus is on: (1) inputs – including individual/RIC users, program managers, technology and physical environment; (2) outputs – RIC usage, ICT-based services (training and workshops), Social Entrepreneurs Club and the Global Entrepreneurs' Week (GEW); (3) intermediate outcomes – computer

skills, employment and business opportunities; (4) ultimate outcomes – social capital, economic benefits and quality of rural life.

(8) ***RIC end-users*** are the end-users who understand most clearly what applications or uses would be most beneficial in particular local contexts (Gurstein, 2003). In this context, they are the users who use the RIC. *RIC end-users*: utilise RIC facilities and services. *RIC non-users*, who are also included in the study, are those who are aware of the RIC but are not RIC users, including ex-RIC users.

(9) ***Program managers*** is the involvement of managers in a program of continuing training and at a telecentre, the managers are involved in operational activities, planning, implementing, monitoring and decision making (Murray et al., 2001). *Program managers* include personnel from the Ministry of Information, Communication and Culture and Warisan Global, RIC managers and RIC management committee members. MICC, WG staff and the management committees support and cooperate with RIC managers to make sure that they deliver the RIC program successfully. RIC managers are the operational managers who run the centres and are responsible for the overall administration of the RIC program.

1.9 Conclusions

This chapter introduces the research problem, general research question and hypotheses investigated in this study, as well as the methodological approach and background to the overall thesis structure. In summary, this study examines the RIC program in rural Malaysia, to determine whether the RIC program is working effectively or not from the perspective of RIC end-users and program managers. Overall, the research gap is whether the people perceive that there is an improvement in human and social capital as a result of the RICs. Thus these contribute to perceived effectiveness of the RIC program and improve in digital knowledge and skills in rural Malaysia. Furthermore, develops study on building social capital through community informatics.

As discussed, this study applied the combination of quantitative and qualitative methods. The quantitative method consists of online survey and government statistical data, while the qualitative method applies interviews, observation and

government reports. The limitations were the social capital concept is restricted to the community informatics aspect; the elements of quality of rural life are those that influence RICs and the constraints of the methodology in terms of field work as well as interpretation of survey results.

An outline of the relevant literature and theories applied in this study was provided. The conceptual framework and RIC model designed to empirically study the RIC program are described. The limitations of this study were acknowledged and the core definitions used throughout the study were provided. The next chapter will discuss thoroughly the relevant literature and theories applied in this study, linking the RIC conceptual framework using RIC program logic model.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This chapter discusses the theories and practices that will inform the development of the research objectives and questions investigated in this study. The aim of the chapter is to develop and explain a conceptual framework for the study and critically review literature on theories and practices in order to lay the ground work for the hypotheses and methodologies. The main research question is: “*How do Rural Internet Centre users and stakeholders perceive the effect of the RIC on quality of rural life?*” Figure 2.1: Literature review sequence provides an overview of the structure and flow of the chapter. First, some possible theories are discussed and some are selected as guides for the study and development of the theoretical or conceptual framework.

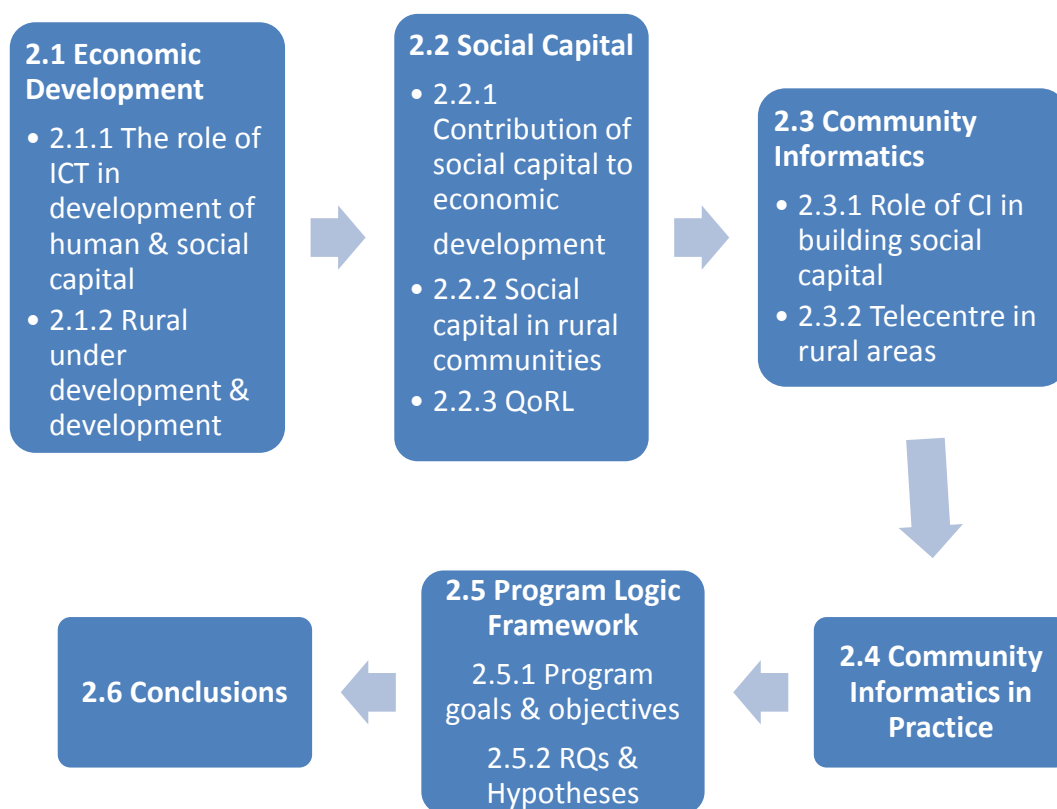


Figure 2.1: Literature review sequence

2.1 Economic Development

Economic development in this context refers to the growth of an economy so as to enhance the living standards of a community. The economic development here refers to the development of the economic base of communities with the involvement of multi-stakeholders (Pigg, 2003), which is conventionally measured in terms of jobs and income, but is also linked to improvements in human development and education, through efforts focused on quantity and quality of employment and an overall improvement in the quality of life. Quality of life can be difficult to define and measure, given differing individual perspectives on what is required for a good life and so conventional economic measures and theories have prevailed.

In neo-classical theories, economic growth is conventionally measured with a production function of outputs relative to the amounts of input and most basically the key inputs are capital and labour. In their seminal works, Harrod (1939) and Domar (1946) explain what factors determine technological change, treated in neo-classical theories as an exogenous variable, which enables an increase in productivity (output per person). Solow's (1957) Cobb-Douglas function is widely used to represent this view of the relationship.

$$y = A k^{\alpha} h^{1-\alpha}$$

where y is output per worker

A is productivity

k is physical capital per worker

and

h is human capital per worker.

Technological progress is captured as a change in value of A and so an improvement in technology will mean that for given quantities of physical and human capital, there will be an increase in output. This is because technology changes the way in which factors of production are combined to produce output (Hess and Ross, 1997).

Solow (1957) addresses the diminishing returns to capital and labour, and views technology as exogenous and a continuous factor of production and a set of knowledge. That is, information is assumed to be universally accessible and the same production functions are used by all economies, hence, investment will inevitably

flow to less developed countries, where labour costs might be lower, and output will increase over time. Technology can, therefore, be used to increase the capital-labour ratios and close the per capita income gaps in developed countries or regions (Van den Berg, 2001). Thus, from this model for example, Internet access and computers could be a change in factor A, enabling an increase in output, and a change in factor h through increasing the value of human capital within a community or regional economy.

In the late 20th century, technological knowledge became recognised as one of the most important sources of economic growth. During this period, Romer (2007) and others started to treat technology as endogenous. That is, countries could facilitate technological change to directly affect productivity and growth. Romer focuses on two main factors: knowledge and technology. As factors of production, these have considerable advantages over labour and capital as drivers of growth because they can demonstrate increasing returns. In this “new growth theory”, diminishing returns are the result of the scarcity of objects, or physical capital. Therefore, the important difference between objects and ideas is that ideas are not scarce. From ideas, knowledge can be enhanced and knowledge is subject to increasing returns because it is a non-rivalrous input (Temple, 1999). New growth theory challenges the neoclassical model in many important ways. As Romer (2007) states, physical capital and/or human capital is ultimately subject to diminishing returns; economies cannot grow simply by adding more of the same kind of capital. Thus, developing countries such as Malaysia, where there has already been considerable industrialisation, can benefit from technology and knowledge enhancement.

The same principles would apply in a local or regional economy, so that technology added to capital and labour could facilitate growth and it has been argued that governments can provide telecommunication infrastructure to facilitate such development (EDA, 2011). More specifically, telecentres are expected to lead to increased opportunity for employment through building IT-based skills (Rothenberg-Aalami and Pal, 2005, UNESCAP, 2006, Bailey, 2009). In addition telecentres may also have a role in developing the skills of local entrepreneurs so they can create businesses that add to local and regional economic growth (ICMA, 2010). This concept of ‘economic gardening’ was pioneered in Littleton, Colorado in 1989, with

a focus on nurturing local entrepreneurs rather than “hunting and gathering” investors from outside the region (Hamilton-Pennell, 2008). The philosophy for Littleton’s economic gardening program was the belief that “small local entrepreneurial firms would be the engine for the creation of sustainable wealth and new jobs, and the role of the city administration was to provide a nurturing environment within which these small firms could flourish” (Quello and Toff, 2006). This approach is supported by the three pillars of: (1) competitive information, (2) physical and quality of life infrastructure, and (3) connections among and between businesses and the education sector, government programs and business services providers (Hamilton-Pennell, 2008) and hence there is a potential role for communications technology in facilitating the ‘gardening’. Other states in the US have adopted the Littleton approach, including Georgia, where a program drew upon the “lessons learned” in Littleton. Here it was found that there were benefits in having specific programs; for example: (1) access to market information (through a market research project), (2) infrastructure (through the Entrepreneur and Small Business Coordinating Network (ESBCN) and the Entrepreneur Friendly (EF) Communities initiative), and (3) connectivity (through a mentor-protégé program) (Quello and Toff, 2006).

2.1.1 The Role of Information and Communications Technology (ICT) in development of human and social capital

If a region or country is rich with information, then higher levels of knowledge in the region should follow. Therefore, with the use of ICT, a region or country could theoretically move from a resource-based economy to a more knowledge-based economy. In addition but strongly related to ICT, education is another key determinant for long-term economic growth and sustainable development. Better education tends to lead not only to higher individual income, but also promotes a country’s aggregate level of economic growth through increased innovation and, therefore, productivity (IIASA, 2008, Woodhouse, 2006, Harris, 2007). The benefits of education can initially help a country overcome poverty (IIASA, 2008). Easterly (2002) asserts that there are two areas that are likely to lead to the desired economic growth in developing countries: (1) utilisation of advanced technology, and (2) education that leads to high skills in technological areas. Effectively, the provision of information and education, abstract and applied, is increasing the potential value of

the human capital already available, and this increase in value will contribute to both employment prospects and entrepreneurial skills. This process of adding value is summarised in

Table 2.1: Theories of capital (adapted from Lin (2001)).

Human capital is defined as “the knowledge, skills, competences and other attributes embodied in individuals that are relevant to economic activity” and the key variables of human capital are education and training (OECD, 1998) p. 9). Lin (2001) however, also thinks that human capital can be considered alongside social capital and since the latter is derived from social networks or relationships, it should also be a factor in determining quality of life. The OECD (2002) defines social capital as the social network and norms that are embedded in a community and that enable the individual or group to cooperate to achieve desired objectives. The potential importance of social capital will be further explained and considered in the next section, following some discussion of a particular form of underdevelopment – rural poverty.

Table 2.1: Theories of capital (adapted from Lin (2001))

Types of Capital	Explanation	Capital Investment	Level of Analysis
(1) Human Capital	(1) Accumulation of surplus value	(1) Investment in technical skills and knowledge	Individual
(2) Social Capital	(2) Access to and use of resources embedded in social networks	(2) Investment in social networks	Individual

2.1.2 Rural under-development and development

In most developing countries there is a wide socio-economic gap between rural and urban areas which results in the relative under-development of rural areas. This gap then becomes a larger problem because, as Olanrewaju and Falola (1992), p. 13) state, “National development is impossible without a successful transformation of the rural areas”. Under-development in rural areas is manifest in: (1) poverty; (2) lack of education; and (3) poor medical care (Adolfo, 1999) and an understanding of rural poverty is a precondition for effective pro-poor development strategies (Anyanwu, 2005).

Rural poverty

Poverty is the overriding problem in under-developed rural areas and can be directly addressed by providing for the basic needs of the rural population (Barro and Sala, 1995) or more indirectly and perhaps sustainably, by providing the means to secure those needs. According to Singh (2006) (see Table 2.2: Factors contributing to rural poverty), there are eight characteristics of the rural sector that contribute to poverty: (1) a low capital-labour ratio; (2) excessive dependence on nature; (3) small uneconomic farm land areas; (4) low factor productivity; (5) low gestation and low rate of turnover; (6) high incidence of poverty and unemployment; (7) a preponderance of illiterate and unskilled workforce; and (8) a lack of basic infrastructure. The UNDP (2004) identifies seven critical factors that contribute to developing countries' high poverty levels: (1) lack of income; (2) lack of access to basic necessities; (3) social, political, and economic exclusion and isolation; (4) lack of marketable skills and exposure to technologies; (5) lack of property ownership rights and access to credit; (6) vulnerability to environmental risks, natural disasters, and other poverty risk factors; and (7) erosion of indigenous cultures, values and social support networks (see Table 2.2: Factors contributing to rural poverty). The scope of this study mainly covers UNDP factors (1) and (4) but addresses (7) through consideration of social capital (see next section).

Chambers (1983) argues that rural development is “a strategy to enable a specific group of people, poor rural women and men, to gain for themselves and their children more of what they want and need. It involves helping the poorest among those who seek a livelihood in the rural areas to demand and control more of the benefits of rural development”. Chambers further explains that rural development is “a process leading to sustainable improvement in quality of life of rural people, especially the poor”. Policies that contribute to enhanced human capital, employment opportunities, knowledge of economic opportunities and engagement worldwide could allow the population to initiate and sustain improvements in the quality of rural life.

Table 2.2: Factors contributing to rural poverty

Studies	Factors of rural poverty
Dyson (2007)	Lack of jobs
Barro & Sala-Martin (1995)	Lack of basic needs
UNDP (2004)	Lack of income, lack of access to basic necessities, social, political, and economic exclusion and isolation, lack of marketable skills and exposure to technologies, lack of property ownership rights and access to credit, vulnerability to environmental risks, natural disasters, and other poverty risk factors and erosion of indigenous cultures, values, and social support networks.
Singh (2006)	Low capital-labour ratio, excessive dependence on nature, small uneconomic land, low factor productivity, low gestation and low rate of turnover, high incidence of poverty and unemployment, preponderance of illiterate and unskilled workforce, and lack of basic infrastructure.

Rural development policy in Malaysia

Malaysian governments have addressed development through a series of national plans, with the difficulties of providing basic infrastructure recognised during the Ninth Plan (9th Malaysian Plan, 2006) period. In 2009, 36 percent of Malaysians lived in rural areas and so access to basic infrastructure, including ICT infrastructure, was viewed as necessary for improving the quality of rural life (EPU, 2010a). There were five key objectives for rural development in Malaysia (EPU, 2009): “(1) To intensify development in rural areas and narrow the economic gap between urban and rural areas; (2) To increase market access of the rural community to generate better income through various cottage and craft industries; (3) To provide better access by the rural community to ICT and new technologies and improve farming practice; (4) To expand and increase credit facilities for agriculture related trade and services; and (5) To further improve the quality of life of the rural population through increasing physical and social infrastructure, as well as to improve rural health and education facility”. This study focuses on key objectives 1, 3 and 5 and in particular the potential for RICs to provide basic ICT infrastructure to rural communities in order to improve the quality of life through better physical and social infrastructure, leading to improvements in human, social and economic capital.

2.2 Social Capital

Social capital (SC) is the networks and norms that enable collective action (World Bank, 2002). It is a “stock” to which society could add through the development of social networks, both informal and formal. However, social capital is not property; it

is a resource accessible to all in a social network and it is not formally excludable but individuals can for various reasons have difficulty in accessing it. Some argue that when a society invests in social capital, this will generate externalities for individuals through social networks (Herreros, 2004). The concept of SC is complex because it involves a multi-disciplinary approach to various applications. For some, SC includes “resources that are linked to networks of more or less institutionalised relationships” (Bourdieu, 1986). Another view is that SC is “defined by its function with different entities having two characteristics in common” (Coleman, 1990) and these are the “features of social organisation such as norms, networks and social trust” (Putnam, 1995a). The networks are the obvious sign of social capital but Putnam (2000) defines it mainly in terms of trust and participation. Regardless of the disciplines/approaches, elements of SC that are widely agreed upon by scholars include social networks, trust, and norms of reciprocity (Yang et al., 2009).

Sabatini (2005) describes SC as the norms of reciprocity within social networks bonding similar people and creating relationships between diverse people. According to this view, social capital has three main dimensions: bonding capital, referring to strong family ties; bridging capital, referring to weaker ties among friends and acquaintances; and more formal ties linking members of voluntary organisations. Furthermore, bonding capital is usually associated with strong ties within a limited group and bridging capital is associated with loose ties across communities (Leonard and Onyx, 2003). Such social connectedness can vary from bonding to bridging arrangements. The Internet could contribute to bridging capital as it connects people to other communities and networks, while the actual community centre could contribute to the bonding capital through the creation of another social space. These concepts are important when considering communications programs, since ICT can be used to facilitate all three lines of communication and organization. In particular, for rural communities, especially isolated ones, ICT enables the formation of bridging ties beyond face-to-face relationships. Coleman (1988, 1990), a contemporary social capital scholar, emphasizes the relationships between social capital and human capital; thus regarding social capital as a source of educational benefits. Putnam (1993, 1995b, 2000) extends the concept to the community level (collective). He focuses on civil society, namely, “people’s connection with the life of their community” (p. 665) and emphasizes that a community with strong

associational life will demonstrate a high level of social capital, which is evident in local organizational arrangements. In addition, Fukuyama (1995) stresses the necessity of trust and the relationship between a high level of social trust (high social capital) to high levels of economic benefits.

Woodhouse (2006), p. 70) defines social capital as “resources available to people when they associate and network, and there is a willingness of the people within the community to help them”. The features/elements of social capital explained by Woodhouse are the building blocks of social capital. These include (1) features of society (such as formal association, community cohesiveness, and neighborhood and family connections); and (2) behaviors of society (such as trust and reciprocity). Coleman *et al.* (1990, 1995, 2000, 2006) and Pigg and Crank (2004) identified the elements of social networks contributing to social capital as trust, reciprocity, human capital (education, training), bonding and bridging capital, community cohesiveness (local community association) and economic development (benefits). The trust element here refers to social trust, that is, having confidence in and trusting other people even if they are people we do not know (such as online contacts / relationships). Here, reciprocity refers to information exchange and other forms of support (such as social support) (Blanchard and Horan, 1998). Building further on these elements, community cohesiveness is evident in informal association such as through events or festivals that reflect a community’s values and interests (Woodhouse, 2006). Portes (1998, 2000) points out that views on SC vary depending on whether the theories refer to individual or collective SC. The distinction between individual and collective SC can be described as follows:

1) Individual SC (Yang et al., 2009)

Bourdieu (1986), Coleman (1988, 1990), Lin (2001) and Burt (2001) studied the phenomenon of SC from the individual’s perspective with a focus on individuals as the unit of analysis and examining the benefits to individuals from relationships with others. This explains that individual SC is define as measuring the individual relationships within community or outside community that focus on individuals as a resource available for collective action.

2) Collective SC (Yang et al., 2009)

Putnam (1993, 1995b, 2000) and Woolcock and Naryyan (2000) extended the concept of SC from an individual to a collective (community). Putnam (2000) argues that SC is a community-level resource and social network has value, and this has led to the concept of “collective SC”.

Coleman (1990) states that social capital is a social structure that facilitates actions performed either by individuals or collectives (such as in a group or community). This supports the idea explored in this study, that an RIC could facilitate social structure either through individuals, collectives, or both.

Moreover, views on the role of social capital depend on whether SC is considered to be a dependent variable or an independent variable (Markus and Robey, 1998). That is, particular social activities may lead to an increase in the stock of social capital or a higher stock of social capital may mean there will be more active networks and relationships or there is a feedback loop with more activities leading to more social capital and this in turn leads to more activities. Studies on SC, relevant to this thesis, consider the impacts of ICT on building and maintaining SC. The impacts are evident at both the individual and collective levels. Yang *et al.* (2009) point out that previous studies have tended to focused on the effects of social capital as an independent variable on the development and use of ICT. The implications for this study of the approaches to SC as a dependent or independent variable are described as discussed below.

Previous studies suggest that the spread of ICT creates networking infrastructure and this encourages the formation of SC and there is a relationship between Internet use and SC in forming social and personal trust (Pierce and Lovrich Jr, 2003). However, some studies argue that ICT can cause de-individuation. This is the feeling of being isolated from others when interacting with people via a computer (Loch and Conger, 1996). SC can also change perceptions about the way a community lives. For instance, previous studies also regard SC as the combined attributes that affect an individual’s acceptance and involvement in diffusion and ICT usage. This relates to the use of ICT through communication channels/media which an individual perceives that others expect the individual to adopt or continue to use ICT. Additionally, SC is seen as a feature of communities and previous studies (Yang *et al.*, 2009, Cagliero *et al.*, 2011) have examined the effect of SC on ICT adoption,

acceptance and use in communities. SC increases the ability to build and use informational capital because trusting relationships facilitate information flows and make information more meaningful (Fountain, 1997). This study starts with the possibility that social capital is both a dependent and independent variable.

2.2.1 Contribution of social capital to economic development

There is disagreement about the impact of social capital on economic development, let alone the quality of life. Based on economic performance, cross-country comparisons support the proposition that social capital has a positive association with economic growth (Knack and Keefer, 1997). Woodhouse (2006) states that a community with high levels of social capital will have high levels of economic development. His study on social capital and economic development in regional Australia (2006) confirms that a town with relatively high social capital will experience a high level of economic development and vice versa. This point is supported by Lutz (2005), p. 19), who states that “social capital has a robust positive influence on income and interaction of social capital with human capital have positive impact on economic development”. These positions are consistent with Fukuyama’s (1999) view that a community with high levels of trust will create more social capital and achieve a high level of economic growth.

In contrast, Sabatini (2007, 2008) argues that the role of social capital on economic development differs according to the three dimensions of social capital, namely, bonding, bridging, and linking capital. Sabatini’s findings provide empirical evidence that bonding capital and strong family ties show negative influence on human and economic development. One explanation might be that communities with strong bonds are insular and resistant to changes and some disruptions may improve economic outcomes. However, through bridging and linking capital, and strengthening weak ties, people can benefit from the social participation process as the ties are connecting friends, neighbours and people belonging different socio-economic backgrounds. This explains that strengthening weak ties should be built in communities and expands the relationships in the long run. Casey and Christ (2005), p. 843) support the argument above that “higher social capital was shown to be positively related to lower income inequality”.

The complexity of the relationship between social capital and economic development is evident in theoretical and empirical studies. Therefore, this study on RICs will further examine the association between perceptions and measures of social capital and perceptions of economic opportunities from the RICs. Figure 2.2: Association of economic development and social capital suggests a possible association between economic development and social capital in this study. This association could lead to improvements in the quality of rural life, rural development and rural social capital (SC). Further discussion of these theories is provided in Chapters 5 and 6.

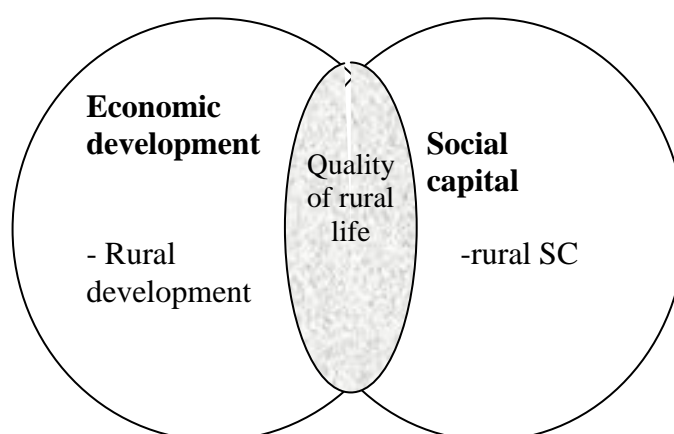


Figure 2.2: Association of economic development and social capital

2.2.2 Social capital in rural communities

Social networks see a community as people and the relationships between them. The relationships or ties differ: they are concerned with the sharing of resources and/or exchange of support; they may be ties of kinship, friendship, acquaintanceship, shared workplace; they may be weak or strong (Granovetter, 1986). Rural communities have a diversity of networks that link groups with different characteristics (Flora et al., 1997).

Rural communities that are high in social capital tend to have a diversity of age, gender and cultural composition (Center for Community Enterprise, 2000) and all these factors can be examined in the target communities for the RIC program. The extent to which social capital exists in a community may be a critical factor in the community's receptiveness to informatics initiatives and its acceptance of the technology and, consequently, the likelihood of the community informatics initiative succeeding and being sustained (Mannion, 1996). Figure 2.3: The interrelated

concepts applied in this study illustrate how social capital, community informatics and economic development may overlap and be interdependent.

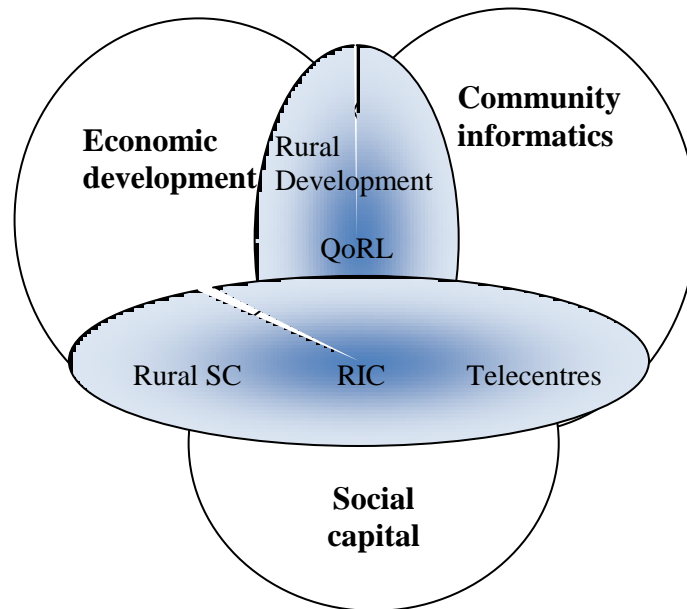


Figure 2.3: The interrelated concepts applied in this study

Figure 2.3 highlights the relationships between social capital, community informatics and economic development. The intercepts presumably result in rural development and improving the quality of rural life. This promotes the idea of rural social capital (SC) at RIC (as a telecentre) indicates how the model and framework can be applied to the RIC concept.

2.2.3 Quality of rural life

There is no particular standard definition on how to define quality of life (QoL). Many studies have left it to individual researchers to define what it means with reference to their topic and consideration of their method of measurement (Best, 1996). The quality of life as a construct yields more than 100 definitions in the literature. Cummins (1995) discusses both the objective and subjective dimensions of quality of life. Objective QoL indicators include income, education level and rates of employment/unemployment; while subjective QoL indicators are the level of the social interaction, relationships, networks, community involvement (social capital)

and entrepreneurship. ICT for development research is now focused on utilizing ICT benefits on the QoL of rural communities, especially in developing countries. However, studies of the perceptions of how ICT has provided social benefits and the study of ICT utilization and use toward improving QoRL are limited (Kivunike et al., 2011).

Kivunike *et al.* (2011) point out that in developing countries, efforts have emphasized maximising ICT benefits to lead to improved QoRL. A study in Uganda on rural communities' perceptions of the role of ICT in improving their QoRL showed perceived social benefits and increased ICT usage leading to improvements of QoRL. The study also suggested that there was limited awareness of the potential of ICT to lead to improvement of QoRL (Kivunike et al., 2011). Cummins (1995) confirms anecdotal evidence that economic benefits and social capital contributions are the source of QoRL that bring benefits to a rural community. This evidence supports the research on Ugandan rural communities' perceptions of the role of ICT on quality of life, which found that indicators of better/good life (QoRL) were identified in regard to three dimensions: (1) economic opportunities, (2) social facilities, and (3) political freedom (Kivunike et al., 2011). As noted earlier, this study focuses on the economic benefits and social capital, since considering and measuring perceptions of political freedom would be beyond the scope of this study. Moreover, International Telecommunication Union (2011b) initiatives in promoting ICT to rural communities also contribute to improved QoRL. These objective and subjective indicators are highly relevant to this study and very much applicable in determining RIC outcomes. Moreover, this study focuses specifically on the quality of rural life, as it involves the rural communities in Malaysia.

The individual perspectives on QoRL refer to the domains of being, belonging, and becoming, and their important sub-domains: satisfaction and opportunities (Proenza et al., 2001, 2013). This study relates to physical, social and community belonging (such as the local community, RICs, family, friends, intimate others, adequate income, employment, educational programs, community events), practical assistance, and growth domains (such as volunteerism, activities that promote improvement on knowledge and skill, adapting to change). These individual rural communities may

find importance, satisfaction and opportunities within these domains as applied to their needs and a better life (Quality of Life Research Unit, 1991).

In conjunction with the World Telecommunication and Information Society Day 2011, the International Telecommunication Union (ITU) made worldwide initiatives promoting a better life in rural communities with ICTs (ITU, 2011b). It called upon all stakeholders to promote the adoption of policies and strategies that will promote ICTs in rural areas to contribute towards a better quality of rural life. Indeed, the aim of the Malaysian Quality of Life (MQoL) is to measure the impact of development projects and programs on people's wellbeing. Currently, as in the past, it continues to give consideration and place emphasis on the national development plans, including the Tenth Malaysian Plan (EPU, 2010b).

2.3 Community Informatics

This section discusses some of the relevant theories on community/individual development in relation to ICT. There are some existing models from the field of Information Systems that relate to similar ICT-based innovations, namely, community informatics (CI), information centres, and end-user computing. These models are examined to establish how they might be adapted to the community-based innovations represented by RICs. A research focus on end-user computing includes consideration of the influence of users' characteristics on satisfaction with a service such as an RIC. These characteristics include: (1) demographic variables; (2) attitudes to computers; (3) training and education; (4) involvement with the systems development; (5) expectations for end-user computing; and (6) computer anxiety (Bergeron et al., 1990). This suggests that user characteristics are determinants of outcomes from computer use and this will be explored in this thesis.

As discussed, community informatics is not just a technical issue which focussed on instrumental approach of technology, it is more than that - it is a deeper and broader understanding of socio-technical issues (Bradley, 2006). This is consistent with Gurstein's broader understanding of the multi-dimensions of CI, include community development, policy studies and public administration, ICTs for development (Gurstein, 2008). Gurstein recently suggested a broader conception of the CI agenda:

“...a commitment to universality of technology-enabled opportunity...; recognition that the ‘lived physical community’ is at a very centre of

individual and family well-being-economic...; a belief that this can be enhanced through judicious use of ICT; ... user-focused understanding of IT; ...entrepreneurship and creativity”(Gurstein, 2008, Heeks, 2002)p.12.

Community informatics is a technology strategy which links economic and social development efforts at the community level with emerging opportunities in areas such as telecentres. Community development is about building capacity by improving skill and knowledge for individuals and the community as a whole (Gilchrist, 2004). The United Nations (1959) stated that community development means:

the processes by which the efforts of the people themselves...to improve the social, economic and cultural conditions of communities,...the participation by the people themselves in efforts to improve their level of living with reliance as much as possible on their own initiative, and the provision of technical and other services in ways which encourage initiative, self-help and mutual help and make them more effective.

The emphasis is placed on the community as a social network, bounded by geographical location or common interest (Talbot and Verrinder, 2005). Most practitioners think of community development as an outcome, namely, physical, social and economic improvement in a community (Phillips and Pittman, 2008). Abu Samah and Aref (2009) adapted the community development approach from Phillips and Pittman (2008) and explained that the outcome of community development contributes to community capacity building, as well as economic development in local communities.

The Malaysian Government plays an active role in rural community development through the Ministry of Rural Development. There are various agencies involved, such as the Community Development Division of the Ministry of Rural Development (KEMAS) and the Federal Land Development Authority (FELDA)(Selvaratnam and Tin, 2001). Rural community development in Malaysia is across two levels: (1) the policy level, where community development means the programs are developed by government and are aimed at improving and developing communities which, in turn, contributes to national development and; (2) the implementation level, aimed at achieving the programs' objectives, and where community development is an approach to encourage a community's participation in those programs (Shamsul, 1986).

Mason (2001) contends that community informatics is the application of technology to enhance and support social structures. As such, the application can be used to improve the quality of life of the users. Community informatics is also a strategy to create new patterns of usage that are community-based and which concentrate on improving life at the community level. Studies in community informatics show how the use of ICT can address the challenge of achieving economic and social development. Community informatics is seen as one means of overcoming digital divides both within and among communities (Gurstein, 2000). This encompasses not only access to the Internet, but also access to ICT within the different segments of society (Internet World Stats, 2010). As implied in the growth theory discussion, regions with more advanced technology will have greater growth potential.

Community informatics focuses more specifically on the relationship between communities and information technology and how information technology can be designed and redesigned and used for the benefit of the community (Roux, 2010). With advancements in community informatics, the use of ICTs as a tool for assessing and retrieving information for socio-economic development is becoming more mainstream. Access to and use of ICTs however, remains extremely inequitable between rural and urban areas and this is a challenge in the process of socio-economic development (Songan et al., 2004). Previous research on community informatics indicates that indicators for measuring the impacts of community informatics projects include: 1) social capital; 2) individual empowerment; 3) sense of community; 4) economic development opportunities and; 5) strong democracy (O'Neil, 2002).

2.3.1 Role of Community Informatics in building social capital

Simpson (2001) introduced a community informatics initiatives framework built on physical infrastructure, soft technologies, social infrastructure and social capital. All of these components are key components in the development of telecentres and explain the need and importance of community informatics implementation at RICs, and the role of social capital interplay in the rural community.

The first component of a telecentre is the physical infrastructure, which includes its location, the telecommunication infrastructure and computers. The access point is where the local community/users interact with the technology and use it in diverse ways to meet differing rural community needs (Simpson, 2001). The second component is the soft technology, which includes basic ICT training, awareness programs, and ICT-related workshops based on target group categories. These activities are for the purpose of building community capacity and developing knowledge and skills to maximise the use of ICT and to promote the community informatics initiative. The third component, social infrastructure, which in the case of the Malaysian RICs, includes a Social Entrepreneurs Club (abbreviated as SEC but better known as KUSPID), events such as the RICs' Global Entrepreneurs Week program and other community service associations or networks such as BELIAWANIS (the female youth network), PUSPANITA (the women's association), RUKUNTETANGGA (the community volunteerism association). These enable individuals and groups to interact and/or build networks with one another. The final component, social capital, includes the intangible resources from interaction and involvement in the local community (both within RICs and outside RICs) such as a strong sense of community and relationships (Simpson, 2001).

Extending CI initiatives serves to strengthen social networks and increases community/rural social capital (Williams and Durrance, 2008). Kavanaugh *et al.* (2005) claim that heavy Internet users with bridging ties are more socially engaged and have more local community association since going online than those without bridging ties. This is similar to a study of a youth-serving telecentre in a rural area of the UK, which found that it was the weak ties in the community that supported the technology centre and helped it serve the community (Williams and Durrance, 2008).

The social capital concept in this study is understood as an outcome of accessibility, interaction and involvement networks through the RIC. The initial point is the RIC as a social network when individual users come and visit the RIC; they had established and built valuable relationships and networks within the rural communities and beyond. As a result of the growth of social capital, rural community members exchange and share information, build increased social and business contacts, and extend their existing networks and/or create new relationships or networks.

Onyx and Bullen (1997) claim that social capital cannot occur in isolation by individuals, but is generated in a group or community forming new associations and networks or expanding existing ones. Hence, in view of the perspective that social capital plays a role in community informatics initiatives and community development, participation or involvement in community activities extends social networks and leads to greater social capital. On the other hand, the uniqueness of community informatics relies on its interactive technology and informal communication, as the technology makes possible the strong ties, networks and diversity that can emerge from increased interaction and involvement in the rural community – as in the case of an RIC. Thus, social capital can contribute to and result from community development processes through community informatics initiatives.

2.3.2 Telecentres in rural areas

Raul and Colle (2002) explain that a telecentre is a public connectivity where people can access a variety of communication services, with a major part of its purpose being to benefit the community. The history of telecentres commenced with the idea of a community sharing computers in the 1980s and the introduction of a telecottage in Scandinavia prior to the Internet (Raul and Colle, 2002). In the mid-1990s, a new breed of telecottages appeared in Hungary, built around social and economic development, computers and the Internet. The 20th century generated a variety of international organisations supporting the diffusion and adoption of ICTs and telecentres (Raul and Colle, 2002).

Due to the digital divide and technology obsolescence, all telecentres are struggling to maintain and secure their technology and equipment (Attwood and Braathen, 2010). Some telecentres in South Africa, for example, are experiencing a lack of functioning computers and slow Internet connections. The telecentres also experience disconnections from the Internet, sometimes for months at a time (Attwood and Braathen, 2010). The ITU (2011a) reports that the quality of Internet access speed is a relevant factor for the purpose of accessing Internet activities. There are some studies showing that poor reliability and speed are barriers to achieving outcomes (Attwood and Braathen, 2010).

A quite similar case is the system of community facilities in parts of Africa, where the public library is commonly used (ITU, 2011b). The use of telecentres in Africa has been reduced due to inappropriate locations and discomfort. The location affected accessibility and the use of facilities in some telecentres. Usually the available space was too small or there was the problem of inadequate physical facilities such as toilets (Etta and Parvyn-Wamahiu, 2003). Similarly, Harris (2007) pointed out that telecentres in Malaysia lacked toilets for users, had unreliable power, were prone to flooding and had insufficient space.

It was observed that factors of demographic characteristics: age, gender, education and income distribution are the common demographic characteristics used in many literatures. Socio-economic characteristics of kiosk users in rural India for example, closely match these factors. For instance, the socio-economic impacts of the kiosk are: (1) kiosk services are perceived by the community, (2) kiosk communication channel within the local community and (3) perceived impact of the kiosk (Kumar and Best, 2006).

At a telecentre, the factors that determine the uptake of Internet activities are service availability and the services that matching the skills and needs of the users in each country (ITU, 2011a). In developed countries such as the US, Australia and Canada for examples, the main focus is on more advanced services (e.g. video conferencing) rather than basic communication services; whereas telecentres in developing countries provide basic services and facilities such as facsimile, photocopying and other value-added services such as Internet access (Dogara, 2011).

A survey on telecentre managers conducted by Raul (2000) found that computer skills are prerequisites for making a telecentre work (involved 17 countries; from Africa, Asia, Latin America, Europe and North America). Government-funded telecentres in Scandinavian and North American countries have aimed at improving computing and communication skills amongst rural and/or marginalised groups (Murray et al., 2001). The UK government has recognised the value of improving telecentre users' ICT skills as a means of achieving sustainable economic development and lifelong learning. In the US, a Community Technology Centers' Network (CTCNet) survey in 1998 revealed that the majority of telecentre users

found jobs and most of them reported that telecentres had overcome their fears of computers and increased their self-confidence and skills.

Telecentres may also provide access to business opportunities (Short, 2001, UN-APCICT, 2010, Telecentre.org, 2011, APDIP, 2012). Thus, telecentres allow entrepreneurs and business people to plan and prepare their arrangements and to communicate with partners and clients from a distance (Jensen and Esterhuysen, 2001). Telecentres are promoted as an answer to some of the problems of the digital divide, whereby large sections of society do not enjoy access to ICTs and are seen to be excluded from the socio-economic benefits (see Chapter 6, Section 6.3). Hence, the delivery of socio-economic benefits via telecentres is also seen as a means of community development and poverty reduction (Harris, 2007). In developing countries such as Africa, Latin America and Asia, telecentres are viewed as a new solution to development problems in terms of ICT accessibility and bridging the digital divide (Gnanih et al., 2006).

Information and Communication Technologies have the potential to improve the quality of life of individuals by providing easy access to information, goods and services (Huggins and Izushi, 2002, ITU, 2011b). It also has the potential to improve the QoRL of low-income people by enhancing the delivery of socio-economic services, offering them opportunities to increase income, and empowering them through participation in decision-making processes. According to the International Labour Organisation (ILO), ICTs can contribute significantly to socio-economic development, but investment in them alone is not sufficient for development to occur (ILO, 2001, EC, 2011). The Rural Development Section of the Economic and Social Commission for Asia Pacific (ESCAP) has studied ICT initiatives in India, Malaysia and Thailand. Their research has found that governments have an important role to play in creating an enabling environment for ICT development in rural areas. Therefore, government leadership is a key element in making ICT work for the rural poor. The Vice President of Microsoft Corporation (2002) stated that the success of the promotion of ICT in poor areas depends on two pre-conditions, namely, (1) partnership between public and private sectors and (2) government leadership. Thus, a national ICT policy is required for poverty alleviation and to address the digital or knowledge divide in ICT development. According to the World Bank (1999), ICT

initiatives should closely focus on infrastructure development and the extension of information and communication services from the centre to the periphery. Of concern to this study are the RIC services that are the inputs extending the information and communication services (ESCAP, 2006).

The World Bank (1999) argues that knowledge could be the key to development. It is important to emphasize that the power of knowledge for development can be greatly enhanced by ICT if it is harnessed to improve access and break down barriers to knowledge because “while education develops cognitive skills, information gives content to knowledge” (UNDP, 2001). This requires effective consideration of the role of knowledge in development to facilitate greater access to and use of ICT through policy planning. The UNDP has also focused on the issue of technological transformation and its impact on development and has further emphasized that “no individual, organisation, business or government can ignore these changes. It requires shifts in public policy to harness today’s technological changes as tools for human development”(UNDP, 2001). The challenges faced by various stakeholders, at both the international and national level, is how to reduce the digital divide and create opportunities by providing rural communities with affordable, equitable and quality access to ICT (UN, 2006). Many studies have shown that the digital divide has led to an increasing wealth gap between rural and urban areas in developing countries (Fong, 2009, Black and Atkinson, 2007, Furuholt and Kristiansen, 2007) and even a developed country such as the UK has a similar divide (DTI, 1999). In rural Malaysian communities, the level of income tends to be low, and the cost of computers and other ICT facilities are beyond the means of a large proportion of the rural population. The low level of computer usage in these communities is associated with low computer or ICT literacy and the inability to realise the benefits of ICT in improving their quality of life (Mahendhiran, 2010).

As a consequence, a greater understanding about ICT knowledge needs to be gained (NITC Malaysia, 2011). Some suggest that the Internet and ICT can help transform society as a whole and create other benefits; thus, bridging the gap when Internet and ICT access is ubiquitous. Some of the arguments for closing the digital divide, as related to this study, include promoting social mobility, which is important especially for school children in their learning and later careers, and an education that includes

the use of computers and the Internet (Internet World Stats, 2010). Without this support by government, the digital divide will be wider for children in rural areas (Internet World Stats, 2010).

Therefore, resolving or minimising the digital divide requires the involvement of four main players (Zaitun AB and Crump B, 2005), namely: (1) institutions of higher education; (2) industry; (3) government; and (4) rural communities. This study focuses on rural communities and one role of government. Despite increased research on telecentres in developing countries, it is limited and there is no clear understanding of the factors that lead to their successful and sustainable operation (Bailey and Ojelanki, 2009).

2.4 Community Informatics in Practice

To date, community informatics has been the focus for ICT development in developing countries. However, there has been little research on the evidence of community informatics in relation to ICT utilisation. Currently, the main research centres for community informatics are the Community Informatics Research Network (CIRN)¹(Bradley, 2006) and MS Swaminathan Research Foundation² in India (Wills et al., 2009). The next section reviews the potential impacts of ICT (particularly community informatics) in practice on rural development and reviews previous studies on rural ICT programs in developing countries.

Studies of rural ICT programs

Some studies have been conducted on rural ICT programs in developed and developing countries such as Asia, Africa, Latin America, North America and Europe (Digital Dividend Report, 2004). The most applicable study for the present research was carried out in India, a country with the most extensive initiatives in ICT for rural development. India (60% of Asian distribution of ICT-projects) has the most ICT-enabled projects worldwide (Digital Dividend Report, 2004). Table 2.3 depicts the distribution of rural ICT projects in developing and developed countries.

¹ CIRN is an international network of researchers, practitioners and policy makers concerned with enabling communities through the use of ICTs. The future of community informatics is based on promoting quality of life for all and improving rural life in particular

² Is one of the most noted centres which aims to make every village a knowledge centre, with information customised to Indian farmers and families

Table 2.3: The geographical distribution of rural ICT projects (adapted from Digital Dividend Report (2004))

Regions/Countries –countries with most rural ICT projects	Regions/Countries – ICT projects
<p>Developing countries:-</p> <p>Asia:</p> <p>(1) India (60%)</p> <p>(2) Thailand (6%)</p> <p>(3) Malaysia, Bangladesh, Philippines, China, Nepal and Pakistan (4%)</p> <p>Africa:</p> <p>(1) South Africa (30%)</p> <p>(2) Kenya, Ghana and Uganda (9%)</p> <p>(3) Nigeria (6%)</p> <p>Latin America:</p> <p>(1) Brazil (18%)</p> <p>(2) Mexico (10%)</p> <p>(3) Peru and Colombia (9%)</p>	<p>Developed countries:-</p> <p>North America:</p> <p>United States (61%)</p> <p>Europe:</p> <p>United Kingdom (15%)</p> <p>Canada (9%)</p>

In one application, the kiosk operators did not find it remunerative to run the government services due to a very low volume of transactions, and many of them closed down their centres (Rao, 2004). However, Bailey (2009) found that the community telecentre is increasingly seen as an effective means to make ICT services accessible to people in rural areas in developing countries (Bailey, 2009). A study in Jamaica found that telecentres need strategies that will assist rural communities by creating jobs and that they need to incorporate aspects such as telework, video editing and music. Telecentres also assist local community members to find employment by providing “a physical address for their correspondence in case their resumes were being rejected because of where they live” (Bailey, 2009) p. 8. For instance, Richardson and Paisley (1998) argue that the use of ICT improves the quality of rural life. This is due to the access to sources of health, business, trading, transport and commerce systems in the urban areas, and sharing and exchanging information.

Rao (2004) believes that most of the rural ICT applications are meant for socially and economically less developed communities. Therefore, service delivery must be aligned with (1) the location of ICT should be in areas convenient to communities to approach and use; (2) operators or managers must be familiar with all user interfaces

and must be supported by the central agency in handling the user services; (3) operators or managers need to be adequately trained in the application context and on all possible services through the kiosk; and (4) a system of record keeping needs to be adopted to measure service utilisation and service quality. Regular reviews are important to monitor and improve the quality of service. This study is investigating the Malaysia's RICs ICT situation. In contrast, as argued by Enberg (1998), not all people can accept and embrace the idea that ICTs should be extended to the rural poor. Enberg believes that many of these efforts are inappropriate and too complicated for rural people who are basically less educated and rely on traditional ways of communicating. However, this study is based on the previous studies of factors that seem to work in the other developing countries and perhaps it will work to Malaysia's RICs. The next section describes the RIC conceptual model based on the findings of the literature review.

2.5 RIC Program Logic Framework– Conceptual Model

2.5.1 Program goal and objectives

This study uses the program logic model to evaluate the RIC program. By definition, program theory is closely related to “program logic” and Weiss (1998) defines program theory as “theories of change” relating programs to desired outcomes. More specifically, Garson (2000) proposes that program theory focuses on the social model underlying a program. Program logic models are more than just inputs, outputs and outcomes but these concepts are a useful means of organising a program analysis. The strength of program logic in planning, implementation and evaluation is how the inputs, outputs and outcomes fit together, connect and relate in order to achieve desired end results (Patton, 1997). These components are considered in this section in relation to the RIC program which is the focus of this study.

To define these components; inputs are resources, contributions, investments that go into the program (University of Wisconsin, 2003). Outputs are activities, services, events and products that reach people who participate or are targeted (University of Wisconsin, 2003). Outcomes for the purpose of this study are results or changes (or differences) for individuals, groups, communities or systems, which relate to changes or improvements in knowledge, skills, motivations or other expected results of a program. The outcomes depend on whether for the targets are the individual or the

community as a whole; therefore, it is necessary to consider what is the focus of the program and who or what is expected to change (University of Wisconsin, 2003). The reason for using this program logic framework, it allows to evaluate the effectiveness of RIC program through making a better decision and reaching goal as changes are made. *A program logic model is a picture of how your program works – the theory and assumptions underlying the program. ...This model provides a road map of your program, highlighting how it is expected to work, what activities need to come before others, and how desired outcomes are achieved (p. 35)*W.K. Kellogg Foundation Evaluation Handbook (1998).

In this study, the overarching conceptual framework is based on the implied program logic of RICs, from program goals through to expected outcomes. Community informatics applications on RIC services (inputs) are expected to provide benefits to the community. As discussed, the community informatics related to this study focus on telecentres and this could best explain that RIC ICT based services are the variables tested for the perceived benefits of the community. This will be considered the outputs for the RIC program. Hence, the user characteristics will also improve the intermediate outcomes. The anticipated improvement in QoRL is expected to be driven by increases in the quantity and quality of relevant information and the value of human, knowledge and social capital, as shown in Figure 2.4: The RIC conceptual framework – program logic model (see Section 2.5.2)

This study assumes the main indicators of quality of rural life (QoRL), as this might be influenced by the presence of a telecentre, are income, education level, strong and weak ties of social capital and employment and entrepreneurship opportunities. These indicators are also applicable to this study as the ultimate outcome of the study is to test whether the RIC program has improved/increased the QoRL of an individual rural community. Subsequently, the literature on economic development focussed on education, employment, income and entrepreneurs. In addition, the rural development with the issue on poverty and the use of technology, particularly ICT were also discussed as part of the literature. The social capital on social relationships and business networks; such as bonding and bridging capital were the highlighted variables for this study.

Furthermore, community informatics is the relationships between communities and information technology and the challenge to achieve economic and social development for the benefits of the community in terms of improving their quality of rural life. As well as the end-user computing approach consideration of the influence of users' characteristics on satisfaction with RIC services. For instance, this study is investigating RIC as a community telecentre on the overall RIC program outcomes. These literatures have been discussed fully in this chapter.

2.5.2 Research Questions and Hypotheses

The research model of this study is based on the perceived of RIC users and stakeholders on the affect of RICs on quality of rural life. This study examines whether the individual RIC users are satisfied with the RIC services. In addition, this research also examines whether the individual RIC users perceived an increase in income, employment opportunities and level of education (knowledge and skills). For instance, this study also examines whether the individual users perceived an increase in social capital and investigates this range of variables which may correlate to perceptions. The hypotheses aim to test the relationships within the program logic model and to provide empirical basis for the quantitative research questions stated above. In the subsection below, the eight research hypotheses are introduced and the literature support for the proposed hypothesised relationships is provided.

Determination of the effect of RICs on QoRL-related research constructs on perceived benefits and services satisfaction

This subsection provides a discussion of the relevant literature which supports the proposed hypotheses measuring the impact of QoRL on related research constructs. Similar research area in this study opposed (i.e. Subramaniam et al. (2011); Abdul Razak (2009); Yang et al. (2009); Kivunike et al. (2011); UN ESCAP (2006)) all possible impact of QoRL as ultimate outcome is examined. The rationale for this is the survey involved multi-stakeholders within one specific telecentre and the variables are impediments to the success operation of RICs.

Bonding capital

Bonding capital refers to as 'social support' such as networking with family relationships or strong family ties (Zhang et al., 2011), as such, bonding similar people relationships (within the local community). The strong and complementary

analyses regarding the interaction between social capital characteristics and information technology in local communities can be found in Simpson (2005), Gaved and Anderson (2006), and Anderson et al (2006). This study relates bonding capital as part of social capital characteristics and contribution. Therefore, this study proposes to test the following hypotheses:

H1a (i): Perception of bonding capital has a positive impact on perceived benefits (economic benefits and contribution of social capital)

H1a (ii): Perception of bonding capital has a positive impact on services satisfaction (computing, communication, information, training & education, basic office, info-mediation services and speed & reliability of RIC Internet access).

Bridging capital

Bridging capital “refers to the building of connections between heterogeneous groups; these are likely to be more fragile, but more likely also to foster social inclusion” (Schuller et al., 2000), for instance bridging between diverse people (outside the local community). Economic and business performance at both the national and sub-national level is also affected by social capital (Aldridge et al., 2002). This is also one of the elements of social capital characteristics and contribution. Therefore this study proposes to test the following hypotheses:

H1b (i): Perception of bridging capital has a positive impact on perceived benefits (economic benefits and contribution of social capital)

H1b (ii): Perception of bridging capital has a positive impact on services satisfaction (computing, communication, information, training & education, basic office, info-mediation services and speed & reliability of RIC Internet access).

Local community association

Local community association is the link built between local community in an organisation, club, event or group (informal association). Social capital has well established relationships with outcomes such as economic growth, networking or social inclusion...(Maloney et al., 2000). Therefore, this study proposes to test the following hypotheses:

H1c (i): Perception of local community association has a positive impact on perceived benefits (economic benefits and contribution of social capital)

H1c (ii): Perception of local community association has a positive impact on services satisfaction (computing, communication, information, training & education, basic office, info-mediation services and speed & reliability of RIC Internet access)

As discussed in relation to these individual social capital, in addition, Fukuyama (1995) stresses the necessity of trust and the relationship between a high level of social trust (high social capital) to high levels of economic benefits. Casey and Christ (2005), p. 843) support the argument above that “higher social capital was shown to be positively related to lower income inequality”.

Socio-demographic characteristics

Socio-demographic characteristics as defined in Chapter 1 comprises of age, gender, income, education level, employment status and location. Detailed information on the demographic factors such as gender, age, level of education, and income levels of Internet users, is important for governments seeking to adapt e-government applications and services (ITU, 2011a). It may also be important to consider how the demographic characteristics of the users such as their gender, ethnicity, education level, income level and geographical location may affect their information needs (Hudson, 2001).

A previous study on another telecentre program in Malaysia (Ibrahim and Ainin, 2009) found in relation to gender representation where there were more female users than males. This finding is consistent with a recent study in the Northern States on empowering rural communities via the telecentres (Abdul Razak, 2009), which also found that the majority of the users of telecentres were the youth. These findings are also supported by Harris (2001) who noted that in the IC-EUC approach, the influence of individual users' characteristics promoted the success of telecentres. This claim is consistent with the perceptions determination of demographic characteristics and economic benefits in relation to the RICs, this study proposes to test the following hypotheses:

H2 (i): Demographic characteristics (age, gender, income, education level, employment opportunity, and location) have a positive impact on perceived benefits (economic benefits and contribution of social capital)

H2 (ii): Demographic characteristics (age, gender, income, education level, employment opportunity, and location) have a positive impact on services satisfaction (computing, communication, information, training & education, basic office, info-mediation services and speed & reliability of RIC Internet access)

In addition, this study proposes the hypotheses which determine social capital and socio-demographic characteristics have a positive impact on services satisfaction. Telecentres in developing countries provide basic services and facilities such as facsimile, photocopying and other value-added services such as Internet access (Dogara, 2011). Hence, the training courses range from the most basic to the more advanced computer skills and often without charge (Murray et al., 2001). Telecentres provide communities with basic facilities and, as a result, it is expected that they will contribute to social and economic development such as increasing opportunities for employment (Rothenberg-Aalami and Pal, 2005, UNESCAP, 2006, Bailey, 2009) through building IT-based skills. Furthermore, IT-based skills training is closely linked to employment and entrepreneurship (Bailey, 2009). EDA (2011) research on economic development states that the growth of an economy is measured in terms of jobs, income and education which lead to improve in quality of life.

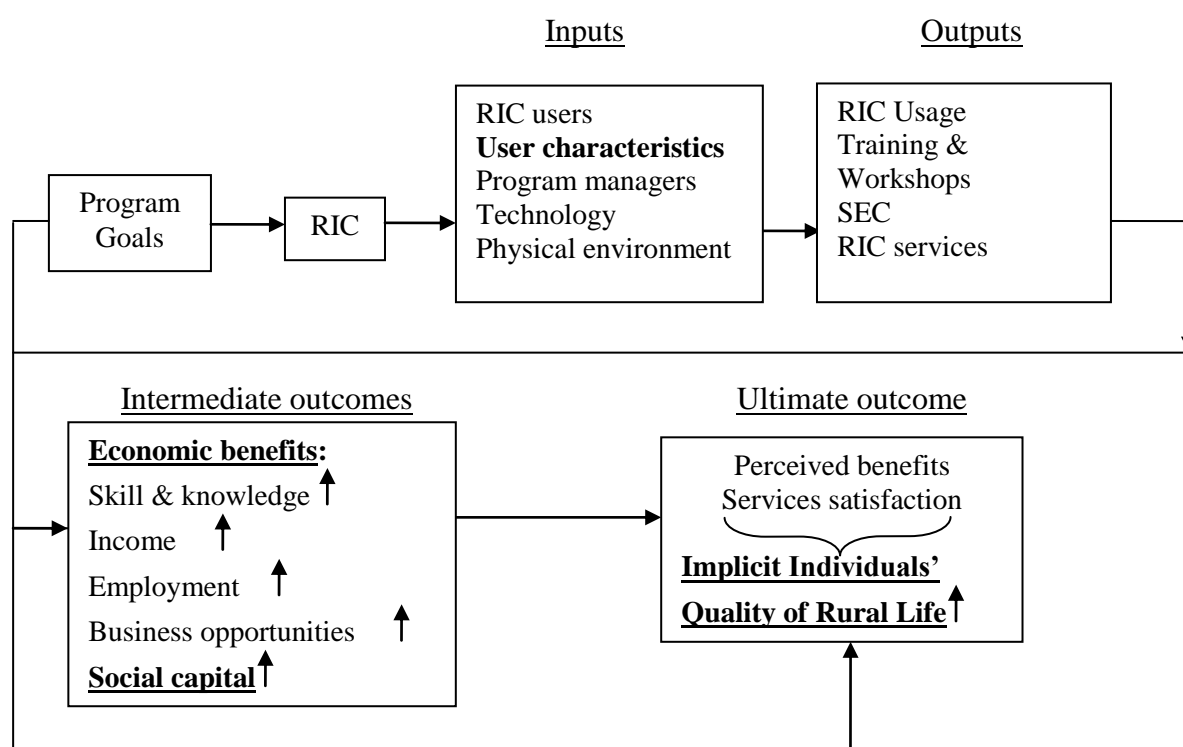


Figure 2.4: The RIC conceptual framework – program logic model

An evaluation needs to identify impediments to successful operation. These are the impediments relevant to this study to evaluate the effectiveness and successful of a telecentre such as RIC. As discussed earlier and illustrated in the diagram, the RIC program logic model is designed in such a way derived from the community informatics theory. Table 2.4 illustrates the impediments and expected outcomes based on the literature and previous studies.

Table 2.4: Summary of impediments on inputs and outputs, and expected intermediate and ultimate outcomes from previous studies

Impediments to technology:	Literature/previous studies
(1) Lack of computers functioning	Attwood & Braathen (2010)
(2) Slow internet connection	
(3) Poor internet reliability & speed	
Impediments to physical environment:	Literature/previous studies
(1) Inappropriate location	Etta (2003); Harris (2007)
(2) Small space	Bashir et al. (2011)
(3) Inadequate physical facilities (e.g.: availability of toilets)	
(4) Infrastructure	
Demographic/characteristics impediments to usage:	Literature/previous studies
(1) Gender	ITU (2011b)
(2) Age	Ibrahim & Ainin (2009)
(3) Level of Education	ITU (2011a)
(4) Income Levels	Subramaniam et al. (2011)
(5) Employment status	Abdul Razak (2009)

(6) Ethnicity

Purpose of usage:

- (1) Educational material – training sessions
- (2) Internet access – social networking sites
- (3) Influence friends & family members
- (4) Information & communication functions

Impediments on basic training & workshops:

- (1) Managers' lack of technical and administrative skills
- (2) Feel comfortable & confident
- (3) Improve ICT knowledge & skills

Impediments on social entrepreneurs' club (SEC):

- (1) SEC awareness
- (2) Sustaining RIC

Impediments to services:

- (1) Availability & match users' need
- (2) Basic services & facilities

Expected employment opportunities:

- (1) Increase job opportunity
- (2) Create new jobs

Expected computer skills:

- (1) Basic training courses
- (2) Prerequisite for telecentre works

Expected business opportunities:

- (1) Entrepreneurship
- (2) Contacts/networking

Expected social capital (contribution):

- (1) Increase bonding capital
- (2) Increase bridging capital
- (3) Increase local community association
- (4) Build social relationships
- (5) Build social networks

Expected economic benefits (contribution):

- (1) Increase income
- (2) Better employment
- (3) Better education attainment – human capital

Expected quality of rural life:

- (1) Perceived benefits
- (2) Services satisfaction

Literature/previous studies

Attwood & Braathen (2010)
UNESCAP (2006)
Dogara (2011)
Gaved & Anderson (2006)

Literature/previous studies

Halim (2008)
Telecentre.org (2009)
MRRD (2010)

Literature/previous studies

ITU(2011b)
Dogara (2011)

Literature/previous studies

Aalami & Pal (2005)
UN ESCAP (2006)
Bailey (2009)

Literature/previous studies

Roman (2000)
UN ESCAP (2006)

Literature/previous studies

Short (2001)
Jensen & Esterhuysen (2001)
UN-APCICT (2010)
ICMA Press (2010)
Telecentre.org (2011)
APDIP (2012)

Literature/previous studies

Putnam (2000)
Sabatini (2005)
Woodhouse (2006)
Yang et al. (2009)

Literature/previous studies

Easterly (2002)
IIASA (2008)
Bailey (2009)

Literature/previous studies

QoL research unit (1991)
EPU (2010a)
Kivunike et al. (2011)
UN ESCAP (2006)

This study follows through these possible impediments and expected outcomes for success of telecentres. These form the basis for testing each element of these inputs, outputs, intermediate and ultimate outcomes.

2.6 Conclusions

The review of the literature began with a focus on the broad aspects of economic development, moving to rural development and then to rural development through the application of ICT. This includes the usage of the specific program, perceptions of satisfaction and whether QoRL is improved. This chapter has reviewed previous studies on community informatics and drawn on existing studies of social capital, including bonding, bridging and local community association. This study of Malaysia's Rural Internet Centres will be a comprehensive examination of the whole RIC program from multiple stakeholder perspectives, whereas previous studies have tended to focus on individual telecentres and one perspective only.

In order to conclude this chapter, Table 2.5 summarises the key literature from previous studies relevant to this study, based on variables included in the program logic framework.

Table 2.5: Key literature based on main variables from the program logic framework

	Study	Method	Findings
(1) Economic benefits: - <i>Current income</i> - <i>Employment</i> - <i>Education (knowledge & skill - human capital)</i>	IIASA Policy Brief (2008)	Survey, secondary data (statistical, government reports)	Human capital formation (knowledge & skills) plays a significant role in a country's economic development. Better education leads to higher individual income.
	Bailey & Ngwenyama (2009)	Qualitative methods (semi-structured interviews and direct observation)	Perceived opportunities for employment influence the usage of telecentres.
	Woodhouse (2006)	Quantitative & qualitative methods	Communities with high levels of social capital will have greater level of economic development.
(2) Service satisfaction: - <i>Communication</i> - <i>Computing</i> - <i>Training & education</i> - <i>Basic office</i> - <i>Information</i> - <i>Info mediation</i>	IDRC (1999) - Telecentres in Global Perspective	Survey, interviews	Communities use telecentre services in their daily lives to satisfy their social and economic needs.
	United Nations ESCAP (2006)	Survey-questionnaire	Services offered by (community e-centres are as follows: 1) communication service, 2) computing service, 3) training & education service, 4) basic office service, 5) information service, and 6) info mediation services.
(3) User characteristics: <i>Demographic variables:-</i> - <i>Age</i> - <i>Gender</i> - <i>Income level</i> - <i>Education level</i> <i>Personality</i> <i>Participation</i> <i>Training/education</i> <i>Computer anxiety</i>	Woodhouse (2006)	Quantitative & qualitative methods	Association between higher levels of social capital with a range of demographic variables including higher incomes, higher levels of education, employment and gender.
	Harris (2001)	Case study, survey	Telecentre users represent the individuals' characteristics in the End-User Computing success model. It influences the adoption of computer usage
	Bergeron & De Serre (1990)		

			behaviour and influence on the success of community telecentres.
(4) Social capital	DiMaggio et al. (2001)	Theoretical analysis	Needs to relate the qualitative data of the online relationships and social interaction use of the Internet.
	Hampton (2001)	Survey ethnographic observations from “Netville”	Internet used to increase neighbourhood social capital and connectivity of local social networks.
<i>-Bonding capital</i>	Ellison et al. (2007) Woodhouse (2006)	Survey	Strong correlation between the use of Facebook and the two types of social capital (bonding & bridging capital).
<i>-Bridging capital</i>	Kavanaugh et al. (2005) Woodhouse (2006)	Survey	Household survey data in Blacksburg, showing that people with bridging ties across groups have higher levels of community involvement than people without it.
<i>-Local community association</i>	Kavanaugh et al. (2005)	Survey	Heavy Internet users with bridging ties are more socially engaged, and have more local community association since going online than those without bridging ties.

Table 2.5 summarises the key literature used for this study, and the methods and key findings that support the arguments and issues of significance for this study. For example, the methods identified in previous studies provide some guidance for this study and the development of a sound methodological approach that is appropriate for the objectives of this study. The next chapter (Chapter 3) focuses on the application of methods and techniques for data analysis. This aspect is discussed in later chapters in relation to the methodology and findings. In addition, the findings reported in the existing literature are important for comparing the results from this study with anticipated outcomes and will form the basis for discussions and recommendations in the closing chapters.

CHAPTER 3: METHODOLOGY

3.0 Introduction

This chapter describes and justifies the methodologies used in this study. The methodological approach was determined by the relevant literature and the framework to encompass the program logic of the RIC program which underpins this study. This chapter begins with the overview of Malaysian ICT policy and RICs, then justifying the research philosophy and epistemology adopted in this study. Then describing the approach and design used to collect data and justifies the reasons for choosing these methods of data collection. Next, this chapter describes the population and study sample data. Then, the chapter describes how the empirical data was collected in two separate phases: an online survey of RIC users; and interviews with multiple RIC program stakeholders; and site observations conducted in parallel with those interviews. Next, the data analysis techniques which were used to ensure the reliability and validity of data collected are described, followed by an overview of the data analyses techniques used for hypothesis testing. The chapter concludes with a discussion of ethical considerations in the research process for this study. Figure 3.1 illustrates the workflow of the methodology. The chapter starts with a brief overview of the Malaysian RIC program.

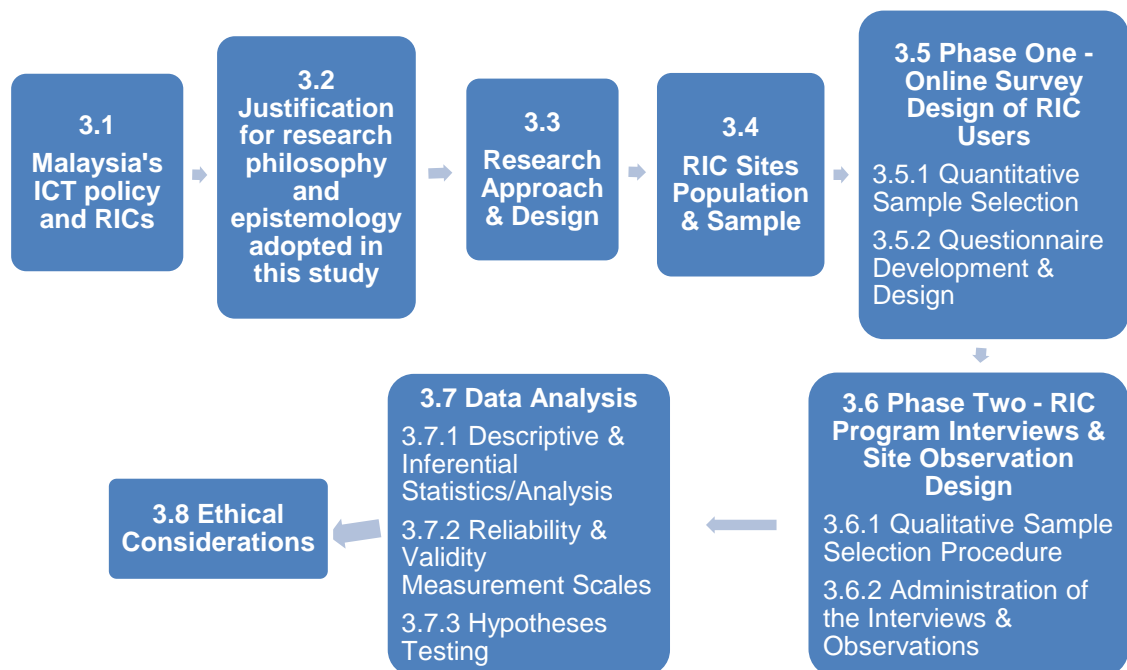


Figure 3.1: RIC methodology workflow

3.1 Malaysia's ICT policy and RICs

There is a national focus on ICT policy in Malaysia. Thus, this study focuses on the rural implications of the national ICT policy where, presumably, the RIC goals are supporting the national policy. Relevant features of the national policy include:

1) Upgrading and expanding communications infrastructure to increase accessibility throughout the country as a means of bridging the digital divide

Efforts will be focused on upgrading communications network in line with technological advancements, providing broadband access on flat rate bandwidth-based charge that are affordable, extending ICT infrastructure to rural areas as part of the effort to narrow the digital divide between urban and rural areas, and consequently, achieving a balanced development in the country. (EPU, 2011)

2) Enhancing human resource development in ICT to increase the supply of highly skilled and knowledge manpower

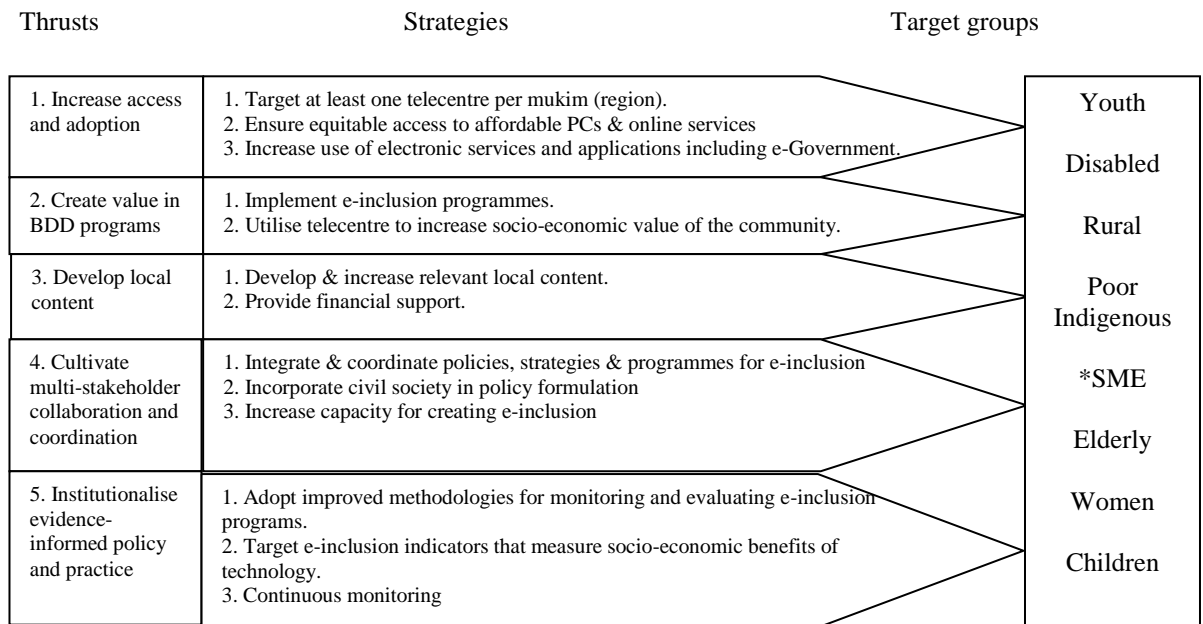
To meet the increasing demand for ICT workers, efforts will be made to improve and expand ICT education. Internet access will be made available to schools and for those in the rural areas where there may be problems to obtain conventional means of access, access will be acquired via satellite communication... ICT training will continue to be given emphasis as the pace of technological change in ICT will necessitate on-going training for the ICT workforce. (EPU, 2011)

As related to the RIC goals, the first one aims to bridge the digital divide between urban and rural areas, however, the concern of this study is to assess the ability of the RIC to improve the digital skills of these rural communities and increase their human capital (as in second policy on HR development). Hence, for the standard policy evaluation of the RIC program goal, one of the impediments to achieving outcomes can be a lack of agreement on, or understanding of, the program goal (NHS, 2007, World Bank, 2006) so this will be a first check for this study.

The global trend of ICT has brought significant changes to individuals and communities across the globe. However, the technologies are not accessible to all individuals and communities. Therefore, gaps exist between those who have access to ICT services and those who do not. As explained, these gaps are commonly referred to as the digital divide. This has become an issue in every developing country. As discussed by Black and Atkinson (2007), there are factors describing the digital divide applicable to this study in the Malaysia context. The factors are income, educational level, age and location. While there have been several studies on ICT development and the digital divide, there is a lack of research and evaluation of perceived gaps in the digital divide (Black and Atkinson, 2007). Rao (2003) emphasises the need for program evaluation so that lessons learnt can be applied to and inform future programs and policy development.

The RICs in Malaysia were introduced with a number of initiatives in the Eighth Malaysia Plan to address issues contributing to the digital divide in rural Malaysia. To consolidate and provide better coordination of all these initiatives, the National Strategic Framework for Bridging the Digital Divide (refer to

Figure 3.2) was formulated. The framework related to RIC, especially in the second thrust of National Strategic Framework-Bridging Digital Divide (2008), aimed to create value in bridging the digital divide programs. As Abdul Razak (2009) explains, according to the National Strategic Framework-Bridging Digital Divide, “the issue of access is one of the crucial factors for the rural community to get to the ICT tools for advancing the social and economic development of a community as these technologies can create new types of economic activities, employment opportunities and enhance social interaction and networking among people”.



**Note SME = Small & Medium Enterprise*

Figure 3.2: Thrusts and strategies of NSF-BDD (Azizah Hamzah, 2008)

In order to bridge the digital divide, the Malaysian government initiated National ICT policy, which is under the Sixth National Policy Objective and National Strategic Framework for Bridging Digital Divide (see Figure 3.2). This is similar with the Thailand Strategic Framework on ICT policy. The Thailand Government implemented a strategic framework (National ICT Master Plan, 2010) based on the national ICT master plan that was previously designed for ICT development in Thailand. Under the national master plan, the second strategy focuses on the use of ICT to promote improved quality of life (Proadpran et al., 2008); this second ICT strategy is particularly important for this study and has been discussed earlier in this section.

To summarize this section, Figure 3.3 outlines the RIC organizational structure that involves multi-stakeholder partnerships. The steering committee are the top level of management, which consists of the Ministry of Information, Communication and Culture and Warisan Global as a private company. In the middle level of management are the RIC managers from 42 RICs; these RIC managers are very close to the rural community. The low level of management is the rural community; they are the grassroots of the RIC program. The RIC management committee is the representative group from the rural community who volunteer assist the RIC

manager at the management and operational level. An overview of this organizational structure is provided at this stage to give a general idea about the identity and role of the key informants in this study and how they are involved. This structure is referred to throughout the thesis.

RIC Organizational Structure

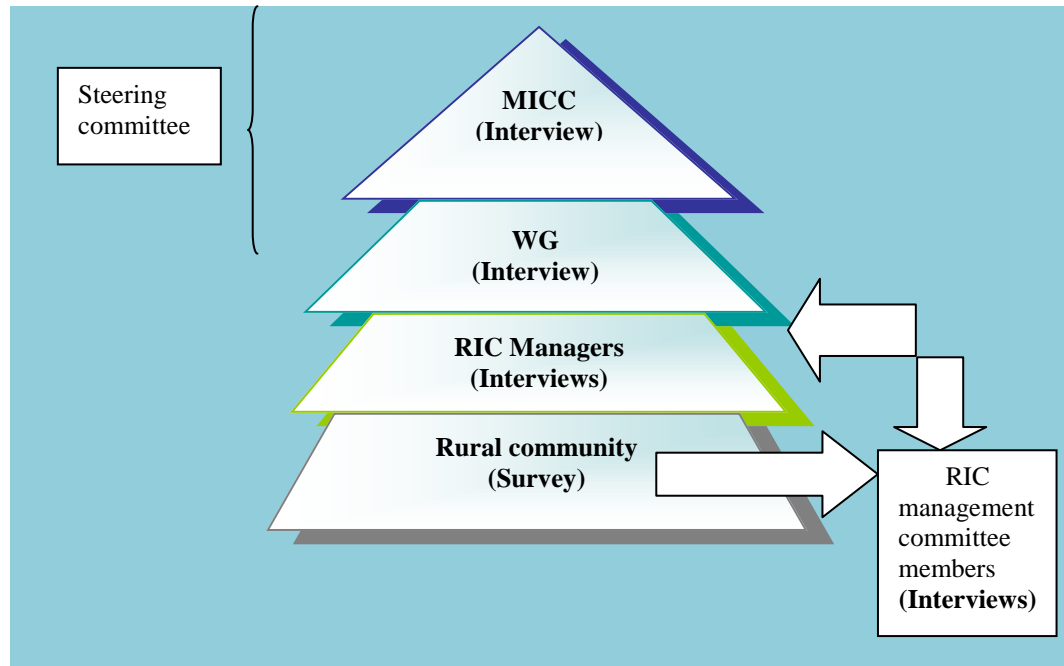


Figure 3.3: Multi-stakeholder partnership at RIC

3.2 Justification for research philosophy and epistemology adopted in this study

This section discusses how the research questions for this study are embraced into the research philosophy and epistemology which provides the justification for theoretical and methodological approaches adopted in this study. The way the research is conducted varies; therefore there are certain standards and rules that guide researchers' action and belief, this is referred to as paradigm (Guba and Lincoln, 1998).

3.2.1 Research paradigm and philosophy

A research paradigm according to Crotty (1998) is defined as follows: “paradigms are beliefs and assumptions regarding knowledge and research and how we approach

research”. The quantitative methodology shares its philosophical foundation with the positivist paradigm (McGregor and Murnane, 2010). Silverman (1998) argues there are two end research philosophies which are positivism and interpretive. These are known as paradigms and each of them emphasise on different perspectives and strategies. Therefore, as a consequence, valid research is demonstrated only by the degree of proof that can be corresponded to the phenomena that study results stand for (Saunders et al., 2009).

In this study, such rigid principles lend themselves more to the objective aspects such as scientific knowledge, logic and measurement incorporated into this study (McGregor and Murnane, 2010). However, such inflexible beliefs did not have the capacity to accommodate the investigatory aspects of this study that dealt with the social and human experiences. As a result, qualitative methodologies were also incorporated into the research design (see Table 3.1).

The qualitative methodology shares its philosophical foundation with the interpretive paradigm which supports the view that there are many truths and multiple realities. This type of paradigm focuses the holistic perspective of the person and environment which is more congruent with the development discipline (Creswell and Clark, 2008, Silverman, 1998). Additionally, the interpretive paradigm is associated more with methodological approaches that generally start from data about how people feel and think in the circumstances in which they find themselves, than making judgements about whether those thoughts and feelings are valid. Interpretive researchers look at the data in depth and to extensive interviews, observations and secondary data analysis; to overcome generalisation (Easterby-Smith et al., 2004).

Table 3.1: Summary of the Research Paradigms
Source: Easterby-Smith et al. (2008)

Characteristic	Positivist View	Interpretive View
Purpose	The researcher will predict and explain changes in participants or RIC users' QoRL	The researcher will interview the stakeholders and recognise the value and depth of the individual content
Beliefs	One truth exists Must be objective	Many truths and realities Different people have different perceptions, needs and experiences
Research Methods	Quantitative	Qualitative
What Study Data is Based Upon	Measurable outcomes from questionnaire data	Descriptive, explanatory and contextual words of interview data
Study Sample	Clear and precise inclusion and exclusion data	Representatives who are able to provide expertise from different points of view

Research philosophy relates to the development of knowledge in a specific area and nature of that knowledge of philosophy as applicable to the research project, which can help researcher recognise which designs will work best and that it enables the achievement of a satisfactory outcome for the research activity (Easterby-Smith et al., 2008). Easterby smith et al. (2004), argues that it is unwise to conduct research without an awareness of the philosophical issues that lie in the background. Easterby-Smith et al (2004), Saunders et.al (2009) considers Ontology, Epistemology and Axiology as the three major paradigms of research philosophy in business and management research. The ontology is the form and nature of reality and what can be known about it. Epistemology on the other hand is more concerned about the “general set of assumptions about the best ways of inquiring into the nature of the world” (Easterby-Smith et al., 2004).

3.2.2 Research Epistemology

Epistemology can be further classified into two perspectives namely positivism and relativism. These two perspectives unite on a common assumption that the job of the researcher is the identification of “pre-existing reality” (Easterby-Smith et al., 2004). Whilst the positivist's researcher approaches the task of understanding reality through design of experiments, on the other hand the relativist achieves it through combination of “triangulation” of methods and through surveying large samples

(Easterby-Smith et al., 2008). The two main approaches in management research namely deductive and inductive indicates the nature of the data to be collected and the direction of shift between data and theory during analysis (Yin, 2003). Marrying these research approaches to the research philosophies, Robson (2002), points out that representational ontology and positivist epistemology adopt inductive approach, whereas relativist ontology and epistemological approaches adopt deductive approach. To understand the philosophical approaches used in this research project, it becomes necessary to revisit and analyse the main research questions. The purpose of this study is to examine:

How do Rural Internet Centre users and stakeholders perceive the affect of RICs on quality of rural life; the following sub-questions assist in the examination:-

- a) to what extent RIC users (community) satisfied with the RIC services,
- b) do RIC users (community) perceive an increase in income,
employment opportunities and level of education (knowledge and skills)
and
- c) do RIC users (community) perceive an increase in social capital.

To achieve this purpose, an appropriate research methodology has been chosen, which is justified in the following section.

3.3 Research Approach and Design

The main sampling method applied for this study was purposeful and random sampling as it produces the smallest possible sampling error. However there were some potential limitations to the random sampling method, which are: (1) time consuming as it covers large geographical area of units for field research and expected to be scattered (2) sometimes the probability results are too small and (3) the selected sample may not be a true representative of the population (Tabachnick and Fidell, 2009). This purposeful sampling and a random sample of RIC users was not surveyed and the sample was not stratified across the 42 RIC sites even though a good representative sample of valid responses across the 42 RIC sites was obtained from the online survey. This study derived its methods and approaches from the literature review and is organised according to a program logic framework (see Table 2.5 in Chapter 2). In the first phase the survey aimed to identify the relationship

between variables and support the hypotheses testing. A structured questionnaire is often considered the most appropriate means to obtain low in cost, and is more convenient for the respondent (Zikmund, 1991). The population of RIC sites in Malaysia is highly dispersed (see later description) and the researcher had limited funding support. As well as the primary data collected from the online survey, this study also collected secondary data, mainly from Malaysian government official statistical data, Warisan Global records and RIC managers' statistical records.

The second phase of data collection involved face-to-face interviews and direct site observations. The interviews were to gain deeper insights from the key program stakeholders and triangulate the findings against the survey results. This study also used data from the Malaysian government and RIC managers' reports. Therefore, the data was triangulated across the different sources and analysed according to the program logic framework. Triangulation refers to the use of more than one approach in the investigation of a research question in order to enhance confidence in the findings (Bryman, 2002). This study used triangulation (as described by (Guion, 2002) to improve the clarity of results and strengthen the validity of the findings. Both, the online survey and interviews were generated from the relevant literature and theories that built the RIC program logic framework (see Figure 3.4).

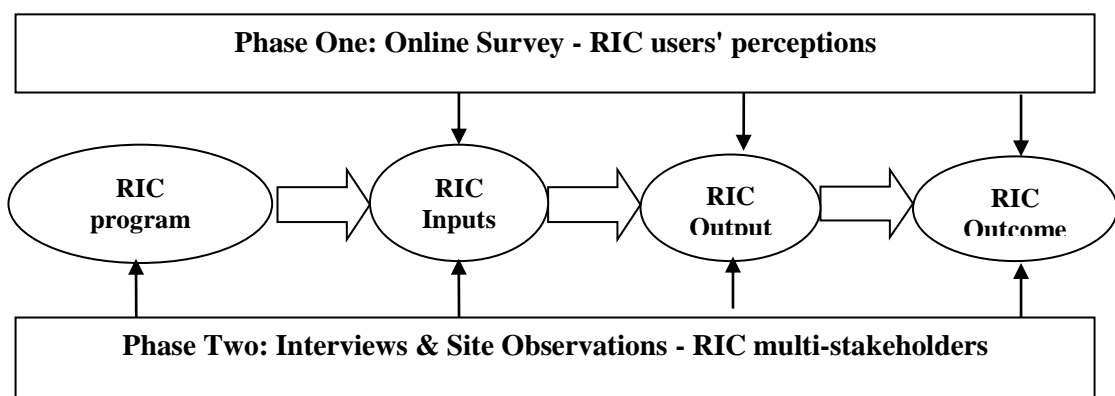


Figure 3.4: RIC program logic methodological flow

A triangulation design is used when a researcher wants to directly compare and contrast quantitative statistical results with qualitative findings or to validate or expand quantitative results with qualitative data (Creswell and Clark, 2008). There were four reasons for using the mixed methods. First, this allows for a deeper study with more data and validation. Second, the study needed to consider ultimate

outcomes such as perceptions of improvements in human and social capital, and this would require qualitative assessments, that include interviews with multi stakeholders on their perceptions and site observations from different site regions. Third, there was limited statistical data at the community level, so some local observation and survey work was needed to identify specific changes in employment opportunities. Last, the different types of analyses would help to minimize the risks of poor or incomplete secondary data. Figure 3.5 illustrates the matrix methods applied for this study.

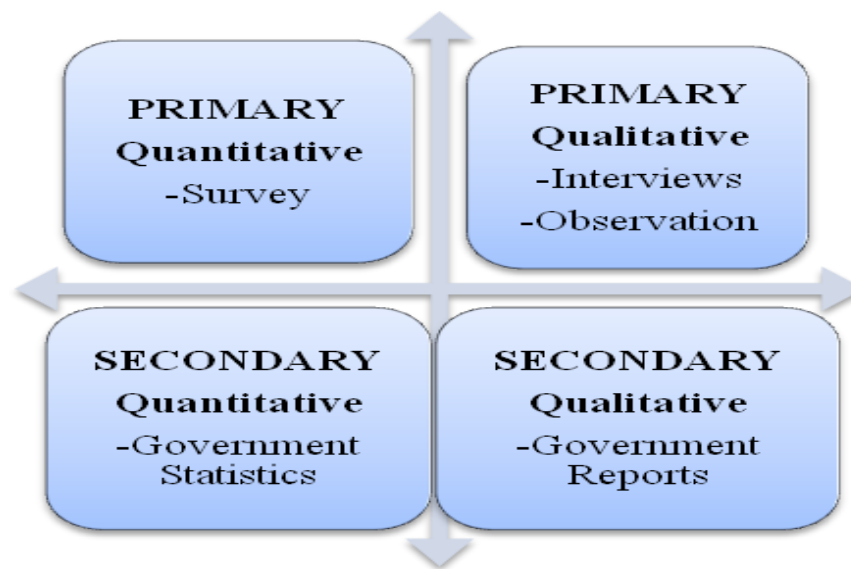


Figure 3.5: Matrix of research methods for data collection in this study

A combination of both methods is expected to improve the validity of the research findings. Furthermore, using the different research approaches could provide a more complete picture of the study than that is obtained by using either method alone. As this study assessed the Internet centres in rural areas of Malaysia, the next section briefly explains the populations of this study, which are at two levels: the study centre in each community and the individuals in those communities.

3.4 RIC Sites Population and Sample

The background information in Chapter 1 explained the RIC locations in detail and the information in this chapter highlights and explains the research sample for the purpose of data collection. The RICs are in the rural areas of Peninsular and East Malaysia. The Peninsular consists of eleven states selected for the data collection,

grouped into four regions (excluding Kuala Lumpur and Putrajaya as federal territories), while East Malaysia consists of one region (Borneo) and two states (Sabah and Sarawak, also Labuan as a federal territory). This study classified the regions based on the direction of each state's location. The survey covered 42 RIC sites in four districts: (1) Yan, Kedah, (2) Kuala Krai, Kelantan, (3) Hulu Langat, Selangor, and (4) Marang, Terengganu, and also the other RICs which were located at a mukim (a subdivision of a district). For Sabah and Sarawak, Borneo Region, the district is known as a division (see APPENDIX 2). Four regions were selected for the purpose of interviews and visits. Three states were classified as the eastern region (Kelantan, Terengganu and Pahang), while four states were classified as the northern region (Kelantan, Terengganu and Pahang), while four states were classified as the northern region (Perlis, Kedah, Penang/P.Pinang and Perak), three in the central region (Selangor, Negeri Sembilan and Malacca/Melaka) and one in the southern region (Johor) (Figure 3.6). Sabah and Sarawak were classified as the Borneo region or East Malaysia. For the purpose of this study, the states were identified only in rural areas and this includes the RIC sites (see Figure 3.6).

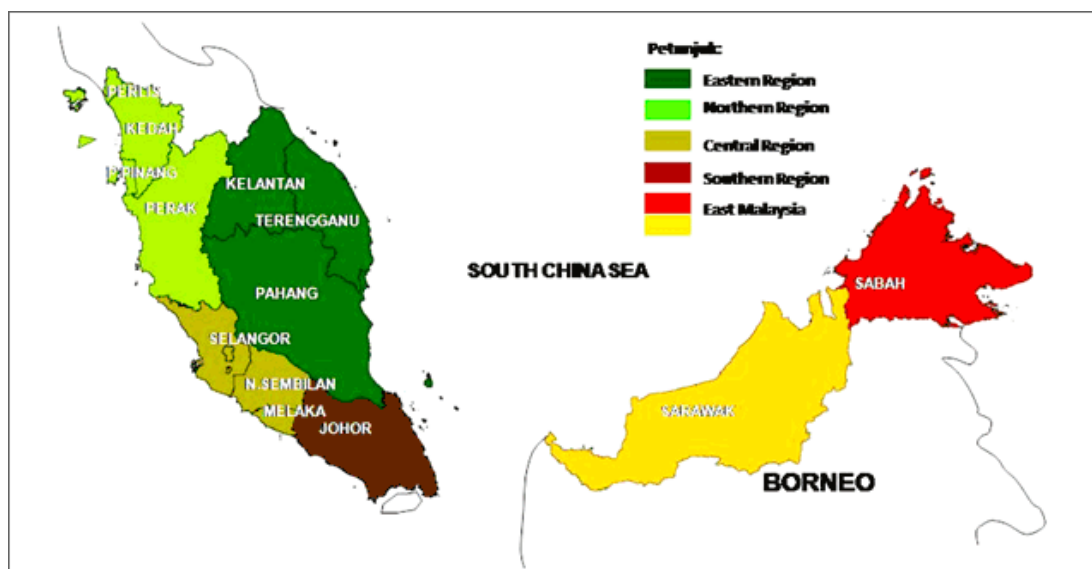


Figure 3.6: Distribution of states and regions in Malaysia

This section describes the RIC regions, including some demographic information as at 2010. This information is from government statistical data and reports. Figure 3.7 classifies the rural population by age group and regions. This figure provides an overview of the population and sample for this study. A more comprehensive description statistics of the regions is included in

APPENDIX 3. This includes the area and population of Malaysia, average percentage distribution of household income, number of employed persons by stratum and gender, number of employed persons by educational attainment and gender, average percentage distribution of households by personal computer used and internet subscription, regions and rural (see

APPENDIX 3, Table 1-5).

The data show that the Northern region has a higher proportion of people in the older age groups, while there are more people under 20 in the Eastern region. The reason for this could be that the Northern region is more remote compared to the Eastern region and therefore have higher youth out-migration.

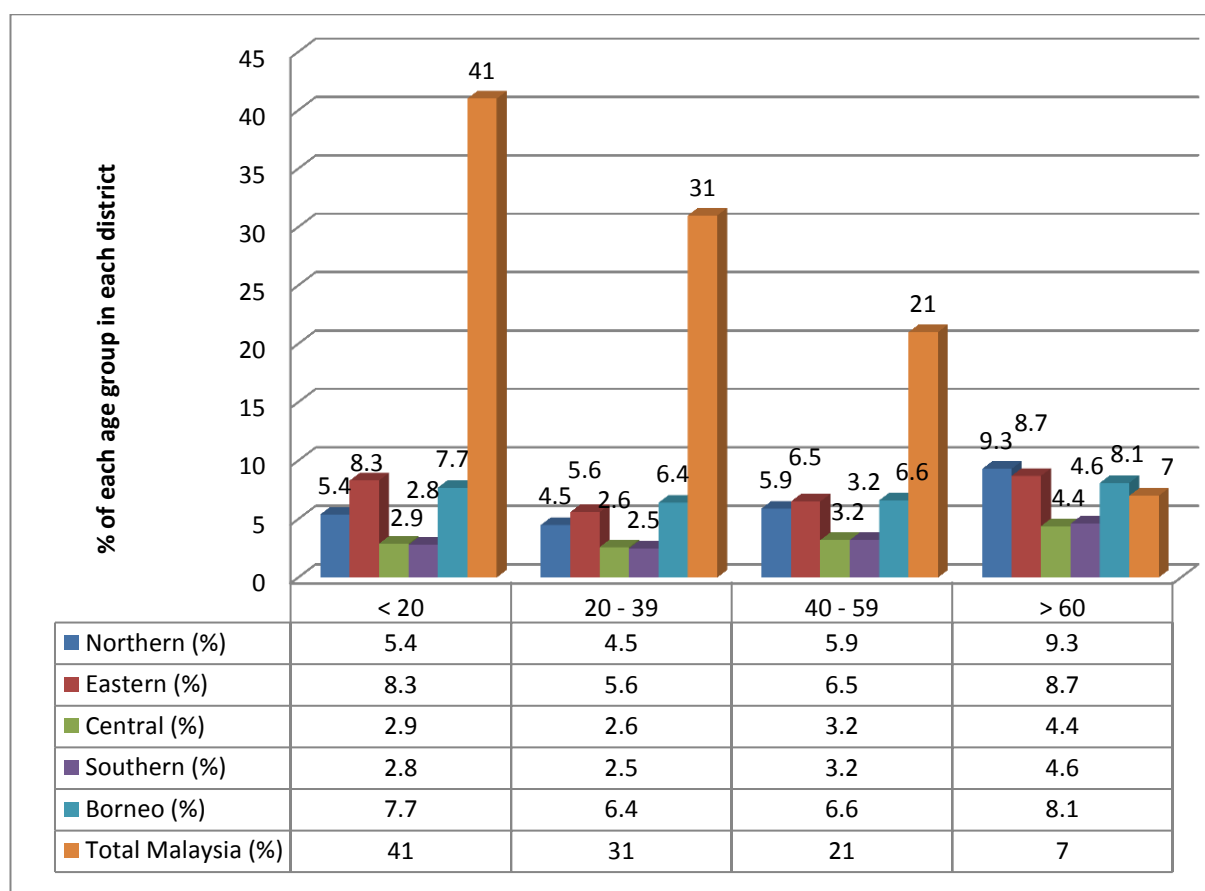


Figure 3.7: Malaysian rural population by age group & regions 2010 (adapted from Department of Statistics Malaysia 2010)

Table 3.2 classifies the characteristics of the study sites sample and the total number of respondents for each region and RIC site.

Table 3.2: Characteristics of study sites sample

Peninsular Malaysia/ Borneo	RIC location by state	Geographical	Major economic activities	Total no. of RICs	RIC centres with responses	No. of RIC user responses
Northern Region	*Perlis (1) *Kedah (1) *Penang (1) *Perak (1)	Rural area	Agriculture Industrial/man ufacturing	12	9	42
Eastern Region	*Kelantan (1) *Terengganu (1) *Pahang (2)	Remote area	Oil, gas & petrochemical Industrial/man ufacturing	7	7	65
Central Region	*Selangor (2) Negeri Sembilan Malacca	Rural area	Industrial/man ufacturing Tourism	10	5	21
Southern Region	*Johor (1)	Rural area	Industrial/man ufacturing	6	6	50
East Malaysia	Sarawak Sabah	Remote area	Palm oil Industrial/man ufacturing Tourism	7	6	21
Classified/ Total	13 states	Rural/remote	Industrial/man ufacturing	42	33 (78.5%)	199

*Note: *asterisk represents the RIC location visited for the purpose of observations (site visits) and interviews*

As shown in Table 3.2: Characteristics of study sites sample of RICs were located in the remote and rural areas of Malaysia in five specific regions (northern, eastern, central, southern (Peninsular Malaysia) and East Malaysia (Borneo)). The 42 RICs were not equally distributed across the regions or states, reflecting the main idea of the RIC program to capture the most deserving areas and to target high poverty rates in the areas. The participation rate (78.5% - see Table 3.2) was acceptable and it was appropriate to check for non-response bias, thus the early respondents were checked against the late respondents. Testing for differences between early and late respondents can be useful in detecting for non-response bias (Armstrong and Overton, 1977). Table 3.3 summarises the results of chi square test in verifying non-response bias which supported by statistical tests.

Table 3.3: Summary results of Chi Square test on non-response bias (against age, income level and level of education)

Non-response bias	Age	Income level	Level of education
Sig./non-sig. (chi square test)	.458	.462	.449

The main purpose was to check for significant differences on the basis of demographic characteristics (namely, age, income level and level of education) using Chi-square testing. There were no significant differences found between the early respondents and the late respondents (see Table 3.3).

3.5 Phase One - Online Survey Design of RIC Users

This section discusses the survey responses and statistical procedures. The data were collected and analysed to examine hypothesized relationships, associations and the study proposed outcomes, derived deductively from existing knowledge (Cormack, 1991), as discussed in Chapter 2. The survey, across the 42 locations, was aimed at evaluating RIC users' perception of the RIC program. Therefore, the questions were designed mainly around the structure of the program logic conceptual framework developed for this study (Chapter 2, Figure 2.4). Besides the survey, this study also used quantitative data from secondary sources such as the government, Warisan Global and the RIC managers. Table 3.4 summarises the methods, design and the purpose of the techniques.

Table 3.4: Methods used in quantitative approach

Instruments/Techniques	Approach & Design	Purposes
Online survey	Total of 42 RICs	To evaluate users' perceptions of impacts of RICs
Government, WG & RIC managers' statistical data	From *EPU, *MDS, WG reports & RIC managers' annual reports	To analyse data on rural population, age, income, education, employment and RIC usage/performance

*EPU – Economic Planning Unit

*MDS – Malaysian Department of Statistics

3.5.1 Quantitative sample selection

Once the rural ICT program was identified, the RIC was selected as one of the rural ICT program in Malaysia. The RIC websites and portal were examined for preliminary information about RICs. In order to seek more information on the RIC,

the researcher contacted the Ministry of Information, Communications & Culture and Warisan Global. A formal letter was sent to the relevant officer at the MICC to try and attain a sample of users diverse in age, level of education, and average household income (individual demographics).

The target groups included registered users, who were also members of the RIC. Normally the registered RIC users will also be regular and frequent RIC users. There were four groups of particular interest, in line with the program aim (see Chapter 1): (1) youth, (2) women, (3) elderly, and (4) entrepreneurs. This study attempted to have respondents from every level of ICT literacy and all age groups. The data was collected from the RIC managers' data on annual reports sent to the MICC, for the purpose of triangulating results on RIC usage.

In addition, the sample population for this study which was RIC users who are registered in the program across 42 RIC sites. Hence the entire population was surveyed but their participation was dependent on the RIC users visiting an RIC in their region during the period when the online survey was open. The RIC managers played a critical role in ensuring the RIC users at their RIC site were aware of the online survey and encouraged RIC users at their RIC site to participate. The RIC users were invited to participate in the online survey by posting the pop-up screen features on questionnaire at RIC computers. Indirectly, the users will participate in responding to the questionnaire.

3.5.2 Questionnaire development and design

In the questionnaire (see APPENDIX 4) there are 9 questions with responses measured on a 7-point Likert scale. Other questions are presented with categories to be selected. A number of instruments have been developed in previous studies to examine the impact of ICT and social capital, and these were adapted with some minor modifications for this study. These measurement instruments were explained in Chapter 2 and also in Table 2.5 on key literature based on main variables from the program logic framework.

One online survey questionnaire carried some previous evidence of reliability and validity with it (Morgan and Hunt, 1994). Therefore, some of the same questions

were used while others were adapted for this study. For instance, the variables/themes on economic benefits were adapted from a previous study (Morgan and Hunt, 1994), the questions on service satisfaction and the themes used were adapted from ESCAP (2006), some of the questions on social capital and most of the main themes were adapted from Woodhouse (2006) and some of the user characteristics/demographics questions and themes were adapted from previous studies; particularly from Harris (2001).

Table 3.5 lists the previous work on dependent and independent variable survey items incorporated in this study.

Table 3.5: Measurement instruments

Variables	Previous Study
<u>Economic benefits</u> <i>(o.d.: employment; Income, education, Best et al. (2009))</i>	IIASA Policy Brief (2008) Bailey & Ngwenyama (2009) Woodhouse (2006)
<u>Service satisfaction</u> <i>(o.d.: users actually used basic facilities, UNESCAP (2006))</i>	ESCAP (2006) IDRC (1999)
<u>Social capital</u> <i>(o.d.: local cohesion-Bonding & external Social links-bridging, Callois and Aubert (2007))</i>	DiMaggio et al. (2001) Hampton (2001) Ellison et al. (2007) Kavanaugh et al. (2005) Woodhouse (2006)
<u>User characteristics/demographics</u> <i>(o.d.: predictors were: age, gender, Income and education, Venkatesh et al. (2003))</i>	Woodhouse (2006) Harris (2001) Bergeron & De Serre (1990)

Note: o.d.: operational definition

The online survey was created using Qualtrics software. The questionnaire had three main sections. The first focused on getting responses from the RIC users about their usage, computer and Internet skills, purposes, activities, and services (inputs and outputs). This came from ESCAP (2006) and IDRC (1999). The second section gathered data on the perceived RIC outcomes and its importance to RIC users. This included questions on economic benefits; such as level of education, job opportunities and income level. Similarly for social capital; the idea for the survey questions came from the previous studies stated in

Table 3.5, on social relationships, social networks, bonding capital, bridging capital and local community association. The last section gathered data about the general demographics of the RIC users, using questions adapted from Bergeron & De Serre (1990), Harris (2001) and Woodhouse (2006). The demographics were placed at the end of the questionnaire since the respondent was more likely to answer this section when a commitment had been made in answering the previous sections of the questionnaire.

Table 3.6 summarises the questionnaire content.

Table 3.6: Summary of the questionnaire content (adapted from Lane (1998))

Section in questionnaire	Questionnaire number	Types of questions
Dependent variables: -Perceived benefits -Service satisfaction } Implicit QoRL	Section 2- Q 23, 24, 25, 28 Section 2- Q 26, 29	7 Likert scale, Open/Closed-ended questions 7 Likert scale, Ranking scale
Independent variables: -Perceptions of Bonding capital -Perceptions of Bridging capital -Perceptions of Local community association } SC -Information functions -Communication functions -RIC usage	Sections 1 & 2- Q 16, 21 Sections 1 & 2- Q 16, 22 Section 3- Q 40 Section 1- Q 10 Section 1- Q 11 Section 1- Q 1, 2, 3, 4, 5, 6, 7, 9, 15, 17	7 Likert scale, Categories 7 Likert scale, Categories 7 Likert scale 7 Likert scale 7 Likert scale 7 Likert scale 7 Likert scale, Categories
RIC activities/purposes	Sections 1 & 2 –Q 8, 10, 11, 12, 14, 18, 19, 20	Closed-ended questions, Categories
Demographic data	Section 3- Q 30-39 & 41	Categories

In order to purify an instrument, (Lewis et al., 2005) suggest a pilot survey should be undertaken with a small sample. It is a strategy used to test the questionnaire using a smaller sample compared to the planned sample size. Pre-testing survey questions and the questionnaire is necessary because target respondents have nobody to ask for help in clarifying questions if necessary (Dillman, 2000). Therefore, a pilot survey was carried out in December 2009 with the assistance of Warisan Global, the Ministry and managers from each RIC. The objective of this pilot survey was to ensure greater validity and reliability from the responses in the main online survey. It was primarily to validate the online survey and to refine the set of questions for the main quantitative data collection in phase one. Therefore, it would be a lesser chance of unreliable results occurred and to test the correctness of the instructions to be

measured by whether all the respondents in the pilot sample are able to follow the questions as indicated (Sincero, 2012).

Out of twelve RIC users that were invited to complete the pilot survey questionnaire, ten managed to complete the pilot questionnaire successfully. The questionnaire was revised and given to MICC and WG officers for further evaluation. Based on their opinion, the best phrasing of questions on perceived indicators of QoRL and selection of RIC locations were determined. There were also some minor changes to the wording and structure based on these expert opinions. The comments and feedback received in relation to the pilot questionnaire seemed promising and based on that feedback and comments a refined online survey instrument was expected to provide better results for the actual survey.

The actual online survey was available via a URL link. This link was set up on the computers at RICs so that when the users logged in at one of the 42 RICs, they could access the online survey questionnaire. The online survey questionnaire was administered in two stages. The first stage of the online survey questionnaire was available from January 2010 until March 2010. Until March 2010, about 150 people responded to the survey. This number of respondents was not as high as expected; therefore, the posting date was extended to April 2010 and a further 60 responses were received. Once the posting date had expired, the raw data was exported from Qualtrics to SPSS software for data analysis. In total, RIC users from 33 RICs responded. The RIC managers encouraged the users to answer the survey by informing them about the survey and made them aware of the usefulness of answering the survey questions online. This formed part of the RIC users' training on how to use applications online.

The data were screened to check for normality and distribution of sample data and the 199 valid questionnaires were scanned individually for inconsistencies and missing data. A number of surveys were randomly checked to verify that the data entry was accurate. The ratings on the negative statements were reverse coded so that the statements reflected the same direction and order as the positive statements.

3.6 Phase Two – RIC Program Interviews and Site Observation Design

To validate and provide further support for the findings, a qualitative method was used to deepen understanding of the perceived impacts of RIC by collecting data from stakeholders as key informants. Qualitative research uses a small sample that has similar characteristics (Wech-O-sotsakda, 2008) and this was appropriate for this study.

Table 3.7 describes the data collection methods used in the qualitative phase of this study.

Table 3.7: Methods used in qualitative approach

Instruments/Techniques	Approach & Design	Purposes
Interviews	Multi-stakeholders' perspectives – Table 3.7 outline different categories of stakeholders	To deepen the perceived impacts of RIC and validate findings
Observations	11 RIC sites	To access and analyse the training, workshop and RIC activities – validate findings
Survey	Open-ended questions (Q.13 & Q.27 in Questionnaire document)	To gain RIC users' perceptions of benefits and their Internet usage
Government & RIC managers' reports	From *MCMC, *ITU , *UNDP, *EPU and 11 RICs	To analyse reports on the Malaysian National Plan and RIC services/activities – to support findings

*Note: *MCMC - Malaysian Communication & Multimedia Commission*

**ITU - International Telecommunication Union*

**UNDP – United Nations Development Programs*

**EPU – Economic Planning Unit*

To deepen the understanding of the impacts of RICs, the researcher conducted in-depth interviews with a senior officer/director, RIC managers/assistant managers (or whoever was most senior and available in the centre as some centres/RICs did not have managers yet), the management committee members and RIC non-users/ex-users.

The researcher conducted direct observations in eleven sites and accessed workshop/training and classes so that the researcher can observe and analyse the interactions between RIC managers and participants. The purpose was to identify and where possible quantify changes in social and human capital and increased employment and business activities that related to the presence and usage of RICs. From the survey, there were two open-ended questions which were also included in the qualitative data. The questions were mainly used to identify the opinions of RIC

users pertaining to RIC benefits and the importance of the Internet/Internet usage to the RIC users.

3.6.1 Qualitative sample selection procedure

The qualitative data from the interviews was analysed by content analysis of each interview question and across the interview groups and more generally to identify the common themes that emerged from the interviews and whether these were consistent or inconsistent with the theoretical framework and conceptual model for this study. The content analysis is "... an approach to the analysis of documents and texts that seeks to quantify content in terms of predetermined categories and in a systematic and replicable manner" (Bryman, 2008) p.4; others also state "content analysis" encompasses; qualitative, quantitative or both, mixture of these two approaches...depending on the research question, research paradigm, texts are reconstructed, reduced or some other way interpreted during the course of analysis (Corbetta, 2003, Krippendorff, 2004).

An attempt was made to ensure that in selecting the sites, there was at least one in each region (excluding Borneo Region (Sabah and Sarawak)). There were some limitations which are summarised in the concluding chapter (Chapter 7). The regions were classified as discussed in Section 3.1. Then selection of interview sites was based on several considerations: (1) the degree of remoteness; whether the area/region is more remote or less remote, (2) selected on the highest rural poverty rate compared with the other RIC locations, (3) the RIC characteristics that are unique and different from others in terms of its services offered, and (4) the RIC location that represents at least one of the regions. The identity of these eleven RICs (see Table 3.8, together with the interviewees, is not revealed in this study as each RIC was promised anonymity in the invitation to participate in the interview. For RICs that agreed to participate, the respective RIC managers were contacted via email to arrange for an interview appointment (see APPENDIX 5: Interviews and site visits schedule at MICC, WG and RICs, 2010).

Table 3.8: Summary of 11 RIC locations selected for interviews and site visits

RIC locations/regions	Code	Differences
Northern 1	N1	More remote, high rural poverty rate, offered info-mediation service
Northern 2	N2	Less remote, many entrepreneurship activities, having business operations
Northern 3	N3	Less remote, high rural poverty rate , provide member card to RIC users as part of the service
Northern 4	N4	Less remote, more advanced in terms of services provided; such as e-government services-using government portal
Eastern 1	E1	More remote, high rural poverty rate
Eastern 2	E2	Less remote, high rural poverty rate, offered more services to the communities
Eastern 3	E3	More remote, training classes after office hours (at night)
Eastern 4	E4	More remote, offered passport photos service
Southern	S	Less remote, offered more educational services
Central 1	C1	Less remote, having other ethnicity using the service
Central2	C2	Less remote, provide one-to-one session for workshop

3.6.2 Administration of the interviews and observations

The interviews were among the RIC non-users, RIC management committee members, RIC managers, officer of Warisan Global, and MICC director (see APPENDIX6 – Interview questions for program managers & non-users). At the same time general observations were made of computer classes, training, workshops and business related activities including a visit to a Social Entrepreneur Club member’s own business operations (see APPENDIX 5– Interview schedule). The interviews with the management committee members were unplanned but were an opportunity to gain additional data. The interviews with RIC non-users/ex-users, RIC managers and the officers were related to services, individual users’ characteristics and intermediate outcomes construct. The interviews were conducted to supplement data collected from the survey and to provide contextual and supporting qualitative data to assist in the interpretation of the qualitative data.

Detailed information about the overall fieldwork and RIC site visits is provided in APPENDIX 7 (Table 1&2– Site visits and observations). A tape recorder was used throughout the interviews. A video recorder was also used to record activities such as training classes, workshops and site visits. As an added dimension, it was hoped that the technical equipment being used in the research would inspire the participants to

see how ICT works and benefits them. Notes were taken during interviews and later transcribed manually using the thematic technique. This was done through four stages. First, the researcher summarised all the transcribed text in a summary table. Second, the researcher translated the interview transcribed from Malay to English Language. Third, the researcher arranged the translated transcripts in a table form according to multi stakeholders groups. Last, the researcher identified key themes developed in relation to the variables used in the RIC program logic framework. The interviews transcripts, as well as other documentation, were analysed using content analysis in which key themes were identified. Notes from on-site observations were also taken during each visit (each visit lasted for two days).

Observations were conducted for the purposes of gaining additional data on facilities, training, workshops and also RIC activities. Silverman (1993) noted that the aim of observations was to gather primary information or data in a “naturally occurring” context. During the observations, no attempt was made to interview the participants because the focus was on what they actually did, rather than what they thought about what they did. The researcher observed the sites between March and May 2010 for four to six hours at different times of the day, such as at the SEC sites, workshops, users’/entrepreneurs’ sites/shops and other relevant activities/events. The focus was on their work and how they dealt with their problems. This helped the researcher gain more knowledge about their daily lives and their needs. It was noted that they were welcoming of outsiders to the local community. Details of the observation process are provided in APPENDIX 7 & APPENDIX 8. Table 3.9 summarises the nature of interviews in terms of stakeholder participation and rural regions. The RIC non-users and ex-users are separate group with the latter having previously used the Internet or a computer at RIC. Thus the interviewees were selected based on the 11 selected RIC locations.

Table 3.9: Summary of interview locations & selection of interviewees

Multi-stakeholders (interviewees)	Criteria for purposively selected	Location	Total
Director	Steering committee- decision maker & monitor the RIC program.	Ministry of Information, Communication & Culture (MICC) -public sector	1
Senior Officer	Steering committee- organized training & entrepreneurship.	Warisan Global Sdn. Bhd (WG)-private sector	1
Managers	Operational-4 regions purposively selected	RIC – Northern (4), Eastern (4), Central (2) and Southern (1)	11
Community (non-user & ex-users)	End-users	RIC – Northern (2), Eastern (2), Central (1) and Southern (2)	7
Management Committee Members	Volunteers as a trainer and representative to the target group	RIC – Northern (1), Eastern (1), Central (1) and Southern (2)	5
			25

Note: Total of eleven RICs based on region

The selection of interviewees was determined across four different regions and they were purposively selected. Hence the criteria for the selection were as follows: (1) Director MICC – the one who makes decision and monitoring. (2) Senior director WG – conduct training program for trainers and social entrepreneurs. (3) Managers – responsible for the operational of RIC program. The regions were purposely selected based on the managers respond to the email send to them respectively and also the RIC portal updated providing useful information to the community. (4) Community (non-users & ex-users) – purposely selected once visit the RIC locations (unplanned). (5) Management committee members – during the visit made at each selected RIC, the researcher purposely select the members who visit the RIC to be interviewed (see Table 3.9).

Some government official reports and statistical data also provided greater evidence to support the primary data obtained from the survey. The reports were from the Mid-Term review of the Ninth Malaysia Plan (2006-2010), the Malaysian Economic Planning Unit report on Quality of Life in Malaysia and other related reports. The statistical data was mainly obtained from the Malaysian Department of Statistics, EPU, MICC and other related government agencies, and the RICs.

3.7 Data Analysis

Statistical analyses of the data gathered from RIC usage records, survey responses and official demographic data were used to categorise communities and to identify potential correlations. It was expected that statistical analysis could reveal whether or not RIC activities are associated with perceptions of better economic and social outcomes.

3.7.1 Descriptive and inferential statistics/analysis

The statistics measure the location (mean), spread (standard deviation), and shape of spread (skewness and kurtosis) to determine the normality of the data (Hair et al., 1995). Then, exploratory data analysis (EDA) is used to get to know the data. There are four reasons for applying EDA: (1) to identify if problems occur in the data, such as outliers (these are extreme cases in data that lie outside the normal range of a dataset), non-normal data, data coding problems, missing values and errors in data input, (2) to examine whether the assumptions of the statistics are met, (3) to get basic information on demographic variables to report in the methodology or findings, and (4) to examine relationships between variables and how to conduct hypothesis testing analyses (Leech et al., 2008). Then, the inferential statistics can be used in more detailed statistical analysis based on the study research questions developed. In relation to this study, the research questions were divided into three types: (1) difference, (2) associational, and (3) descriptive. Figure 3.8 explains the three types of research questions in detail. The RQ (a) is to determine whether the RIC users are satisfied with the RIC services or not. Next, RQ (b) is to examine whether the RIC users perceive there is an increase in their income, employment and level of education. Last, RQ (c) is to examine whether the RIC users perceive an increase in social capital. As highlighted, there are three types of research questions and two types of hypotheses; these hypotheses are grouped based on the conceptual nature and design of the research questions constructed.

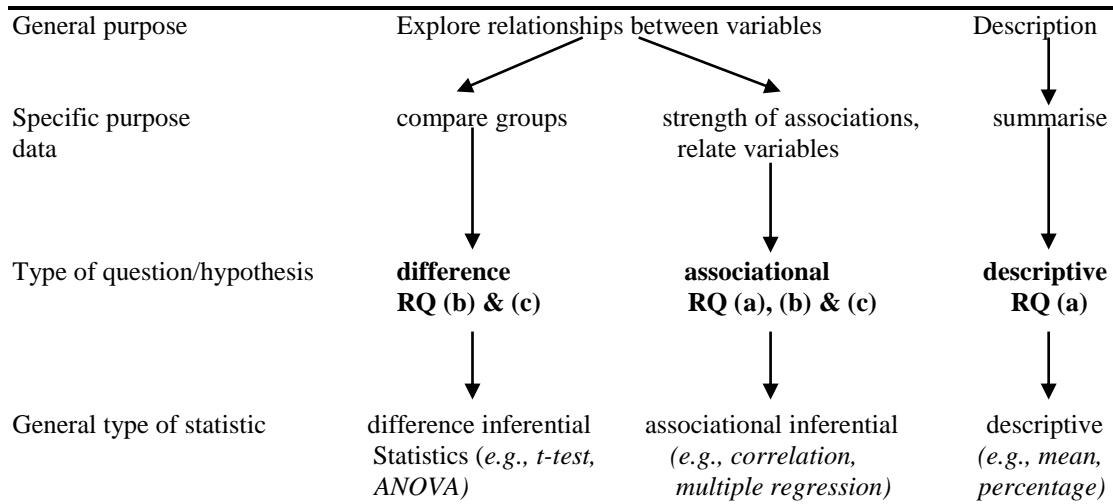


Figure 3.8: Purpose and type of research question related to the type of statistic applied in this study (adapted from Leech et al. (2008))

Statistical tests included Chi Square tests (from cross tabulations)); t-tests; and ANOVAs for all the quantitative data, including between:

- (1) RIC usage data and community demographics to identify whether different types of communities have different levels of usage. This was mainly exploratory work and for the purpose of comparing groups; thus, using inferential statistics.
- (2) Individual demographic data, questionnaire responses and communities/regions to see if individual characteristics promoted or hindered human capital development through RIC usage. This would allow discovery of whether different types of people benefited from RICs; hence, also using inferential statistics. This work began to test Hypotheses 1 and 2 at the general level.

Correlation, multiple linear regression and factor analyses of the survey data were carried out to identify themes relating to the RIC impact on human and social capital development and job and market opportunities to identify the strength of the relationships or associations among the variables. Content analyses of the interviews were conducted to identify themes related to RIC impact on human and social capital development and job and market opportunities. These analyses were also concerned with the perceived impact of RIC on the community members. In addition, an

analysis of the opinions of key stakeholders in regard to the impact of the RIC in improving the QoRL of local rural communities are also identified and examined in this thesis. The program logic framework discussed earlier guided the analysis of the data regarding the RIC impact.

3.7.2 Reliability and validity measurement scales

Reliability indicates the extent to which the different items, measures or assessments are consistent with one another and are free from measurement error. It is concerned with internal consistency. The construct consistency is indicated by each item's Cronbach Alpha score. Internal consistency is determined by the evaluation of the Cronbach Alpha score on questionnaire items, which tests whether construct items can be loaded together. Therefore, items that do not load together can be removed. If the inter-item correlation is low, that indicates the item is not from the same domain and should be removed, to improve the Cronbach Alpha score and increase the reliability. Factor analysis is used to establish construct validity, which is the most common validity testing. In factor analysis, construct validity occurs if the items of the construct load together and do not cross load onto another constructs. It determines how strong the group of items is in measuring the construct (Lane, 1998). This thesis applied internal consistency and construct validity for measuring the reliability and validity of questionnaire items.

Factor Analysis

This is the statistical technique designed to reduce a set of variables to a smaller set of factors. The factor scores can be used as input variables into the multiple regression equation (Lane, 1998). This study conducted exploratory factor analysis (EFA), which provides an understanding of the relations among variables by understanding the constructs between them. As such, there are two main conditions for EFA: (1) there needs to be relationships among the variables, and (2) the larger the sample size, the more reliable the resulting factors. Therefore, the sample size is less crucial, to the extent that communalities of items with the other items are high, or at least relatively high (Leech et al., 2008).

This research developed a comprehensive measure of SC that incorporates each of the variables. The level of SC at each RIC was assessed through a triangulation approach combining quantitative and qualitative methods. The questionnaire included 22 variables designed to measure aspects of SC formation covering bonding, bridging capital and local community association. Responses to the questionnaire were assessed via measurement on a seven-point Likert scale. It is acceptable for this study to use Likert scale to measure an abstract concept such as social capital as this summated scale utilizing item analysis approach. This item analysis is a number of statements on agreement and disagreement degree. The respondent is asked to react and the total scores are measured to analyse the respondent's attitudes. For instance, this research also factor analysed the computer anxiety items scale from the survey questionnaire and included in the program logic model for RICs as an intermediate outcome and RIC users perception of their computer skills. However, this research did not hypothesised the computer anxiety relationships with perceived benefits and services satisfaction as the research objective or research questions did not attempt to find out about the computer anxiety as an ultimate outcome. Hence this research attempted to confirm social capital as one of the ultimate outcomes and determine its relationships in the RIC program logic model.

Table 3.10: Reliability analysis and factor analysis for social capital

Statements	Factor loadings	Item-total correlation
Component/variable 1 – Bonding Capital		
There is someone online I can turn to for advice about making very important decisions	.863	.747
There are several people online I trust to help solve my problems	.849	.729
My interaction online would be a good job references for me	.772	.630
When I feel lonely, there are several people online I can talk to	.752	.602
The usage of RIC results in strong relationship between the users	.606	.453
<i>Cronbach Alpha = .831</i>		
<i>No.of Items = 5</i>		
<i>Total % of Variance = 59.89</i>		
<i>Kaiser-Meyer-Olkin measure of Sampling Adequacy = .784</i>		

Component/variable 2 – Bridging Capital

Interacting with people online makes me interested in things that happens outside of my town	.832	.757
Online, I come in contact with new people all the time	.807	.737
I am willing to spend time to support general online community activities	.787	.708
Interacting with people online makes me want to try new things	.786	.698
Online relationships are just as strong as my relationships within the community	.768	.689
Interacting with people online makes it easy for me to hear about new jobs opportunity	.730	.630
Interacting with people online makes me having more business contacts	.686	.595
RIC usage brings more contact outside RIC	.668	.568

Cronbach Alpha = .891

No.of Items = 8

Total % of Variance = 57.765

Kaiser-Meyer-Olkin measure of Sampling Adequacy = .867

Component/variable 3 – Local Community Association

I am an active member of a local organization or club other than RIC	.804	.696
I have been part of a project to organize a new service in my area	.785	.687
I have attended a local community event recently	.723	.595
I have made online conversations with friends	.688	.563
I am a management committee for the RIC	.687	.562
My local community feels like home	.661	.530
I do go outside my local community to visit my family	.655	.530

Cronbach Alpha = .840

No.of Items = 7

Total % of Variance = 51.392

Kaiser-Meyer-Olkin measure of Sampling Adequacy = .822

Total No. of Items = 20

Two statements out of 22 items were omitted which were: (1) *There is no one online that I feel comfortable talking to about intimate personal problems* and (2) *I do not*

know people online well enough to get them to do anything important. These exhibited low and weak correlations between the items and the Cronbach Alpha reliability test. The data resulting from the analyses shown in Table 3.10 was analysed using principal component analysis extraction. Each component explained the total percentage of variance of about 50-60 percent; the factor model had a high Cronbach Alpha score of about .80 and a Kaiser-Meyer-Olkin (KMO) measure of .70 to .80. Communalities were good with all values at or above .61, and 13 of the 20 were over .70.

Leech et al. (2008), p.63) explain that a KMO measure, which indicates whether or not enough items are predicted by each factor, should be greater than 0.7, and is inadequate if less than 0.5. According to Leech *et al*, “this means that the variables are correlated highly enough to provide a reasonable basis for factor analysis”.

The three components or constructs seemed to match the SC components had bonding and bridging capital and local community associations. These components were factors/groups from the questionnaire responses from the RIC users and also draw the labels from Pigg and Crank (2004) and Woodhouse (2006).

3.7.3 Hypotheses testing

In testing associations between dependant and independent variables, a statistical test that is considered appropriate to use is multiple regression. It also tests the significance level. The level of significance indicates whether to accept or reject the null hypothesis. This study used the five percent level of significance to accept evidence for the hypotheses. This analysis is discussed further in Chapter 5 (Findings on RIC Outcomes), Chapter 6 (Discussion) and Chapter 7 (Conclusion). Table 3.11 summarises the measurement of the variables for hypotheses testing.

Table 3.11: Variables for hypotheses testing

Variables Measured	Characteristics (Outputs)	Outcomes Perceived benefits	Outcomes- Services satisfaction
Social capital	Bonding capital (Q21) Bridging capital (Q22) Local community association (Q40)	Social relationships (Q28) Social networks (Q28)	Services satisfaction (Q26)
Demographic/socio- economic characteristics	Age groups (Q30) Gender (Q31) Education level (Q32) Employment status (Q34) Income (Q39) Location (Q41)	Economic benefits – income, education and employment (Q28)	Services satisfaction (Q26)

Lane (1998), p. 66) explains that “the level of significance at which the null hypothesis is tested indicates the probability of accepting or rejecting the idea that chance caused the results”. The rejected null hypothesis at the accepted level of significance is usually 0.05 and we can say that the results are statistically significant or at $p \leq 0.05$ (5%) (Leech et al., 2008). This study used the five percent level of significance in order to support the research hypotheses. Table 3.12 describes the results regarding whether to accept or reject the null hypothesis; for example, if the Sig. or p-value is small (less than .05), the finding is statistically significant, and we can reject the null hypothesis of no difference or no association (Leech et al., 2008).

Table 3.12: Test of significance (adapted Leech et al. (2008))

Sig.	Meaning	Null Hypothesis	Interpretation
1.00	$p=1.00$	Do not reject	Not statistically significant
.50	$p=.50$		
.06	$p=.06$	↓	↓
.05	$p<.05$	Reject	Statistically significant
.01	$p=.01$	↓	↓
.000	$p<.001$	↓	↓

This study used multiple linear regression to determine the degree of association of the independent variables (bonding capital and bridging capital, local community association, age, gender, income, education level, employment status and location) on the dependent variables (perceived benefits and service satisfaction). As explained

by Markus and Robey, 1998 (see chapter 2.2), the role of social capital depend on whether SC is considered to be a dependent variable or an independent variable.

3.8 Ethical Considerations

The Human Ethics Committee at the University of Southern Queensland (USQ) (see APPENDIX 9) approved this research on 8 February 2010 and the ethical approval was used as a guideline throughout the study. Personal networking was used to approach the key informants from the Ministry and Warisan Global through formal and informal ways. The consent letter was sent to introduce the study to the Ministry. Once the approval letter was received from the Ministry (see APPENDIX 10), the researcher started to plan and structure the interview schedule and contacted the WG and respective RIC managers. This was done via email.

The researcher employed online survey, interviews and observations methods (primary data) and secondary data for the data collection. A triangulation approach was used throughout the process of this study. Personal data was kept confidential, secure and used only for specific approved purposes. A copy of reporting documents on findings of data analysis, discussion and recommendation sections will be submitted to the Ministry, WG and the interviewed RIC managers after this thesis is officially submitted.

3.9 Conclusions

This chapter has provided an overview of the research purpose, which is descriptive and explanatory in nature. The data was collected from both the primary and secondary sources. To measure the validity and reliability of the data, this study applied a triangulation technique to compare and contrast the quantitative results with the qualitative results. In addition, the study adopted several analysis techniques to measure and interpret the findings. For instance, this research is one of the most comprehensive studies on rural ICT program in Malaysia, the measurement instruments used in this study very much depends on other work or studies. The survey questions from other work were identified in the first instance to see whether it is relevant to this study. Then, the variables were identified based on the themes adapted from reviewed literature and RIC program logic model. These variables and

themes have been used throughout this thesis and tested based on the analysis techniques discussed earlier. Therefore, this may provide the contribution and originality to the body of knowledge in this research area. The next chapter outlines the results and analysis for the overall study.

The next chapter focuses on the findings from the data analysis. The reporting of the findings is divided into two chapters, as follows: (1) Chapter 4 – Findings on RIC Program goal, Inputs and Outputs, and (2) Chapter 5 – Findings on RIC Outcomes. All of the findings are reported using the mixed methods of the quantitative and qualitative approaches.

CHAPTER 4: FINDINGS ON RIC PROGRAM GOAL, INPUTS AND OUTPUTS

4.0 Introduction

The aim of this study is to assess the efficacy of Malaysia's Rural Internet Centres based on the perceptions of key stakeholders in the RIC program, according to the program logic, of Figure 4.1. This chapter presents and discusses the key findings in relation to the first three components of the logic model, namely, the goals, inputs, and outputs.

First, an overview of the data sources for this study is provided. The RIC program goal is then recapped and the key stakeholders' understanding of the goal is discussed. The key stakeholders in the RIC program who are of concern in this study include the RIC end-users and program managers; noting that the RIC end-users considered in this study are RIC users and RIC non-users. The program managers include the Ministry of Information, Communication and Culture program director, Warisan Global officer, individual members of RIC management committees and RIC managers. This chapter also includes an assessment of the technology and physical environment of RICs, the socio-economic context of RICs, and the roles (inputs) and the key outputs of the RIC program. This will help determine how key stakeholders interact in the RIC program within the constraints of the RIC technology and physical environment and usage of services provided by RICs. The results of this chapter in combination with the results of Chapter 5 (RIC program outcomes) are then discussed in Chapter 6 to evaluate the overall effectiveness of the RIC program.

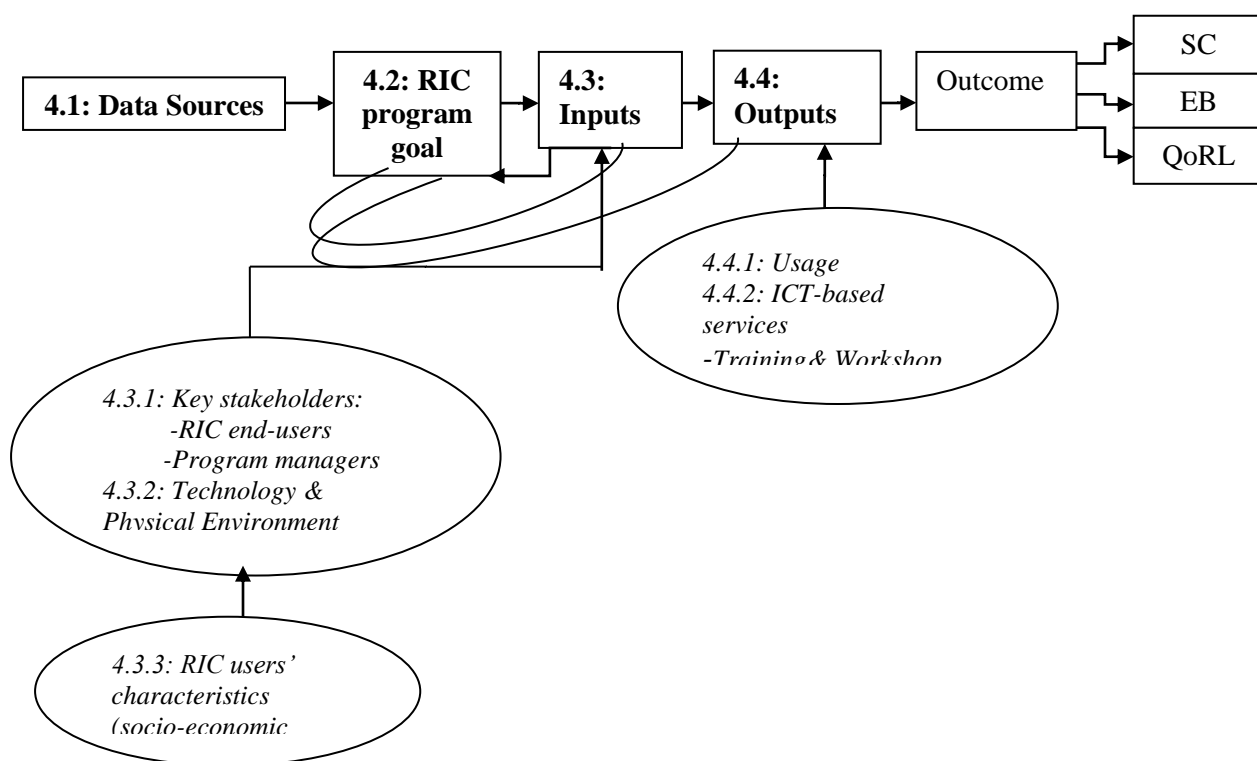


Figure 4.1: RIC program logic and chapter overview

4.1 Data sources

This section reports on the response rate of the online survey of RIC users and describes the other key stakeholders of the RIC program who were interviewed and observed during site visits to 11 RICs.

There are 42 RICs within Malaysia. One hundred and ninety-nine valid online survey responses were received from 33 of the 42 RICs (79 percent of centres); resulting in a total of 199 usable RIC user responses (see Table 4.1 & Chapter 3 in Section 3.3).

Table 4.1: Summary of survey responses

Response Details	Number
Total responses received	229
Reliable responses (answered most of the questions)	210
Unreliable responses (answered some parts of the questions or later part of the survey was unanswered)	11
Range of responses across RICs	1 to 24
Total usable responses received from 33 RICs	199

Perceptions of other key stakeholders in the RIC program were obtained through 25 semi-structured interviews involving the MICC program director, WG officer, and 11 RIC managers consisting of four personnel from the northern region, four from

the eastern region, two from the central region and one from the southern region. Interviews were conducted with five Management Committee individual members. Seven RIC non-users or ex-users were also interviewed during the site visits (see Table 4.2).

Table 4.2: Summary of interview responses

Interview participants from different key stakeholder groups	Number
MICC program director	1
WG officer	1
RIC managers	11
RIC Management Committee individual members	5
RIC non-users or ex-users	7
Total number of interviewees	25

The 25 semi-structured interviews with other key stakeholders in the RIC program and observations by the researcher during the RIC site visits are presented and discussed in this chapter in relation to the first three stages of the RIC program logic model (program goal, inputs and outputs), as explained above.

4.2 Program managers' perceptions of the RIC program goal

As noted in the literature review (Section 2.4.2), one of the impediments to achieving outcomes is a lack of agreement on, or understanding of, a program goal. If those individuals and agencies implementing the program have an understanding different to that of the program designers or overall managers, then the outcomes may vary from what was intended. This section explores whether there is any evidence of disagreement or differing understandings among the key stakeholders in the RIC program (an input into the RIC program) in order to retain or eliminate this as a variable for further consideration. In order to assess whether there was general agreement about the program goal, key stakeholders involved in the management of the RIC program were interviewed. This included the director from the MICC, an officer from WG, five individual members of RIC management committees and 11 RIC managers. Each of these key informants was asked a question about the RIC program goal during the interviews. The interview data was analysed to find similarities and differences among these key informants. The interview data obtained from the higher level (Ministry) was compared to the interview data of the lower level (RIC manager), to check the transmission of the program goal.

The main goal of the RIC program was originally to bridge the digital divide between the urban and rural areas of Malaysia. There had however been some evolution of this as the MICC program director explains:

The main goal of RIC is to bridge the digital divide. It was the divide in terms of ICT, between urban and rural areas of Malaysia. Therefore, the emphasis was on basic ICT; for example, email usage, MS Word (for typing), etc. For more than two years (2008), then the emphasis changes to human capacity building. And the focus is on entrepreneurship. Every RIC should have the RIC resource centre known as KUSPID or RIC Social Entrepreneurs Club.

As the summary in Table 4.3 shows, at all levels of the RIC program there was some adherence to the goal of closing the digital divide by all the key stakeholders in RIC program management, but also an emphasis on human capacity building. The RIC managers have a much more detailed and applied interpretation of capacity building and the target groups (youth, women, elderly and entrepreneurs) in the RIC program.

Table 4.3: Summary of program managers' perspectives on the RIC program goal

Program Director MICC	WG Officer	RIC Management Committees	RIC Managers
1) To bridge digital divide-urban and rural areas 2) Recently, changed to human capacity building	1) To narrow the digital divide 2) Emphasise capacity building through Social Entrepreneurs Clubs	1) To bridge digital divide 2) Focus on target groups	1) To bridge digital divide- (a) basic ICT (b) mentality/changing attitudes (c) target groups (d) individual's knowledge (e) between generations 2) Later, to focus on Social Entrepreneurs Club and develop capacity building

Warisan Global introduced the Social Entrepreneurs Club network to assist and advise club members or RIC users about entrepreneurship and business development.

According to the WG officer:

The main goal is to narrow/bridge the digital divide... to closely reduce the gap, not really; with the advanced technology and fast ICT changes...at RIC means there is a sense of ownership, they have the club and they fulfil the Ministry's aspiration.

In other words, the main goal was to bridge the digital divide but this is difficult because of the rapid changes in technology. Therefore, the sense of belonging to the

RIC was important so that the local community feels the ownership and strives to achieve the stated goal.

In the interviews with the members of the RIC management committees, only one out of five representative committee members raised the RIC original program goal:

... the goal to bridge digital divide and the RIC is focused on target categories; youngsters, women, elderly, and also entrepreneurs. [RIC management committee 3]

This seems to imply that the RIC management committees in general do not have an understanding of the RIC program goals. This finding was further evident in that RIC management committees appeared to be focused on the target groups, even though this was a sub-goal of the RIC program.

At the operational management level, all the 11 RIC managers reported that the main goal was to bridge the digital divide between the urban and rural areas of Malaysia. The RIC managers understood that this was to be achieved through the capacity building of rural communities and in particular RIC users in terms of ICT knowledge and skills. Table 4.4 illustrates the key issues identified in the interviews with the RIC managers in relation to the program goal.

Table 4.4: RIC managers' perceptions of the program goal

Key issues	RIC managers
Divide/gap – knowledge and skills – mentality & different target groups	Eastern 4 Manager
Elderly & housewives – left behind	Southern Manager
Mindset shift – gap between target groups	Central 2 Assistant Manager
Train local community – IT literate	Eastern 2 Manager
IT illiterate to literate – can be achieved – learnt and have not learnt	Northern 1 Manager
Between generations – individual's knowledge	Eastern 1 Manager

These 11 RIC managers have similar perceptions of the program goal. The comments by the RIC managers suggest that the gap or divide existed not only between the urban and rural areas, but also within rural communities between the youth, elderly, women and indigenous people. It seems that the youth (most of whom were IT literate) were easier to approach or attract in relation to their participation in the RIC program compared with the elderly and women (those who are already left behind and have zero knowledge and skills). These issues are highlighted in the following quotes from the interviews:

The divide or gap is actually in terms of the knowledge, skills...we at RIC see that the gap is not only in terms of the knowledge, but also mentality... as for elderly and aborigines, there are gaps...when we want to approach them, they are a bit scared; especially the aborigines...but the youth we do not have problem...this year we can see the difference...compared with previous years, the aborigines are scared to learn, but now they had changed and can accept it. [Eastern 4 Manager]

Especially to those that are already left behind, such as the elderly, housewives [this is before the RIC exists]...even though they are working, but they have no computer; means that they must have the basic computer knowledge and skills...nowadays everything is so sophisticated, if it is not for this generation, it could be for the next generation. [Southern Manager]

The goal is more towards to change their mindset shift; change their routine activities to the use of technology...we introduced ICT and their acceptance towards ICT...the gap [to bridge digital divide] here is reducing and it is not critical... the community is beginning to become IT literate. Most school children and youth know how to use computer...normally, those with zero knowledge and skills are the women or elderly...those who know how to use it will learn something that they seldom or rarely use such as Internet...due to the reason that they want the certificate and improve their skills. [Central 2 Assistant Manager]

The gap in digital literacy was also seen in terms of the individuals' level of knowledge, skills and mentality. The managers also claimed that the gap was between those who were IT literate and illiterate, as well as between generations.

These points were expressed in the following quotes:

...our goal is to make sure we can train as much as possible the local community. That means, to make them IT literate, provide the knowledge to them, not only the ICT, but also the current technology development. [Eastern 2 Manager]

It can be achieved ...those who came to RIC IT illiterate become literate...we teach the basic ones...but there might be those who are still illiterate, but we do not know. Those who haven't learnt and interested to learn, but did not come to RIC, we do not know. [Northern 1 Manager]

...the divide is between generations to the other generation...between those layers; maybe next year will still have a generation that is IT illiterate...therefore, to bridge this gap because people do question about this; already being operated for 7 years but did not bridge the divide yet...the problem is that we do not have the same people coming in; maybe those who came do not know anything yet...this is being going for so long, continuously...this digital divide not within 10 years can be reduced everything...the divide is in terms of individual's knowledge.[Eastern 1 Manager]

These interviews indicate that there were no obvious inconsistencies in interpretation of the main RIC program goal across the different key stakeholder groups. However, only one of the RIC representative management committee members highlighted the goal to bridge the digital divide and this interpretation was similar to that of the other stakeholders. Thus, among the interviewed stakeholders it is widely perceived that the main goal of the RIC program was to emphasise human capacity building and the Managers had a much stronger focus on attracting the target groups.

4.3 Inputs of the RIC program

The inputs for the RIC program are: the key stakeholder groups involved in the program; the technology (hardware and software); the RIC physical environment; and the RIC users' characteristics (in the socio-economic context). Inadequate inputs can reduce program effectiveness (see Chapter 2 in Section 2.3.2). Table 4.5 provides a summary of the RIC inputs.

Table 4.5: Summary of RIC inputs

Input components		Features/Characteristics
RIC users		Registered users who use RIC services and facilities
Program managers	Key stakeholders	At the management level, the stakeholders include: (1) the Ministry, (2) WG, (3) management committees, and (4) RIC managers. The RIC managers are also the operational managers who are responsible for the overall management and administration of the RIC program
Technology		Computer hardware and software
Physical environment		Space/building, location and facilities
RIC users' characteristics		The characteristics consist of: (1) gender, (2) age group, (3) ethnicity, (4) education level, (5) household monthly income, (6) employment status, and (7) housing/accommodation

As shown in Table 4.5, there are five main components of RIC inputs. Each component describes the features or characteristics of the inputs in relation to the RIC program. These inputs are discussed later in this chapter and in Chapter 6. The following sub-sections present and discuss the results of the analysis of each input, beginning with the key stakeholder groups.

4.3.1 Key stakeholders in the RIC program

The key stakeholder groups in the RIC program are identified as RIC users, RIC non-users, RIC managers, RIC management committees, Warisan Global and the Ministry of Information, Communication and Culture. The RIC management committees encompass Malaysia Berhad (Malaysia Post) personnel and volunteers from among members of the community. The following comment illustrates the typical make-up of an RIC management committee:

While each community is unique, some of the RICs management committees are among district officers, local champions, head of villages, representatives from target groups, that comprises teachers, other civil servants, farmers, women or youth leaders that will represent the educational or agricultural or some other major sector in the community.[RIC management committee 1]

It was found that not all RICs had active or even existent RIC management committees. From eleven RIC sites visited, only five committees were randomly selected to be interviewed (see Chapter 3 in Section 3.5.2). In some RICs, the management committee did not exist and there are some that exist but never met. In the previous section on program goal, there was some evidence that they might not be in touch with the program goal. For example, it became apparent that there were no management committees in the central region.

From the observations and interviews, four different types of relationships between the key stakeholders (ESCAP, 2006) in the RIC program are identified as potentially affecting program outcomes. These are: (1) the relationship between the RIC managers and RIC users or communities; (2) the relationship between the RIC managers and RIC management committees; (3) the relationship between the RIC managers and WG; and (4) the relationship between RIC management committees and RIC users or communities. These four different key stakeholder relations are listed in Table 4.6, and a discussion of these relationships follows.

Table 4.6: Key stakeholders' relationships

-
- | |
|--|
| (1) RIC managers & RIC users – social relationship/bonding capital, feeling connected and comfortable |
| (2) RIC managers & RIC management committees – cooperation & commitment, capabilities and differences between RICs |
| (3) RIC managers & WG – consult & rely on each other, cooperation |
| (4) RIC management committees & RIC users – representative, volunteer, trust, strong social relationship and influence |
-

(1) RIC managers and RIC users

The RIC managers and the RIC users had very close relationships, mainly in the form of social contacts. The users hoped to get more from the centres, especially in terms of knowledge and skills, as well as increased contacts or friends (data from observations). Data from the interviews with RIC managers also show that RIC users were comfortable interacting with RIC managers and felt attached to the Centre. In addition, the RIC managers felt that they were very close to the RIC users:

....the users said that they feel comfortable communicate with RIC managers...they feel no fear of asking questions...connected to RIC managers as well as the RIC itself...the users call us teacher and feel that we are closer to the community.[Eastern 1 Manager]

However, the two RIC managers (manager and assistant manager) at each RIC would not be able to cope or handle the tasks on their own; they need the other key stakeholders to be involved and assist them in order for the RIC to be successful in delivering the main objectives of the RIC program. On the other hand, not all the RIC managers were capable of sustaining the RIC and some of them did not have the initiative to develop and sustain the RIC (data from observation).

(2) RIC managers and RIC management committees

Some of the RIC managers and RIC management committees had good relationships; they cooperated, were committed and capable of handling their roles. Despite that, in some RICs the RIC managers did not have working relationships with the management committee. This variation in the quality of the working relationship between the RIC manager and the RIC management committees is highlighted in the following comments:

The relationship is good and work well. The committee would prefer to have it informal and be involved. [Southern Manager]

...we can easily communicate and deal with them, if we happen to have problem/s; we can directly deal with that. Normally the manager will come directly. [RIC Management Committee 2 (Eastern)]

...the committees are not involved and difficult for the relationship to work well... [Northern 3 Manager]

...not all of the committees are committed, some are willing to cooperate...they are supposed to introduce us to the community, but it happens that we introduced ourselves...they never assist us.[Northern 1 Manager]

Indeed, the RIC management committee members' role had not been implemented thoroughly, some RICs had good cooperation, commitment and relationships with the committee; but some did not (data from observation during site visits and interviews with RIC managers).

(3) RIC managers and Warisan Global

As for the relationships between RIC managers and WG, these seemed to be working well. They relied on each other, consulted and cooperated. The RIC managers and WG had no problems in working together and contacted and assisted one another on a regular basis (data from interviews and site observations). The following comments illustrate these points:

...when we had an event, we contact them. We also send report or when we had a request from them. If not, we will operate as usual. Normally we email, fax and telephone. For the time being the relationship works well, no problem at all. [Central 2 Assistant Manager]

...normally through buddies; because WG had divided the buddies according to regions, for example; there were 2 buddies in every region/zone. We will always contact each other. [Eastern 2 Manager]

...every month we send report through email; we had no problem... they will help us to organise a workshop. [Eastern 3 Manager]

In addition, in the training on trainer program (TOT) at the RIC, the WG trained the RIC managers, the managers trained the management committees, and the committees then trained the RIC users. This TOT training was implemented with the purpose of getting more trainers or volunteer trainers to train RIC users and as additional training besides the general training conducted by RIC managers.

(4) RIC management committees and RIC users

RIC management committees and RIC users had a social relationship due to the fact that the RIC management committees were influenced and trusted by the rural communities. The management committees also acted as representatives and volunteers for the RICs. Thus, they were the people who can encourage the local communities, particularly the elderly, to participate in RICs (data from interviews and observations). This point was evidenced in the following comment:

The committees are the representatives and volunteers. They are trusted and can influenced communities... have a good relationship with the users... especially the elderly since the representatives are from the same target group...their role is more on promotion to find the participants. [Eastern 4 Manager]

In regards to the key stakeholders in the RIC program, the relationships work well between managers and users, managers and WG, as well as committees and users. As for the relationship between committees and managers, some RICs did not have a good working relationship between them. This concludes that there is little evidence of dysfunctional relationships and this can be considered as a factor that may affect outcomes. The next part of the discussion reports on the RIC technology and physical environment as an input in the RIC program.

4.3.2 Technology and physical environment

This sub-section is concerned with the second type of inputs in relation to the RIC program, namely, the technology and physical environment of the RICs. First, the key findings on technology in relation to the RICs are reported, followed by the findings on the physical environment of the RICs.

(1) Perceptions of Technology at RICs

As part of the inputs into the RIC program, the technology at RIC was assessed regarding what was available and used. Technology refers to the computer hardware and software being used at RICs. This study investigates the actual applications of technology amongst survey respondents and their impressions of the ICT services which are delivered by technology. In addition, the perceptions of the RIC managers, the MICC program director and RIC management committees regarding the ICT facilities and technology are presented and discussed.

From the online survey, data were obtained on RIC users' perceptions of Internet speed and reliability at RICs. Previous studies have shown that this can impede the outcomes from telecentre programs (Attwood and Braathen, 2010; ITU, (2011a). The mean score for RIC Internet speed and reliability was 5.21 (see Table 4.7). The mean score of 5.21 is interpreted as that the RIC Internet speed and reliability was quite high on the highest scale of 7 point. This was a single item measured on a 7 point Likert scale, with 1 being very dissatisfied and 7 being very satisfied.

Table 4.7: RIC Internet speed and reliability

Mean	5.21
Standard deviation	1.447
N	199
Item-total correlation	.526

The survey findings indicate that almost 65 percent of users were at least somewhat satisfied with the quality of speed and reliability of Internet at RIC, while 10.5 percent the users were dissatisfied or very dissatisfied with the speed and reliability (see Figure 4.2).

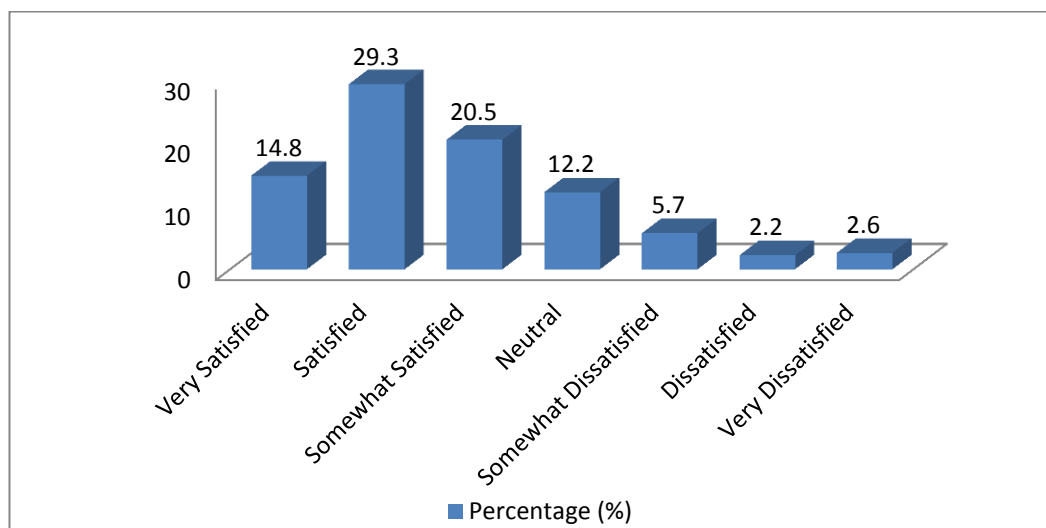


Figure 4.2: RIC users' perception on RIC Internet speed and reliability (n=199)

This study also analysed the data on RIC Internet speed and reliability using One-Way ANOVA. This was to test the level of satisfaction with the Internet speed and reliability of RICs across the RIC regions. As Table 4.8 illustrates, there was a significant difference in RIC Internet speed and reliability between RIC regions (see the detailed results in APPENDIX 11-Table 1).

Table 4.8: RIC Internet speed and reliability

ANOVA	F	Sig.
RIC Regions	2.358	.05

Applying a post-hoc Tukey test shows there was a significant difference between perceptions from the central and southern regions ($p=.033$). The central region is less remote than the southern region. Therefore, the southern region was more dissatisfied with the Internet speed and reliability and more remoteness. The remoteness of the southern region and telecommunications infrastructure is of a lesser standard in the southern region (Alleman et al., 2003). However, there are no significant differences between the other regions (see the detailed results in APPENDIX 11-Table 1).

As previously explained, the online survey finding on technology was in relation to Internet speed and reliability of RICs, and there were mixed views from the RIC managers, MICC program director and RIC management committee members on technology. Table 4.9 shows a summary of the main issues identified by the program managers in relation to technology during the interviews conducted with these key stakeholders in the RIC program.

Table 4.9: Summary of main issues identified in relation to technology

Main issues/Program managers	RIC managers	Program director	RIC management committees
Limited and old PCs & not functioning / old technology	Eastern 2 Manager	MICC Director	Management Committee 1 (Eastern)
Shared computers and limited usage time	Central 1 Manager	No comments	No comments
Insufficient PCs – use managers’ laptops & old PCs	Eastern 3 Manager	No comments	No comments
Low Internet capacity & accessibility – less PC	Northern 1 & 4 Manager	No comments	No comments

The main findings in relation to the RIC technology regarding the program managers’ perceptions are: (1) lack of computers, outdated computers and some computers are not functioning (due to adopting old technology); (2) RIC users had to share computers and this limits the time to use computers and Internet; (3) there were cases whereby the RIC users borrow RIC managers’ laptops; (4) ‘slow’ Internet speed and reliability at RIC; and (5) low Internet capacity and accessibility.

According to one RIC manager there were:

...limited facilities and basic amenities...the rural area is left behind...the equipment and tools must be added and upgraded; the PCs are too old and many of them are not working...and still using the old Window package...we are using whatever we have. [Eastern 2 Manager]

In some cases RIC users needed to share the computers:

In the early establishment of RIC, there were too many users...PCs are limited...we had to set a system to limit the use of PC for only two hours per user and sometimes they also share PCs. [Central 1 Manager]

Similarly, for another RIC manager:

Some RICs only have three or four computers; this RIC has six computers, still insufficient to facilitate the users, especially when they came together at the same time. Sometimes the manager even offers the users their laptops. For instance, if the RIC is unable to provide it, the users will use it at other telecentre...the computers were since 2003. [Eastern 3 Manager]

The MICC program director and one of the management committee members had similar views:

... The RIC with the capacity of about 4-8 computers and next to the post office, that is the limitation, but RIC has the opportunity and potential to grow; but with lots of capital, human ware and software injection. The main problem is that the computers at the RICs are too old and outdated. Besides, the training content and syllabus needs to be updated and relevant. [MICC Director]

There were also mixed views across the 11 RIC managers regarding speed, reliability, capacity and accessibility of the Internet at the RICs:

Even though there is lacking of PC, the Internet speed and reliability is quite fast. [Northern 1 Manager]

...the name is Internet centre, but the Internet capacity is still low. [Northern 4 Manager]

From the survey, the RIC users may not really have the meaningful comparison so they might be quite happy with what the managers might consider a slow speed. An overall observation from the site visits revealed that people were sharing computers and standing in queues to use them and the Internet. Some of the computers were not working, the computer hardware and software were outdated and ‘slow’ Internet speed compared with the case in the urban areas (see Chapter 2), was evident across all the RICs. As explained previously, the lack of a sufficient number of computers,

the presence of some computers that were not functioning and slow Internet speeds at some RICs were major impediments in the technology infrastructure. These shortcomings in the current computer infrastructure were exacerbated in peak periods. However, those who had laptops used them at the RICs to compensate for the lack of computers available. The number of RIC users who participated in training courses was limited by the computers available at the centre. For instance, if the RIC had only five computers at the centre, for one session, the RIC had five participants. Hence, for one day, the RIC had four sessions ($5 \times 4 = 20$ participants per day)-(data from site observations).

(2) Perceptions of the physical environment of RICs

This section reports on the findings regarding the physical environment of the RICs. The program managers had some common and some divergent perceptions about the physical environment at the RICs. A number of impediments with regard to the physical environment were identified in the interviews and the observations made during RIC site visits. All these factors were noted by respondents, though not all of them were identified as impediments at every location. The findings are summarised in Table 4.10.

Table 4.10: Summary of main issues identified in relation to physical environment

Main issues/Program managers	RIC managers	Program director	RIC management committees
Some RIC buildings old & leaky, Insufficient space - requested to extend the building Unequipped building when first established	Eastern 2 Manager Northern 2 Manager Northern 3 Manager	No comments	No comments
Small space	Northern 1 Manager	MICC Director	No comments
-Some had bigger space – had extended -Located next to post office – annexe building	Eastern 1 Manager	No comments	Management Committee 4 (Southern) Management Committee 3 (Northern)
Limited operational hours	Northern 4 Manager Central 2 Assistant Manager	No comments	No comments
No public amenities (toilets) available on RIC sites	Central 2 Assistant Manager	No comments	No comments

The RIC managers indicated that RICs needed new or extended buildings due to: (1) aging, (2) leaks, and (3) small space of RIC buildings and limited access to RICs

(constrained by operational hours). Some of the RICs managed to get a new building or some were able to extend the building to have a bigger space:

We had a problem with the old RIC building...its leaking...we apply for a new building through the Ministry at that time...2007...the RIC closed operations for 6 months. [Eastern 2 Manager]

We had requested to extend this RIC building...the feedback from the post office and Ministry were so slow.... [Northern 2 Manager]

Most of the RIC space is small...when there are too many people coming in, we had to inform that the place is full, please come back later. [Northern 1 Manager]

This RIC is quite big compared to the other RICs, thus, depends on the postmaster when they first built this place. We had extended our RIC space to accommodate more users to participate in training classes and we want the users to feel comfortable. It happens that the local community accidentally went to the RIC because they thought it was the Express Post Mail (situated next to the Post Office-annexe building). [Eastern 1 Manager]

The MICC program director and RIC management committee members agreed with the RIC managers' perceptions on the physical environment of the RICs. They also indicated that RIC space was too small for its purpose:

The space of RIC is small and it is not suitable as a training centre. [MICC Director]

This place is small...the RIC place is too small and we had requested for extending the building, but have not got it and had requested it for so many times. [RIC Management Committee 4 (Southern)]

The MICC program director and RIC management committee members agreed that the locations of the RICs were strategic, usually located next to the post office in rural communities as community members regularly visit the post office and are able to also visit RIC:

...the location is strategic; very close to post office. [RIC Management Committee 3 (Northern)]

...there were lots of villages here and most of them know about RIC. Normally when they go to the post office, they will also go to RIC because there will always deal with the post. [RIC Management Committee 4 (Southern)]

However, the limited operational hours restrict the use of RICs by people who are working:

...as it is situated next to the Post Office, we are not allowed to have training or classes after 5 pm or at night (after office hours)...for the safety

purpose...but there is a high demand during these hours...business opportunity to generate income. [Northern 4 Manager]

The RIC can be sustained if the facilities can be upgraded...needs to operate from Monday to Sunday (7 days a week). [Central 2 Assistant Manager]

During a visit to one of the RICs, an RIC manager explained that this RIC stayed open after office hours and that training courses were held at night. For that reason, it was found that there were more male IT users and entrepreneurs involved in this RIC (during evening classes).

One of the participants claimed that there were no public amenities, such as toilets:

Toilet had to share with the Post Office...most of the time, we had to go to the mosque nearby to use the toilet...few cyber cafe...the RIC location is strategic...the cost is cheaper. [Central 2 Assistant Manager]

In summary, the RIC managers, MICC program director and RIC management committee members noted similar issues pertaining to the physical environment of RICs. The physical environment issues included small and inadequate spaces, which were not purposely built but strategically located to attract people. In addition, the issues on physical environment were limited operational hours and no toilets available on RIC sites. Observation confirmed that toilet facilities were often not located within the RIC building, thus this was an inconvenience for the RIC users. Therefore, an assessment of the input issues in relation to the technology and physical environment at RICs from the perspective of the key stakeholder groups indicates that there were some constraints on the physical inputs into the RIC program.

4.3.3 RIC Users' Characteristics

Different target groups of RIC users

The key difference between the RIC program and some other telecentre programs in Malaysia is that the RIC program focuses on particular target groups. There were four target groups in the RIC program: (1) youth, (2) senior citizen or elderly, (3) women, and (4) entrepreneurs. Hence, usage and responses are analysed by age and socio-economic factors in order to determine how well the outputs of the RIC program were aligned with the needs of the four key target groups of the RIC program.

The results of the online survey show that an overwhelming majority of RIC users are registered members of RICs (90 percent) and almost half of the respondent RIC users are youths; which is defined as those under 20 years old (48 percent). Each of the characteristics (impact of different characteristics-differences in age groups, level of education, income-see Table 2.5 in Chapter 2) of the users is discussed as follows.

(1) RIC users across gender

Seventy-four percent of RIC respondents were female and 26 percent were male (see Table 4.11). Given that RIC female users were more representative than male users in RICs may be due to the RIC opening hours that are more suited female users. Another reason that the majority of RIC users were female could also be that most RIC managers were female.

Table 4.11: RIC respondent users' gender

Attribute	Item	Frequency/response (n=199)	%
Gender	Male	51	26
	Female	148	74

Another RIC manager noted:

Even a fulltime housewife had learnt how to use a computer and able to use it...thus she is still attending training classes at RIC...she had also subscribed to the internet at home and bought a laptop with the assistance of RIC manager...recently, almost everyone in her family is ICT literate.
[Eastern 2 Manager]

The housewife (female) was also an RIC user and was supported with ICT assistance from the RIC manager and this led to increased RIC usage for everyone in the family.

(2) RIC users across age groups

As noted previously, almost half of the respondents were youth (under 20 years) and the lowest numbers of participants were the elderly (over 50). These age groups meet the RIC target groups that comprise the youth and elderly. The middle-aged group of RIC users comprised eleven percent of the respondent RIC users (see Table 4.12).

Table 4.12: RIC respondent users' age groups

Attribute	Item	Frequency/response (n=199)	%
Age	< 20	95	48
	20-30	74	37
	31-50	22	11
	>50	8	4

As the data in Table 4.12 shows, the age categories less or equal to 30 years represented the largest segment of RIC users. These age categories represented 85 percent of the total RIC users in the survey responses, while the elderly category of users was greater than 50 years were the least represented age group in the survey responses. Eleven managers reported having RIC users above 60 years old, and several managers also reported having people from neighbouring communities frequenting the RICs.

Different types of occupations were evident among the different age categories of RIC users. The interviews with the RIC managers confirmed the findings of the online survey regarding the types of occupations of the RIC users, which were: (1) school-going adolescents (9%), (2) school leavers (53%), (3) housewives (12%), (4) entrepreneurs (20%), and (5) senior citizens or elderly (6%). Most of the RIC managers described the majority of their RIC users as school-going and those searching for jobs. The site observations also confirmed the low number of elderly using the centres.

(3) RIC users across ethnicity

Besides the gender and age groups, ethnicity may also influence the engagement of the users as a demographic independent variable (Ibrahim & Ainin, (2009); Subramaniam et al. (2011). Table 4.13 shows the breakdown of type of ethnicity in RIC users.

Table 4.13: RIC users' ethnicity

Attribute	Item	% (n=199)
Ethnicity	Malay	89
	Chinese	1
	Indian	1
	Other: (i.e. indigenous & Bumiputra)	9

The Malays are the dominant majority ethnic group in Malaysian rural communities (Guan, 2000, Khalid, 2011, Thirunaukarasu et al., 2011). This is reflected in the findings in this study where 89 percent of the survey respondents were Malay (Table 4.13). Chinese and Indian users may be the minority in the RIC user respondents because: (1) few of them responded to the online survey because very few of them participated in the RIC program (data from interview with RIC manager and site observations), and/or (2) the nature of rural communities is that the majority are Malays (Guan, 2000). The other characteristic of ethnicity in RIC users is the indigenous and Bumiputra, mostly from the Borneo region of Sabah and Sarawak. There were not enough respondents in these categories to use this as a reliable variable for this study.

(4) RIC users across level of education and income

The level of education and income are independent variables which may influence the output on RIC usage. These two variables may also be interdependent and therefore a cross-tabulation and simple regression was applied to test the relationship between these two variables. Table 4.14 shows a cross-correlation between RIC users' level of education and income level.

Table 4.14: Cross-tabulation between RIC users' highest level of education and monthly income (%)

Monthly income:	Highest level of education					
	finished grade 6 (primary school) *	PMR**	SPM#	STPM/Diploma^	Tertiary level	Total (n=199)
< than RM1,000	0.5	1.5	52	8	3	65
*RM1,000 to RM2,000	0.5	0	7.5	15	3.5	27
RM2,001 or more	0.5	0.5	1	0	6.5	8
Total (%)	1.5	2	60.5	23	13	100

Note:

*Finished grade 6 (age 12)

**Certificate of lower examination to enter arts/social science or pure science stream (age 15)

#Certificate of middle-upper examination to finish secondary/high school and enter tertiary level (age 17)

^Certificate of higher education examination for those who are not qualified to enrol tertiary level (age 19)

*Rural Malaysian average income is between RM1,000 to RM1,499 per month (EPU 2011)

RIC users with secondary school education level (SPM) represented 60.5 percent of the respondents. This suggests that most of the RIC users were students (in

secondary school-121 users still in school) as revealed by the RIC users' education level. Most (65 percent) of the RIC users' household average income was less than 312 USD (RM1, 000) per month, which is considered to be below the rural poverty line in Malaysia (MMDG 2010).

Closely related to differences in education levels, income inequalities were also a major factor for ICT or Internet usage at RICs as the lower income group of RIC users were less likely to have access to ICT.

(5) RIC users across employment status

The RIC users were asked to identify their employment status, and the breakdown is illustrated in Table 4.15.

Table 4.15: RIC users' employment status

Attribute	Item	Frequency (%) (n=199)
Employed	Earned monthly income	59 (29%)
	Self-employed	22 (11%)
	Home duties/chores	7 (4%)
	Students	108 (54%)
	Retired	3 (2%)

Table 4.15 shows that the majority of the RIC users were students (54%-108). The employment status also indicates that 29 percent of the RIC users earned monthly income, thus some of them were self-employed. For instance, four percent did daily home chores and only two percent were retirees.

(6) RIC users across venue

As previously mentioned, the dominant group of RIC users were the youth (aged less than 20); 26 percent of them used the Internet most frequently at the RIC. At other types of venues, such as the cybercafé or public library (15%), at home (8.5%), school or college (7.5%), at work (7%) and mobile (2%), the Internet was used less frequently by each of these age groups. One of the reasons suggested for why the RIC users use the Internet less at other venues was that they may more favourable to using computers and Internet at RICs. This can be inferred from the results reported in Table 4.16.

**Table 4.16: Comparison between age and location where Internet is accessed
(n=199)**

Age Groups	RIC (%)	Cybercafé/public library (%)	Home (%)	School/college (%)	Work (%)	Mobile (%)	Total (%)
under 20	26	11.5	3.5	5.5	0	1	48
20-30	23	3.5	4	1.5	5	0	37
31-50	7	0	1	0	2	1	11
Over 50	4	0	0	0.5	0	0	4
Total (%)	60	15	8.5	7.5	7	2	100

As shown in Table 4.16, most of the RIC users' used the Internet most frequently at the RIC (total 117 respondents out of 199), which is about 60 percent, compared with the other ways of accessing and using the Internet. The elderly did not use the Internet at places other than at the RIC (except one at school/college). The RIC users were most likely to utilise the RIC in terms of the venue where they had their first experience using the computer and Internet.

Therefore, the purpose of this section is to assess whether the RIC program was reaching the target groups and to identify possible demographic impediments to its usage. This shows that the RIC program is hitting the target for women and youth but not for the elderly.

4.4 Outputs of the RIC program

The outputs from the RICs are RIC usage, ICT-based services (training and workshops), Social Entrepreneurs Club (SEC) and Global Entrepreneurs Week (GEW).

4.4.1 Perceptions of usage by the key stakeholders in the RIC program

This section reports on the usage of RIC by users, for different purposes, activities and interests. This study also assessed RIC users' perceptions of the services offered at their RIC.

Different reasons and purposes for using RICs

During interviews with RIC managers, the researcher observed that some of the RIC users (about 1/3 of them) visited the RIC almost every day (see APPENDIX 7). The researcher also noted that there were a number of other reasons why RIC users frequented RICs, such as "when there is training", "when my internet connection is

down”, “when there is a program or meeting”, “whenever I accompany my child” and “when I feel the need to increase my knowledge” (data from the open-ended survey question). The RIC was observed to be developing into a community infrastructure that would be utilised when the RIC users felt a need to do so.

(1) RIC users’ experience using the Internet and RIC ICT services

In describing the RIC users’ Internet skills (such as sending and receiving messages or searching for information), most of the RIC users were at the beginner stage (34% or 78 of them) and twenty-four percent of them were well advanced in terms of basic Internet access (see APPENDIX 11 – Figure 1 Internet competency level). The majority of the users (58%) use or access the Internet on average 1 to 5 hours per week. The other Internet usage groups were: (1) more than 5 to 9 hours – 22 percent, (2) more than 9 to 13 hours – six percent, (3) more than 13 to 17 hours – three percent, (4) more than 17 to 21 hours – four percent, and (5) only seven percent of them use the Internet more than 21 hours weekly (see Figure 4.3).

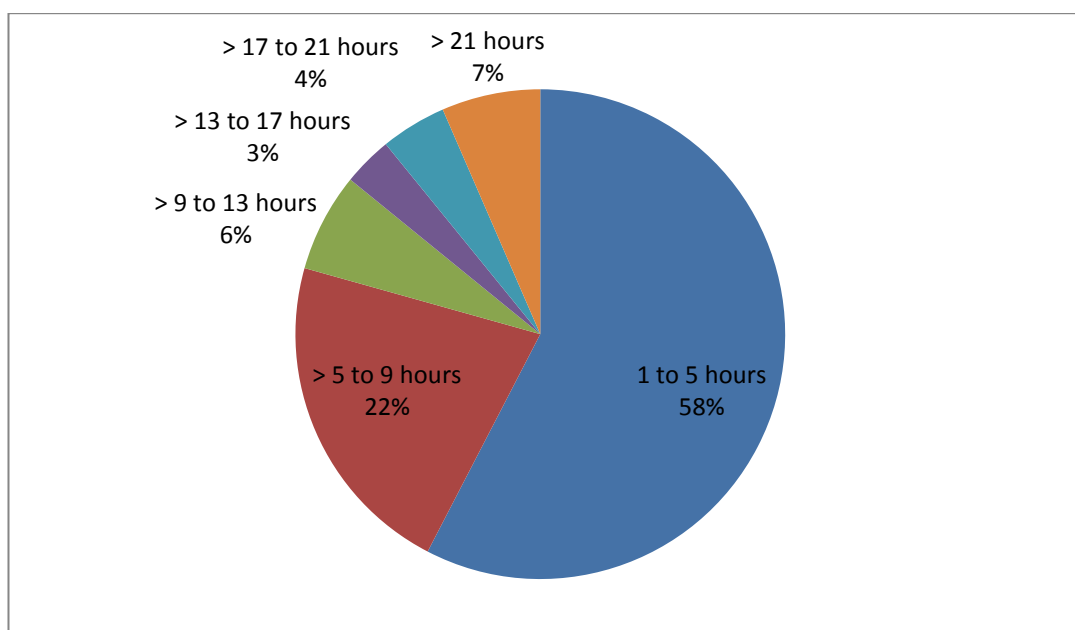


Figure 4.3: Average Internet usage per week by RIC users

School-going youths tended to visit the RICs in the afternoon while the majority of the adults came in the morning. Women aged 25 to 35, however, would visit the RICs in the afternoon; as the women were mostly housewives utilising the RIC around 11am after most of their household duties had been completed. The data from the site observation show a steady stream of RIC users throughout the day, starting

with those who came in for training sessions in the morning, the adults in the mid-morning and afternoon, and school-going youths in the late afternoon (based on observation made during 11 site visits). The younger and older users, however, visited the centres for ICT support and training.

The RICs reported an average of 20-30 users per week with a few charting 50-60 users per week (data from the managers' annual reports). RIC utilisation also varied during the year. A higher number of RIC users were recorded during school breaks and after major national examinations. RIC usage by and large peaked at the end of the year when school-leavers come in to be trained. However, rains and floods were also cited by several RIC managers as deterrents to RIC utilisation during the rainy season from December to February.

(2) RIC users' purposes of RIC usage on information and communication functions

Besides using descriptive statistics, this study also applied inferential statistics in testing the RIC users' perceptions of their RIC usage purposes, this study used a seven-point scale to measure frequency of purpose usage for information (scale 1 – never, to 7 – daily) and communication (scale 1 – never, to 7 –very often) functions by RIC users. The information functions were: (1) information on training or learning, (2) information on job opportunities, (3) information about business prospects, (4) information on local events, (5) distance learning from home, (6) information on government services, and (7) information on “my health”. The communication functions were: (1) sending and receiving emails, (2) learning, education and training, (3) online shopping, (4) entertainment, (5) online banking, (6) creating Webpage, and (7) social networking (social interaction). The means are aggregated from all of those functions (information and communication functions).

a. Information and communication functions in relation to age groups

Overall, the findings from ANOVA and t-test analyses of the differences in usage means for the information functions and communication functions across RIC user characteristics (age, income, gender, level of education, employment and locations) show that there are differences in key factors (information and communication functions) of RIC usage across RIC user characteristics. Table 4.17: Purpose of use

(information and communication functions) by age groups shows that there were differences established from the results of an ANOVA test. A post-hoc Tukey test was run to identify which specific age groups were different.

Table 4.17: Purpose of use (information and communication functions) by age groups

Age:	N	Mean for information functions (7-scale)	Mean for communication functions (7-scale)
Under 20	95	2.28	3.69
20 to 30	74	3.55	5.80
31 to 50	22	4.22	6.30
Over 50	8	3.86	4.16
Total	199	3.03	4.79
ANOVA Sig.		.000**	.000**
df		3, 195	3, 195
F-value		18.815	20.318

The results of the ANOVA tests for differences in age group usage across information functions show that those in the age group of 31 to 50 more frequently used information functions than the other age groups. Table 4.17 also illustrates that the purpose of RIC usage was mainly for communication functions (using email, Facebook, other social networking/media). The age groups (1) 20 to 30 and (2) 31 to 50 represented half of the RIC users and these two groups appeared to be more closely aligned in their RIC usage of communication and information functions (see Table 4.17). The data suggests that the 31 to 50 year olds utilised the RIC for communication more than the other age groups, while the users aged 50 years and above were frequenting the RIC the least and mainly for assistance in their daily or family responsibilities (data from observations).

Using post-hoc Tukey tests on multiple comparisons between the age groups and information and communication functions results shows that the differences for most of the age groups were statistically significant. There was a significant difference in information and communication functions between the under 20 age group and the 20-30 age group ($p=.000$), between those under 20 and those aged 31-50 ($p=.000$) as well as between those under 20 and over 50 years of age ($p=.013$). The groups of under 20 and over 50 were statistically different from other age groups regarding their usage of the RIC for information functions and not for communication

functions. However, there were no differences between the other age groups (see APPENDIX 12-Table 1).

b. Information and communication functions in relation to monthly income

Table 4.18 shows statistically significant differences in the purpose of use by household monthly income.

Table 4.18: Purpose of use (information and communication functions) by household income

Household monthly income:	N	Mean for information functions (7-scale)	Mean for Communication functions (7-scale)
Less than RM1,000	129	2.57	4.15
RM1,001 to RM2,000	53	3.83	5.99
RM2,001 or more	17	4.03	5.89
Total	199	3.03	4.79
	ANOVA Sig.	.000**	.000**
	df	2, 196	2, 196
	F-value	18.662	16.821

Those household income groups with levels of higher income (RM1001 and above) tended to have higher usage for both information and communication functions as indicated by the means for these groups in Table 4.18. The results of post-hoc Tukey tests (see APPENDIX 12-Table 2) suggest there is a significant difference in the purpose of use for the information functions between the income group of less than RM1,000 and the income group of RM1,001 to RM2,000 ($p=.000$), and between the income groups of less than RM1,000 and RM2,001 or more ($p=.000$). However, there are no differences between the other income groups. For the communication functions there is a significant difference between the income group of less than RM1,000 and the income groups of RM1,001 to RM2,000 ($p=.000$), and between the income groups of less than RM1,000 and RM2,001 or more ($p=.005$). However, there are no differences between the other income groups (see APPENDIX 12-Table 2).

c. Information and communication functions in relation to gender

Table 4.19 shows the results of an ANOVA test and indicates there are statistically significant differences in the purpose of use by gender.

Table 4.19: Purpose (information and communication functions) by gender

Gender	n	Mean for information functions (7-scale)	Mean for communication functions (7-scale)
Male	51	3.45	5.57
Female	148	2.89	4.51
Total	199	3.03	4.79
	ANOVA Sig.	.029*	.004*
	df	1, 197	1, 197
	F-value	4.840	8.508

This is also implied for the difference in usage between the genders, which was slightly different. The male RIC users used information and communication functions more frequently compared with female RIC users.

d. Information and communication functions in relation to education level

Table 4.20 shows the results of a one-way ANOVA test and indicates there were statistically significant differences in the purpose of use by education level.

Table 4.20: Purpose of use (information and communication functions) by education level

Level of Education	N	Mean for information functions (7-scale)	Mean for communication functions (7-scale)
Primary school/PMR	7	2.80	2.76
SPM	121	2.60	3.99
STPM/Diploma	45	3.73	6.07
Bachelor degree	24	3.91	6.83
Master degree or higher	2	4.00	6.64
Total	199	3.03	4.79
	ANOVA Sig.	.000**	.000**
	df	5, 193	5, 193
	F-value	6.861	15.067

This shows that the users were using the RIC more for the communication functions rather than for information functions except for the primary education level group. The results of the post-hoc Tukey test show that there was a significant difference in usage of information functions between the SPM level of education and STPM or Diploma ($p=.000$), as well as between those who were SPM holders and Bachelor degree holders ($p=.001$). However, there were no differences between the other

levels of education (see Appendix L-Table L.3). Regarding the communication functions, the results show there was a significant difference between the levels of education groups. Appendix L, Table L.4 summarises the differences between these six groups of education level. However, there were no differences between the other levels of education (see APPENDIX 12-Table 4).

e. Information and communication functions in relation to employment status

The next demographic characteristic is employment status. There were five categories of employment status. Overall, the results of a one-way ANOVA test show that there were statistically significant differences in purpose of use by employment status. Table 4.21 illustrates the information and communication functions by employment status.

Table 4.21: Purpose of use (information and communication functions) by employment status

Employment status	N	Mean for information functions (7-scale)	Mean for communication functions (7-scale)
Earned monthly income/wage	59	3.91	6.22
Self-employed	22	3.64	5.00
Home duties/chores	7	2.90	4.47
Student	108	2.37	3.97
Retired	3	5.33	5.05
Total	199	3.03	4.79
	ANOVA Sig.	.000**	.000**
	Df	4, 194	4, 194
	F-value	15.465	11.418

A post-hoc Tukey test shows that there was a significant difference in information functions between those who earned monthly income and students ($p=.000$), between those who were self-employed and students ($p=.001$), as well as between those who were retired and students ($p=.003$). However, there were no differences between the other employment statuses (see APPENDIX 12-Table 5). In regard to communication functions, the results of a post-hoc Tukey test show there was a significant difference between those who earned monthly income and students ($p=.000$). However, there were no differences between the other employment statuses (see APPENDIX 12-Table 5). The results of the one-way ANOVA test regarding the purpose of use by employment status show that the RIC users used more

communication functions, except for those who were retired (who were the least frequent users of RICs and the sample is too small to be meaningful) (see Table 4.21)

f. Information and communication functions in relation to RIC regions

Table 4.22 shows the results of one-way ANOVA for the purpose of use by RIC regions.

Table 4.22: Purpose of use (information and communication functions) by RIC regions

RIC Regions	n	Mean for information functions (7-scale)	Mean for communication functions (7-scale)
Central	27	2.65	5.19
Southern	44	2.47	3.90
Eastern	65	3.39	5.14
Northern	41	3.04	4.32
Borneo	21	3.56	5.86
Total	198	3.03	4.78
ANOVA Sig.		.011**	.003**
Df		4, 193	4, 193
F-value		3.384	4.116

The different types of communities (based on RIC locations/regions) had different levels of usage and the overall mean shows that the RIC users had higher overall usage of communication functions rather than information functions (see Table 4.22). There was a significant difference in information functions between the eastern and southern regions ($p=.021$). However, there were no differences between the other regions (see APPENDIX 12-Table 6). In regard to communication functions, the results of a post-hoc Tukey test show there was a significant difference between the eastern and southern regions ($p=.035$) as well as between Borneo and the southern region ($p=.009$). However, there were no differences between the other regions (see APPENDIX 12-Table 6).

The differences in purpose of use across the RIC location or regions varied. The interview with the WG officer provided further explanation and reasons for this difference in RIC usage across the RIC location or regions, namely, (1) that it may be due to low populations in some RIC location or regions such as sparsely settled, therefore they use more or less communication or information functions (such as in Central and Borneo regions); and (2) that it could be due to fewer youth in some of

the RIC locations and regions (in Central and Southern regions). With higher populations, large numbers of students and many schools in some RIC locations or regions there was high usage, thus more participation, support and volunteers from the local communities at these RICs:

Based on the report that the managers sent to us...there are some RICs that had reached 900 usages per month, some were 400, and some were only 100 and the difference is obvious... One of the reasons is because there is less community in the area and also because of less youth in the community, therefore less support and reception... But, in terms of educational or classes for the users were the same. This is the disadvantage to some of the area, but there are areas with lots of community, plenty of students, many schools and therefore the reception is there... That is the difference and we and the ministry acknowledged about that, since we had made a site visit to all of these 40 RICs. [WG Officer]

The pattern of usage goes beyond the survey respondents and the results suggest that the users' family or relatives were often also RIC users. Figure 4.4 shows family users by percentage and the frequency of their usage. Sixty-eight percent (142) of RIC users reported that their siblings had been using the RIC. The elderly (grandparents) were the least representative of the additional family or relatives of RIC users, at about six percent (12). Thus, the x-axis represents the percentage (number) of additional family members.

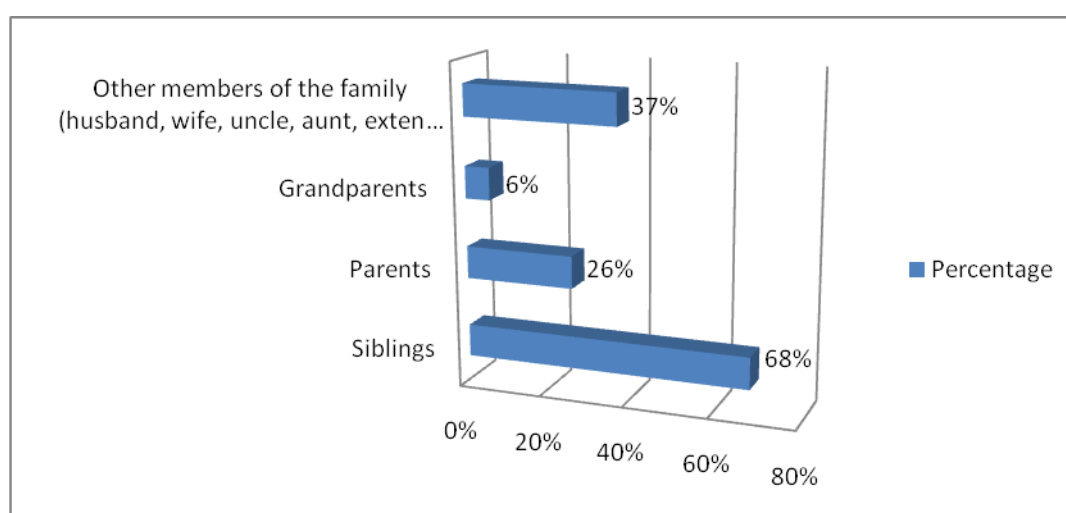


Figure 4.4: Additional family members who use the RIC

The next sub-section explains the other RIC output, namely, ICT-based services.

4.4.2 ICT-based services

In regard to the ICT-based services as one of the outputs of RICs assessed in this research, basic computer training was the most frequently used service (see Table 4.23) with 74 percent (156 respondents) using the training and workshops service (basic computer training). This finding can be explained in that the majority of the respondent RIC users were youths (under 20 years) and this type of training is an important aspect of secondary education. The next most frequently used RIC services were information (59%) and communication (53%), followed by computing (47%), basic office (35%), and info-mediation services (15%).

Table 4.23: Most frequently used RIC services

Type of Services	% (n=210)
Training& workshops service (basic computer training)	74%
Information service (internet searches and information services, e.g.: government information/local events)	59%
Communication service (telephone calls, emails and internet access)	53%
Computing service (word-processing, webpage design and online banking facilities)	47%
Basic office service (printing, scanning, binding, laminating and photocopying)	35%
Info-mediation service (for a community member who is illiterate, or advanced in age, is unable to use the computer without assistance)	15%

The information service is mostly used for seeking information online, using the Internet. Communication service is about accessing Internet-based communication services, such as email, Facebook, Yahoo messenger and other Internet communication tools. The computing service is about using basic Microsoft Office package and online facilities. The basic office service is the use of functions such as printing and scanning using computers. Lastly, the info-mediation service is about the assistance that RIC managers offer to the RIC users who are ICT-illiterate and unable to use a computer without assistance. These types of ICT-based services were offered to the local rural communities to meet their daily needs. This research suggests these services would benefit the RIC users in relation to their ongoing schooling, tertiary studies and current and future employment activities. The researcher in her observations of 11 RICs during site visits noted that at several RICs parents came in to have documents for their children's schooling prepared. Similarly, the RIC management committee members sought help in preparing minutes of meetings or having letters typed at their RIC.

Another RIC manager noted that the most widely used service was the Internet and the most frequently used application was social networking sites such as Facebook, thus this service was based on demand and basic need:

Besides training, most widely use service is internet...for social networking such as Face Book...the services is basically based on demand and the users' basic need. [Eastern 1 Manager]

Another service noted by a participant RIC manager was the basic office service. This was a seasonal service which depends on the demand for a particular season:

The basic office service depends on season...if that is the season the university students wish to print their assignments; therefore, printing is widely used during that particular season. [Eastern 2 Manager]

There was also a demand for info-mediation service, normally by the elderly and youth. Therefore, the RIC managers used this service to encourage them to participate in training and workshops as noted in the following comments from RIC managers:

...we provide basic services and facilities to the RIC users, as we cannot afford to provide advance services...however; they are satisfied with the services...we managed to fulfil the demand and needs. [Eastern 4 Manager]

The elderly request us to type letter for them (info-mediation service)...and the youth need us to assist them with seeking job online and fill in online forms...then, we encourage them to attend training and workshop. [Northern 1 Manager]

Thus, one of the RIC managers explained that they needed to make sure that all the services were working well due to high demand for the basic services:

If the service is not functioning, we find it difficult, because there is always a demand for services. [Eastern 3 Manager]

The RIC managers planned to offer more ICT-based services for the benefit of the RIC users; however, the lack of financial and other resource constraints prevented this. This is discussed further in Chapter 6. Further explanation on these types of services is explained in more detail in the following sub-section on training and workshops.

RIC key stakeholders' perceptions of training and workshops

In the RIC program, training and workshops were a vital part of the ICT-based services delivered to the rural community. The RICs offered basic ICT training, workshops, events such as Global Entrepreneurs Week, events with the local community and basic services. These were basically pitched at the grassroots of the rural community to create awareness of ICT and to provide them with the opportunity to learn and make use of ICT in their daily activities.

As noted earlier, the core business of each RIC was to attract the community to use the application tools at the RIC, by attending training courses, workshops and participating in the relevant ICT activities and programs. Thus, this study assessed the RIC training and workshop purposes, content, implementation and outcomes for the RIC users. The basic training was provided for Microsoft Office applications such as MS Word, MS PowerPoint and MS Excel. These software packages gave an overview and background to the RIC users especially users with zero knowledge of ICT (such as using computers). The training courses were divided into sessions and categories. Each session was divided due to the time sessions for every course. This depended on how many RIC users were registered per day. If there were too many RIC users on that day, the RIC manager would divide the session into two or three sessions and this would also depend on the availability of computers at the centre (data based on interviews and site observations).

The workshop content was focused on Web 2.0 and the use of the Internet such as creating a webpage, introduction to Facebook, Twitter, e-services application, digital storytelling, and online shopping. This was also based on the target group categories (data based on interviews and site observations).

From the survey, there were three main types of training offered at RICs: (1) basic computer or ICT or MS Office, (2) basic computer training (BCT) during school holidays, and (3) BCT for the elderly. These training types are shown in Figure 4.5. Other types of training were provided as per request or demand. The training that was most likely to be participated in by the RIC users was BCT or ICT which represented 81 percent of the RIC users who responded to the online survey.

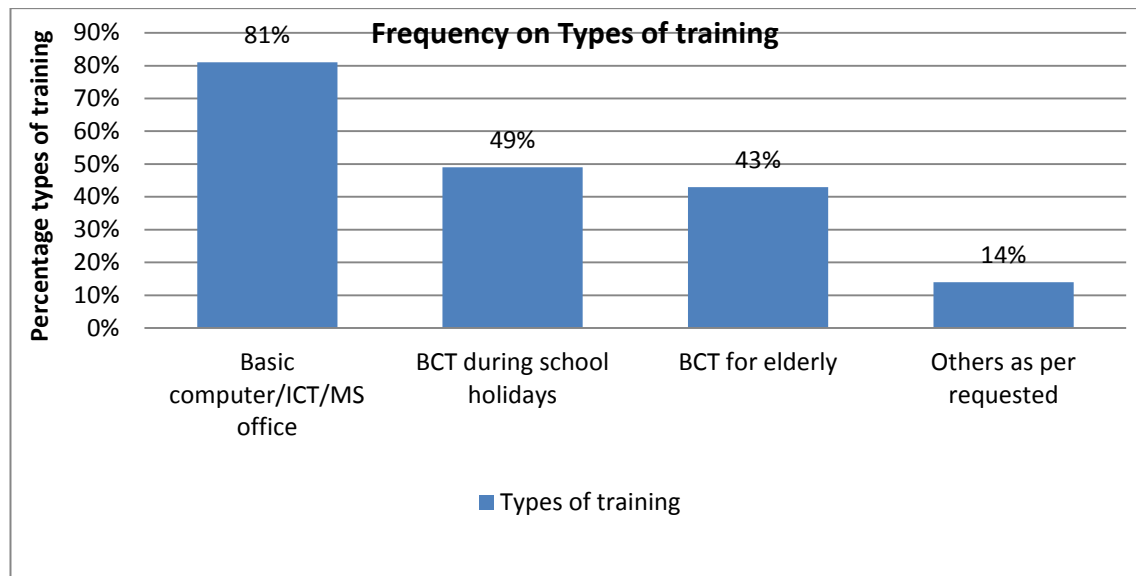


Figure 4.5: Types of training

From the interviews, it was confirmed that every training course was focused on target groups for the RIC program. The target groups were: (1) youth, (2) women, (3) elderly, and (4) entrepreneurs. The RIC manager decided which group category needed to come and register for the course. For example, in the beginning of the year, most of the RIC users were the youth, because this was the time for them to use the computers for their assignments. Therefore, the RIC manager focused on conducting training for them to meet their needs in preference to the other RIC groups.

The users responded positively to the question about how RIC access had improved their knowledge and education. This was supported in the qualitative responses provided in the interviews of RIC managers. One RIC manager commented that most of the RIC users started with zero knowledge of ICT. Although they had the basic ICT knowledge and skills, they were still participating in the training programs to improve their ICT knowledge:

They came to RIC with zero knowledge of computer and internet. Normally their friends introduced the RIC to them and they finally signed up for the computer training, they are still attending the training and their knowledge of computers has increased. [Southern Manager]

Furthermore, the WG officer indicated that the training was provided to all four target groups in rural communities on various ICT aspects including training on how to use blogs, Facebook, e-services and Microsoft Office. It was found that the target group of elderly users preferred the training to be done separately from the other

target groups. Thus, a number of WG staff trained all of the RIC managers who in turn trained the RIC users the same way. However, there were some RIC managers who had their own way to train the RIC users. The RIC users were also trained to be co-trainers in their RIC. WG monitored the implementation of training and workshops in RICs and worked closely with the MICC to ensure that the main goal of the RIC program was being carried out at the operational level. The WG officer explained these points as follows:

In terms of training delivery is the same, the managers are trained the same way...In capacity building training, every managers had got it and they train the users the same way, how to do promotion, how to cooperate with the community, it is all the same... But, not all what we have trained the managers, they will train back to the users...The managers were trained to become trainer (TOT)...we also encouraged the community to be the co-trainer, so they can be trained and re-train...for example; we had trained the manager and assistant manager, and we had another training whereby the manager will choose 2 committees to be trained directly from us...and then, these 2 committees go back and train at least 10 users and we guide them...to make sure that they implement what they had been trained; we work with MICC.

From the observations the researcher noted the basic ICT training at the RICs was reaching the target groups basic ICT needs and purposes as they made use of these training and workshop courses and programs when made available. However, it appears they would prefer to learn more from the courses as evidenced in the previous sections in this chapter. For instance, besides the training and workshops, another frequently used and important service at RICs was communication services or pathways. The communication pathways in the context of the RIC program was the communication that occurred through the RIC between the MICC, WG, RIC managers, RIC management committees, RIC users and hence extended to other communities. The method of communication pathways in the RIC program included the RIC portal and website, Face book, email, brochures and pamphlets.

The RIC managers perceived that communication pathways at RIC were poor as some of the RIC users were not committed to using the communication pathways effectively. Table 4.24 summarises the main findings in relation to communication pathways.

Table 4.24: Summary of main issues identified by RIC managers in relation to communication pathways

Main issues	Descriptions	RIC Managers
Website and portal – not fully utilised	Local information and content on RIC website and portal were not fully utilised by the local community.	Eastern 1 Manager Central 1 Manager
Social networking applications – less interested	Not all of the users are interested to use the social networking applications to communicate.	Eastern 2 Manager Northern 2 Manager
Expand communication – two-way communication	Lack of communication between users, managers and management committees; thus two-way communication is effective.	Northern 2 Manager
Many government agencies – have no Internet connection & website	Many government agencies in rural areas do not have website and Internet connection, thus should be utilising RIC communication pathways as a better way to communicate.	Eastern 4 Manager

Overall, the findings from the interviews suggest that the RIC managers thought that the local community did not fully utilise the RIC website and portal and its communication pathways:

... have put up the local information and content on RIC website and portal.... some of them read, but some would not bother. [Eastern 1 Manager]

We communicate to the local community by distributing information on computers, ICT to them...but, less responds. [Central 1 Manager]

Another RIC manager noted that RICs focused on web communication (social networking) as a tool for RIC users to communicate more frequently with other RIC user extended communities, however it seems that only some of the RIC users were interested in maintaining their accounts with these application tools. On the other hand, there was a lack of communication between RIC management committees, RIC users and RIC managers:

The communication between the managers and users were via electronic mail (email), Yahoo messenger (YM), and Face Book...however, they would prefer using telephone...could be due to not all of the users have accounts on these social networking applications. [Eastern 2 Manager]

We focus more on web communication (Web 2.0)...to encourage users to create and use Face Book...easier to communicate, especially when we want to have an event....but only a few communicate...The communication needs to be expand, lack of communication means and needs to be developed...lack of communication between users, managers and committees as well...The committee must also be socialised, there must be a two-way communication. We want the local community to participate, generate and give their own ideas. [Northern 2 Manager]

One of the participant RIC managers presented a slightly different issue on the effective use of communication pathways in the RIC program, which was about utilising the RIC communication pathways to better communicate and interact with Malaysian government agencies. However, this was problematic because many government agencies did not have an Internet connection in some of their rural offices.

However, the MICC program director, WG officer and RIC management committee members as a key stakeholder group in the RIC program had some different perspectives from the RIC managers on the effectiveness of the communication pathways in the RIC program. Table 4.25 outlines these differences.

Table 4.25: Summary of main issues identified by MICC director, WG officer and RIC management committee members in relation to communication pathways

Main issues	Descriptions	Director	Officer	RIC management committees
Website and portal – communicate between the program managers	The MICC director and WG officer agreed they used the website and portal to communicate.	MICC director	WG Officer	No comments
Social networking applications – communicate between the program managers & RICs	The WG officer used the social networking applications to communicate.	No comments	WG Officer	No comments
Conventional communication	The RIC management committee communicate verbally; face-to-face with the RIC users and other local communities.	No comments	No comments	Management Committee 4 (Southern)
SEC - platform to communicate verbally, confidently & continuous contacts	RIC management committee and RIC users used SEC as a platform to communicate effectively.	No comments	No comments	Management Committee 5 (Southern)

The WG officer explained that the RIC communication pathways were facilitated via social networking applications such as Facebook, the RIC portal and RIC network hub in the following ways:

...for example; the RIC is the community connector. With the capacity building training, the manager use the Face book and portal, they had exchanged their experience... the RIC itself communicate and has the Face book platform, they will communicate with the other RICs...they are communicate through the RIC...we developed the RIC portal, RIC network hub; between the managers and MICC, and then we report to MICC. A yearly report on RIC usage sent to us for review and we sent it back to MICC.

The MICC program director also agreed that they were using the website to communicate with the managers:

The managers had updated the training programs and other ICT activities in the RIC website... one of the ways to communicate with the other program managers...

Another RIC management committee interviewee added that the communication was verbal and this was the communication culture of rural communities in delivering and receiving information. Therefore, this was the communication mode used by RICs and it could also be due to the culture as most of the local community did not use ICT communication applications such as email or Facebook to communicate:

We help in terms of increasing the number of users, promotion, disseminate information about RIC to those who wants to learn computer or ICT...come out with a pamphlet and distribute that to the mosque because that is the place where we have many people and a gathering place...or it could be done verbally; mouth-to-mouth. Normally, this is how people in the rural areas pass on information. [RIC Management Committee 4 (Southern)]

Likewise, another committee member commented that the RIC management committees' role was not only to be representatives of their rural community and volunteers in RIC program. The committees also promoted the RICs by communicating verbally to local communities and represented government agencies. The committees also used the Social Entrepreneurs Clubs as a platform for communication pathways to the local communities. Through the SEC, the communication become effective and this made the SEC members and RIC management committee members feel more confident to communicate verbally. However, without the SEC, they would not have face-to-face communication and continuous contact with other local communities and entrepreneurs:

...the committee needs to promote the RIC to the local community... I encouraged them to come to RIC if they want to learn...when the SEC had a meeting we had lots of people, then we share information, communication, even the way we communicate is also different...before it was a bit afraid, but now we can actually interact with one another...if there is no SEC, we only have RIC, they only learn computer; we would not have the communication...to keep in touch, they need a long-term or continuous contact; they need to have their own website or Face Book. This SEC does not have that yet. [RIC Management Committee 5 (Southern)]

In summary, the communication pathways at RICs were via ICT infrastructure and conventionally, such as verbally face-to-face. Not all of the RIC users were keen to use the ICT applications to communicate; however, they still managed to communicate with one another. Through the direct observation made at 11 RIC sites, the researcher noted that most of the RIC users come to the RIC because they were aware of RIC and they had made contacts. This suggests that the RIC is well-known to the local communities and they feel like home, which explains the relevance of RICs to the users. This communication service connects to the next output which is the SEC and social and business networking.

4.4.3 Social Entrepreneurs Club

As noted, a sub-goal of the RIC program was to develop entrepreneurs in rural Malaysian communities. The Social Entrepreneurs Club in the RIC program (also known as KUSPID) is a club owned by each local rural community and operated under the RIC program with its own committee. This was a platform for grassroots entrepreneurs where they can share the knowledge, experiences, learning about traders by marketing their products through the Internet and connecting to other communities. There were more than 2,000 SEC members at the 42 RICs (MRRD (2010)). Table 4.26 summarises the functions and purposes of SEC as part of the human capacity building focus of the RIC program.

Table 4.26: Summary of SEC (Entrepreneurial Program)

Functions and purposes	Descriptions
1) Involve SEC business operations and sustainability	To involve SEC as a business operation and as a club that can contribute to sustainability of RICs.
2) Build strong committee and participation	To establish a strong management committee and attract them to participate in SEC program.
3) Creative managers to attract community	To recruit more creative RIC managers to promote and attract more local communities to join SEC.
4) Job opportunity, business and social networking	To create job opportunity, business and social networking for the entrepreneurs or SEC members.
5) SEC as an indicator to increase quality of rural life and a community connector	To develop SEC in the long term that can contribute to improve in QoRL and SEC as a community connector.

The RICs introduced and established the SEC to encourage the rural community to get involved in social entrepreneurship, and for the existing entrepreneurs to socialise with other entrepreneurs in other rural communities. The SEC involved business

operations and this could contribute to RIC sustainability. In addition, SEC needed to establish strong committees and participation in the program (WG officer, 2010). As a consequence, there was a need to recruit more creative RIC managers to promote and encourage the local rural community to join the SEC. Thus, the SEC was seen as a means to create job and business opportunities, as well as social networking in the rural communities associated with each RIC. The SEC was also a community connector which connected the local rural community with the RIC. SEC in the longer term should contribute to increasing quality of rural life through the activities of its member (data from interviews) (see Table 4.26).

Figure 4.6 indicates RIC members' awareness of the SEC. Sixty-nine percent of the RIC users were aware of this club while 31 percent of RIC users were not aware of the club (data from this study survey).

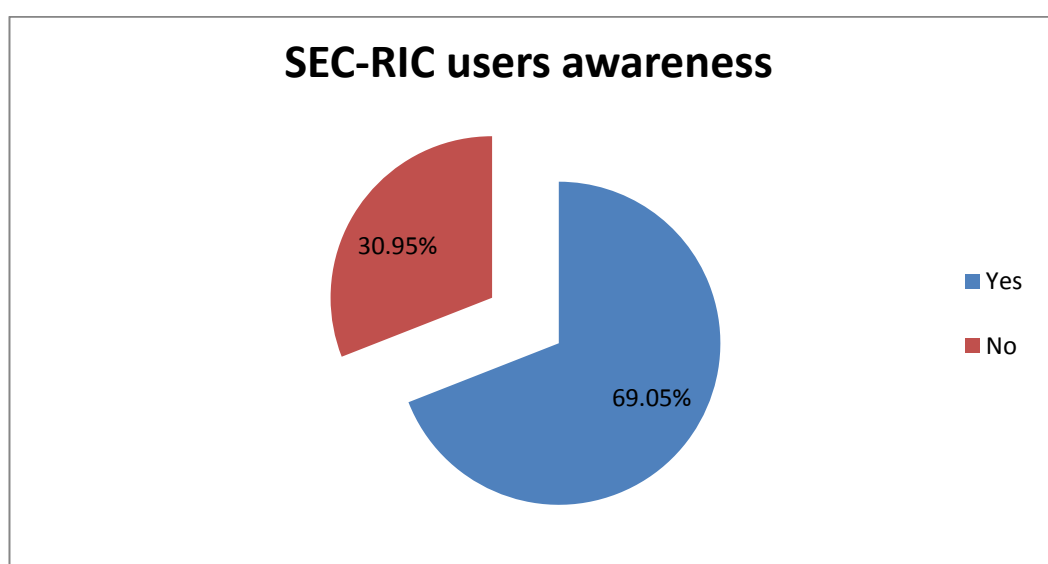


Figure 4.6: SEC awareness among RIC users

The general level of awareness of RIC users in relation to the SEC may be due to the fact that the government had done extensive promotion and advertising of the SEC and RIC in Malaysian rural communities. Hence, about 38 percent of the adult users were aware of SEC, therefore this shows that the level of awareness is high (see Table 4.27). The RIC managers also promoted the SEC to their local rural community through the RIC users at each RIC. Table 4.27 shows the age distribution with their awareness and become members; that of the 69 percent of RIC users who

were aware of the SEC, almost half were members (31 percent). Findings from the interviews with the RIC managers explain why others did not become members.

Table 4.27: Proportion of Users' SEC awareness and SEC members

Users' age groups	SEC Awareness (%)	SEC Members (%)	Total age distribution (%)
Youth	27	10	47
Adults	38	21	49
Elderly	4	0	4
Total	69	31	100

The findings from interviewing RIC managers support the key findings from the online survey in that even though almost 70 percent of the members were aware of the SEC, only a third of them had become members of the SEC. This shows that SEC awareness and membership is lower amongst the youth and elderly. In the interviews with the RIC managers there were mixed opinions on the effectiveness of the SEC. One of the RIC managers, however, indicated that there were entrepreneurs, who were aware of the SEC and became SEC members, then they cooperated and as a result they enjoy the SEC benefits:

We also have aggressive entrepreneurs and they can actually work together and enjoy the benefits from the club (SEC)... due to their awareness of SEC and thus become the member. [Southern Manager]

To complement the activities of the SEC, the Global Entrepreneurship Week event was held for one week annually in which SEC members can participate. During GEW, the SEC sought to encourage new and existing entrepreneurs to promote their products, to develop networking, social relationships and expand their contacts beyond their local rural community. However there was no continuous networking once the one week event was over:

...WG introduced GEW and it is an event held once a year...within a week...during GEW, we want more new entrepreneurs and existing to promote their products...we can help them to promote the products, networking and social relationships...but when GEW is over, it stops and no continuous relationship... it supposed to be continuously done... then we can have more entrepreneurs and get to know and assist them. [Northern 1 Manager]

The SEC encouraged the entrepreneurs and local rural community in terms of networking. The SEC gathered the local rural community to generate ideas and develop networking. According to one RIC manager:

...RIC facilitates SEC and the club network the community. The motto is: community activate. That means; gather the community and gather the new ideas to advantage all. So, it is a matter of networking. We need to generate the ideas to move forward. I also participate with lots of entrepreneurs during GEW and we gather the ideas and got new ideas. This is the place for the club; generate ideas. [Northern 2 Manager]

On the other hand, fifty-five percent (55%) of the RIC user feedback on the SEC from the survey suggests that the SEC was not very effective for the rural communities because the majority of SEC members or entrepreneurs were not committed to the program and were less cooperative in running SEC activities or programs. The SEC members were mostly entrepreneurs who were not socialising well among themselves:

We do not have active club...users/entrepreneurs are not active...no commitment...they are not socialised among themselves. [Northern 3 Manager]

The findings from the interviews with the RIC managers indicate that there seemed to be different views about the effectiveness of SEC in individual RICs and rural communities. An analysis of the interviews indicates that the SEC that at some RICs there were local impediments to the success of this program:

...some of them do not really want to join the club... and it is difficult to attract them to join. [Northern 1 Manager]

This reinforced the RIC managers' opinion that some SEC was less effective than the other SEC in generating commitment and participation among SEC members. The interviews with the RIC managers nonetheless indicated that the SEC could be successful in certain rural communities. Some rural communities lacked entrepreneurs; and had more elderly and retirees in their population than other rural communities participating in the RIC program. RICs with active SECs encouraged the entrepreneurs to expand their businesses by training them to use websites and learn basic Internet functions. Facebook had also been used widely as means for entrepreneurs to increase their networking and generate new business ideas for entrepreneurs in SEC:

...The demographic of community in the regions differentiate them...some locations they have more senior citizen and retirees...train entrepreneurs to use basic ICT applications. [WG Officer]

In addition, findings from the interview with the WG officer and some of the RIC participant managers (Southern, Northern 2, Northern 3, Eastern 2 and Eastern 3 Manager) indicated that the SEC did not work where there were more elderly than youngsters.

In summary, the SEC was a program sub-goal to develop entrepreneurs at RICs. There were mixed opinions on the effectiveness of the SEC. Some respondents thought that the SEC brought benefits to the community and the RIC, but there were others who thought the SEC did not benefit the RIC community. However, WG was confident that RIC managers were capable of implementing the Social Entrepreneurs Club as part of capacity building.

4.5 Conclusions

The findings from this chapter show that there was generally good understanding of an agreement about the program goals amongst the RIC management groups, with the possible exception of some committee members. The program is hitting 2 out of 3 of its target groups, with the most frequent users of RIC being youth and females. As for the ethnicity, it was not a reliable variable for this study as the overwhelming majority of the RIC respondents were Malays and this was representative of the ethnicity of Malaysian rural communities. The youth and school-going RIC users were the majority users. Thus, there appears to be a positive association between the level of education and income; therefore, the role of the RICs in supporting youth studying in rural communities was improving the youth educational level. For instance, the better educated, higher income and male users are using different functions. The results suggest that RICs might actually be assisting those with better education and more money to a greater extent than the poor.

From a detailed analysis of the inputs and outputs in the RIC program, we identified that the targeted group categories of RIC users were satisfied with the RIC services. However, as analysed from the key stakeholders' (RIC end-users' and program managers') perceptions on technology and the physical environment, several key

issues were identified. As previously explained, these issues were: (1) a shortage of computers and out dated technology, (2) ‘slow’ Internet speed and reliability, (3) old buildings and limited space, (4) limited operational hours, and (5) not all RICs have public amenities (toilets) available on RIC sites.

Thus, the overall findings of this chapter indicate that the RIC program was reaching the youths and women but not reaching the elderly, and meeting the needs of the RIC purposes and usage. RICs have tried to engage the entrepreneurs by implementing SEC at RICs; however it is not working well even though there were the right age group become members. This analysis was based on the perceptions of whether or not the RIC program has improved the condition of people using the centres. As a conclusion, the RIC program was reaching most of the target groups in relations to RIC inputs and outputs. Figure 4.7 presents RIC model 1 which is summarised in the form of key variables in relation to this chapter and an applied community informatics approach. The arrow in the figure shows that the inputs and outputs influenced each other, as there is a link and relationship between the elements in each component. Therefore, as people use the services and facilities, the feedback from the output had influenced inputs. In addition, interviews with MICC, WG, RIC managers and RIC user representatives revealed problems with RIC intermediate outputs and the feedback loop exists for those responsible for managing the RIC program at micro and macro levels of the organisation.

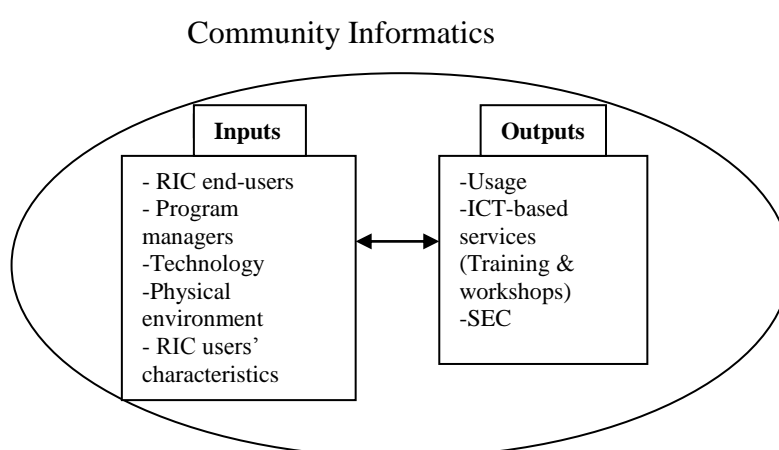


Figure 4.7: RIC Model 1

CHAPTER 5: PERCEPTIONS OF RIC OUTCOMES

5.0 Introduction

The previous chapter presented the main findings regarding the program goal, inputs and outputs of the RIC program from key stakeholder perspectives in relation to rural communities. In this chapter, the key stakeholder perspectives (RIC end-users and program managers) regarding the intermediate and ultimate outcomes of the RIC program are presented and discussed. The first part of this chapter discusses the intermediate outcomes of concern in this study which are: (1) computer skills, (2) employment opportunities and (3) business opportunities. The second part presents and discusses the ultimate outcomes which are: (1) social capital (SC), (2) economic benefits (EB), and (3) quality of rural life (QoRL). The last part discusses the impacts based on measuring the perceived benefits (PB) and services satisfaction (SS) (see Figure 5.1). This chapter presents the main findings in relation to the key outcomes according to the RIC program logic framework (depicted with the solid lines in Figure 5.1).

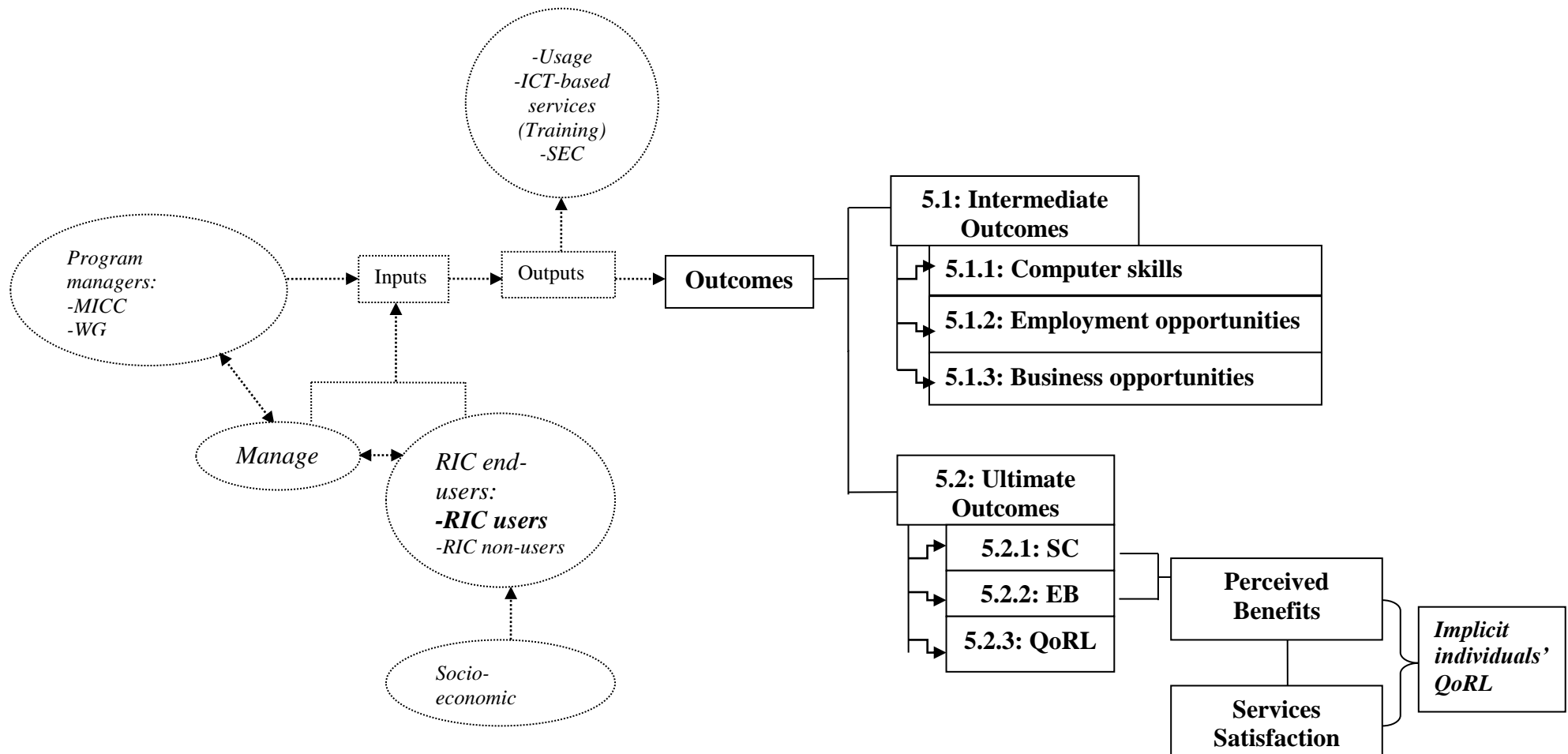


Figure 5.1: RIC program logic

5.1 Intermediate Outcomes of the RIC Program

This section discusses the perceptions of the key stakeholders in the RIC program regarding its intermediate outcomes. The intermediate outcomes of concern for this study are: (1) computer skills, (2) employment opportunities, and (3) business opportunities.

5.1.1 Perceptions of Computer Skills at RICs

The study concern of “computer skills” refers to the RIC users’ and RIC non-users’ characteristics in relation to their perceptions of using computers at the RIC. Table 5.1 shows RIC users’ attitudes to using computers which were classified into two distinct dimensions from a factor analysis. One factor was the RIC users’ positive view of the beneficial effects of using computers, and the other factor was the RIC users’ negative views of the use of the computers (RIC user perceptions of computer usage).

Table 5.1: RIC users’ dimensions on using computers

	Variables	User Perceptions		Mean
		Factor 1– Negative perceptions (Computer anxiety)	Factor 2 – Positive perceptions (Beneficial effects of computers)	
Factor 1	I hesitate to use a computer for fear of making mistakes that I cannot correct	0.842		4.50
	It scares me to think that I could cause the computer to destroy a large amount of information by hitting the wrong key	0.836		4.11
	I have difficulty in understanding the technical aspects of computers	0.706		3.63
Factor 2	Anyone can learn to use a computer if they are patient and motivated		0.787	6.46
	I think that learning to operate computers is like learning any new skill-the more you practice, the better you become		0.784	6.49
	I feel computers are necessary tools in both educational and work settings		0.783	6.74
	I am confident that I can learn computer skills		0.774	6.32
	I feel that the challenge of learning about computer is exciting		0.714	6.20
	I would like to learn about and use computers		0.625	6.48
	I feel that I will be able to keep up with the advances happening in the computer field		0.541	6.20
Cronbach’s Coefficient Alpha		0.773	0.840	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy			0.815	
Bartlett’s Test of Sphericity	Approximate Chi-Square		757.581	
	Df		45.000	
	Significance level		0.000	

Overall, Table 5.1 shows that while some barriers exist there was an overall positive attitude towards using the computers. Generally, the local rural communities found no difficulties in learning to use computers. Some RIC users were also fearful or apprehensive about the technical aspects of using computers but the overall mean for computer anxiety was lower compared with the overall mean for beneficial effects of computers (see Table 5.1). The item means within the second factor ranged from 6.20 to 6.74 (on a scale of 1 to 7). This indicates that Factor 2 is dominant factor and suggests that the respondents had a strong interest in learning and exploring ICT as indicated in high percentage of RIC users who undertook required training courses to improve their ICT knowledge and skills (see Chapter 4.4.2 – data from interview, even though the RIC users had the basic ICT knowledge and skills, they still participate in RIC training courses). This may be due to RIC users starting at a basic level of knowledge in ICT and also because of the strong need and awareness of these local communities towards improving their ICT skills and knowledge (findings based on site observations and interview – see Chapter 4.4.2).

RIC users gave an account of being transformed from “IT illiterate to IT literate” and reported that they were “now able to type documents for their daily use”; such benefits were gained through the computer and Internet skills that RIC users developed in the RIC program [Northern 2 Manager]. During the interviews, the participant RIC managers explained that, as the RIC users developed an interest in ICT, they tended to learn more and started browsing on the Internet via the World Wide Web. The knowledge and skills they developed led them to use communication tools (Web 2.0) such as email, Face Book, Twitter, blogs and Skype.

Similarly, the other program managers agreed with the RIC users and RIC managers, that the RIC program improves local rural communities’ basic ICT knowledge and skills as noted by the Warisan Global officer and Ministry of Information, Communication and Culture director:

Currently, these RIC communities are already computer literate, because they have the basic ICT knowledge...before, people would translate ICT literate for those who can use computer only; they can type, send email...they are all ICT literate. [WG Officer]

We had done the first phase of RIC implementation that is to uplift people basic ICT knowledge and skills...now we are in second phase. [MICC Director]

There is a possibility that the sample is skewed in that the people with poor skills are not entering the program and so some RIC non-users' and ex-users' were interviewed. From the interviews, the findings show that 86 percent of them assessed themselves as computer and Internet literate about the use of computers (Table 5.2).

Table 5.2: Computer/Internet competency level

Zero	Basic	Intermediate	Advanced	Total
1 non-user	2 ex-users	3 (2 ex-users + 1 non-user)	1 (elderlyex-user)	7
14%	29%	43%	14%	100%

86%



The zero level means that the RIC non-user did not know anything about computers or the Internet, whereas the basic and intermediate levels show that this group had some computer or Internet knowledge and skills. As for the advanced level, the RIC ex-user (who was previously an RIC user and trained at the RIC) was one senior citizen who was well-advanced in terms of computer and Internet competency compared with other elderly. Even though this is a small sample, it does provide a snapshot of the digital literacy of these RIC non-users and RIC ex-users and suggests that low skills are not in themselves barriers to using the RICs.

Overall, the finding regarding RIC non-users' and RIC ex-users' computer or Internet literacy levels shows that this group had the interest to learn more about computers and the Internet but did not become RIC users or stopped using the RIC because of specific reasons such as:

- finishing the course (it was a basic course and it was the only course available at the centre),
- having no transportation,
- working full-time (the working hours will not suit with the time schedule for training), and
- having time constraints (especially housewives). (See APPENDIX 7). However,

- people who use the RIC are happy with the level of skills and non-users or ex-users are not prevented from doing so by lack of skills.

5.1.2 Perceptions of Employment Opportunities at RICs

The results of the online survey on employment opportunities which were facilitated by the RICs are presented and discussed in this section. Table 5.3 shows RIC users' perceptions of employment opportunity, income, knowledge and skills obtained from the use of the RIC. About 30% of users found jobs through the use of the RIC. The responses suggest that RICs had increased the income of about 44 percent of RIC users, had increased knowledge and skills for about 46 percent (see Table 5.3).

Table 5.3: RIC users' perceptions of employment opportunity, income, knowledge and skills obtained from use of RIC

Employment opportunity	Frequency (n) Responded (Yes)	Percentage of RIC user perceptions
Job found through the RIC	200	29%
Leading to increased income	138	44%
Leading to increased knowledge & skills	133	46%

The results suggest that program had enhanced local employment opportunities and the acquisition of new IT-based skills. A potential limitation is that these benefits might only be accruing to some of the population and perhaps even missing the target groups.

Figure 5.2 provides an overview of the perceptions of RIC users across their different age categories in relation to the potential intermediate outcomes of participating in the RIC program for increased knowledge and skills, employment opportunities, and increased incomes.

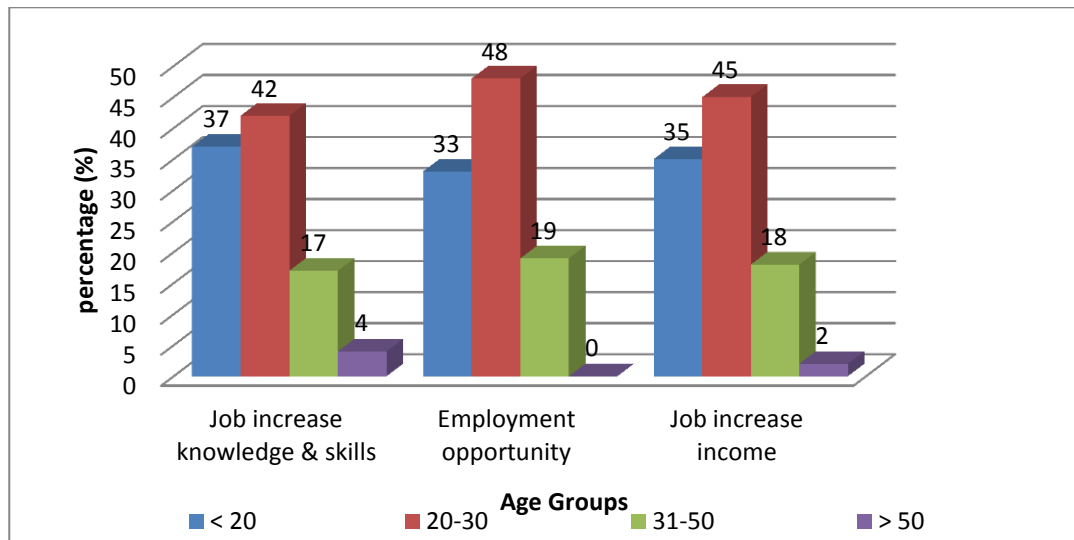


Figure 5.2: Proportion of RIC users' perception knowledge & skills, employment opportunity and income gained by age

Based on age group differences, the dominant age group that indicated the RIC program provided them with employment opportunities (81%) was the youth users, that is, those under 20 and 20-30 years old. The middle-aged group seemed less affected; 19% as most of them could be assumed to be already employed. In contrast, the elderly may not really have been interested in seeking employment as many would have been retired from active work. However, the elderly are also a target group for the RIC program, therefore, this needs to be considered. In relation to knowledge, skills and income, the age groups follow a similar trend of differences as in employment opportunity (see Figure 5.2). This shows that the distribution across the age groups of the youth, middle-aged (adults) and elderly; they had different perceptions of employment opportunities. Thus, within the age groups, they perceived to have found jobs through RICs which leading to increase income, knowledge and skills (see APPENDIX 13-Table 1).

In the interviews with the 11 RIC managers, some strongly agreed that RICs did bring employment opportunities to RIC users. They said that some of the users got jobs through the RIC and most of them were youths. This was through jobs advertised online and the managers had been informed of outcomes verbally so there were no records. In addition, if there was a job vacancy it would be advertised at the RIC through the Social Entrepreneurs' Club and the resume would be kept at the centre. The RIC managers also acted as referees and provided recommendations to

employers. Most of the youth used the certificates obtained from training at the RICs in applying for jobs. As a result, many of them got permanent jobs.

The basic training courses and certificates obtained from the RIC program provided RIC users with increased employment opportunities:

Most of the youth who came here, they are seeking for jobs...they got jobs online and physically at RIC or SEC through job vacancy advertisement... the manager becomes a referee... training certificates use to apply jobs.
[Northern 3 Manager]

The following comment by the WG Officer supports these findings:

... The TOT [trainer-on-trainer] results in providing employment or job opportunity to users. [WG Officer]

5.1.3 Perceptions of Business Opportunities at RICs

The SEC is also meant to provide business opportunities for RIC users and/or SEC members in entrepreneurship (see Chapter 4.4.3 – description of the program). The online survey results regarding business opportunities arising from SEC are shown in Figure 5.3 which provides an overview of the perceived benefits of SEC membership for RIC users.

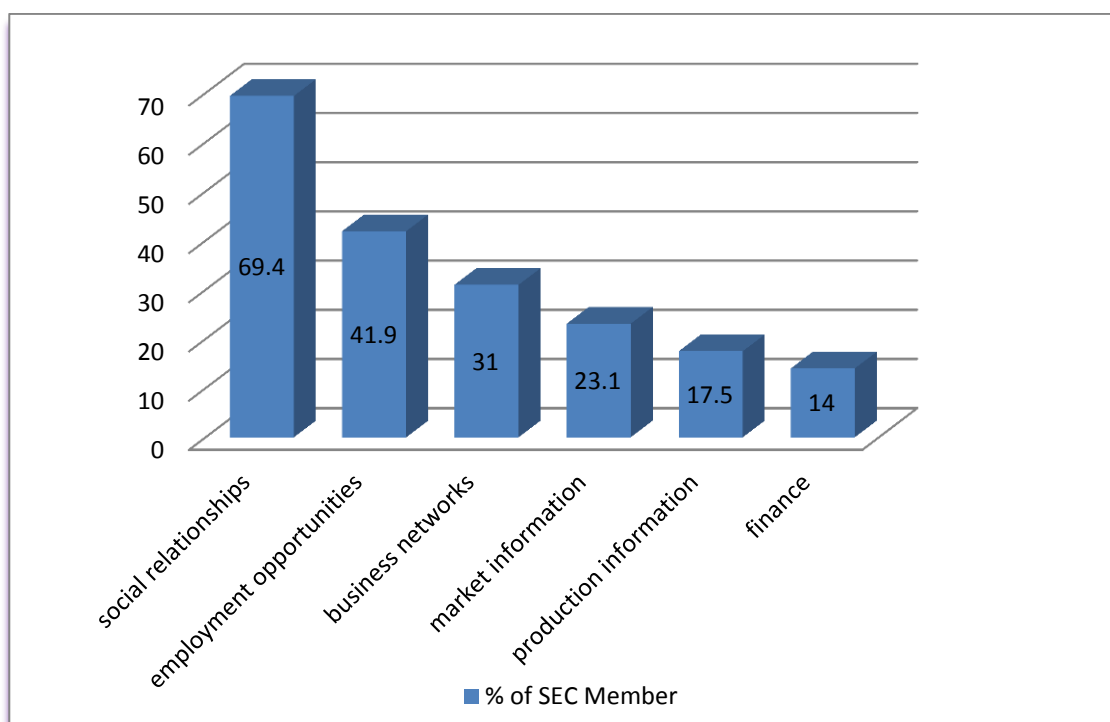


Figure 5.3: Perceived benefits (SEC) of SEC member

The most identified benefit is social relationships. The SEC would bring the members together and for some, help establish networks. However, SEC was considered of less benefit to members in terms of market, production and finance aspects.

In comparing the findings regarding RIC users' perception of SEC benefits with those of the RIC managers' similarities and contrasts in their perceptions are revealed.

According to one:

SEC contributes to users who are members of the SEC as a platform for entrepreneurs to put up their products, pamphlets, and poster... we give discount for printing, pamphlets, brochures and we can also provide for example; create a Blog for free... SEC also benefits the members because the RIC is a centre, thus there are a lot of people will know about the products through the RIC. [Eastern 3 Manager]

Another similarity is that the SEC members benefited from having business networking, social relationships and employment opportunities through the connection of Global Entrepreneurship Week and indirectly from SEC:

... They have lots of great entrepreneurs and got the connection through GEW. Therefore, they can be close and work together, have the networking. All of these become inspiration source for the users/members to be entrepreneurs and encourage the others to become one...this is as a source of employment opportunity... GEW; it is a place for RIC to sustain with the help of the community. Before this, the entrepreneurs move by themselves, but now the community and entrepreneurs move together. [Northern 2 Manager]

The SEC was seen as a critical initiative which could generate income for the RIC program and thus sustain the RIC financially (self-sustainability). Furthermore, the club can be successful if the RIC can convince the local community of the benefits gained by individuals becoming entrepreneurs and having their own business:

Many RICs do not run SEC actively... we had to focus on training (core business-70%) and 30% on entrepreneurship...this is more towards making the RIC sustain and that is why we need SEC. In my opinion, the SEC is good if we know the way and will succeed; we can see that, it is just that the local community here they cannot see the benefits...we do not have any influence people because we do not have committee. The SEC can generate income. [Central 1 Manager]

Similarly, some RIC managers also noted that not all RICs could implement an SEC because for some regions it was not applicable:

...for example; they want us to have the SEC; but it is not that applicable here and it is not active, therefore we can feel the stress and we are as if a middleman. [Central 2 Assistant Manager]

Some of the participant RIC managers perceived that the SEC was irrelevant and it actually detracted from them focusing on core activities of the RIC program, which were the basic ICT training and workshops:

Among other telecentres in the world, RIC is the only telecentre that has SEC. This is the Ministry ideas and plans to extend the RIC services through entrepreneurship...having SEC to support RIC is good, is just that most of the RICs are against the SEC because they perceived that SEC is irrelevant... once we have SEC, we are as if forgot about our core activity at RIC, more being focus at SEC...Doing business... [Eastern 4 Manager]

The other program managers noted that the SEC brought benefits to entrepreneurs or members and also to the RIC. In addition to the SEC, the RIC program also conducted training courses and workshops in relation to business application programs such as e-shop³ and e-carnival⁴. These programs also encouraged entrepreneurs to use the SEC as a connector and to use the RIC as a platform for connecting with other potential business contacts.

With the SEC, the RIC will share the benefits with the entrepreneurs. The club members [entrepreneurs] should leverage the RIC for them to grow or develop and provide business opportunity. The SEC will also assist in terms of the business operations and towards sustainability of the RIC. [MICC Director]

The RIC also train the community to use e-shop, therefore there will be more open up the e-shop; and then we will organize the carnival [GEW]... which is part of SEC activities; they can sell their products or offer services. With e-carnival, they will have both; through internet (online) and outside (offline). The online is that the customers from other places have the opportunity to purchase... this is an online business opportunity for them. [WG Officer]

One of the RIC management committee members developed their business through the social relationships built through the SEC, thus it was noted that entrepreneurs were able to do a lot of networking through the SEC. Despite that, the main purpose of the SEC was for socialisation of entrepreneurs within rural communities. At the SEC, normally they first develop the social relationships or networks and this led to them engaging in building business networks:

³ E-shop is dealing with online business and 'virtual' shop

⁴ E-carnival is engage with promoting and advertising business activities virtually

I do online business, my product is very simple; I sell domain and web hosting... I see the business is just about idea and networking...we got business networking and social relationships. Usually, you start with social first and then it will become business. Definitely, lots of networking gets through the SEC. [Management Committee 3-Entrepreneurs' representative]

In considering the business opportunities in relation to SEC benefits, there are similarities and contrasts in the findings based on the perceptions of the SEC members and program managers. The SEC members considered social relationships as the most benefit they gain from the SEC. This is similar to the findings from the interviews with the program managers. In fact, the observations made during RIC site visits also supported the fact that SEC members were making new contacts and increasing their social contacts through the SEC.

Therefore, in summary, the SEC is perceived to bring many benefits to the members and indirectly to the RIC, though following from the findings in the previous chapter, some did not see the benefits and considered that it is irrelevant with some SECs being inactive, and having members. This results in having difficulties to influence the local community to get involved in SEC.

5.2 Ultimate Outcomes of the RIC Program

This section provided a descriptive analysis of the two dimensions of ultimate outcomes (economic benefits and social capital) individually and comparatively establishing a relationship exists between these two variables. The potential ultimate outcomes pertaining to this study of the RIC program in rural Malaysia are: (1) enhanced social capital, (2) economic benefits, and (3) improved quality of rural life which is assumed will be an ultimate outcome from the first two (see Chapter 2, Section 2.2.2). Hence, the findings presented and discussed in this section are based on the perceptions of RIC users and program managers in relation to these three interconnected and related outcomes. The first two outcomes in this study are social capital and economic contribution. It is assumed that the increase or changes in social capital and improvements in economic outcomes are expected to result in an improvement in the third ultimate outcome – QoRL – over time.

5.2.1 Perceptions of Social Capital at RICs

Social capital as defined for the purpose of this study is the community resources that are invested to achieve intended goals. Social capital is built through the use of the RIC (as physical space) and via the Internet access at the RIC (as virtual space). There are three forms of social capital entailed in this study: 1) bonding capital (BOC), 2) bridging capital (BRC), and 3) local community association (LCA). Bonding capital refers to contacts within each RIC community (internally), whereas bridging capital refers to contacts to other than the RIC community or to other communities in other places (externally). Thus, local community association refers to a community with strong associational life within a group or club and informal association through events or festivals that reflect a community's values and interests (community cohesiveness). This study limits the elements of social capital to community informatics.

This research assessed the RIC program to determine whether the Internet and ICT infrastructure provided by RIC brings more social capital to Malaysian rural communities. The results suggest that people believe RICs build social capital in Malaysian rural communities. In relation to social capital in RICs, the bonding capital suggests there were strong ties within and the bridging capital suggests that weak ties existed outside the community. Similarly, with the local community association as another component of social capital, the LCA brings social networking informally to the local community within and outside the RIC. The next section interprets and explains the key findings on social capital.

Figure 5.4 illustrates the type of contacts that RIC users interact with whenever they visited the RIC. These contacts suggest the development of both bonding and bridging capital at RICs.

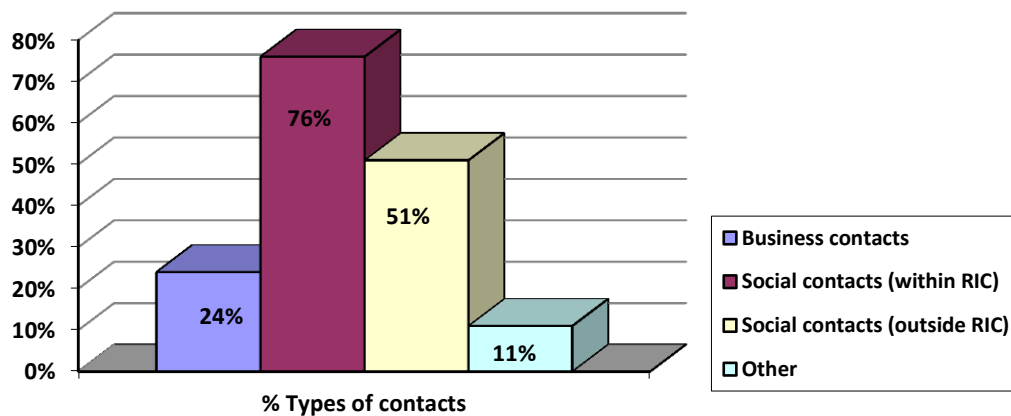


Figure 5.4: Types of contacts made at RIC

Seventy-six percent (76%) of the respondent RIC users indicated that they had social contacts within the RIC (bonding capital); as compared to the fifty-one percent (51%) of the respondent RIC users indicating that they had social contacts outside the RIC (bridging capital). Twenty-four percent (24%) and eleven percent (11%) of respondent RIC users had a small percentage of business and other contacts occurring within the RIC. This seems to indicate that developing bonding and bridging capital were more of an outcome from RIC use than obtaining business and other contacts through the RIC. This may however be due to the fact that the majority of RIC users were youth. In addition, by checking the responses by age, those at the age of 20-30 made more business contacts compared with the other age groups. For instance, the youngsters had developed their social capital more than the elderly (see APPENDIX 13– Table 2).

Besides the types of contacts made in person at the RIC, the RIC users were also asked to rate how regularly they met with their online friends or contacts. Table 5.4 shows that 41% of RIC users met online friends on a daily or weekly basis but 37% never did but that the latter regularly met offline, most probably at the RIC.

Table 5.4: Regularly met online friends or contacts

Valid frequency	Frequency	Percentage (%)
Daily/weekly	85	41
Monthly	32	15
Yearly	13	6
Never	77	37
Other	3	1
Total	210	100

The results suggest that the RIC users or local rural community did have contacts online (virtual); and this suggests the potential to build bonding and bridging capital through RIC user activities at the RIC. Through the training attended, they built networks, both social and business at RIC. The communication means, such as email, did widen their contacts. This was supported by site observations. For instance, this study also used factor analysis to measure the individual social capital components (see Chapter 3, Section 3.6.2).

Bonding capital at RICs

Results of a factor analysis and reliability analysis (APPENDIX 14, Table 1) show that the bonding capital component of social capital displays a positive correlation between the items and factor loadings of 0.6 and above which is considered a good indicator of internal validity (Hair et al., 2010, Tabachnick and Fidell, 2012) . This is empirically evident with a Cronbach Alpha score of .831 and 60 percent of variance for the bonding capital component being explained in the factor analysis. This shows that the items measuring the construct BOC display a high level of internal reliability and validity (see APPENDIX 14, Table 1).

Bonding capital was measured across several demographic variables to see if there were differences in demographic groups. Using a one-way ANOVA, it was found that there was no difference in bonding capital scores in relation to age, level of education, income, employment and RIC location (no significance). However, using a T-test on the bonding capital mean scores reveal significant differences between gender (male & female), the differences by gender show that between male and female RIC users, the bonding capital is perceived differently. For instance, those who had newly found jobs and increased their knowledge and skills had higher ratings on bonding capital than those who didn't; and also for those who had newly found jobs and increased their income. Therefore, this overall perceptions might be that those who are doing better tend to have high social capital scores. The results show that the differences in these demographic groups are statistically significant, where the p-value = .000. One of the participant RIC managers claimed that the impact of the RIC program for RIC users consisted of basic ICT knowledge and

skills and the use of communication tools (Web 2.0) which resulted in increased social capital (data from interview).

Bridging capital at RICs

In checking the reliability and internal validity of bridging capital, the results of factor analysis and reliability analysis show that the bridging capital component of social capital displays a positive correlation between the items and factor loadings of .7 and above which is considered a good indicator of internal validity. This is evident with a Cronbach Alpha score of .891 and 58 percent of variance of BRC component being explained in the factor analysis. This shows that the items measuring the construct BRC display a high level of reliability and internal validity (see APPENDIX 14, Table 2).

In using ANOVA, when comparing means of bridging capital across demographic variables, the bridging capital mean scores are not significantly different across the demographic variables age, income, levels of education, employment and location of the RIC users. However, using the T-test in comparing bridging capital mean scores, there are differences between male & female users (gender) perceptions. Those who had newly found jobs and increased their knowledge and skills had higher bridging capital mean scores than those who didn't; and similar with those who had increased their income. This shows that those who found jobs and doing better tend to have higher social capital scores, which contributes to the increased in bridging capital. The results show that they are statistically significant, where the p-value = .000.

Local community association at RICs

Besides bonding and bridging capital, local community association is also one of the components of social capital which was investigated in the RIC program by this study. Results of the factor analysis and reliability analysis show that the LCA component of social capital displays a positive correlation between the items and factor loadings of .5 and above which is considered a good indicator of internal validity. This is evident with a Cronbach Alpha score of .840 and 51 percent of variance for the LCA component explained in the factor analysis. This shows that the

items measuring the LCA construct display a high level of internal reliability and validity (see APPENDIX 14, Table 3).

A one-way ANOVA test and a post-hoc Tukey test were used to determine if there were differences across groups in the demographic variables and which groups were statistically different in each demographic variable. The results of the one-way ANOVA tests and post-hoc Tukey tests show which age groups, level of education, income groups and employment status categories were statistically significant different with regard to local community association. Table 5.5 below outlines the results of a one-way ANOVA test, showing that there were statistically significant differences in LCA across the age groups.

Table 5.5: LCA by age groups

Age	N	Mean rating for LCA
Under 20	95	3.87
20-30	74	4.57
31-50	22	4.93
Over 50	8	4.46
All	199	4.27
ANOVA Sig.		.000*
Df		3,195
F-value		8.579

A post-hoc Tukey test (see APPENDIX 15, Table 1 for specific details) shows that there was a significant difference in local community association between the age group of those under 20 and 20 to 30 ($p=.000$) as well as between those under 20 and 31 to 50 ($p=.000$). However, there were no differences between the other age groups. In testing one of the assumptions of the one-way ANOVA, Levene's Test of Homogeneity of Variance shows the result of similar variances between groups. The Test of Homogeneity of Variance shows a Levene statistic of 3.761 (sig. 0.012), indicating that there were no similar variances; therefore, Robust Tests of Equality of Means were used to check for significance levels (sig. 0.000) (see APPENDIX 15, Table 2 for specific details).

Table 5.6: LCA by highest level of education

Highest Level of Education	N	Mean rating for LCA
Primary school/PMR	7	4.69
SPM	121	3.98
STPM/Diploma	45	4.65
Bachelor Degree or higher	26	4.82
All	199	4.27
ANOVA Sig.		.000*
Df		3,195
F-value		6.831

The results of a one-way ANOVA test reported in Table 5.6 show that there were statistically significant differences in LCA across the highest level of education. A post-hoc Tukey test (see APPENDIX 15, Table 3 for specific details) shows that there was a significant difference between the SPM holders and STPM/Diploma holders ($p=.010$) as well as between those SPM holders and Bachelor Degree holders ($p=.010$). However, there were no differences between the other levels of education. In testing one of the assumptions of the one-way ANOVA, Levene's Test of Homogeneity of Variance shows similar variances between the groups. The Test of Homogeneity of Variance shows a Levene statistic of 0.807 (sig. 0.546), therefore, the assumption of homogeneity of variance is met (see APPENDIX 15, Table 4 for specific details).

Table 5.7: LCA by income groups

Current Income	N	Mean rating for LCA
Less than RM 1,000	129	3.95
RM1,001 to RM2,000	53	4.83
RM2,001 or more	17	4.93
All	199	4.27
ANOVA Sig.		.000*
Df		2,196
F-value		15.659

A post-hoc Tukey test (see APPENDIX 15, Table 5 for specific details) shows that there was a significant difference in local community association between the income group of less than RM1,000 and income of RM1,001 to RM2,000 ($p=.000$) as well as between those who earned less than RM1,000 and RM2,001 or more ($p=.002$). However, there were no differences between the income groups of RM1,001 to RM2,000 and income of RM2,001 or more ($p=.942$). In testing one of the assumptions of the one-way ANOVA, Levene's Test of Homogeneity of Variance shows the result of similar variances between groups. The Test of Homogeneity of

Variance shows a Levene statistic of .719 (sig. 0.489), therefore, the assumption of homogeneity of variance is met (see APPENDIX 15, Table 6 for specific details).

The results of a one-way ANOVA test are reported in Table 5.8. The results show that there were statistically significant differences in LCA across the employment status groups.

Table 5.8: LCA by employment status groups

Employment status	N	Mean rating for LCA
Earned monthly income	59	4.84
Self-employed	22	4.51
Home duties	7	4.22
Student	108	3.90
Retired	3	4.57
Total	199	4.27
ANOVA Sig.		.000*
Df		4,194
F-value		7.271

The results of the post-hoc Tukey test (see APPENDIX 15, Table 7 for specific details) show that there was a significant difference in local community association between the employment status groups “earned monthly income” and students ($p=.000$). However, there were no differences between the other employment status groups. In testing one of the assumptions of the one-way ANOVA, Levene’s Test of Homogeneity of Variance shows similar variances between the groups. The Test of Homogeneity of Variances shows a Levene statistic of 1.817 (sig. 0.127), therefore, the assumption of homogeneity of variance is met (see APPENDIX 15, Table 8 for specific details).

RIC Regions and Social Capital

This study also examined social capital across RIC locations or regions to test whether there was a different perception of social capital between the regions. In order to present the findings on social capital in relation to RICs within Malaysian rural regions, the RICs were classified into five rural regions. Table 5.9 shows the number of RIC location or sites across these five rural regions, the number of survey respondents for each region and the social capital mean score for each region.

Table 5.9: RIC regions and social capital mean

RIC sites/regions	Number of respondents (n)	Social capital mean score (Max = 7)
RIC Borneo (Sabah & Sarawak)	21	5.11
RIC Eastern	65	5.09
RIC Northern	41	4.90
RIC Southern	44	4.72
RIC Central	27	4.70

As explained earlier, the social capital mean scores were calculated on a seven point scale. This social capital is an overall measure of the aggregated social capital. It can be observed that there was no significant difference between regional sites in terms of social capital scores. The Borneo and Eastern regions tended to have higher mean scores of social capital 5.11 and 5.09 compared with Northern, Southern and Central regions which scored 5.11, 5.09, 4.95, 4.72 and 4.70, respectively, thus this may be due to the location of remote regions. Testing using one-way ANOVA, there was no difference between regions and social capital (bonding, bridging and local community association) (see APPENDIX 15, Table 9). This shows that there would appear to be no significant difference between social capital and RIC locations or regions. This finding would suggest that social capital does not necessarily depend on where individuals or communities are located. Social capital can exist anywhere; the level of social capital was not significantly different across the rural communities by location or region. However, aggregated to regions there were some differences, this suggests the numbers were too small for specific sites.

Table 5.10 provides a comparison between the five different regions of RIC and the three individual constructs of SC components. The results for the SC and each of the three factors are provided in Table 5.9, where higher scores indicate higher levels of SC.

Table 5.10: Comparative mean scores of SC

Components/mean scores (Regions)	Central (n=27)	Southern (n=44)	Eastern (n=65)	Northern (n=41)	Borneo (n=21)	F-value
Component 1- Bonding Capital	5.04	5.25	5.34	5.29	5.55	.778
Component 2- Bridging Capital	5.07	5.07	5.31	5.30	5.57	1.242
Component 3- Local Community	4.05	3.97	4.51	4.15	4.60	2.259

Thus, components 1 and 2 have quite similar mean scores (5.04 to 5.57) at all of the five regions and other factors seem to score quite high as well. At each region, the mean score is from 3.97 to 5.57, which indicates a quite high score and the level of SC is also high. The F-value explains that component 3 is statistically significant as the F-value is more than 1 ($F\text{-value} > 1$), significant at .000. Hence, the highest SC level is among the RIC users from the rural communities in Borneo (Sabah and Sarawak) region, which is considered to be a remote region.

Ninety percent of the RIC managers agreed that RIC users developed and built their social relationships and networks, either online or offline or both, during courses and workshops held at the RICs. Sometimes they did not even know each other but were making friends and initiating contacts. This spurred them to get connected and build trust to disseminate information. Ninety percent of the RIC managers strongly agreed that the communities within and outside the RIC were connected to each other:

...there are social relationships among users...normally the students, there are those they already know...but there are they did not know each other yet; they made a contact. [Eastern 3 Manager]

Sometimes we had it by group and those who came were from different areas, they hardly know each other; through RIC they got the social relationships... for example when we teach them Face book, they will be connected... not only within the community but also from outside. [Eastern 4 Manager]

The social relationships were built once the RIC user started to use and learn at the RIC, and then the siblings and families also started to learn. The RIC users informed their friends about RIC and attracted them to come and learn; even though they had finished their training courses. This was a social network that created bonding and bridging at the RIC. However, there was a social network that was also built through bonding and bridging online using the Internet at the RIC. The relationships were built:

...when users starts to use RIC...they will start bringing sisters and sometimes when the mother send the daughter for training the mother will also want to learn... they felt easy and convenience for them... they built social relationships... even tourists from overseas, use internet to contact their families or friends. Most of the users that complete their training tell their friends about RIC. It is easy to spread the information and easily contact one of them and they can get in touch with the others. [Northern 1 Manager]

Besides the bonding and bridging capital that shaped the RICs, local community association also shaped the RICs through local champions' influence on local rural

communities and especially through senior citizens. This influence was via a direct contact which was informal and arose whenever it was related to rural community activities. Some RIC users also built strong networks through the SEC:

...normally, if we can attract the elderly it is easier to get their assistance...therefore, we attract the head of village first or the head of any department...then we can see the relationship is through RIC; this includes the business and networking... before this, their networking is not that strong, but once join RIC and particularly SEC; they got strong networking. [Southern Manager]

One of the participant program managers noted that through the SEC Global Entrepreneurship Week, RICs' users who were members of the SEC increased their external contacts from telecentres worldwide. With the use of Web 2.0 applications (Face book, email, blogging, Twitter) as a platform, RIC users were communicating through the RIC indirectly and were able to share their experiences. They could also get advice from entrepreneurs at the other RICs. As a result, among the RICs also communicated with one another through Face book presence. Therefore, the RIC had connected through the application at the RIC:

... Via GEW event...RIC also got contacts from other telecentres and from other countries...RIC itself communicates and has the Face book platform... communicate with the other RICs, they are communicating through the RIC, indirectly, the RIC had connected the entrepreneurs. [WG Officer]

Another participant program manager claimed:

... Through SEC and RIC the users do create networks... business networking and social relationships. [Management Committee 3]

Once they got contact...they complement each other...before this, their networking is not that strong, but once they join RIC...particularly SEC; they have strong network. [Southern Manager]

One of the program managers emphasised that through the SEC, local rural community members and SEC members who did not know each other would become their friends or contacts. The SEC was building social and business networks in rural communities for these RIC users. The entrepreneurs need to be socialised and this could be achieved in continuous contacts through networking, through Web 2.0 applications such as Face book and creating their own websites, as learnt during training and workshops at RIC:

That is the need of SEC, to socialise; for example, I met this lady somewhere outside RIC, but I did not know her because I hardly know this place; but when I join SEC, I get to know her. Therefore, through the SEC we will get

social and business relationships. When we sell things, we need to socialise... the entrepreneur needs to socialise... to keep in touch, they need a long-term or continuous contact; they need to have their own website or Face Book.
[Management Committee 5]

In summary, the key findings regarding social capital at RICs indicate that RIC users built social and business relationships through involvement in SEC and RIC activities. In regard to RIC locations or regions, all of the key stakeholders agreed that the social capital created by the RIC was not different across regions. In contrast, the survey suggests some regional differences in Borneo and Eastern regions which are considered as remote regions. During observations made at eleven RIC locations, it seemed that the levels of social capital activity at each region or location were similar. Furthermore, local rural communities tended to increase their contacts because when they entered the RIC, some of the RIC users hardly knew each other prior to becoming involved in the RIC program. Similarly, during the SEC meeting or activities at RICs, the SEC members were getting to know one another and sharing their knowledge, skills and business experience.

5.2.2 Economic Benefits of RICs

The main expected economic benefits of RICs for this study are income, employment and education attainment. The education factor considered for this study is associated with the building of human capital in RIC users (see Chapter 2, Section 2.1). The results from the online survey illustrate that as there is an improvement in education contribution, there is also an improvement in income contribution and thus this leads to better employment opportunities.

Table 5.11 shows there is a strong relationship between perceived improvements in education, income and employment contribution (outcomes); thus, a strong correlation between the three variables of economic benefits. This finding suggests that users believe the RIC program will improve individual economic benefits and that the tendency is, if they believe in one benefit, they believe in all of them.

Table 5.11: Correlations between improved education (Ed), income (I) and employment (E)

	Pearson correlation			Sig. (2-tailed)	N
	Ed	I	E	.000	200
Improved education	1				
Improved income	.477*	1			
Improved employment	.579*	.621*	1		

Therefore, in order to provide further support for these findings regarding the relationships between education contribution, income and employment, this study tested a multiple regression model to find out whether there is a statistically significant association between education and income contribution and the dependent variable of employment (Table 5.12). Table 5.12 summarises the result of this multiple regression analysis.

Table 5.12: Regression model summary – Economic Benefits (DV-Employment)

Model	R	R square	F-value	Beta	t	Sig.
(Constant)	.699	.489	94.31	2.30	.022	
Education contribution				.366	6.32	.000
Income contribution				.446	7.70	.000

These results indicate there is a statistically significant relationship between an improvement in level of education and level of income and employment prospects. It shows significant results of $R^2 = .489$; this is a high correlation and indicates that these variables are interrelated. Hence, the beta values and t values for improvement in education and income indicate a very strong association and these independent variables are strong predictors of employment prospect (statistically significant) (Hair et al., 2010, Tabachnick and Fidell, 2012). This indicates that assumptions of linearity, normally distributed errors, and uncorrelated errors were checked and met. The other assumptions are checked in the partial regression plots (residual scatter plot), which indicates that the errors are normally distributed, the variances of the residuals are constant, and the residual is relatively uncorrelated with the linear combination of predictors (Hair et al. 2010; Tabachnick & Fidell 2010) (see APPENDIX 16, Table 1).

Furthermore, the results of these economic benefits are in support with the interview data. The key findings presented and discussed here summarise the results of the analysis of interview transcripts from the eleven RIC managers in relation to the economic benefits of RICs. These findings focus on the economic benefits gained through employment and RIC sustainability. Table 5.13 provides a summary of the main findings in relation to economic benefits from the perspective of the eleven RIC managers interviewed in this study.

Table 5.13: Summary of main outcomes identified in relation to economic benefits

Main perceived outcomes	RIC managers
(1) Increase level of education (2) Online business – increase income (3) Low income – afford to learn at RIC	Eastern 2 Manager
Business online – made profit	Southern Manager
(1) Information – business (2) Education – increase ICT knowledge & skills (3) Better job prospects	Central 2 Assistant Manager
Job prospects or opportunity	Eastern 3 Manager Eastern 1 Manager Northern 2 Manager Northern 1 Manager

Table 5.13 lists key themes identified in these eleven interviews of RIC managers in relation to economic benefits. Most of the RIC managers believed the main benefits for RIC users were largely in terms of employment prospects. The RIC managers noted that through business online some RIC users were making profits and this led to an increase of these RIC users' income. Even though some RIC users earned low income they had the opportunity to learn ICT at the RIC and potentially increase their income level with these skills:

In terms of income, the users who had online business, they had increase their income...as for those who are less fortunate, they can still learn computer and internet at RIC...they can afford to learn because of RIC...Based on our survey, from the beginning of RIC operation until recently, the total number of those who know how to use computer and ICT knowledge is increasing (improving). [Eastern 2 Manager]

The entrepreneurs that have business online, made profit online, they exchange products online... users also improve their ICT knowledge through training at RIC. [Southern Manager]

Despite that, the RIC managers also noted that RIC users got information on business opportunities and education attainment via accessing the Internet at the RIC.

Therefore, this information would lead to increase the users' ICT knowledge and skills. The other economic benefit for RIC users noted by the RIC managers was employment prospects:

...the information from internet on business opportunity and other educational materials also increase users ICT knowledge and skills...I got the job here because the former manager offered me better job and before, I was the RIC user and always use the RIC. [Central 2 Assistant Manager]

... those who came to RIC to do resume, type resignation letters, SPA online (apply government sector jobs online), seek for information, sometimes they also seek our advice on the job scope or requirements...there are also who got the jobs, but not sure what type of jobs...but those who came back after finished their training, we will ask them about the job. [Eastern 3 Manager]

There was also a case noted by one of the RIC managers in which the RIC user got a job offer while attending training at a RIC:

... There is a case during e-services training, there is one participant being contact that he got a job and immediately fill the form online to accept the job offer. [Eastern 1 Manager]

Most of the users attended training because they need the certificate in order to get a job. [Northern 2 Manager]

Besides, there are users who already got a job, but they still come to RIC to use other services; such as printing and internet. [Northern 1 Manager]

These findings indicate that the RIC managers did believe that RIC users were able to improve their income, level of education and employment prospects as a result of their participation in RIC activities. From the direct observations made at RICs, the RIC managers did not have empirical data to confirm these perceived economic benefits for RIC users; however, they did observe and monitor RIC users' progress and improvement by asking the RIC users directly or through information they got from other RIC users. Thus, the spread of information regarding the perceived economic benefits of the RIC for RIC users was verbal and there was no written formal report about these benefits produced by the RIC managers.

The WG Officer agreed with the RIC managers' perceptions of the economic benefits of RICs for the RIC users directly and indirectly for other people in the rural communities surrounding the RICs:

The RIC gives benefits to the users and indirectly gives benefits to the other community... for example; between entrepreneur A (EA) and entrepreneur B (EB), the EA use RIC and knows how to do Digital Story Telling (DST), then

the other entrepreneurs know about this, they are attracted. So, there are a network, not only between RICs, but also wider... benefits for entrepreneurs to expand their business globally and leads to increase their income. [WG Officer]

In summary, the RIC users and program managers had similar perceptions regarding the economic benefits obtained from using RICs. Hence the key findings from the online survey and interviews strongly suggest that there were two perceived benefits (ultimate outcomes) of this study: (1) social capital, and (2) economic benefits. As explained earlier, economic benefit is one of the factors that determine the impact of RICs on rural communities and has a relationship with the other key factor, social capital contribution. The EB here is explained as a sub-set of perceived benefits and refers to EB contribution or outcome. The next section explains how quality of rural life may be derived from the perceived benefits obtained from RICs.

5.2.3 Quality of Rural Life at RICs

As relevant and adapted to this study, the main indicators of QoRL are income, education level, strong and weak ties of social capital, employment and entrepreneurship. The previous sections presented the results for particular areas of social and human capital that could be presumed to lead to improvements in QoRL. This section presents the RIC managers' overall impressions of RIC contribution to QoRL. The RIC managers were asked to comment on the impact of the RICs providing access to ICT in their designated rural communities. The RIC managers were initially asked to relate the impact of the RICs on economic benefits and social capital in each rural community in interviews conducted at each of their respective RICs. They rated each aspect of economic benefits and each aspect of social capital as listed in Table 5.14 with either a *Yes* (Agree), or a *No* (Disagree). Table 5.14 explains the RIC managers' perceptions of contributions to community informatics, EB and SC, and highlights the responses of the RIC managers.

Table 5.14: RIC managers' perceptions of contributions to community informatics, EB & SC

Managers	1	2	3	4	5	6	7	8	9	10	11
Regions	Northern 1	Northern 2	Northern 3	Northern 4	Eastern 1	Eastern 2	Eastern 3	Eastern 4	Southern	Central 1	Central 2
Community informatics											
EB:											
Basic training (computer skills)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Business networks	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Employment opportunities	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SC:											
Social relationships	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Social networks	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes
SEC-entrepreneurship	Disagree	Agree	Disagree	Disagree	Disagree	Agree	Disagree	Disagree	Agree	Disagree	Disagree
Bonding capital	No	Yes	No	No	Yes	No	No	No	Yes	Yes	Yes
Bridging capital	No	Yes	No	No	Yes	No	Yes	No	Yes	No	Yes

Relationship between RIC managers & community

Note: Yes = managers agreed that the attributes exist.

No = managers disagreed that the attributes exist.

Attributes are: 1) social relationships, 2) social networks, 3) bonding capital and 4) bridging capital

From the analysis of the interviews of eleven RIC managers, there was consensus that the biggest impact of the RIC was the direct impact on the basic training, employment opportunities and social relationships between RIC users. However business and social networks also appeared to be part of the big impact of the RIC. Despite the variations between RICs, most RIC managers perceived a positive impact of the RIC program on EB, ability to learn computers, having business networks and ability to find jobs, as well as on SC, ability to meet people and ability to communicate with family and friends (see Table 5.14). In contrast, there are some disagreements among the managers on their perceptions of Social Entrepreneurs Club (SEC) at RICs. The managers perceived that SEC does not bring benefits to the SEC members; however, five of the RIC managers interviewed thought that the SEC brought benefits to the local rural community and the RIC. As for social entrepreneurs, the benefits were expected in their long-term learning process.

As part of the key findings from Table 5.14, one of the initial main aims of the RIC program was to address the digital divide in Malaysian rural communities. However, this was not the focus of this study, because whether RIC program was achieving this goal could only be determined in a longitudinal study. Therefore, the focus of this study was determining whether the RIC program was increasing digital skills among the rural communities. In addition, the RIC digital skills also emphasise whether the local rural communities' were improving their QoRL.

As noted previously (Chapter 4, Section 4.4.2), once the RIC users learned and were trained in using ICT applications such as Microsoft Office and Web 2.0 at the RIC, they became ICT literate. This also applies for the ICT accessibility. They would have no issue on accessibility to ICT as the RIC was the place for them to access and use ICT applications and services. Therefore, the issue of digital divide in rural communities could be reduced through the RIC program. Hence, it could be said that the purpose of implementing a telecentre such an RIC was to improve digital skills in Malaysian rural communities. Table 5.15 summarises the main issues identified from RIC managers' interviews in relation to the digital divide in their rural communities.

Table 5.15: Summary of main issues regarding digital divide

Main issues	RIC managers
Narrow digital divide by making rural communities more IT literate	Central 2 Assistant Manager
Improve IT literacy of elderly	Eastern 4 Manager
Digital divide is generational rather location specific	Eastern 1 Manager
Closing the gap between those who are IT literate and illiterate	Northern 2 Manager

From the interviews with the RIC managers, the main findings in relation to the digital divide issues in these rural communities were: (1) uplifting and improving their ICT knowledge and skills, (2) encouraging the elderly to become IT literate, (3) noting that the gap was between generations and not specifically between locations, and (4) noting the divide between those who were IT literate and illiterate.

The RIC program in terms of its main aim of reducing the digital divide in Malaysian rural communities would appear to be working as evidenced in the following comments by RIC managers. From the interviews with the RIC managers, the key findings regarding the digital divide in these rural communities were that most of the RIC users were IT literate, women and elderly who were slowly adapting to the use of ICT at the RIC. These groups often started with zero knowledge and skills on ICT as evidenced in the following direct quotations from RIC managers:

DD [digital divide] is reducing and not critical...the community becoming IT literate...they had to change their mindset and change their routine activities to the use of ICT...those with zero ICT knowledge and skills are the women and elderly. [Central 2 Assistant Manager]

There is no gap between the youngsters ...but as for the elderly, there are gaps...when we want to approach them, they are a bit scared...but this year (2010), we can see the difference that these elderly are starting to be aware and learn ICT. [Eastern 4 Manager]

Furthermore, another RIC manager claimed that the digital divide was individuals' levels of ICT knowledge and it was not specific to RIC locations or regions. In addition, the gap could also be occurring across subsequent generations as noted in the following comment by a RIC manager:

The divide among one generation to the other generations...people question; RIC operated for 7 years but did not bridge the divide yet...the problem is we do not have the same people coming in...The divide is in terms of individuals' knowledge, but not the location. [Eastern 1 Manager]

Interestingly, another RIC manager noted that they do not know who were the IT illiterate people in their rural community and whether these people were interested to learn IT skills and become IT literate. This is evidenced in the following comment by a RIC manager:

RIC main purpose is to give ICT to all communities...even some were afraid to use computers...we want to know to whom does the IT illiterate goes to?...there might be those who are still illiterate, but we do not know...those who have not learn and interested to learn, we do not know. [Northern 2 Manager]

As explained previously, RIC managers from different regions and locations had varying perspectives on economic benefits of the RICs, particularly in relation to income, employment, education and entrepreneurship. Similarly, the perspective of RIC managers regarding the impact of the RIC in narrowing the digital divide in Malaysia rural communities varied as well. However, overall, the findings from the interviews with the RIC managers suggest that rural communities were deriving economic benefits in the form of income, employment, education and entrepreneurship from using the services provided by RICs. As a result, this would benefit the rural community well-being, hence increase QoRL and as the local rural community had improved their QoRL, this should also reduce the digital gap within the RIC community. The health of rural communities is one of the key factors of QoRL; however, since health was not emphasized as an objective of the RIC program, this factor was outside the scope and was not the concern of this study (see Table 5.14).

In 2008, the MICC decided to focus on human capacity building as a main objective of the RIC program (see Chapter 2, Section 2.3). Hence, the MICC business model for the RIC program focused on the Social Entrepreneurs Club. The program managers perceived QoRL as an outcome from the purpose and functions of the SEC. However, some of the RIC managers did not agree with the SEC purpose and functions. Hence, the success of the SEC program within RICs was seen as an indicator that will increase quality of rural life. Therefore, the SEC was seen as one of the key factors contributing to QoRL (see Table 5.14).

Besides the economic benefits factors, the SEC is an indicator which the RIC program managers believed could increase quality of rural life and a community

connector. An additional factor for QoRL in relation to the SEC program within the RIC program is entrepreneurs' characteristics. This was an associated factor contributing to QoRL:

In general, all of these factors have impacts to the quality of life...therefore, entrepreneurs' characteristics would be another factor for quality of life...if there is a problem, they will look for opportunity...entrepreneurs' characteristics would be one of the factors to increase the individual's quality of life. [WG Officer]

Indeed, this was the result of reducing the digital divide at the RIC. The rural communities used the RIC in both a physical and virtual sense. This kind of space benefited the RIC users in many different ways, such as providing avenues to the RIC users not only to use the computer and the Internet, but also to use the services and get assistance from the RIC managers. This was also true for improving digital skills. These local rural communities were increasing their human capital due to the increase in their ICT knowledge and skill.

5.3 Perceived Benefits at RICs

This section is about presenting the results of the hypothesis testing for the relationship between social capital characteristics and perceived benefits and also the relationship between user characteristics and perceived benefits. The impact suggested for this study is that the EB and SC contributions are presumed as perceived benefits and regarded to indirectly improve the QoRL. In summary, the initial or preliminary findings provide evidence that the RICs built SC and there was a strong correlation between bonding, bridging and local community association. Table 5.16 indicates a correlation between social capital and economic benefits. EB is one of the factors that affected RIC impact on rural communities and it had a statistically significant relationship with all three dimensions of social capital examined in this study of the RIC program. That is, those people who had higher ratings for social capital were also more positive about the benefits of the RIC.

Table 5.16: Perceived benefits - Social capital and economic benefits contributions

	Pearson correlation						Sig. (2-tailed)	N
	I	E	Ed	BOC	BRC	LCA		
EB:								
Income (I)	1	.621*	.477*	.527*	.503*	.365*		
Employment (E)		1	.579*	.451*	.498*	.237*		
Education (Ed)			1	.508*	.454*	.190*		
SC:								
Bonding capital (BOC)				1	.797*	.375*		
Bridging capital (BRC)					1	.400*		
Local community association (LCA)						1		

Table 5.16 confirms that the dimensions of perceived benefits assumed in this study as economic benefits and social capital contribution were strongly correlated. Individually, economic benefit variables such as perceived improvements in income, education and employment were also strongly positively correlated with bonding, bridging capital and local community association. This also indicates that the higher the level of income, education and employment, the higher the level of bonding, bridging capital and local community association that will exist in RIC users and potentially in rural communities.

The equations of these relationships are as follows:

$$(1) \text{ Economic benefits } EB(f): I; Ed; E$$

$$(2) \text{ Social capital (SC) contribution} = BOC + BRC + LCA$$

$$(3) \text{ Perceived benefits (PB)} = EB + SC$$

$$PB = \uparrow I = \uparrow Ed = \uparrow E = \uparrow BOC = \uparrow BRC = \uparrow LCA$$

The correlation between economic benefits and the aggregated social capital score indicates a strong positive correlation of .680* (see Table 5.17). The SC is an outcome or contribution and aggregated factor of bonding, bridging capital and local community association. This is statistically significant at the level of 0.01 (2-tailed) and confidence interval of 99%. This positive relationship means that as the economic benefits increase, the SC will also increase comparatively in rural communities.

Table 5.17: Correlation

	Pearson correlation		Sig. (2-tailed)	N
	EB	SC		
Economic benefits (EB)	1	.680*		
Social capital (SC)		1		

Table 5.18 reports the results of the multiple regression model analysis and the impact of social capital characteristics and demographic characteristics on the dependent variable – perceived benefits.

Table 5.18: Regression model summary – Perceived benefits (Hi)

Model	R	R square	F-value	Beta	t	Sig.
(Constant)	.705	.497	20.639		2.241	.026
Social capital characteristics: H1i						
a) Bonding capital				.429	4.870	.000**
b) Bridging capital				.273	3.065	.002*
c) LCA				.082	1.318	.189
Demographic characteristics: H2i						
1) Age categories				.090	1.404	.162
2) Gender				.040	.743	.458
3) Current Income				.100	1.402	.162
4) Education level				-.106	-1.698	.091
5) Employment status				.095	1.212	.227
6) Location/regions				.080	1.509	.133

These benefits summarised the relationship between the aggregation of perceived benefits (contribution of economic benefits: i.e. income, employment, and education; and social capital-dependent variable), social capital characteristics (bonding capital, bridging capital and local community association) and demographic or RIC users' characteristics (age, gender, income, education level, employment and location). It shows significant results of $R^2 = .497$; this is a high correlation and indicates that these variables were interrelated. Hence, bonding and bridging capital indicated a very strong association with perceived benefits. This indicates that all of the assumptions of multiple regression analysis have been met (Hair et al., 2010, Tabachnick and Fidell, 2012). The assumptions of linearity, normally distributed errors, and uncorrelated errors were checked and met. The other assumptions are checked in the partial regression plots (residual scatter plot), which indicates that the errors were normally distributed, the variances of the residuals were constant, and the residual was relatively uncorrelated with the linear combination of predictors (see APPENDIX 16, Table 2).

On the other hand, the results of the multiple regression analysis with perceived benefits as the dependent variable provide evidence that local rural communities had a positive association with bonding and bridging capital characteristics which are

predictors of economic benefits obtained through the RIC program, however there was a negative association with LCA and demographic characteristics.

The adjusted r square value (.497) indicated that the independent variables accounted for about 50 percent of the variance in the dependent variable (perceived benefits). Each of the hypotheses which were empirically tested in the above multiple regression model are now briefly discussed.

Hypothesis 1a (i) – *Perceptions of bonding capital is positively determined perceived benefits*

The beta value for the bonding capital is significant at the five percent level with the value of (.429). This provides strong support for hypothesis H1a (i) that there is a positive association between bonding capital and perceived benefits.

Hypothesis 1b (i) – *Perceptions of bridging capital is positively determined perceived benefits*

The beta value for the bridging capital is significant at the five percent level with the value of (.273). This provides some support for hypothesis H1b (i) that there is a positive association between bridging capital and perceived benefits.

Hypothesis 1c (i) – *Perceptions of local community association is positively determined perceived benefits*

There is a negative association between LCA and perceived benefits and it is not significant and thus H1c (i) is not supported at 5% level of significance.

Hypothesis 2i – *There are differences in perceived benefits across RIC users' characteristics or demographics*

There are no differences between demographic characteristic of RIC users and perceived benefits of RIC. This is not supported at the 5% level of significance.

As a summary of the results in relation to RIC users' perceptions of perceived benefits of the RICs, the findings from the online survey using correlation analysis and multiple regression analysis suggests that there was a positive correlation between EB and each components of SC, as well as between aggregated SC. Thus, to provide further support the validity of the key findings regarding the RIC users'

perception of the perceived benefits (EB and SC), Table 5.19 reports the summary of RIC users' overall perceptions of perceived benefits. These results are interpreted based on the RIC users' comments pertaining to a set of open-ended questions in the online survey where they were asked to rate the statements in terms of what the RIC users hoped to gain or benefit most from using the RIC.

Table 5.19: Summary of RIC users' perceptions on RIC perceived benefits

Themes:	Total responses (n=202)	% (n=202)
ICT knowledge & skill (human capital)	122	60
RIC services & facilities	44	22
Economic benefits (employment, income-business)	24	12
Social capital	20	10
RIC sustainability	7	4
Bridge digital divide	3	1

In the online survey, the RIC users were provided with the opportunity to provide some open-ended comments about a number of aspects of the RIC program. The following provides a summary of the key findings in relation to the qualitative data collected in the online survey. In the open-ended comments provided in the online survey, RIC users gave accounts of how RIC usage promoted their self-confidence and how they regarded ICT knowledge and skills as a valuable asset in their life. This statement about the importance of ICT knowledge and skills (human capital) had the highest number of responses from the users (60%). A number of users indicated that ICT was a means for them to stay abreast of the changing world and gain economic benefits (12%) and to be an informed and knowledgeable person, enhance their social awareness and networking (10%). These results show how the RIC users perceived the benefits of the RIC on various facets of their lives. But only one percent of respondent RIC users perceived the RIC as a benefit for bridging the digital divide in rural communities. It may be that individual RIC users were not really concerned about the digital divide as much as the government was concerned about the implication of the digital divide for rural communities as a whole. It may also be that individual RIC users did not understand what is meant by the digital divide. These findings are also in contrast to the survey findings on the importance and significance of social capital. That is, when directly asked, the respondents were more focussed on the human capital and perhaps are not noticing the social capital effects or do not consider them obviously important.

Some comments (from the online survey) from the open-ended question about RIC users' perceptions of the RIC program provide support for the proposition that the perceived benefits of the RIC contribute to QoRL. These comments are provided below. As evidenced in the comments, users also saw the impact of RIC usage as improving rural quality of life and their preparation for further higher education studies or to be more employable, as ICT skills are an essential requirement to be competitive in the digital economy:

I can see that by using RIC I can further study and get a job... with the ICT skills learnt at RIC...these can improve my quality of life.

Some RIC users also viewed a benefit of RIC as improving their social capital by participating on-site at the RIC physically and virtually. The users could increase their contacts and feel closer to people even though they live, in some instances, a long distance apart. They can also search for old friends who have moved to other parts of Malaysia and beyond. This also shows that the RIC can lead users to enjoy a better lifestyle as their use of RIC Web 2.0 applications had enhanced their communication networking:

... enhanced communication networking with family and friends, as well as make new friends and feel closer to those who are living far way... another stated that they be able to get in touch with old friends.

Therefore, another impact of RIC was services satisfaction. This is a formative variable as it is tested on the basis of the aggregation of different types of services offered at RICs to provide an overall service satisfaction. The next section explains the results regarding RIC users' perceptions of their overall satisfaction with services provided by the RICs.

5.4 Overall Perceptions of Services & Satisfaction

In terms of the most frequently used RIC services, Figure 5.5 illustrates how the RIC users rated these ICT-based services in terms of level of satisfaction. The ICT-based service that had the highest level of satisfaction among the RIC users that responded to the survey was training and education, which is 81 percent of people were 'satisfied'. The other ICT-based services also showed a high level of satisfaction among RIC users with a range of 68 to 77 percent satisfaction. This included computing, information, communication, basic office applications and info-

mediation. Overall, this shows that the RIC users were satisfied with all of the ICT-based services offered at RICs.

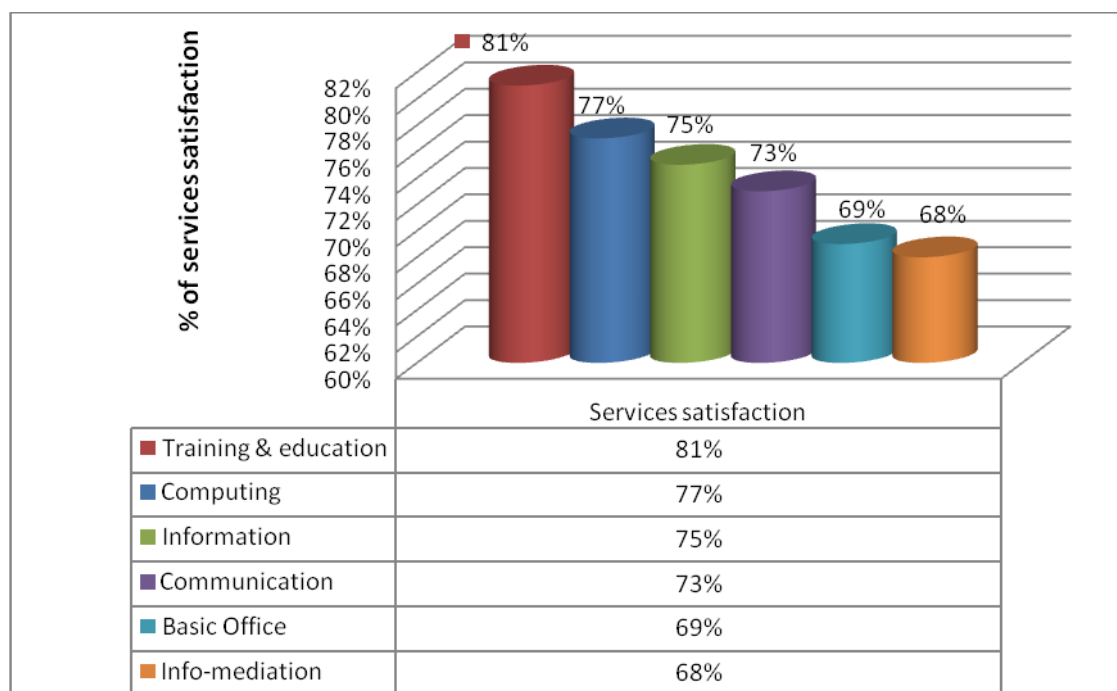


Figure 5.5: RIC users' services satisfaction

Similarly, the interviews with RIC managers identified their perceptions of RIC users' usage and satisfaction with ICT-based services provided by the RIC program. These are highlighted in the following direct quotes from the interviews below and in Table 5.20.

Table 5.20: Summary of main issues identified in relation to services and satisfaction

Main issues	RIC managers
Basic services and facilities – users satisfied – fulfil demand and need	Eastern 4 Manager
Info-mediation service – elderly & youth	Northern 1 Manager
Internet service – social networking	Eastern 1 Manager
Basic office service – season	Eastern 2 Manager
High demand for services	Eastern 3 Manager
Computer training – cheapest fee – fully utilised	Northern 2 Manager
Add services – demand	Central 1 Manager

The RIC managers indicated that the RIC users were satisfied with the basic services and they had fulfilled the service demand and need. Furthermore, the RIC managers explained in the interviews that RIC users were satisfied with the services because

these were useful to them. Users were charged minimum costs compared to the other places and the RIC users had fully utilised the Internet positively:

...The users said they are satisfied because the services are useful as per requested and demand...they had fully utilised internet positively...therefore, to be sustained, users need must be fulfil. [Northern 2 Manager]

The analysis of the interviews indicates that most of the RIC users were satisfied with the services, and they visited the RIC even though they had finished the training courses because they wanted to use the services. The services that had been offered at each RIC were based on RIC users' need and demand. Different RICs had slightly different services which were offered based on the specific needs of RIC users at each RIC. For example, at Eastern 4, they offered a photo service (passport photos). Other RICs did not offer this kind of service. This was based on the RIC users' demand and need in the Eastern 4 region.

All eleven RIC managers interviewed noted that the RIC users made use of the ICT-based services and they were satisfied with the basic ICT-based services, especially the ICT training. This study also analysed the perceptions on services satisfaction using multiple regression analysis with social capital and demographic characteristics. Table 5.21 summarises the result of a multiple regression analysis with the dependent variable – services satisfaction.

Table 5.21: Regression model summary – Services satisfaction (Hii)

Model	R	R square	F-value	Beta	t	Sig.
(Constant)	.584	.341	10.797		5.062	.000
Social capital characteristics: H1ii						
a) Bonding capital				.526	5.221	.000**
b) Bridging capital				.039	.383	.702
c) LCA				.061	.847	.398
Demographic characteristics: H2ii						
1) Age categories				.097	1.327	.186
2) Gender				.017	.277	.782
3) Current income				-.004	-.054	.957
4) Education level				-.115	-1.607	.110
5) Employment status				-.008	-.092	.926
6) Location/regions				-.006	-.105	.916

The results of the multiple regression analysis with bonding capital as an independent variable accounts for 34% of the variance in the dependent variable overall satisfaction with RIC services. All of the other social capital characteristics

and demographic characteristics did not significantly impact on overall services satisfaction. This indicates that only bonding capital is statistically significant and is a strong predictor of RIC users' overall services satisfaction. For RIC users, the higher the bonding capital level, the higher their overall satisfaction with the services provided or offered by RICs.

The assumptions of linearity, normally distributed errors, and uncorrelated errors were checked and met (Hair et al., 2010, Tabachnick and Fidell, 2012). The other assumptions were checked in the partial regression plots (residual scatter plot), which indicates that the errors are normally distributed, the variances of the residuals are constant, and the residual is relatively uncorrelated with the linear combination of predictors (see APPENDIX 16, Table 3).

The results of the multiple regression analysis with overall services satisfaction as the dependent variable are now discussed in relation to the hypotheses that were tested in this multiple regression model.

Hypothesis 1(a) ii – *Perceptions of bonding capital is positively determined services satisfaction*

The beta value for the bonding capital is significant at the five percent level with the value of (.526). This provides strong support for hypothesis H2 (a) ii that there is a positive association between bonding capital and services satisfaction and which is highly significant at 0.01 level.

Hypothesis 1(b) ii – *Perceptions of bridging capital is positively determined services satisfaction*

There is a negative association between bridging capital and services satisfaction. This is not significant and thus H2 (b) ii is not supported at 5% level of significance.

Hypothesis 1(c) ii – *Perceptions of local community association is positively determined services satisfaction*

There is a negative association between LCA and services satisfaction. Thus, it is not supported at 5% level of significance.

Hypothesis 2ii – *There are differences in services satisfaction across RIC users' characteristics or demographics*

There are no differences between demographic characteristic of RIC users and services satisfaction of RIC. Thus, it is not supported at 5% level of significance.

5.4.1 Perceptions of Satisfaction with Performance of the RIC Program

Besides assessing the RIC ICT-based services satisfaction, this study also examined the overall satisfaction with the performance of the RIC program. Satisfaction with the performance of the RIC program takes into consideration how the RIC users rated the performance of the RICs, and how the program managers evaluated the RIC program.

Table 5.22 shows the level of overall satisfaction of RIC users with the RIC program. This table examines how the RIC users rated the performance of the RIC program based on their level of satisfaction with the RIC program. Furthermore, Table 5.22 also shows that most of the RIC users rated the RIC program at the highest level because they were highly satisfied with the performance of the RIC program. Indeed, none of them rated the RIC program with a low level of satisfaction, which would indicate bad performance of the RIC program.

Table 5.22: Overall satisfaction with the RIC program

Level of satisfaction	Users' satisfaction (%)
High level	92.5
Average level	7.5
Low level	Nil

**Note: Indicators of the rating scale*

1 to 4 - low

5 to 9 – average

10 to 13 – high

As also discussed in the interviews with the RIC managers, RIC users were satisfied with the performance of the RIC program and the managers believed that RIC users gained lots of benefits. One participant explained that the RIC was “a must” for them because they referred to the RIC as a clinic. Even though they had computers at home, they came to the RIC for the RIC manager’s assistance:

...what if the RIC is closed...they said, it will be difficult for them because they need to go online and do all their works...if looking at other places are very far...these are their need...RIC is just like clinic; when they are sick, they need to go to clinic; and here, if they want to type a letter, they need to

go to RIC...even though most of them already got computers at home; but they still come to RIC for reference or assistant...therefore, the RIC is a must or necessary especially for basic ones. [Eastern 3 Manager]

Another RIC manager also commented on RIC satisfaction and benefits. The RIC manager added that there were many RIC benefits that satisfied RIC users such as ICT knowledge and skills, employment opportunities and thus increased quality of rural life:

Benefits gain by users – so many things; in terms of ICT, from zero they got the basic, from unemployed becomes employed...that is why we need RIC...it can also increase quality of life of the local community...for example the women; they can save their time by learning e-banking because women always do not have enough time, there is a change in life because what they want, we give/provide to them, in terms of the knowledge that we had. [Eastern 4 Manager]

Indirectly, the RIC could also bring benefits to the other segments of the community who are not the RIC users:

...the RIC is at level 2; means there is a sense of ownership...they have the club and they fulfil the ministry's aspiration... but no measurement how successful... number of users and usage increased... RIC is relevant and should continue, thus also benefits other communities... if it is at level 1, means at the very basic level. [WG Officer]

Overall, the high level of RIC user satisfaction with the performance of RICs shows that local rural communities were highly satisfied. As a result of the overall impact of the RIC program, the perceived benefits (PB) and services satisfaction (SS) are the dependent variables for this study. These dependent variables are presumed as the ultimate outcome.

5.5 Conclusions

The findings from this chapter show a positive attitude by RIC users towards using computers. People who use the RIC are happy with their level of computer skills and non-users or ex-users are not prevented from doing so by lack of skills. Despite that, those who found jobs through RICs perceived that the employment opportunities lead to increase their income, knowledge and skills. Different age groups of people had different perceptions on employment opportunities; due to their need, their level of education and their age factor. Thus, the youth group is the majority users that use RIC regularly to seek for jobs. For instance, business opportunities at RICs built upon social entrepreneur club (SEC). This SEC member perceived the benefit of

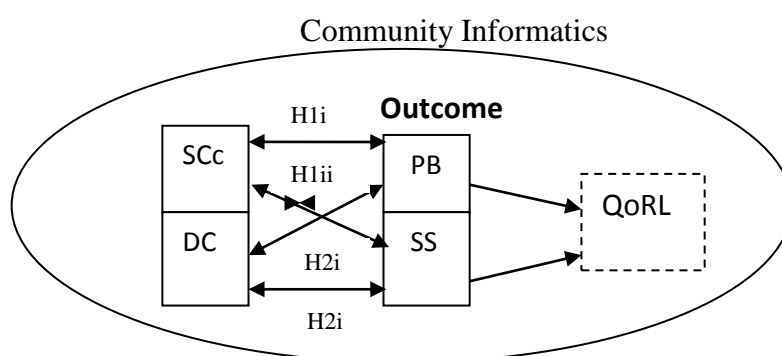
SEC more on social relationships within members and other local communities. Even though some members perceived SEC brings more benefits to them, however there are some members who did not see the benefits.

As explained, the people perceived social capital built around the social contacts, social and business relationships exist at RICs and SECs. At SECs, the people not only gained the benefits of business opportunities but the social benefits as well. The people also perceived that economic benefits also contribute to RIC benefit. The findings suggest that, overall; RIC users believed that they had gained economic benefits as well as strong bonding, bridging capital and local community association. Therefore, this would lead to an improvement in quality of rural life for the individual communities. In addition, the people also perceived that they are satisfied with the RIC services and overall RIC performance.

RIC Model 2

RIC model 2

Figure 5.6) representing the hypothesised relationships which were tested as part of the program logic model for RICs and summarises the key variables that resulted from this chapter (in relation to community informatics and social capital theories- SC characteristics, demographic, PB and SS). The next chapter discusses the main findings from Chapter 4 and this chapter in relation to existing theory and knowledge, as illustrated in the flow of the RIC program logic framework.



**Note: SCc – Social Capital characteristics
DC – Demographic characteristics
PB - Perceived benefits
SS – Services satisfaction*

Figure 5.6: RIC model 2

CHAPTER 6: DISCUSSION OF DATA ANALYSIS FINDINGS

6.0 Introduction

This chapter provides an insight into the operation of the Rural Internet Centre model for rural Malaysia. The first section discusses the key findings from Chapter 4, which investigated the RIC program goal, inputs and outputs. Thus, the program goal, inputs and outputs discussed in this chapter focus on the overall perceptions, as well as the input and output problems and improvements. The second section presents the key findings in Chapter 5 and discusses the overall perception and improvements. These assessments of the main findings from chapters 4 and 5 are in relation to the RIC program logic evaluation framework developed for this study and relevant literature. The last section of this chapter covers the overall RIC benefits and features in relation to what could be improved based on the RIC program logic model. In the proposed RIC program logic model (Figure 6.1), the key findings of the stakeholders' perceptions' of the RIC program are displayed. Detailed discussions of these individual RIC program logic variables are presented as follows.

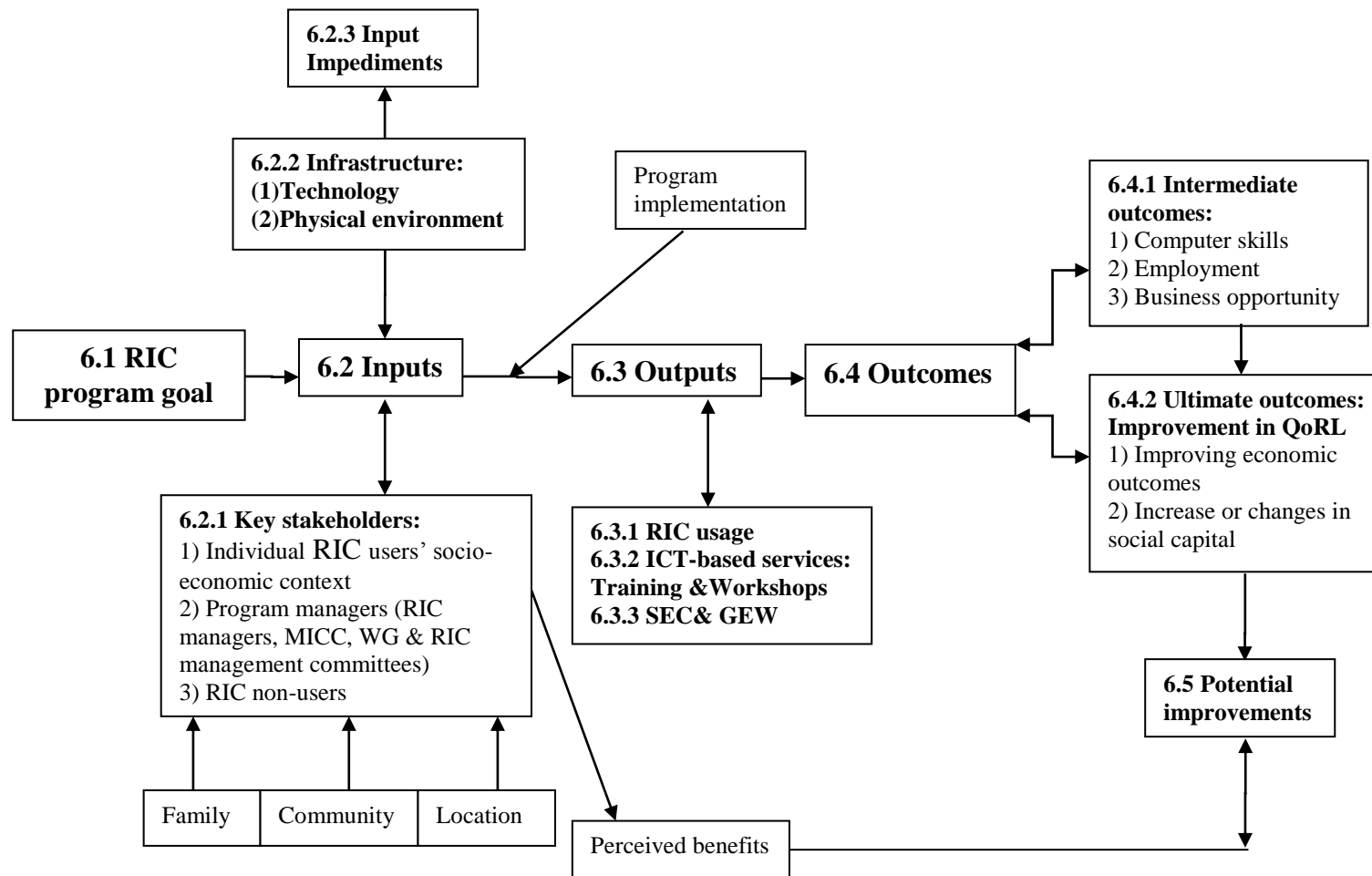


Figure 6.1: RIC program logic conceptual model

6.1 RIC program goal

As explained in Chapter 4 (Section 4.2), the program director from the Ministry of Information, Communication and Culture stated that the RIC program goal is in line with the Tenth Malaysian Plan to reduce the digital gap between urban and rural Malaysia. However, recently the RIC program goal has emphasised human capacity building and developing the Social Entrepreneurs Club for the RIC communities. Despite that, the Warisan Global officer supported the MICC director's opinion on bridging digital divide and emphasised capacity building. In relation to the development of human capital at RICs, WG focused more on the social entrepreneurship program for the local rural communities. This was to ensure that the rural communities had the sense of ownership towards the RIC, by utilising the SEC and also fulfilling the MICC's aspirations for the RIC program.

Table 6.1: Summary on RIC program logic data triangulation

RIC program logic components/variables	Similarities	Data sources	Differences	Data sources
RIC Program goals	The RIC managers, MICC & WG were in agreement with the goal.	*IPM	One of the representative management committee members	*IPM

*Note: *IPM-Interview with program managers*

Similarly, the RIC managers were in agreement regarding the RIC program goal on bridging digital divide, however the representative RIC management committee members were not in agreement (see Table 6.1). This suggests some slight disconnect at the committee level. RIC and program managers all seem to be in tune with the goal. Thus, these stakeholders have focussed on the target group of RIC users (youth, women, elderly and entrepreneurs) and building their human capacity, in particular, their ICT knowledge and skills.

6.2 Perceptions of inputs into RIC program

The key findings in relation to the perceptions of RIC users, RIC managers, program director, WG officer, RIC management committee members and RIC non-users of the inputs into the RIC program are now discussed. This analysis will determine where there may be some deficiencies in the RIC program, as summarised in Table 6.2

Table 6.2: Summary on RIC program logic data triangulation

RIC program logic components/variables	Similarities	Data sources	Differences	Data sources
RIC Inputs: (1)Key stakeholders' relationships	1) The relationships were good and working well.	*IPM & O	1) Some RICs have inactive RIC management committees at their respective locations.	*IRM
(2)RIC users' characteristics	2) All the multi-stakeholders perceived majority RIC users were the youth and female users. Those users highest level of education was from secondary school. They earned less income and majority are full-time students.	*IPM, OS & O		
(3)Technology	3) Mixed views from program managers on limited and old PCs & not functioning – old technology, share computers and usage time limit, 'slow' Internet speed and reliability.	*IPM& O	3) Most of the RIC users were satisfied with RIC Internet speed and reliability.	*OS
(4)Physical environment	4) The RIC managers and program managers noted RIC small space but strategically located. Besides, some RIC managers identified there is a toilet facility within the building.	*IPM& O		

Note: *IRM-Interview with RIC managers

*O-Observation

*OS- Online survey (users)

*IPM-Interview with program managers

In summary, the inputs relates to the impediments of RIC operations. There were some issues and problems in relation to the RIC inputs; however this does not stop the RIC program from being effective. The program may be effective if the operations could be improved. To some extent, the users were still happy with the overall RIC program.

6.2.1 RIC key stakeholder input (people)

The key stakeholders in this study are: (1) individual RIC users, (2) RIC managers, (3) MICC program director, (4) WG officer, (5) RIC management committee members, and (6) RIC non-users. Groups 2 to 5 are categorised as program managers.

RIC users' characteristics

One of the reasons for the majority of RIC users being female may be that women are predisposed to nurturing so they learn and in turn teach their skills to their children. Similar results have been established in other studies conducted in other countries. The International Telecommunication Union (2011b) reported Internet user surveys in New Zealand and Thailand showing a higher percentage of women than men using the Internet, but the difference was minor. A study of telecentre usage in Jamaica found that more women than men used the telecentre and attended training sessions (Bailey, 2009). A previous study on another telecentre program in Malaysia (Ibrahim and Ainin, 2009) found similar results in relation to gender representation where there were more female users than males.

The program appears to be reaching the target groups of the youth and women but not so much to the elderly (see Section 4.3.3). This may mean there is an increasing digital divide between these target groups. We note that the elderly were using the Internet at the RIC, which goes some way to meeting the government's aim to bridge the digital divide in specific target groups (this research sample was compared with the proportion of elderly in these regions. There is a slightly similar proportion that shows a low percentage of elderly participate in RIC and the nature of the proportion of elderly population is much lower than the youth – see Section 3.2 & Section 4.3.3). This finding is consistent with a recent study in the Northern States on empowering rural communities via the telecentres (Abdul Razak, 2009), which also found that the majority of the users of telecentres were the youth. These findings are also supported by Harris (2001) who noted that in the IC-EUC approach, the influence of individual users' characteristics promoted the success of telecentres. The findings show that there were differences in age groups and RIC usage or purposes (see Chapter 4).

The RIC managers are the main source of human capital for RIC development and sustainability. Hence, the success or effectiveness of the RIC program depends on RIC managers' capability and efficiency. From the site visit observation made at eleven RICs, most of the RIC managers were female and two of them were male. This suggests that this may be one of the reasons why female users were the majority of RIC users. There were also a few male assistant managers.

The RIC management committee volunteers were also an important means to convince the RIC users or rural communities to come and use RIC (see Chapter 4, Section 4.3.1(4)). The RIC management committee members' roles and relationships with the other key stakeholders were important in assisting RIC managers. One of the roles was to influence the rural local community to learn and improve their ICT knowledge and skills (see Chapter 4). In relation to the evaluation of the program, the local support systems are generally working well and therefore this is not an impediment to the program success.

As explained, RIC non-users were the local community members who were aware of the RIC but did not use it. The reasons for not using the RICs were: (1) they already had the basic ICT knowledge and skills, (2) they did not have transportation to commute, and (3) the operating hours did not suit them since most of them were full-time employees (data from interviews with the RIC non-users). This shows that from the sample of RIC non-users, it was not a lack of knowledge of the service that limits their participation. Even though they were no longer the users, some of them still came to the RIC to become volunteers and use other services at RICs. This was a good opportunity to encourage the non-users to use RIC in the future. They are a potential target group who may indicate why there is a problem in attracting people. They might be better discussed as a possible indicator of the failure to attract some of the necessary 'inputs'.

6.2.2 RIC infrastructure

Regarding facilities and infrastructure, there is no need to change or renew and add more useful and effective ones, as the system is working with the basic infrastructure. However, there could be some improvements to facilities and computers that would help the operation but this may not increase participation. To

evaluate whether the users' participation increase or not, this is beyond this study scope and this suggests for future study. Therefore, support from different aspects is crucial in this situation. The support can be in terms of formal support, such as ICT support, and informal support such as intergenerational integration, with young users helping older users. In rural areas, the access to infrastructure and services is limited and this is an area for improvement (ITU, 2011a).

Technology and physical environment inputs

Despite the noticeable limitations of technology and physical environment inputs into the RIC program this has not discouraged its use in rural communities because the program is still fulfilling some unmet needs (see Section 4.3.2(1)). A strategic location for RIC centres is an advantage for the local community to learn about ICT at their own place or areas (see Chapter 4, Section 4.3.2(2)). Hence, the relevant and appropriate services offered at the RICs would also attract the rural community to visit the RIC and use the services provided. In most developing countries and in rural areas, commercially operated public facilities play a major role in facilitating Internet access. In the case of community facilities in Africa, location, size of the space, and other aspects of the physical environment are the concern of some studies (Etta and Parvyn-Wamahiu, 2003); (ITU, 2011b). Similarly, Harris (2007) focused on the physical environment of telecentres in Malaysia, including the lack of toilet availability for users, unreliable power, flooding and insufficient space. The present study found similar results to RICs in relation to limited toilet availability for some RIC users and space problems (see Section 4.3.2).

As explained in Chapter 4 (Section 4.3.2), the limited time of operational hours appeared to be a disadvantage to RIC sustainability and potentially excluding working male participation in RIC program. This also seems to be inhibiting the involvement of male RIC users and more specifically entrepreneurs who are part of the new direction in the program goals of the RIC. With the extended operational hours, that particular RIC could generate more income and this could lead to sustainability.

6.2.3 RIC input impediments

(1) Impediments to interactions between key stakeholders

The interaction between managers and the management committees seems not be working well as some of the RICs do not have their own management committees and they are less committed. In contrast, the other key stakeholders had their working relationships working well. This suggests this is due to the managers' role and indicative of how they work with the committees and impediments to the users' participation in the program. For instance, if there is less commitment from the committee and the working relationship is not working well, this could lead to less users' involvement at RIC, as the committee member is the influenced person to attract the users.

All of the RIC managers should be capable of the operational functions (or aspects) of running an RIC. Some of the RIC managers were creative and willing to take their own initiative to develop new ICT programs and get the funding for individual RICs, but there were also some RIC managers who did not have that kind of initiative. Despite that, the relationship between the managers are good, but there is a problem with the relationship between managers and 'amateurs' (committee members) which are apparently being managed in some communities. Therefore, some possible responses to this relationship are: (1) committee training and (2) more engagement. The reason for this could be that different RIC managers have different capabilities on how to operate RICs successfully.

Therefore, the main challenges of sustaining telecentres (specifically an RIC) were: 1) different stakeholders' interests, and 2) resource constraints (Bailey and Ojelanki, 2009). In summary, sustainable telecentres such as RICs require resources for providing ongoing support; both for the users and to ensure ongoing operation of the infrastructure (Gaved and Anderson, 2006). This accommodates the different RIC stakeholders' interests and the resource constraints as challenges to sustain RICs.

(2) Impediments of technology and physical environment at RICs

As discussed, the RICs have to manage with a lack of computers, and outdated hardware and equipment. Managers also identified that there was a need to add more computers and upgrade the hardware, software and other ICT tools. The RIC spaces tended to be small and uncomfortable for the RIC users (evidenced in Chapter 4); however there are still users participate in the program. This shows the need for the RIC program, the physical space is not really the impediment to the success of the program. For instance, the RICs that were bigger in terms of space tended to have similar number of users, usage, and facilities available, thus this explains that it does not show any difference in the number of users, usage and facilities, if the space is small. There was little funding available for the physical resources however, some RICs received funding from local authorities for toilets inside the RIC building (as evidenced in Chapter 4).

Most RICs were lacking in terms of the funding for operational expenses associated with RIC and more importantly capital investment in new ICT infrastructure to underpin the RIC program. As discussed earlier, they needed to seek more financial resources. Therefore, the role of the RIC management committee becomes very important to assist RIC managers to gain more funding for operational expenses and capital investment in the RIC program. Besides that, the other ways of raising money is may be due to privatisation for example commercial services, business one-stop centres and etc. However there are problems with the injection of funds for RICs due to this being a government program, it should not make any profit and become a business centre. With sufficient funds, the RIC will have a high potential to be sustained.

6.3 Perceptions of activities and program (outputs)

The outputs of the RIC program are the activities provided at the centres. These activities were perceived positively by RIC end-users and program managers. Studies in developing countries on information technology access, report that little is known about the usage and users of ICT services and technologies, with limited data available on aspects of ICT usage by individuals (ITU, 2011b). Detailed information on the demographic factors such as gender, age, level of education, and income

levels of Internet users, is important for governments seeking to adapt e-government applications and services (ITU, 2011a). These findings are consistent with the RIC study findings on ICT-based services, RIC usage purposes, and measuring similar demographic factors. Table 6.3 summarised the RIC outputs to analyse the similarities and differences based on program logic data triangulation.

Table 6.3: Summary on RIC program logic data triangulation

RIC program logic components/variables	Similarities	Data sources	Differences	Data sources
RIC Outputs: (1) Usage	1) Their purpose of usage was more on communication functions. The usage goes beyond the RIC users, thus revealed the RIC users' family or relatives.	*IPM, OS & O		
(2) ICT-based services: Training and workshops	2) Basic ICT training improved RIC users ICT knowledge & skills. As for the workshops, it fulfilled the target group users' need - multi-stakeholders' perception. Basic computer training was the most frequently ICT-based service used at RICs. The RIC managers perceived that communication pathways at RIC were poor as some of the RIC users were not committed to use the ICT communication pathways effectively.	*IPM, OS & O *IRM		
(3) SEC and GEW	3) RIC users and RIC managers agreed that only a third of the RIC users became the SEC members even though they were aware of the SEC.	*OS & IRM	3) Forty-five percent of the RIC managers perceived that SEC brings benefits to the community. However, fifty-five percent of the RIC managers noted that SEC was ineffective for the community.	*IRM

Note: *IRM-Interview with RIC managers
*O-Observation

*OS- Online survey (users)
*IPM-Interview with program managers

As explained earlier in previous chapter, SEC is seen as a problem to some RIC communities because the people do not see the benefits of having SEC and this leads

to less participation from the communities or members (see Section 6.3.3 for further discussion on SEC).

6.3.1 RIC Usage

The RIC site observation data shows steady stream of RIC users who attended training programs throughout the day. Even though there was a limited number of computers available at the RIC, if the RIC managers can manage the flow of people and extend operating hours this would mitigate the problem of having few computers with more RIC users (Section 4.4.2). This would eventually extend their local or existing ties and may lead to the development of social capital (Gaved and Anderson, 2006). Thus, the RIC operational hours and training content should suit the target users' demand and availability. Hence, this can encourage the RIC users to visit the RIC and feel that they are part of the RIC and have ownership.

Participation in the RIC snowballs through families and the community. The family influenced could be siblings, parents, grandparents, relatives, and husband or wife. The influence can be direct or indirect: (1) directly, if the users bring along the family member to learn ICT; and (2) indirectly, such as if the parents sent a child (user) to the RIC and encouraged them to learn (see Chapter 4, Section 4.4.1). At the community level in regional locations, the neighbours, friends and others are the people who get connected to the RIC and regional RICs. Each different level of people perceived the impact of the RIC differently (Figure 6.1). This is discussed thoroughly in the later sections of this chapter.

From the perspectives of RIC usage described above, the next discussion is on another RIC output which is the ICT-based services. The next section begins with an overview of basic RIC services and how the training and workshops were conducted in the RIC, how they were perceived by key stakeholders and the benefits to the RIC users.

6.3.2 RIC ICT-based services

The basic RIC services were generally the same across all 42 RICs. However, there were slightly different additional services offered at some of the RICs, such as some RICs in the Northern and Eastern regions. The services were offered due to the

request or need of the communities and also based on how the individual RIC managers perceived the services needed for their RIC. Access to these services was charged at a very minimal cost to support the RIC operational costs. Most of the rural local communities were satisfied with the services and found that the services were relevant to their needs and their daily life (as evidenced in Chapter 4). From this study the RICs have a strong educational focus, as expected given the age of many of the users. Research in some Latin American countries suggests that around 50 percent of people using the Internet were using it for educational or learning purposes or activities (2009-2010). This was due to the fact that the majority of users in Latin America were young and were students (ITU, 2011b) as is the case here.

The elderly most likely used the services for basic skills and daily needs information, and required RIC managers to assist and guide them. These services met the target groups' needs and matched their purposes (see Chapter 4). As a result, this was an achievement of the ICT-based services offered and available to RIC users. RICs do provide services to users, who are encouraged to use computers, which are provided in the centre. The services that the Information Centres (IC) provided are similar to the services that RICs provide, ranging from training in the use of technology to assistance in finding and accessing useful information. Similarly as according to Harris (2001), the focus of the Information Centres (IC) and End-User Computing (EUC) theories corresponds closely to the purpose of RICs, and they were intended to promote the use of computers (ICT-based services) within their target users.

RIC training and workshops

Basic ICT training and workshops provided by the RICs were useful for the RIC users or participants to learn and educate themselves about ICT. Even though the training was in basic ICT knowledge and skills, it can change the RIC users or communities from being computer illiterate to literate (data from interviews with RIC managers). From the activities, they will not only improve themselves, but also increase their contacts and relationships or networks. That can be in terms of social and business contacts or networks and online and/or offline contacts. This illustrates the RIC users' perceptions on activities. The activities were based on four target groups and each group had different purposes. Despite that, the overall perceptions

of RIC users matched all the target groups' needs and purposes. The majority of RIC users responded that they surfed for information on educational materials more than other information on the net. This supports the statement that the telecentres now must function not just as access points but also as social and economic agents for the rural communities (Abdul Razak, 2009).

At RICs, the managers and users believed the basic ICT training improved the RIC users' ICT knowledge and skills and the ICT information functions are better (see Section 4.4.2 & 5.1.1). The RICs offered basic training courses to the local communities and added value to that, which made the RIC users feel comfortable when using and learning computers at the centres. This indicates that basic training at RIC has worked (see Chapter 4). According to Dogara (2011), the provision of training will make users improve their knowledge and skill, thus the diffusion of ICT information will be better. Previous studies on telecentres have found that the users who did not have computer access needed to feel comfortable with using computers in general before using computer applications, such as the Internet for web browsing. Therefore, telecentres needed to offer basic training courses to equip the users with basic computer skills (UNESCAP, 2006).

For instance, training at RICs was perceived to build social capital and strengthen the relationships within the RIC community and improve their quality of rural life. In addition, RIC training emphasised improving human capacity building and due to its nature as informal training, the RIC training strengthened the bonding and bridging capital. The training at RICs tended to be informal, therefore this informal training between participants or users assisted in building both bridging and bonding capital (Foth, 2005). Gaved and Anderson (2006) noted that training can act as the basis for the development of social capital, developing social ties within the community (bonding capital), and benefiting communities in terms of ICT skills and wider benefits of quality of life factors such as improving employment opportunities, business prospects and education attainment. As mentioned, training is a key capacity-building aspect.

These different groups of RIC users attended training and workshops based on their specific needs which were common for some things and specific for other things. For the youth, the purpose of attending training and workshops was mainly for

educational purposes, which is different from the other target groups. Therefore, the results show that the RIC training programs matched the target groups' needs and purposes but the consideration was for more programs related to ICT. Similarly, for the target group purposes, not all were matched with the RIC training program's purposes. For example, the entrepreneurs' main purpose of attending training and workshops was for business activities, such as learning e-commerce application. However, some RICs implemented the ICT applications such as (e-services, e-procurement and e-commerce) and some entrepreneurs used these ICT applications for their business (see Chapter 4). For instance, it was found that the target group of elderly users preferred the training to be done separately from the other target groups which consisted of younger generations. Perhaps more of this would help increase the participation of this target group (elderly).

Therefore, the discussion here is about specific RIC training and workshop activities and the delivery of ICT services to rural communities. As a consequence, this program was also a service and related to ICT-based services. This study distinguishes training and workshop activities from ICT-based services due to training being a core activity of the RIC as a telecentre. Hence, it needs to be explained and discussed separately. The Social Entrepreneurs Club and Global Entrepreneur Week are also discussed as outputs in the next section.

6.3.3 RIC Social Entrepreneurs Club

The SEC (or KUSPID in Malay) follows the principles evident in economic gardening, which is an entrepreneurial approach to economic development that seeks to grow the local economy at the local level. The purpose of the clubs was to recruit the local community to become entrepreneurs and create jobs, wealth and also improve their quality of life.

The four target groups of RIC users perceived the SEC and Global Entrepreneur Week differently based on specific purposes. The purposes met some of the target groups' benefits. However, some elderly, women, entrepreneurs and middle-aged users did not see how the SEC benefits them. Their main purposes of becoming SEC members and participating in the SEC and in GEW events were mainly the same, which was to gain social relationships and made business benefits. This club and

event participation matched the target groups' needs; however, not all users or RICs were benefiting from them. This evidence was captured from one of the interviews with an RIC manager (see Chapter 4). Most of the RIC managers seemed uneasy towards the Social Entrepreneurs Club. This resulted in having some ineffective SEC activities in some RIC locations and hindered the RIC sustainability (as evidenced in Chapter 5).

There were also perceptions whereby the location of the RIC itself was not strategic so as to encourage the RIC users to become entrepreneurs or attract existing entrepreneurs to join the SEC because of the socio-economic activities in the area. For example, in some areas of rural Malaysia there were entrepreneurs, but for some areas the SEC was not applicable; there might be a problem for those RICs that did not have any entrepreneurs in an area that depends more on agriculture (see Chapter 4).

During the Global Entrepreneurship Week event, the local community also had a chance to promote their products or services to rural people. This was the opportunity for the rural community and especially the entrepreneurs to sell and promote their products. Their marketing will be wider and expanding; previously, the products may not have been known to the outside community, however, within the RIC and through events such as the GEW, people could get to know the products. They can also make contacts and friends as well as build or expand their business networking (see Chapter 5). While it seems that the concept of economic gardening can be employed to the RICs' SEC, there might be a slight difference in terms of how the community would perceive this approach. The culture in Malaysia, specifically in rural areas, may not be similar to the US. The rural community in Malaysia may find it quite difficult to accept the entrepreneurship and it perhaps would be something new to them. Therefore, training and workshop activities would be needed to facilitate the SEC community within RICs to adopt the economic gardening approach to entrepreneurship activities (as evidenced in Section 4.4.3). Most likely, the gardening programs are best suited to regions and states already exhibiting positive signs of entrepreneurship community building (Quello and Toff, 2006).

Therefore, the SEC might be attracting a reasonably high proportion of the working age range, which would mean that it is actually reasonably successful in attracting attention (see Section 4.4.3). Thus SEC might attract the right group but it is not really working.

6.4 Perceptions of outcomes in the RIC program

RIC outcomes as pertaining to this study are divided into two groups: intermediate and ultimate outcomes. Hence, the findings on these outcomes are discussed separately. The analysis on data triangulation of intermediate and ultimate outcomes as summarised in Table 6.4.

Table 6.4: Summary on RIC program logic data triangulation

RIC program logic components/variables	Similarities	Data sources	Differences	Data sources
RIC Intermediate Outcomes: (1)Computer skills	1) Tested using factor analysis from the survey on computer anxiety; the target groups were positive towards using the computers-supported with tested using mean differences vs. age groups-not significant. Most of the non- & ex-RIC users were positive about the use of computer and the Internet at RICs.	*OS	1) One of the participant RIC manager reported that the elderly and indigenous people were negative towards using the computers (a bit scared to try and learn).	*IRM
(2)Employment opportunities	2) Survey results show there was employment opportunity, thus, increased RIC users' income, knowledge and skills. Based on age categories, the youth were the most affected, while the middle-aged were less affected. The elderly were not affected – supported by program managers' perceptions.	*OS & IPM		
(3)Business opportunities	3) SEC as a business opportunity for RIC users and/or SEC members in entrepreneurship. Online survey results	*OS & IPM	3) RIC managers noted that not all RICs had an active SEC members or entrepreneurs-the local community could not	*IRM

	show perceived benefits of SEC membership for RIC users. The program managers noted that SEC brought benefits to entrepreneurs or members and also the RIC.		see the benefits. Some of RIC managers also noted that not all RICs can implement SEC because for some regions it was not applicable. The majority of RIC managers perceived that SEC was irrelevant and it actually detracted from them focusing on core activities of the RIC program.	
RIC Ultimate Outcomes: Quality of Rural Life:-	The RIC managers perceived in terms of improving RIC users' economic benefits and social capital.	*IRM	Thus, other program managers perceived QoRL in terms of the purpose and functions of SEC. SEC was an indicator which the RIC program manager believes can increase QoRL and a community connector. An additional factor for QoRL is entrepreneurs' characteristics.	*IPM
(1) Economic Benefits	1) Perceptions of increased income, education level and improved employment prospects.	*OS & IPM		
(2) Social capital	2) RIC users had built networks; social and business at RIC. Tested using One-Way ANOVA, the result is not significant between location and social capital. Thus supports program managers' perception on *BOC, *BRC & *LCA.	*OS & IPM		

Note: *IRM-Interview with RIC managers

*OS- Online survey (users)

*IPM-Interview with program managers

*Bonding capital (BOC), Bridging capital (BRC) & Local Community Association (LCA)

6.4.1 RIC intermediate outcomes

The intermediate outcomes of concern in this study are: (1) computer skills, (2) employment opportunities, and (3) business opportunities. Telecentres provide

communities with basic facilities and, as a result, it is expected that they will contribute to social and economic development such as increasing opportunities for employment (Rothenberg-Aalami and Pal, 2005, UNESCAP, 2006, Bailey, 2009) through building IT-based skills. Furthermore, IT-based skills training is closely linked to employment and entrepreneurship (Bailey, 2009).

(1) Computer skills at RICs

As explained in Section 5.1.1, the overall findings show a positive result on key stakeholders' perceptions towards computer skills. The findings show that managers and users perceived that the RIC program assisted RIC users in improving their computer skills. This suggests that the RIC program appears to be achieving some of its main objectives, at least as the users see that their computer skills have improved, which may also improve their digital skills and reduce the gap between the local communities.

The key stakeholders presumed that the users already had basic ICT knowledge and skills and were beginning to show more interest in ICT and develop their human capital. Therefore, they were moving to the next level of usage by using Web 2.0 applications such as Facebook, Twitter and creating their own webpage. For instance, RIC users probably did not need high-level ICT skills and knowledge to participate in social networking sites and social media. Other studies on telecentres in Scandinavia and North America support these findings on maturity levels of ICT and Internet usage (Murray et al., 2001, ITU, 2011b).

The results of the online survey were confirmed by the interviews with the RIC managers and RIC non-users which found that in terms of the computer usage competency level of these users, they had the basic knowledge and skills. In relation to computer anxiety, the findings from the survey differ from the interview data. In the survey, the target groups (youth, women, elderly and entrepreneurs) were positive towards using the computer (see Table 5.1 in Chapter 5). However in an interview with one of the RIC managers, it was reported that the elderly (and indigenous people) are somewhat scared of using the computer: *"But as for the elderly and aborigines, there are gaps. When we want to approach them, they are a bit scared"*. The mean differences between computer anxiety and age (target group categories) show that there were no significant differences between age categories

for computer anxiety. However, the RIC managers noted in the interviews that specific categories of RIC users experienced computer anxiety. These specific categories of RIC users (elderly and indigenous people) were under-represented in the survey responses so there may be differences which are not picked up in the survey responses.

(2) Employment opportunities at RICs

The overall findings regarding the employment opportunities created by the RIC for RIC users is now discussed in relation to the different perspectives of the relevant stakeholders in the RIC program. From the online survey and interviews it was established that the RIC users and program managers believed that RICs had brought more employment opportunities to the users such as recruitment in full-time and online jobs. This employment increased their income and skills. This suggests that the RICs program is achieving one of its objectives to improve individual users' quality of life by providing employment opportunities to them.

Different groups of RIC users had different perceptions about employment opportunities and whether jobs increased knowledge and skills as well as income. The results of this study show that employment opportunities were primarily the concern of the youth. However, this finding needs to be qualified in that many of the youth were also seeking to gain places in universities for undergraduate degrees. A similar trend is apparent in the results from this study in relation to income, knowledge and skills; for instance, the target groups had different perceptions in relation to how the RIC program had assisted them in increasing their knowledge and skills through training and workshops, to create new employment opportunities and potentially an increase in income. Similarly, the RIC managers emphasised the importance of RICs as a centre especially for the youth users to use the RIC for seeking jobs. This trend was also supported by the program managers who stressed that the SEC is a club that enables the members to find employment opportunities. Hence, this enhanced the SEC members' ability to build their human capital. From the interview findings, through basic training, RIC users received job opportunities at RICs (Section 4.4.2). A survey in Buwama and Nabweru Uganda, Africa, found that RIC users tended to be youth users seeking information on education and job

opportunities (Hudson, 2001). This RIC study found evidence in the survey and interviews that RIC youth were seeking similar information.

(3) Business opportunities at RICs

Business opportunities arose from the RIC program and in particular the SEC and GEW, suggesting that the SEC members became entrepreneurs and/or expanded their businesses. With the RIC the SEC members also communicate with customers virtually; using internet (see Section 2.3.3), these key findings link to the existing literature on telecentres and business opportunities. The SEC not only motivated the users to use the RIC, but also to seek more social and business contacts (see Section 5.1.3). This key finding agreed with previous studies on telecentres that were built around users' connection (Raul and Colle,(2002).

6.4.2 RIC ultimate outcomes

This study refers to the perceived benefits of the RIC program as economic benefits and social capital constructs. This study uses social capital and economic benefits as indicators of improvements in quality of rural life brought about by the RIC program.

Quality of Rural Life at RICs

In summary, the desired outcomes for the RIC programs are increases or changes in social capital and improving economic outcomes, such as increased job opportunities or employment, increased income and increased educational levels. This would eventually improve the rural communities' quality of life. It is significant that the role of ICT in improving rural communities' quality of life was more aligned towards social capital or benefits and this finding is consistent with evidence in Uganda (Kivunike et al., 2011). The study in Uganda also found that the QoRL indicators were highly relevant to the RIC outcomes (Cummins, (1995). This confirms anecdotal evidence that RIC economic benefits and social capital contributions were the source of QoRL that brought benefits to the RIC rural community.

(1) Economic benefit at RICs

Economic benefits are regarded as ultimate outcomes consisting of: (1) increased job opportunities or employment, (2) increased income, and (3) increased educational

level. EDA (2011) research on economic development states that the growth of an economy is measured in terms of jobs, income and education which lead to improve in quality of life. This claim is consistent with the key findings on perceptions of economic benefits in relation to the RICs. Hence, the training courses range from the most basic to the more advanced computer skills and often without charge (Murray et al., 2001). In relation to this, one of the RIC managers narrated that there were RIC users who came to the RIC as housewives, but once they had learned appropriate ICT knowledge and skills through training and workshops, they were able to start online businesses and improved their level of income. Therefore, the benefits for these RIC users consisted of two elements: (1) ICT literacy building their human capital and (2) improved/increased economic level. This suggests that the RIC program plays a key role in education and income level factors (see Section 4.3.3 (4)). Similarly, IIASA, 2008; Woodhouse, 2006; and Harris, 2007 supports that better education leads to higher income and promotes economic growth.

Technology or ICT can be used to increase human capital and close income gaps in regions (Van den Berg, 2001). In this study of the RIC program, the key findings indicate that improvements in computer and Internet usage should result in an increase in human capital, income and individual QoRL. From the equation in the Cobb-Douglas production function, it can be explained that changes in ICT, inputs and capital-labour outputs equal to changes in individual's quality of life. Therefore, the basic principles of the Cobb-Douglas production function underpin the key findings for this study that economic benefits are an outcome of RICs and should lead to changes in QoRL. The OECD (1998) states that the key variables of human capital are education and training, thus training at an RIC is the key ingredient and tool to improve RIC users' ICT knowledge and skills. Application of the ICT training program will lead to regional economic growth; hence it is assumed there is an association between economic growth and QoRL.

From the findings, the perceived benefits or outcomes of the RIC program were economic factors, improved quality of rural life and building of social capital within rural communities. Therefore, the finding of this study implies that even though there were perceived economic benefits from the RIC program, the social outcomes seemed to feature most strongly. According to the RIC managers' broader evaluation

of the RIC program, there were limited economic benefits to date. The RIC generation of significant economic benefits was a long-term goal beyond its time horizon. Indeed, this was not a main objective of the RIC program; the main objective was to bridge the digital divide.

(2) Building social capital through RICs

This study found that increases in social capital were perceived to be one of the ultimate outcomes of RIC. This supports the notion that people do not notice the social benefits but expect the program to deliver tangible economic benefits, that is users explicitly still focussed on the economic benefits (see Table 5.19, Section 5.3.1). When there is an increase in SC, the EB may also be affected as these factors are interrelated. For example, when the RIC community increases their networks (either social or business), they might also increase income as these people communicate through the RIC and develop business opportunities or relationships.

The findings of this research indicate that the services provided by the RIC program were perceived to strengthen the social capital of RIC users but that measures of social capital were also statistically correlated to positive attitudes about the program. The RIC was not only a telecentre for training and learning, but also for the purpose of enhancing and changing SC within the rural communities which it served (Chapter 2, Section 2.2; data from site observations). Findings from the survey of the users that responded indicate that users are using RIC more for the communication function rather than for information purposes, this link shows that the strength of social capital at RIC is strong and this goes to social rather than human capital. It could be argued that the program is reaching a lot of people (the young) who are using it for quite trivial purposes – possible building of social capital but not really contributing directly to human capital, except where learning is incidental to the entertainment.

As discussed earlier, bonding and bridging capital are the components of SC and these form a new pattern for an RIC community as bonding capital forms very close relationships and thick trust (people know each other very well; it is not a new contact/network). However, bridging capital also forms between people whose relationships are new or not close and who have thin trust (they hardly know each

other well; it is a new contact/network). At RIC, bridging capital is the users extended communities and the RIC is a community connector (Chapter 2, Sections 2.2 and Chapter 5 Section 5.2.1). Thus, when the community builds their SC, it will expand their network, increase their contact or relationship or friends, at the same time, share and exchange their information, knowledge and skills. Findings indicate that the most identified benefit is social relationships (see Section 5.1.3). This supports the notion of the importance of social capital. From the analysis on each social capital components, the more privileged have higher levels of social capital and they rate the RIC benefits higher. That is, the RIC may be working better for those with advantages.

From the findings discussed in previous chapter, it is seen that different people or communities have different views on local community association (one of the SC components). This component is related to whether or not communities at the RIC were active and participated in the activities and how the RIC management committee was involved at the RIC (some were active, some were not-see Chapter 4). Furthermore, interview findings also illustrates that the RIC built SC through community participation and this relates to local community participation (see Chapter 5, Section 5.2.1). For example; one of the RIC has its own Face Book and email group-MyPID (data from site observations). This makes it easier to reach the community and assists the community in terms of networking (web communication 2.0).

For instance, the Global Entrepreneurs Week event brought many entrepreneurs to the SEC and RICs. The entrepreneurs generated ideas and networks and also moved together with the local community. With the implementation of the SEC, and the perspective of the role that social capital plays in community informatics initiatives and community development, participation or involvement in community activities extends social networks and leads to greater social capital. Hence, this describes the concept of bonding and bridging capital, as well as local community association at RICs. Related to this research, the RIC was an example of bonding ties, within the RIC, or bridging ties that formed a bridge between communities. According to social network theory, “weak social ties are generally thought to bring new information (information that led to a new job), strong ties to bring social support” (Williams,

2005). This study agrees with this statement that the RIC built SC and also created employment opportunities for rural communities; in addition the RIC became a social support to the RIC users.

These findings provide further support for Pierce and Lovrich Jr. (2003) who argued that the RIC individuals and communities built ICT network infrastructure and encouraged the formation of SC. This finding also agrees with a previous study by Fountain (1997) who stated that SC affects RIC individual and communities' acceptance and ICT adoption. The findings of this study regarding social capital also agree with the findings by Quan-Haase and Wellman (2004) who argue that the effects of the Internet on social capital occur from three approaches: 1) the Internet transforms SC, 2) the Internet diminishes SC, and 3) the Internet supplements SC. The key findings of this study relate to the findings of Quan-Haase and Wellman regarding the effects of the Internet on SC. Based on these approaches, the RIC effect is that the Internet supplements SC because it is presumed as another means of communication, it strengthens existing social relationships (such as bonding capital), and engages participation and builds socialisation (social network). The outcome from interaction and participation in local and external networks is known as social capital. Despite that, these findings provide empirical evidence that social capital has a positive association with economic growth (Knack and Keefer, 1997, Woodhouse, 2006, Lutz, 2005, Fukuyama, 1999). These studies identified SC as an important variable for predicting improvements in QoRL. The SC at the RIC connects and changes SC (as a dependent variable) and also influences and enables SC (as an independent variable) (Chapter 2 Section 2.2 and Chapter 5, Section 5.2.1).

Based on the detailed discussion of the RIC intermediate and ultimate outcomes, this study now summarises the people, referring to RIC stakeholders' perceptions of the RIC inputs, outputs and outcomes. The RIC users gave accounts of their overall satisfaction and the potential improvements they gained from the RIC program.

6.5 Potential improvements of RIC program

6.5.1 People's perceptions of RIC input improvements

As discussed earlier, the RIC program inputs were lacking computers. However, this may suggest that there is a need for injection of sufficient funds, human capital and technology, then the RICs will have the opportunity to grow. For instance, it was a

ten year project forecasted to cease by 2010. Therefore, the following year was supposed to be focused on RIC sustainability; however, in general not all RICs could contribute to sustainability.

Government funding was usually short-term and withdrawn after 3 years (Gaved and Anderson, 2006). The government provided the initial hardware and software and other ICT infrastructure; this was seen as the platform for the RICs to establish in 2003 and operate as a telecentre with basic ICT facilities and services. The RIC managers had to think of a way to get additional funding in order to run their RIC efficiently. Some of the RIC managers sought the funding from the local champions, but some could not get any funding from them. However, all of the RIC managers received funding from the services which they charged to the users (at a very minimum charge). As these charges provided limited funding; little effort in program development could be done. This lack of regular ongoing funding hinders the development, success and sustainability of RICs. This lack of funding for RIC was clearly evident from the interviews conducted with the RIC managers and the MICC director (see APPENDIX6).

As some of the RICs were having problems generating adequate funding for the day-to-day running of the RIC, the financial aspect had become an issue for these RICs. In addition, the RIC managers assist the RIC users not only during the training program, but also after the program. The relationships become very close. This is not happening at other telecentres in Malaysia. For instance, in regards to the 42 RICs, each RIC was unique in its own way depending on how the RIC manager shaped the centre. This could eventually improve the funding of the RIC by generating income for the RIC and individuals and that should lead ultimately to improvements or changes in the quality of life for the rural community in this aspect. However, this kind of opportunity for RICs to generate funding did not exist at all RICs, because some of the RICs did not have the characteristics of entrepreneurship in their location or region and lacked a proactive RIC manager with vision. The benefits (outcomes) are discussed in further detail in Section 6.4.

From the interviews and RIC site observations it was apparent that not all of the RIC managers were capable of transforming a RIC so that it could be self-sustaining in generating sufficient funding to maintain its day-to-day operations. Based on

observation made at 11 RIC sites, the capability of individual RIC managers varied greatly. An RIC managers' human capital was crucial in determining whether they were effective or not in their role (this study does not measure the managers' capacities directly). The interviews and RIC site observations indicated that there were RIC managers who were active, efficient and put in a lot of effort to make an RIC effective in delivering outcomes for rural communities. However, there were some RIC managers who were passive and put in little effort to make an RIC effective. In addition, not all RIC locations or areas could successfully run the SEC; this was also a constraint for some RICs and the RIC managers. This was largely due to the geographical condition, socio-economic factors and the RIC managers' communication skills (see Chapters 4 & 5).

Training courses were well organised and planned. RIC users were keen to learn the courses and most of them had completed the courses and received the certificates (data from the observation – see Chapter 4). For example, at Eastern and Northern RIC, the RIC managers were very close to the local community, the RICs had a strong relationship with the RIC management committees and the RIC managers also had good communication skills. These factors made the RIC users feel comfortable and interested to learn at RICs. Hence, the RIC users wanted to learn and were eager to learn more due to the efforts from the RIC managers. As a result, the RIC users improved their basic ICT knowledge and skills, and this in general benefited the rural community.

Self-sustaining – can the RIC program be sustained?

Sustainability is a complex concept and the main factor or reason determining the sustainability of the RIC program is a continuous source of financial funding (Hopkins, 2005). Hence, in order for the RIC program to ensure any ongoing improvements to the social capital and the quality of life of the rural communities, RICs need to be self-sustaining in terms of the necessary operational and capital expenditure to be maintained in the long-term (Gaved and Anderson, 2006). During an interview discussion about how RICs can be sustained, two RIC managers stated that an RIC can be financially sustained if the SEC contributes a certain percentage to the RIC and expressed their view that the RIC program needs a longer time period of government funding support to be sustained.

6.5.2 People's satisfaction and improvements of RIC outputs

Different groups of RIC users perceived the usage and ICT-based services differently based on their demographic factors. The data from the survey shows a high level of satisfaction (see Section 4.4). This summarises the RIC outputs in relation to usage, ICT-based services (including training and workshops) and also the SEC and GEW. The RIC users were satisfied with the overall services and thus the overall improvements implied that the RIC program was reaching the target group in relation to RIC output.

From the discussion on the key findings in the previous sections, several achievements in relation to RIC outputs can be noted as follows:

- The RIC had introduced and offered basic services to the local communities and this had improved their basic ICT knowledge and skills.
- The RIC implemented basic ICT training and workshops based on four different target groups of users and this implied that different target users used the services differently due to their different needs (there was not equal participation from the groups).
- The RIC was not just a training centre; it supported the RIC users in terms of ICT-based services. This allowed the RIC users to seek assistance when needed. For example, the info-mediation service was for those community members who were ICT illiterate or the elderly who were unable to use the computer without assistance. This can be done by having the younger generation to assist the older generation to learn how to use a computer.
- The RIC program had also implemented the SEC and GEW in each RIC region, and this was an opportunity for the RIC managers and the rural local community in each region to gain the benefits from the SEC.

6.5.3 People's satisfaction and improvements of RIC outcomes

This sub-section discusses the people's satisfaction with the RIC program and their improvements. People were generally satisfied with the computer skills they acquired at RICs, their employment and business opportunities rendered at the RICs, as well as overall RIC program performance.

Stakeholders also identified improvements linked to RIC program outcomes. From the earlier discussion on outcomes, we summarise the discussion on improvements linked to RIC outcomes. The perceived improvements are as follows:

- The youth had found jobs through the RICs and SECs; this led to the creation of a source of employment opportunity at RICs.
- People found more business opportunities, especially the entrepreneurs. This created another economic benefit to the rural local communities.
- The youth, women and elderly had improved their computer skills and this resulted in adding more ICT literate rural communities in rural Malaysia.
- The four target groups had increased their social capital and economic benefit. This explained that RIC is a telecentre which built and enhanced social capital and also contributed to individual economic development. In fact, the positive relationships between social capital and economic benefit exhibited positive signs of RIC outcomes; hence, this implied the strong connection between rural communities' social capital and their economic benefit.
- People had improved their individual quality of rural life and this presumably suggests that these rural local communities had eradicated from rural poverty. For instance, the RIC roles and functions had proven to improve the people lives and create a better life to these communities.

6.6 Conclusions

In terms of the overall discussion, the RIC users' perceptions of the RIC program were generally positive. Those RIC users who utilised the RIC appeared to benefit and regarded the RIC as an access point for their ICT needs. They believed that the RIC improved their ICT awareness and skills. Nonetheless, the needs of the diverse range of RIC users differed. This shows to some extent that the RIC program is working reasonably well and meets its main objectives. The people had improved their digital skills and uplifting their quality of rural life. Their perceived benefits (outcomes) were more on social benefits rather than economic benefits and the people do not seems to notice that. Those people with higher income, better education and employment and also higher level of social capital considered as

having higher RIC benefits. Presumably, the RIC may be working better for those with advantages.

As explained in the data findings of Chapter 5, the association between SC and EB is strongly supported statistically and positively associated. Eight hypotheses tested the relationship between bonding, bridging capital, local community association (social capital) and demographic characteristics and also two dependent variables which were perceived benefits and services satisfaction as illustrated in Table 6.5.

Table 6.5: Hypotheses testing results

Hypothesis	Perceived benefits		Services satisfaction	
	Supported	Strength	Supported	Strength
H1a (i) – Perceptions of bonding capital is positively determined perceived benefits	Yes	Strong		
H1a (ii) – Perceptions of bonding capital is positively determined services satisfaction			Yes	Strong
H1b (i) – Perceptions of bridging capital is positively determined perceived benefits	Yes	Moderate		
H1b (ii) – Perceptions of bridging capital is positively determined services satisfaction			No	
H1c (i) – Perceptions of local community association is positively determined perceived benefits	No			
H1c (ii) – Perceptions of local community association is positively determined services satisfaction			No	
H2 (i) – Demographic characteristics are positively determined differences of perceived benefits	No			
H2 (ii) – Demographic characteristics are positively determined differences in services satisfaction			No	

Note: Yes indicates supported and No indicates not supported

H1 – Social capital (a - bonding capital b – bridging capital c- local community association)

H2 – Demographic characteristics

i – Perceived benefits

ii – Services satisfaction

As a consequence, the key stakeholders perceived benefits of RIC associated with social capital and a strong tie to bonding capital. They viewed RIC bonding capital as the structure that increased social integration. Economic benefits such as income, employment and education were also correlated with one another. These were also factors of economic development and quality of rural life emphasised in this study. The higher the income earned, the stronger the ties of RIC bonding capital. Employment had a strong correlation with bridging capital (statistically significant). An increase in RIC bridging capital is associated with an increase in employment of RIC users (noting this was probably going to be more relevant for youth as we know the middle-aged and elderly were generally not actively seeking new employment). This explains that the higher the RIC bridging capital, the more employment secured by the RIC users (Chapter 5, Section 5.3.1).

RIC bonding capital was a key driver in the RIC program, reflecting the positive attitude of RIC users regarding benefits and service satisfaction with RIC. In contrast, bridging capital, LCA and demographic characteristics did not reflect the RIC users' positive attitude regarding services satisfaction with the RIC program. The bonding capital was statistically stronger all across the other variables (using general correlation). This indicates that people perceived economic benefits to be strongly associated to bonding dimension of social capital. This suggests that communities with higher social capital may be more successful with RICs.

In relation to the issue of bridging the digital divide, people with higher education were perceived to be reducing the divide. As a consequence of being RIC users, people tended to have better education with improvement in their ICT knowledge and skills, hence, gained better employment and increased their income. Therefore, this study assessed the program goal in terms of improving the digital skills among RIC users, but not on bridging the digital divide between urban and rural areas.

In summary, the inputs were the need for ICT and community telecentres to enhance the RIC users' daily lifestyle. As discussed, the RIC users were satisfied with the services and overall RIC program, therefore, this was one of the pieces of evidence that the RIC program was working reasonably well. In addition, the perceived benefits or outcomes were likely to be contributing to improving the local community quality of rural life, increasing their social capital and economic benefits. These benefits were different by categories of target group users. For youth who were the major group of RIC users, the main perceived benefits of the RIC were their basic necessity and importance for their daily activities. This is supported from the finding results on RIC usage. However, for women and the elderly, the main perceived benefits of the RIC were to learn basic ICT skills and have access to information. The RIC also bring benefits to the other segment of the community who are not the RIC users. Furthermore, funding should be made available to help sustain RICs in the long-term if the government wants to make this contribution to social capital and perceived benefits, then more money is needed. As a result, the RICs were bringing resources of quality of rural life into rural Malaysian lives. The next chapter concludes this study, with an overview of the implications for theory, policy and practice, as well as recommendations for future research.

CHAPTER 7: CONCLUSION & IMPLICATIONS

7.0 Introduction

This chapter concludes the thesis. The first section provides general conclusions on how rural communities use ICT at Malaysian Rural Internet Centres. This is followed by a discussion of the RIC program logic model based on the proposed RIC model. The next section describes the main contributions of this dissertation to theory, policy and practice. The limitations of this study are acknowledged and a number of recommendations are provided for further research in the area of policy studies and community informatics. Figure 7.1 shows the structure of this chapter.

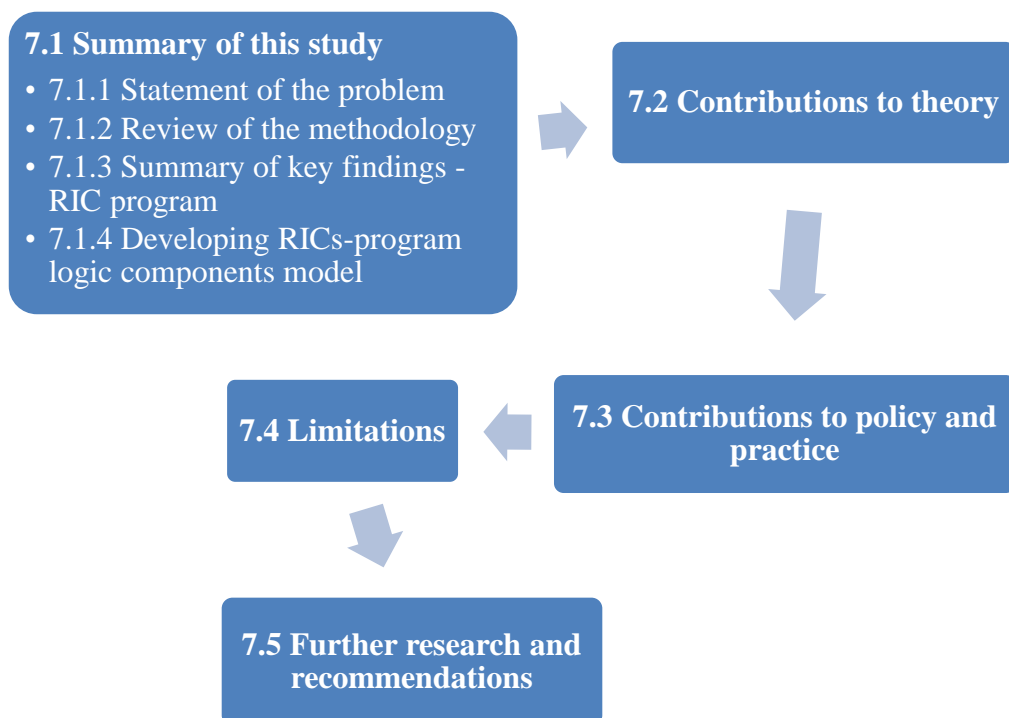


Figure 7.1: Structure of conclusions and implications overview

7.1 Summary of this study

In conclusion, there is little previous empirical research on the long-term impacts of ICT or telecentre initiatives on social capital or quality of rural life indicators in rural

communities in developing countries. Therefore, this study investigated how the RIC program has contributed to social capital and QoRL in rural Malaysia. In brief, much of this comprehensive RIC study emphasises RIC improvements and the changing levels of ICT usage and consequent impact on the local rural community members' lives. Haythornthwaite and Kendall (2004) noted that the Internet is a new social phenomenon and this is an emerging phenomenon, not a mature one. Hence, this study selected the RICs as emerging Internet centres in rural Malaysia to evaluate the impact of the ICT and Internet usage on these rural communities. This study examined in-depth the key stakeholders' (RIC end-users, RIC managers, MICC, Warisan Global, and RIC management committee) perceptions of the main inputs, outputs and outcomes and benefits to RIC communities from the RIC program and the Social Entrepreneurs Club. In addition, insights into the RIC implementation and continuation were sought. The RIC program has run from 2003, therefore it was timely for an evaluation of what RIC end-users and program managers perceived about the program. The study was concerned with the future of the RICs, practitioner implications (implications for policy) and the lessons learnt from the RIC program. The Malaysian RIC is an example for similar programs running in other countries, especially developing countries.

7.1.1 Statement of the problem

The main research problem being investigated in this study is whether the RIC is the answer to narrow the gap in digital skills between rural communities and urban communities given that previously there has been limited evaluations of this and similar programs to determine whether the expenditure is actually leading to a bridging of the digital divide. Thus, the study does not evaluate whether the divide is closing, but focuses on whether people perceive there is an improvement. From the implementation of this program, overall, the RIC is benefiting the users and the local community indirectly. This is strongly evidenced from the key findings discussed in Chapters 4 and 5. For instance, the RIC goal or objective to bridge the digital divide between urban and rural areas in Malaysia is definitely too high to be achieved. Therefore, this study suggests that the RIC program goal is to improve rural communities' quality of life, thus through improving digital skills; then rural community members can be better off or change their lifestyle with the aid of technology or ICT. Specifically, this would overcome the digital divide both within

and among RIC communities (see chapter 6-Discussion). The general research question addressed in this study was: “Can Rural Internet Centres be an effective tool in bridging the digital divide for rural communities and improving rural quality of life?”

Furthermore, if this gap or divide is left out unintentionally of general efforts to improve or involve rural communities, it would create another form of poverty related to an imbalance to ICT access. This should not happen if government and stakeholders correctly play their respective roles in the RIC program. This study shows that RICs are contributing to the rural community in every location or region they were represented. This contribution could improve or change these local rural community members’ lives and should help to address poverty. However, this also depends on the individual community, including their perceptions of whether the program brings any benefit to them or otherwise. These perceptions were a major focus of this study, and, as discussed thoroughly in the previous chapters, the rural communities investigated in this study had varying and in some instances different perceptions towards the RIC program.

7.1.2 Review of the methodology

In summarising the methodology applied in this study, a thematic analysis was generated to triangulate the multiple sources of quantitative and qualitative data collected in this study. Table 7.1: Main themes from the data analysis findings. Themes 1 to 5 were illustrated and explained in Chapter 4 and themes 6 to 9 were reported and explained in Chapter 5. These were the main themes and methods applied in this study. The previous chapters 4 and 5 discussed the findings thoroughly and explicitly regarding the RIC program logic. The thematic analysis produced several categories of impact as perceived by the key stakeholders in the RIC program.

Table 7.1: Main themes from the data analysis findings

Themes	Methods
Chapter 4	
Theme 1 – Program goals (improving digital skills)	Interviews
Theme 2 – Users’ characteristics	Survey & Observation
Theme 3 – RIC usage/frequency	Survey & Observation
Theme 4 – Users’ purpose/activities – ICT-based services	Survey, Interviews & Observation
Theme 5 – SEC characteristics	Survey & Interviews
Chapter 5	
Theme 6 – Computer skills, business and employment opportunities	Survey, Interviews & Observation
Theme 7 – Quality of rural life	Survey & Interviews
Theme 8 – Components of social capital	Survey, Interviews & Observation
Theme 9 – Economic benefits (income, employment, education)	Survey, Interviews & Observation

7.1.3 Summary of key findings – RIC program

The results of this study reflect overwhelmingly the Malaysian government objective to enhance IT literacy of women and youth is being achieved in the RIC program. Overall, the program is reaching the target group and they perceived the benefits to skills and opportunities. As discussed, the women (especially housewives) and elderly also constituted an increasing number of RIC users. Therefore, the government aim to transform these local rural communities to become ICT literate was achieved in certain target categories, to the level of basic ICT knowledge and skills. These skills have been learned through introductory training courses and workshops.

The key stakeholders perceived that RICs were achieving their goals in terms of improving the RIC communities’ digital skills. Through the usage, training and workshops at RIC, they had improved their ICT knowledge and skills. Most of them started with zero knowledge on computers and the Internet or basic or introductory knowledge of ICT. Some RICs were achieving at a very minimal level of ICT usage, but some had moved forward and achieved more with Web 2.0 training (website, Facebook, Yahoo Messenger, movie maker, etc.). The local rural communities were improving their ICT knowledge and skills through the RIC communities.

Research Questions:

RQ (a): Are RIC users (community) satisfied with the RIC services?

All the target user categories were satisfied and happy with the RIC services; especially the elderly (aged over 50 years old) (see chapter 4, section 4.4.2 and chapter 5, section 5.4). This may be due to the elderly expectations are low. They had made use of the services offered at RICs. The services were charged at very minimal costs. The basic service (training and education) were the service that most satisfied the users. The other services also reported high satisfaction.

RQ (b): Do RIC users (community) and stakeholders perceive an increase in income, employment and level of education (knowledge and skills)?

(1) Different age groups had different perceptions about RIC usage. The youth perceived that RIC usage was beneficial in regard to school/university work/assignment, access to educational information and communication function (sending & receiving email and education/training purpose), social networking, job opportunity and education attainment. However, the middle-aged group and elderly perceived RIC usage to be beneficial in regard to business and social networking, business opportunity, income, access to government information and services (see chapter 4, section 4.3.3 & 4.4.1).

(2) Meanwhile, there were differences between male and female perceptions on RIC usage. The male RIC users frequently focused more on information and communication purposes compared with female RIC users. They had different perceptions on how they accessed and utilised the RIC (see chapter 4, section 4.4.1).

(3) The higher income group of people perceived that they accessed more information functions (see chapter 4, section 4.4.1).

(4) The employment and education levels indicated that there were differences between the employment and education categories on RIC usage (see chapter 4, section 4.4.1).

(5) The location referred to the five RIC regions in Malaysia: Northern, Eastern, Southern, Central and Borneo. There were differences in RIC usage between the locations or regions. People had different RIC usage in different locations. The differences in RIC usage across the RIC locations were: a) low population in some RIC locations, b) less youth in some of the RIC locations, and c) fewer students and schools in some RIC surrounding areas (see chapter 4, section 4.4.1).

(6) There were differences between social capital components on RIC usage. People with high RIC usage were highly correlated with bonding and bridging capital, as well as local community association. This indicates that there is an association between RIC, social capital and economic benefits (see chapter 5, section 5.2.1).

(7) The RIC users perceived an improvement in income, employment and ICT knowledge and skills. One of the impacts of the RIC was that people became entrepreneurs and started their own business; this led to increased household income and suggests a reduction in rural poverty. In addition, people who were unemployed sought jobs through the RIC and became employed. For instance, their levels of education also increased or improved through training courses and workshops at the RICs (see chapter 5, section 5.2.2).

RQ (c): Do RIC users (community) and stakeholders perceive an increase in social capital?

There was an increase of social capital as people built their social relationships and networks within and outside the RIC. This could be online or offline or both types of communication interaction at RIC. The results showed that different age groups had different levels of social capital and similarly had different income, employment and education factors (see chapter 5, section 5.2.1).

The four elements of social capital associations were: economic benefits with social capital, bonding capital with age and income, bridging capital with employment, and also local community association with education. These associations empirically and theoretically assumed that there were associations between RIC, community informatics and social capital for the purpose of this study. Due to the associations between the RICs and the elements of social capital, the key stakeholders perceived

that the RICs contributed positively to community informatics (see chapter 5, section 5.2.3 & 5.3).

Summary of Research Hypotheses

The research hypotheses were derived from the general research question designed for this study. Hence, the RIC program logic framework theoretically identified measured variables for testing the hypotheses. The hypotheses were as follows:

(1) The social characteristic of concern in this study was social capital. Social capital was relevant to this study for three key elements: (a) bonding capital, (b) bridging capital, and (c) local community association. Thus, the perceived benefits are the contribution of social capital and economic benefits.

H1a (i): Perceptions of bonding capital will be positively associated with perceived benefits (supported)

H1a (ii): Perceptions of bonding capital will be positively associated with services satisfaction (supported)

- a) As discussed in Chapter 6, the hypothesis *H1a (i)* shows that bonding capital was positively associated with perceived benefits. This shows that there were strong ties of bonding capital. Similarly, hypothesis *H1a (ii)* shows that bonding capital was positively associated with services satisfaction. Thus, this shows that how the rural community perceived the bonding capital influenced the people's satisfaction with RIC services (see chapter 5, section 5.3).

H1b (i): Perceptions of bridging capital will be positively associated with perceived benefits (supported)

H1b (ii): Perceptions of bridging capital will be positively associated with services satisfaction (not supported)

- b) Meanwhile, the hypothesis *H1b (i)* shows that bridging capital was positively associated with perceived benefits. In contrast, bridging capital *H1b (ii)* was not associated with services satisfaction (see chapter 5, section 5.3).

H1c (i): Perceptions of local community association will be positively associated with perceived benefits (not supported)

H1c (ii): Perceptions of local community association will be positively associated with services satisfaction (not supported)

- c) Similarly, hypothesis H1c (i) which is local community association was not associated with perceived benefits and hypothesis H1c (ii) similarly was not associated with services satisfaction (see chapter 5, section 5.3).

These findings show that the local rural community perceived social characteristics as one of the benefits of RIC and that the social capital characteristics also influence people's satisfaction with RIC services.

(2) Demographic characteristics included: (a) age groups, (b) gender, (c) income, (d) education level, (e) employment status, and (f) locations or regions. These characteristics have been perceived as socio-economic factors as well. As a result, these characteristics lead to the contribution of growth in human capital and improve individual quality of rural life.

H2 (i): Demographic characteristics will be positively associated with perceived benefits (not supported)

H2 (ii): Demographic characteristics will be positively associated with services satisfaction (not supported)

- a) In Chapter 6, the hypothesis *H2 (i)* results show that demographic characteristics were not associated with perceived benefits and for hypothesis *H2 (ii)* similarly demographic characteristics are not associated with people's satisfaction with RIC services. For instance, demographic characteristics did not influence the outcome of social capital and economic benefits, as well as services satisfaction. Hence, it is assumed that, there are no differences in perception across the levels of six categories of demographic characteristics (see chapter 5, section 5.3 & 5.4).

In summarising the main findings of this study, we developed and proposed a RIC program logic model.

7.1.4 Developing RICs-program logic components model

In the overarching empirical and theoretical framework of this RIC program logic, we concluded that there were four components of RIC development to be sustained and developed. The components were:

- 1) Economic growth or development – as the local rural communities attained high level of education; they were likely to get better jobs and increased income. This would lead to economic growth of the rural community.
- 2) ICT development – the rural community would increase their human capital in terms of ICT knowledge and skills and, thus, increase their digital skills. This results in reducing the digital gap or improving the digital skills at the RIC.
- 3) Community development – as the most promising outcome of the RIC was social capital, the local rural community perceived that there was an increase in social capital and this would lead to the rural community development.
- 4) Rural development – the rural community and stakeholders perceived the growth in economics, ICT and social capital; this would result in decreasing the rural poverty rate (Figure 7.2).

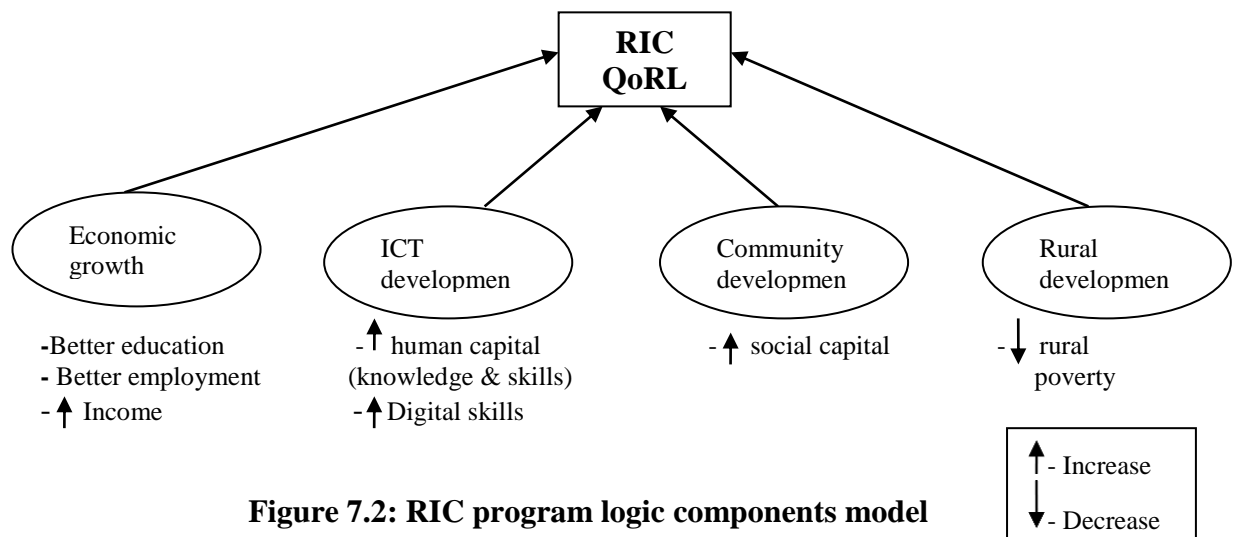


Figure 7.2: RIC program logic components model

This model (Figure 7.2) illustrates that these four components were the results that the RIC brings to the rural community in an attempt to benefit them and sustain the RIC program. There is a strong possibility that RICs can be sustainable provided that there is an improvement and continuation of RIC development.

7.2 Contributions to theory

The previous studies on Malaysian telecentres have been limited in scope and have focused on a few case studies whereas this study is comprehensive multi-method, multi-stakeholder evaluation of the RIC program using program logic theory. This

program logic theory was applied to develop the RIC program logic framework of this study.

ICT has a role to play in building social capital, yet the role will depend on how individuals, communities, organisations and governments incorporate ICT into their lives and social structures (Information Economy Division, 2005). Therefore, the impact of Internet access on social relationships, psychological wellbeing, on individual and collective action in communities plays an important role in understanding the level of social capital (Borgida et al., 2002). This thesis developed a comprehensive theoretical framework drawn from community informatics on community development and social capital theories for evaluating the RIC program in rural Malaysia. It emphasises the four components, namely, physical infrastructure, soft technologies, social infrastructure, and social capital (Simpson, 2005) (Chapter 2, Section 2.3.2).

ICT can indeed improve social capital in local neighbourhoods, but its effects are closely related to interrelated factors such as education, income, number of household members and age (Bianchi and Robinson, 1997). Income, age, and education were more closely associated with the use of information technologies than was geographical location (Razak, 2009; Osman et al., 2007). With regard to the RICs, the RIC users' characteristics examined in this study applied those factors highlighted by the previous studies. Thus, the social capital aspect at RIC was also relevant to the RIC Social Entrepreneurs Club. As Lin et al. (2006) states, entrepreneurs are successful when they can adjust their entrepreneurial strategies according to their social capital and capabilities.

In addition, greater access to essential services such as health care should also be provided to RIC communities. This may increase or improve community capacity and strengthen communities (Telenor, 2004). However, this study on RIC did not place much emphasis on this indicator or service. As said, the ICT initiatives may also provide access to some health services for the local community and improve the rural quality of life (Gaved and Anderson, 2006).

Community technology centres, or telecentres, have emerged at an increasing pace to deal with the digital divide. These are places in which people gather, exchange ideas

and build relationships (Black & Atkinson, 2007). The RIC is a community technology centre that connects the local rural community to build social capital and improve their wellbeing. In India, through the use of the right communications technology and a sustainable business model, Lifelines India aims to help improve the quality of life for people across the rural regions of Southeast Asia. This is a similar effort to improve the digital divide. Lifelines India is a telephone-based information helpline that provides advice and guidance to improve the lives of rural farming communities (Carless, 2009). One of the major findings of this analysis has been that the RIC also improves rural communities' quality of life with the aid of ICT.

The Akshaya e-centres in Kerala, India also a telecentre that has been successful in educating basic IT literacy training to communities in the district with many trainees today and created a space for the women, children and entrepreneurs to engage their lives in socio-economic development (Madon, 2004). This is the ICT4D project implemented to help reducing poverty and as such being implemented by RICs program. For instance, in the case of the RIC, there is an arrangement between public policy and communities, using technology that can lead to social change. This provides further support for the literature on bridging the digital divide in the areas of technology, community, and public policy (Servon, 2002). This type of assessment will provide a better insight into appropriate public policies and programs that will encourage the use of computers among rural communities (Mahendhiran et al., 2010).

7.3 Contributions for policy and practice

Social capital has become increasingly important and become a topic of interest in a large number of policy areas. The definitions or concepts are varied but accepted to be social interactions and resources created through social networks (formal and informal relationships) within RIC communities and outside the RICs. Social capital also refers to capitalism. Therefore, the implication for policy and practice is to implement a Social Capital Project in Malaysia such as some of the projects that had been included in the Human Capital and Malaysian Quality of Life (MQoL). Related to the "virtuous circle" in the creation of social capital in Malaysia, the states or regions should provide subsidies to build new associations and implement an

efficient public administration. This is due to the fact that the higher the social capital, the more accountable the local government. Hence, the support from the government is important. As a consequence, the local community learns to trust the people they do not know and build strong ties with their associations. This is also known as bridging capital.

Shamsul (1986) explains that community development at the national policy level means the government is looking to improve and develop a program in order to contribute to national development. Following the report of the UNDP (2001), as public policy shifts to enhancing ICT for rural development, it is the role of ICT to harness the rapid changes on technology as a tool for improving the rural community's knowledge and skills and strengthen social capital. Despite the discussion on social capital contribution as one of the outcomes of RIC, employment opportunities and education attainment were also seen as key features of RIC sustainability.

In fact, this study is about ICT for development at rural areas of Malaysia. For instance, this focuses on telecentre operations, implementation and evaluation of the telecentre program. Therefore, the contributions of this study would be emphasizing ICT and rural development to assist the local rural communities improve their quality of rural life. From the policy stand, this is aligned with the national ICT policy on rural development. Thus in practice, these RIC key findings could contribute to the improvement on RIC inputs, RIC-ICT training program, RIC ICT-based services, RIC-SEC activities and RIC outcomes. In later section explained the recommendations for further research.

7.4 Limitations

As the quality of rural life is the implicit ultimate outcome of this study, the emphasis on its concept is necessary, but, as stated, the definition differs depending on how the indicators are defined and measured. Therefore, measurement changes in terms of different indicators were identified within QoRL. This study suggested measuring improvements in QoRL when a rural community accesses free computer training and uses IT in a supportive environment. Moreover, the way the program is implemented is very important. There are three key facets in the implementation of

the RIC program: (1) investment in RIC, (2) convenient access; such as strategic location, and (3) public-private encouragement and support.

The concept of social capital is somewhat ambiguous and requires a multi-disciplinary approach. Indeed, this study had adapted some of the concepts from previous studies and modified them to suit this thesis's context. Similarly, in regard to community informatics, there is no definite definition on this approach. However, this study adapted Gurstein's (2000) concept of community informatics and implied it to the RIC context.

Funding or financial capital which is another limitation not addressed in this research as an input. This is an important component of input that can affect the sustainability of internet centres. It is their funding model, whether or not they are providing their services for free (government subsidy) or to cover cost or to earn enough to cater for growth.

In relation to methodology, this study was comprehensive and covered most of the regions in Malaysia, excluding Borneo. The researcher had to limit the regions and locations due to time and travel cost constraints. This limitation was applied for the qualitative research; while for the quantitative research method, this study covered all the five regions. For instance, focus group instrument should also apply as an additional qualitative method and analysis. This was not applied as due to the time constraint to interview RIC users in a group and difficulties in seeking for reliable interviewees. The focus group should employ a moderated discussion of a set of target groups on the same shared topics such as a focus group with youth whose demographic characteristics are similar (age, level of education, employment, etc.). Therefore, this group of users or participants should be grouped together to conduct a focus group and to discuss the topic in-depth.

In order to better assess the RIC program a longitudinal study is perhaps necessary so as to evaluate the impact of RICs, in pre-implementation, post-implementation and future implementation phases. This would provide greater insight into the impact on the rural community as longitudinal study encourages the researcher to conduct participatory research. This again limitation of the researcher's timeframe of about 3

years to complete this PhD study meant a longitudinal study of the RIC although desirable was not possible.

7.5 Further research and recommendations

Research on the interactions between ICT and SC in organisations and communities is still in the early stages and has not produced consistent results. This is epitomised in the following statement: “At this stage, there is little consensus on the role of ICT in building SC” (Song et al., 2009). Therefore, further study is needed in the area. Telecentre studies have shown that the centres become socially relevant only when they provide services in accordance with the needs of the local community (Rajalekshmi, 2008).

Furthermore, this study’s overall main contribution is social capital benefits, even though the goals, stakeholders and RIC users are all focussed on the economic and human capital benefits. Therefore, this will be a great study for future research of whether governments will want to fund such a program where the benefits may be intangible. On the other hand, there is also evidence, that this program is of relatively greater benefit to the reasonably privileged (higher incomes, higher education; as discussed in chapter 6). Perhaps governments would accept a program in which there is some benefit to the poor even if they do not get as much benefit as others who presumably could more easily access communications with their own resources.

Recommendations for government

The RIC program logic model used in this dissertation to evaluate the RIC program uses a bottom-up approach, as supported by Wech (2008) who researched telecentres in Thailand. Recommendations for the Malaysian government and local governments for promoting and harnessing RICs are that government should: (1) extend the community informatics approach or policy, (2) invest heavily in technological infrastructures that underpin RICs, (3) enhance social entrepreneurs and social capital in RICs, and (4) develop collaboration and cooperation in RICs. Each of these recommendations is discussed in more detail as follows:

- 1) Extend the community informatics approach or policy for programs like the RIC – the CI approach is crucial for rural communities, it does not focus on the economic

capital alone, but also on social capital. This eventually gives the opportunity to the community to improve and change their quality of rural life. Therefore, extending the CI approach is necessary for the RICs as continuous improvement and sustainability is a concern.

2) Invest heavily in technological infrastructures for programs like the RIC – the Malaysian government has invested in ICT infrastructures; however the investment is not heavily invested in the rural areas of Malaysia. There are some rural areas which are benefiting from the ICT infrastructures, while there are still rural communities in other areas that are not receiving the ICT benefits. This is somewhat unequal segregation between the rural areas. Also, compared with urban areas, the rural areas are lagging behind in access to ICT infrastructure and particularly high speed fixed wire and wireless Internet.

3) Enhance social entrepreneurs and social capital in programs like the RIC – the RIC Social Entrepreneurs Club initiative is an attempt to encourage the local community to get involved in entrepreneurship and socialised within the environment. The focus of the initiative was to encourage people to start and expand their business and also at the same time, build social networking and relationships. At the RIC and SEC, this can be seen as social capital. The people were connected and made contacts through the RIC and indirectly, the SEC. The RIC and SEC should enhance social entrepreneurs and social capital, thus, the local community will participate more and gain more from RIC benefits.

4) Develop collaboration and cooperation in programs like the RIC – the RIC has multiple stakeholders involved within the program. This collaboration and cooperation between the key stakeholders in the RICs is necessary to run the project successfully. Therefore, the involvement from the grassroots groups of people is crucial as the community members and leaders will know what they want from RIC. Hence, an active management committee at each RIC is a must to sustain the RIC for the next few years. On the other hand, the private companies in the ICT sector and non-government organisation are also the key stakeholders with whom the RICs should develop collaboration and cooperation. For example, most telecentres in India are run by NGOs, not directly by government.

Recommendations for the RIC Program managers

The following recommendations are made to RIC Program managers

- (1) Combining goal-setting activities should be added along with computer-based training courses; this will address the needs of the local community.
- (2) RICs should be opened at times that suit the needs of users; this would benefit the RIC users.
- (3) The cost of using computers and services needs to be reduced in some parts of the RICs.
- (4) RIC managers should be able to call directly for service providers to fix technical problems from the government-approved lists and the government should pay the costs.
- (5) Service providers should be engaged to provide basic training to the RIC managers on how to fix simple technical problems.
- (6) A minimum charge per hour for computer use should be regulated and the government should pay the Internet bill.
- (7) Government should subsidise the cost of the Internet by providing broadband coverage to all centres.
- (8) RIC managers should be part of decision-making as this allows the RIC to benefit from their good ideas and keeps them motivated by recognition of their valuable services.
- (9) To ensure good governance and management at the local level and between RIC and government, RICs should develop a business plan and clear structure of reporting, decision-making and accountability. This will help to make better use of funds they have for providing “universal access to all”.

Recommendations for further study

- (1) Another variable suggested for further study is participation by each group of the community, specifically the disadvantaged groups such as people with disabilities and single parents. These groups of people were not identified as the target groups of the RIC. As Bailur (2008) explains, the World Bank defines participation as “a process by which people, especially disadvantaged people, influence decisions that affect them. As participation increases, assumed that participation can lead to accountability and better performance (governments more accountable)”.

(2) This study used ordinal data to gather data on perceptions of users. The use of interval data would be best to represent social capital for future study or research (strongly recommended) that would focus on this variable independently.

(3) In relation to employment, teleworking can be introduced at RICs as it is relevant to achieve sufficient income to maintain services. As such, it is all too easy for telecentres in rural areas to fall behind on current ICT usage and business practices. This is important and should be emphasised more to the SEC as a business feature for the RIC users to become new entrepreneurs. Bertin (2001, p.183) explains the features of teleworking as follows:

Teleworking is working at a distance from the people who pay you, either at home, on the road or at a locally based centre. Teleworkers use e-mail, phone and fax to keep in touch with their employers or customers. Teleworking is part of a range of flexible work practices that are becoming widespread and also include flexi-time, part-time working.

Teleworking could also provide jobs to people after completing ICT training programs at an RIC. Bertin (2001) claims that many telecentres generated most of their income in exchange for providing ICT training courses to the users or trainees. On the other hand, teleworking could also inspire the RICs to act as multi-purpose providers of services and information for their local community. The local community members could be made aware of the opportunity and be paid for jobs.

As a consequence of teleworking, creating continuous training services are relevant especially to remote rural areas; if there is no continuing market for the training, the RICs will eventually run out of trainees or users and will close down. This is supported by the example of one of the longest-surviving telecentres in the UK, Moorlands Telecottage, which provides telework opportunities to trainees. In that example, local government and other funding bodies provide assistance with training telecentre users. In return, the trainees will gain a greater variety of training and learn a variety of skills for different work tasks (Bertin, 2001).

(4) In addition, education attainment is important as the majority of RIC users were the youth. Therefore, the RIC should engage in providing online distance education learning or e-learning. Panda and Chaudhary (2001) noted that, in India, the IGNOU

telelearning centre offers distance learning via teleconferencing, using the Internet to access and retrieve educational materials online. Almost all of the academic work for these programs is done online. The users or students pay for the tuition fees at a reasonable rate and a few percentages of profit goes to the centre. This fee allows the students to use all the services and facilities available at the centre at no cost.

In Australia, the Queensland Open Learning Network was established to expand the educational opportunities available to rural and remote locations through a state-wide network of Open Learning Centres supported by advanced ICT infrastructure. The network facilitates the provision to local communities of formal accredited programs from universities, colleges and other educational and training providers (Gooley, 2001).

This study suggests that teleworking, telelearning and e-learning networks should be introduced and implemented at RICs. These initiatives will benefit the users, and would create sustainability for the RICs. Therefore, to be sustained, telecentres (particularly RICs), must be substantially demand-driven and this transforms to the need of community to have relevant and useful content (Colle and Roman, 2002). While human capacity building in the context of social capital has emerged as one of the major findings of this study, this finding is mutually exclusive of bridging the digital divide as much of the training and workshops provided in the area of ICT-based skills which should help rural community members to catch up on their metropolitan counterparts even though the program appears to be mainly benefiting youth and predominately females.

Conclusions

The main objective of this study was to find out the effects and effectiveness of RIC program on quality of rural life. Although there are a few limitations to this study, the findings have both, theoretical and practical implications as discussed earlier. Some of the results on data analysis are consistent with the previous studies and some are not. Theoretically, this study has shown that the RIC improved the individual community quality of rural life with the use of ICT applications. Meanwhile, this study adopted program logic theory to evaluate the RIC program. For instance, this thesis developed a comprehensive theoretical framework drawn from community informatics on community development and social capital theories

to evaluate the RIC program. This is a new empirical contribution to the growing literature on community informatics and social capital; while the majority previous study indicates a research on social capital in sociology, ICT, however not particularly on the contribution of community informatics and social capital in telecentres; especially in developing countries such as Malaysia. Furthermore, previous studies also have not evaluated telecentre program using program logic theory; specifically on RIC program.

On the other hand, this study also examined the RIC users' demographic characteristics as used in previous studies. It was shown that there are differences in each characteristics and no association between the demographic characteristics and perceived benefits and services satisfaction. As discussed, the demographic characteristics do not influence the social capital, economic benefits and services satisfaction outcomes. This assumed that the individual RIC users had similar perceptions on the levels of six categories of demographic characteristics.

Based on the RIC key findings conducted earlier and related literature on previous studies, the majority studies on telecentres emphasised the impact of ICT in developing countries. While this study evaluated RIC as a telecentre, focused on community informatics and quality of rural life. This study proves that the community informatics contribute to the improvement in social capital and economic benefits. In fact, results from these key findings are similar to other studies on the association of social capital with economic benefits. Despite that, this study further proves that the perceptions of an increased in perceived benefits improved the quality of individual rural life.

This study's findings and review of literature led to the conclusions presented and the subsequent recommendations for developing RIC model. The chapter has concluded with recommendations for further research.

REFERENCES

- 7TH MP, G. O. M. 1996. The Seventh Malaysia Plan 1996-2000. *In*: DEPARTMENT, G. (ed.). Kuala Lumpur, Malaysia: Percetakan Nasional Malaysia Berhad.
- 9TH MALAYSIAN PLAN, G. O. M. 2006. The Ninth Malaysia Plan 2006-2010. *In*: DEPARTMENT, G. (ed.). Kuala Lumpur, Malaysia: Percetakan Nasional Malaysia Berhad.
- 10TH MP, T. M. P. 2010. TENTH MALAYSIA PLAN 2011-2015. *In*: DEPARTMENT, P. M. S. (ed.). PUTRAJAYA: THE ECONOMIC PLANNING UNIT.
- ABDUL RAZAK, N. 2009. Empowering the rural communities via the telecentres. *European Journal of Social Sciences* 9, 425-432
- ABU SAMAH, A. & AREF, F. 2009. Community Development Programmes in Malaysia. *Nature and Science*, 7, 86-89.
- ADB, A. D. B. I. 2004. <http://www.adbi.org>.
- ADOLFO, F. 1999. SOCIAL EXCLUSION AND RURAL UNDERDEVELOPMENT. *World Bank Conference on Evaluation and Poverty Reduction*. Washington D.C.: World bank.
- AGRIINFO.IN 2011. What is Rural Development?
- ALDRIDGE, STEPHEN, DAVID HALPERN & FITZPATRICK, S. 2002. Social capital. *Performance and innovation unit*. London, England.
- ALLEMAN, J., HUNT, C., MICHAELS, D., MUELLER, M., RAPPOPORT, P. & TAYLOR, L. 2003. Telecommunications and Economic Development: Empirical Evidence from Southern Africa. Sydney: International Telecommunications Society.
- ANYANWU, J. C. 2005. Rural Poverty in Nigeria: Profile, Determinants and Exit Paths. *African Development Review*, 17, 435-60.
- APDIP, A. P. D. I. P. 2012. *Official Portal Asia Pacific Development Information Programme* [Online]. Bangkok: UNDP. Available: <http://www.apdip.net/projects/dig-rev/info/> 2012].
- ARMSTRONG, J. S. & OVERTON, T. S. 1977. Estimating non-response bias in mail surveys. *Journal of Marketing Research*, 14, 396-402.
- ATTWOOD, H. & BRAATHEN, E. 2010. Telecentres and poor communities in South Africa: What have we learnt? . *In*: (ICT), P. O. C. E. O. C. P. A. A. T. I. A. C. T. (ed.) *The Chronic Poverty Research Centre (CPRC) Conference*. Manchester, UK: National Research Foundation (NRF) and the Norwegian Research Council (NRC).
- BAILEY, A. 2009. Issues Affecting the Social Sustainability of Telecentres in Developing Contexts: A Field Study of Sixteen Telecentres in Jamaica. *The Electronic Journal on Information Systems in Developing Countries (EJISDC)*, 36, 1-18.
- BAILEY, A. & OJELANKI, N. 2009. Social Ties, Literacy, Location and the Perception of Economic Opportunity: Factors Influencing Telecentre Success in a Development Context. Proceedings of the 42nd Hawaii International Conference on System Sciences, 2009 Hawaii, US. Crown Copyright.

- BALA, P., SONGAN, P., HAMID, K., HARRIS, R. & KHOO, G. 2002. Bridging the Digital Divide: the e-Bario experience. *Sarawak Development Journal*, vol. 5, pp. 63-78.
- BARR, D. 1998. Integrated Rural Development through Telecommunications. *First Mile of connectivity* [Online]. Available: <http://www.fao.org/WAICENT/FAOINFO/SUSTDEV/Cddirect/Cdre0029.html> [Accessed 15 December 2008].
- BARRO, M. & SALA, X.-M. 1995. A Brief History of Modern Growth Theory. *Economic Growth*. New York: McGraw Hill.
- BASHIR, M. S., ABU SAMAH, B., EMBY, Z., BADSAR, M., MOHAMED SHAFFRIL, H. & ALIYU, A. U. 2011. Information and Communication Technology Development in Malaysia: Influence of Competency of Leaders, Location, Infrastructures and Quality of Services on Telecentre Success in Rural Communities of Malaysia. *Australian Journal of Basic and Applied Sciences*, 5, 1718-1728.
- BERGERON, F., RIVARD, S. & DE SERRE, L. 1990. Investigating the Support Role of the Information Centre. *MIS Quarterly*, 14, 247-260
- BEST, M. 1996. Understanding our Knowledge Gaps: Or, Do we have an ICT4D field? And do we want one? : IDRC Forum Diversity and Global Inclusion New Institutions.
- BEST, M. L., THAKUR, D. & KOLKO, B. E. 2009. The contribution of user-based subsidies to the impact and sustainability of telecentre-the eCenter project in Kyrgyzstan. *ICT4D 2009 International conference*. Doha.
- BLACK, R. & ATKINSON, J. 2007. Addressing the Digital Divide in Rural Australia. Available: <http://ausweb.scu.edu.au/aw07/papers/refereed/black/paper.html> [Accessed 18 December 2009].
- BLANCHARD, A. & HORAN, T. 1998. Virtual Communities and Social Capital. *Social Science Computer Review*, 16, 293-307.
- BOURDIEU, P. 1986. *The Forms of Capital*, New York.
- BRADLEY, G. 2006. *Social and Community Informatics - Humans on the Net* New York, Routledge.
- BRYMAN, A. 2002. *The debate about quantitative and qualitative research: a question of method or epistemology?*, London, Sage Publication.
- BRYMAN, A. 2008. *Social Research Methods* [Online]. Toronto: Oxford University Press. Available: <http://samuellearning.org/Research Methods/Bryman 3ed glossary.pdf>
- BURT, R. S. 2001. *Structural Holes versus Network Closure as Social Capital*, New York, Aldine de Gruyter.
- CAGLIERO, R., CRISTIANO, S., PIERANGELI, F. & TARANGIOLI, S. 2011. Evaluating the Improvement of Quality of Life in Rural Areas. "EVIDENCE-BASED AGRICULTURAL AND RURAL POLICY MAKING: METHODOLOGICAL AND EMPIRICAL CHALLENGES OF POLICY EVALUATION". Ancona: Istituto Nazionale di Economia Agraria (INEA), Roma, Italy.
- CALLOIS, J. M. & AUBERT, F. 2007. Towards indicators of social capital for regional development issues. *Regional studies*, 41, 809-821.
- CASEY, T. & CHRIST, K. 2005. Social Capital and Economic Performance in the American States. *Social Science Quarterly*, 86, 826-845.

- CENTER FOR COMMUNITY ENTERPRISE 2000. *The Community Resilience Manual: A Resource for Rural Recovery and Renewal*. Port Alberni, Canada: Center for Community Enterprise.
- CHAMBERS, R. 1983. *Rural Development: Putting the Last First*, New York, US, Longman Scientific & Technical.
- COLEMAN, J. S. 1988. Social Capital in the Creation of Human Capital. *The American Journal of Sociology*, 94, S95-S120.
- COLEMAN, J. S. 1990. *Foundations of Social Theory* Cambridge, Mass, Belknap Press of Harvard University Press.
- CORBETTA, P. 2003. *Social Research: Theory, Methods and Techniques*, Thousand Oaks, Sage Publications.
- CORMACK, D. S. 1991. *The Research Process*, Black Scientific, Oxford.
- CRESWELL, J. W. & CLARK, V. L. P. 2008. *The Mixed Methods Reader*, Lincoln, Nebraska, SAGE Publications.
- CROTTY, M. 1998. *The Foundations of Social Research- Meaning and Perspective in the Research Process*, London, Sage.
- CUMMINS, R. A. 1995. On the trail of the gold standard for subjective well-being. *Social Indicators Research*, 35, 179-200.
- DAVIES, S., SCHWARTZ, A. W., PINKETT, R. D. & SERVON, L. J. 2003. Community Technology Centres as Catalyst for Community Change.
- DIGITAL DIVIDEND REPORT 2004. Lessons from the field: An overview of the current uses of information and communication technologies for development. In: PAUL, J., KATZ, R. & GALLAGHER, S. (ed.). World Resources Institute.
- DILLMAN, D. 2000. *Mail & Internet Surveys: The Tailored Design Method* Wiley.
- DIMAGGIO, P., HARGITTAI, E., NEUMAN, R. & ROBINSON, J. 2001. *Annual Review of Sociology*, 27, 307-336.
- DOGARA, M. A. 2011. *Information Requirement for Rural Development through Telecentre in Kaduna State, Nigeria*. Master of Science (ICT) Master, Universiti Utara Malaysia
- DOMAR, D. 1946. "Capital Expansion, Rate of Growth and Employment," *Econometrica*, 14.
- DTI 1999. Moving into the Information Age: Regional Benchmarking Study. In: INDUSTRY, D. O. T. A. (ed.). London :HMSO.
- DYSON, F. 2007. *Our Biotech Future* [Online]. Available: <http://www.nybooks.com/articles/archives/2007/jul/19/our-biotech-future/?pagination=false>.
- EASTERBY-SMITH, M., GOLDEN-BIDDLE, K. & LOCKE, K. 2008. Working with pluralism:determining quality in qualitative research. *Organisational Research Methods*, 11 (3), 419-429.
- EASTERBY-SMITH, M., THORPE, R. & LOWE, A. 2004. *Management Research*, London, Sage Publications.
- EASTERLY, W. 2002. *The Elusive Quest for Growth: Economists' Adventures and Misadventures in the Tropics*, Cambridge, Mass, MIT Press.
- EC, E. C. 2011. Information and Communications Technology. *Cooperation: Theme* 3.
- EDA, E. D. A. 2011. Goal of Economic Development. Australia.
- ELLISON, N. B., STEINFELD, C. & LAMPE, C. 2007. The Benefits of Facebook 'Friends:' Social Capital and College Students' Use of Online Social Network Sites. *Journal of Computer-Mediated Communication*, 12, 1143-1168.

- ENBERG, J. 1998. Telecommunications for sustainable development. *First Mile of connectivity*. [Online]. Available: <http://www.fao.org/WAICENT/FAOINFO/SUSTDEV/Cddirect/Cdre0042.html> [Accessed 29 December 2008].
- EPU, E. P. U. 2009. *Official Portal of EPU* [Online]. Putrajaya, Malaysia: Prime Minister's Department Malaysia. Available: <http://www.epu.gov.my> [Accessed 1 September 2009].
- EPU, E. P. U. 2010a. THE LOGICAL FRAMEWORK APPROACH. In: EPU, E. P. U.-P. M. S. D. (ed.). Putrajaya, Malaysia.
- EPU, E. P. U. 2010b. *The Malaysian Economy in Figures* [Online]. Putrajaya, Malaysia: Prime Minister's Department, Malaysia. Available: <http://www.epu.gov.my> [Accessed 5 March 2010].
- EPU, E. P. U. 2011. *Income Distribution and Poverty* [Online]. Putrajaya, Malaysia: Official Portal of EPU. Available: <http://www.epu.gov.my/chapter4> [2011].
- ESCAP, E. S. C. A. P. 2006. Guidebook on Developing Community E-Centres in Rural Areas: Based on the Malaysian experience. Nations, U ed. New York: United Nations (UN).
- ETTA, F. E. & PARVYN-WAMAHU, S. 2003. *Information and Communication Technologies for Development in Africa, Volume 2 : The Experience with Community Telecentres*, Ottawa, ON, CAN, IDRC Books.
- FLORA, J. L., SHARP, J. & FLORA, C. 1997. Entrepreneurial Social Infrastructure and Locally Initiated Economic Development in the Nonmetropolitan United States. Nonmetropolitan, US: The Sociological Quarterly.
- FONG, M. W. L. 2009. Digital Divide between Urban and Rural Regions in China. *The Electronic Journal on Information Systems in Developing Countries (EJISDC)*, 36, 1-12.
- FOTH, M. 2005. Towards a design methodology to support social networks of residents in inner-city apartment buildings. *Creative Industries Research and Applications Centre (CIRAC), Creative Industries Faculty*. Brisbane, Queensland University of Technology.
- FOUNTAIN, J. E. 1997. *Social Capital: A Key Enabler of Innovation in Science and Technology*, Cambridge, The MIT Press.
- FUKUYAMA, F. 1995. *Trust: Social Virtues and the Creation of Prosperity*, New York, Free Press.
- FUKUYAMA, F. 1999. *The Great Disruption: Human Nature and the Reconstitution of Social Order*. New York: Free Press.
- FURUHOLT, B. & KRISTIANSEN, S. 2007. A Rural-Urban Digital Divide? Regional Aspects of Internet Use in Tanzania. *The Electronic Journal on Information Systems in Developing Countries (EJISDC)*, 31, 1-15.
- GARSON, G. D. 2000. The role of information technology in quality education. In: GARSON, G. D. E. (ed.) *Social Dimensions of Information Technology: Issues for the New Millennium*. London: Idea Group.
- GAVED, M. & ANDERSON, B. 2006. *The Impact of local ICT initiatives on social capital and quality of life*. Colchester: University of Essex, UK.
- GILCHRIST, A. 2004. *The well-connected community: a networking approach to community development*, Great Britain, UK, The Policy Press, UK.
- GNANIAH, J., YEO, A. W., ZEN, H., SONGAN, P. & AB. HAMID, K. 2006. e-Bario and e-Bedian Project Implementation in Malaysia.

- GOVERNMENT DEPARTMENT OF MALAYSIA 2001. The Eighth Malaysia Plan 2001-2005. *In: MALAYSIA, G. D. O. (ed.).* Kuala Lumpur, Malaysia: Percetakan Nasional Malaysia Berhad.
- GOVERNMENT OF MALAYSIA 2011. The Tenth Malaysia Plan 2011-2015. *In: DEPARTMENT, G. (ed.).* Kuala Lumpur, Malaysia: Percetakan Nasional Malaysia Berhad.
- GRANOVETTER, M. 1986. Economic action and social structure: the problem of embeddedness. *Journal of Sociol*, 91, 481-510.
- GREENBERG, A. 2005. ICTs for Poverty Alleviation: Basic Tool and Enabling Sector. *In: PER-EINAR TRÖFTEN (ed.).* Quebec, Canada: Published by Sida.
- GUAN, L. H. 2000. Ethnic Relations in Peninsular Malaysia: The Cultural and Economic Dimensions STUDIES I.O.S.A., ISEASed.:
- GUION, L. A. 2002. Triangulation: Establishing the validity of qualitative studies. Gainesville, FL: Institute of Food and Agricultural Sciences, University of Florida.
- GURSTEIN, M. 2000. *Community Informatics: enabling communities with communication technologies*, Hershey, PA: Idea Group Publishing.
- GURSTEIN, M. 2003. Effective use: A community informatics strategy beyond the Digital Divide. *First Monday: peer- reviewed journal on the internet*.
- GURSTEIN, M. 2007. *Community Informatics (and Why Does It Matter)?*, Italy, Polimetrica.
- GURSTEIN, M. 2008. What is community informatics (and why does it matter?). Milan, Italy: Polimetrica.
- HAIR, J. F., ANDERSON, R. E., TATHAM, R. L. & BLACK, W. C. 1995. *Examining Your Data, Multivariate Data Analysis*, New Jersey, Prentice Hall.
- HAIR, J. F. J., BLACK, W. C., BABIN, B. J. & ANDERSON, R. E. 2010. *Multivariate Data Analysis*, Prentice Hall.
- HAJI MAT ZIN, R. 2004. Revisiting Urban Poverty and the Issue of Social Protection in Malaysia. *In: ZHANG, Y. (ed.) Emerging Urban Poverty in East Asia*. Beijing: World Affairs Press.
- HAMILTON-PENNELL, C. 2008. Growing Local Economies. *Economic Gardening*.
- HAMPTON, K. 2001. *Living the Wired Life in the Wired Suburb: Netville, Glocalization and Civic Society*. Doctoral dissertation, University of Toronto.
- HARRIS, R. Telecentres in Rural Asia: Towards a Success Model
International Conference on Information Technology, Communications and Development (ITCD)2001 Kathmandu, Nepal
- HARRIS, R. 2007. Telecentre Evaluation in the Malaysian Context. *5th International Conference on IT in Asia*. Hilton Hotel, Kuching, Sarawak, Malaysia.
- HARROD, R. F. 1939. AN ESSAY IN DYNAMIC THEORY. *The Economic Journal*, 49, 14-33.
- HEEKS, R. 2002. Information systems and developing countries: failure, success, and local improvisations. *Information Society Journal*, 18(2), 101-112.
- HERREROS, V. F. 2004. *Problem of Forming Social Capital : Why Trust?*, Gordonsville, VA, USA, Palgrave Macmillan.

- HESS, P. & ROSS, C. 1997. *Economic Development: Theories, Evidence, and Policies*, Orlando, U.S.A, The Dryden Press, Harcourt Brace College Publishers.
- HOPKINS, L. 2005. Making a Community Network Sustainable: The Future of the Wired High Rise. *The Information Society*, 25, 379-384.
- HUDSON, H. (ed.) 1998. *Global information infrastructure: The rural challenge*, Rome: FAO.
- HUDSON, H. 2001. Telecenter Evaluation: Issues and Strategies. In: LATCHEM, C. & WALKER, D. (eds.) *Telecenters: Case Studies and Key Issues*. Vancouver: The Commonwealth of Learning.
- HUGGINS, R. & IZUSHI, H. 2002. The Digital Divide and ICT Learning in Rural Communities: Examples Good Practice Service Delivery. *Local Economy*, vol. 17, pp. 111-122.
- IBRAHIM, Z. & AININ, S. 2009. The Influence of Malaysian Telecenters on Community Building. *Electronic Journal of e-Government*, Volume 7, 77-86.
- ICMA, P. 2010. Strengthen Your Local Economy through Economic Gardening. In *focus strategies and solutions for local government managers*.
- IDRC , I. D. R. C. 1999. TELECENTRE EVALUATION A GLOBAL PERSPECTIVE. In: RICARDO, G. & PATRIK, H. (eds.) *Pan Global Networking*. FAR HILLS INN, QUÉBEC, CANADA: IDRC.
- IIASA, I. I. F. A. S. A.-P. B. 2008. Economic Growth in Developing Countries: Education Proves Key. In: DEMOGRAPHY, V. I. O. (ed.). Austria: Austrian Academy of Sciences.
- ILO, I., LABOUR, ORGANISATION 2001. <http://www.ilo.org>.
- INFORMATION ECONOMY DIVISION 2005. The Role of ICT in Building Communities and Social Capital. Department of Communications, I.T. at. A.
- INTERNET WORLD STATS 2010. The Digital Divide, ICT and the 50x15 Initiative.
- ITU, I., TELECOMMUNICATION, UNION 2011a. ITU Contribution to the implementation of the WSIS outcomes. *November 2010 to May 2011*. May 2011 ed.: International Telecommunication Union World Summit on the Information Society.
- ITU, I., TELECOMMUNICATION, UNION 2011b. Measuring the Information Society. Geneva, Switzerland: Telecommunication Development Bureau.
- JENSEN, M. & ESTERHUYSEN, A. 2001. The Community Telecentre Cookbook for Africa Recipes for Self-Sustainability How to Establish a Multi-purpose Community Telecentre in Africa. Paris: United Nations Educational Scientific and Cultural Organization.
- JHUNJHUNWALA, A., RAMACHANDRAN, A. & BANDYOPADHYAY, A. 2004. n-Logue: The Story of a Rural Service Provider in India. *The Journal of Community Informatics*, vol.1, pp. 30-38.
- KAVANAUGH, A. L., REESE, D. D., CARROLL, J. M. & ROSSON, M. B. 2005. Weak Ties in Networked Communities. *The Information Society*, 21, 119-131.
- KHALID, M. A. 2011. Household Wealth in Malaysia: Composition and Inequality among Ethnic Groups. *Journal of Malaysian Economy*, 45, 71-80.
- KIVUNIKE, F. N., EKENBERG, L., DANIELSON, M. & TUSUBIRA, F. F. 2011. Perceptions of the role of ICT on quality of life in rural communities in Uganda. *Information Technology for Development*, Vol. 17, 61-80.

- KNACK, S. & KEEFER, P. 1997. Does social capital have an economic payoff: a cross country investigation. *The Quarterly Journal of Economics*, pp. 1251-85.
- KRIPPENDORFF, K. 2004. Content Analysis: An Introduction to Its Methodology. 2nd ed. Thousand Oaks: Sage Publications.
- KUMAR, R. & BEST, M. 2006. Social impact and diffusion of telecentre use: A study from the sustainable access in rural India project. *Journal of community informatics*.
- LANE, M. 1998. *The Effect of Management Commitment User Participation and Requirements Volatility on Software Development Productivity-An Australian Study*. Bachelor of Information Technology (Honours) Bachelor Degree University of Southern Queensland.
- LEECH, N. L., BARRETT, K. C. & MORGAN, G. A. 2008. *SPSS for Intermediate Statistics: Use and Interpretation*, New York, US, Taylor & Francis Group.
- LEONARD, R. & ONYX, J. 2003. Networking Through Loose and Strong Ties: An Australian Qualitative Study. *International Journal of Voluntary and Nonprofit Organizations*, vol. 14.
- LEWIS, B., TEMPLETON, G. & BYRD, T. 2005. A Methodology for Construct Development in MIS Research. *European Journal of IS*, Vol.14, 388-400.
- LIN, N. 2001. *Social Capital: Theory and Research*, New York.
- LOCH, K. D. & CONGER, S. 1996. Evaluating Ethical Decision Making and Computer Use. *Communication of the ACM*, 39, 74-83.
- LUTZ, -. M. B. 2005. Institutions, Social Capital and Economic Development in Africa: An Empirical Study. International Centre for Economic Research, ICER.
- MADON, S. 2004. Akshaya Media Launch: Publicity at the right time. August 2004 ed.
- MAHENDHIRAN, N. 2010. Determinants of the Digital Divide in Rural Communities of a Developing Country: The Case of Malaysia. FAGS.org.
- MAHENDHIRAN, N., HAN, G.-S., LEE, H. J., GOON, P. & MUDA, R. 2010. Determinants of the Digital Divide in Rural Communities of a Developing Country: The Case of Malaysia. *DEVELOPMENT AND SOCIETY*, 39, 139-162.
- MALONEY, W. A., SMITH, G. & STOKER, G. 2000. Social capital and associational life. In: SCHULLER, T. (ed.) *Social Capital: Critical Perspectives*. Oxford: Oxford University Press.
- MAN, H. E. D. D. H.-S. G., MINISTRY OF ENERGY, WATER & COMMUNICATIONS, MALAYSIA. 2008. *Introduction of Malaysian PID Social Entrepreneur's Club & Video Presentation* [Online]. KLCC, Kuala Lumpur Malaysia. Available: <http://www.e-asia.org/2008/pdf/eAsia2008ProgrammeSchedule.pdf> [Accessed November 2011].
- MANNION, J. 1996. Partnership, participation and capacity building: rural development based on local bottom-up strategies. *Leader Magazine*.
- MARKUS, M. L. & ROBEY, D. 1998. Information Technology and Organizational Change: Causal Structure in Theory and Research. *Management Science*, 34, 583-598.
- MASON, D. 2001. *Book Review: Community Informatics: Enabling Communities with Information and Communications Technologies*, Hershey, PA: Idea Group Publishing.

- MCGREGOR, S. L. T. & MURNANE, J. A. 2010. Paradigm, methodology and method: Intellectual integrity in consumer scholarship. *International Journal of Consumer Studies*, 34, 419-427.
- MCMC, M. C. A. M. C. 2009. 2009 Annual Report : Broadband Towards 1Malaysia.
- MCMC, M. C. M. C. 2008. *Facts and Figure-Internet Subscriber 2008* [Online]. Available: <http://www.mcmc.gov.my/facts/stats/index.asp>. Statistical Brief, no.7].
- MEWC, M. O. E. W. C. 1998. *Telecentre-RIC project plan* [Online]. Available: <http://www.ktak.gov.my>.
- MEWC, M. O. E. W. C. 2006. *Pusat Internet Desa (RIC) Introduction: Brief* [Online]. Available: <http://www.ktak.gov.my>.
- MICROSOFT CORPORATION 2002. Expert Group Meeting on Information and communication technology (ICT) for Rural poverty reduction: Developing national policies. 28-29 January ed.: UNESCAP.
- MILLER, P. B. 2013. From the Digital Divide to Digital Inclusion and Beyond: Update on Telecentres and Community Technology Centers (CTCs)
- MMDG 2010. The Malaysian Millennium Development Goals at 2010. In: EPU, E. P. U. & UN, U. N., MALAYSIA (eds.). Kuala Lumpur, Malaysia: UN.
- MOHAMMAD, M. 1998. The Seventh Malaysia Plan 1996-2000. In: (EPU), E. P. U. (ed.). Putrajaya, Malaysia Prime Minister's Office.
- MORGAN, R. M. & HUNT, S. D. 1994. The Commitment-Trust Theory of Relationship Marketing. *Journal of Marketing* 58, 20-38.
- MRRD, M. O. R. A. R. D. CHALLENGES IN BRINGING ICT TO THE RURAL COMMUNITIES: TRANSFORMING RURAL COMMUNITY TOWARDS K-SOCIETY. ASEAN SHORT COURSE 2010, 27th – 29th September 2010 2010 Kuala Lumpur, Malaysia. ASEAN SECRETARIAT.
- MURRAY, B., MURRAY, C. & BROOKS, S. 2001. Training Telecentre Managers, Staff and Users. In: COLIN, L. & DAVID, W. (eds.) *PERSPECTIVES ON DISTANCE EDUCATION Telecentres: Case studies and key issues*. Vancouver: The Commonwealth of Learning.
- NATIONAL ICT MASTER PLAN, -. E. T. 2010. Strategic Framework for Bridging the Digital Divide 2008-2010. In: THE MINISTRY OF INFORMATION AND COMMUNICATION TECHNOLOGY, T. (ed.).
- NHS 2007. How to change practice: Understand, Identify and Overcome Barriers to Change. Holborn, London WC: National Institute for Health and Clinical Excellence.
- NITC MALAYSIA. 2011. *Malaysia Information Technology Report Q1 2011* [Online]. Ministry of Science, Technology & Innovation (MOSTI) Malaysia. Available: <http://www.nitc.my/newsmaster.cfm?&menuid=36&action=view&retrieveid=65>
<http://www.reportlinker.com/p0178051/Malaysia-Information-Technology-Report-Q1.html#ixzz1EtM02O1X> 2011].
- O'NEIL, D. 2002. Assessing community informatics: A review of methodological approaches for evaluating community networks and community technology centers. *Internet Research: Electronic Networking Applications and policy*, 12(1), 76-102.
- OECD 1998. Human Capital Investment - An International Comparison. In: ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, O. (ed.). Paris.

- OECD. Social Capital the Challenge for International Measurement. Summary of proceedings from the United Kingdom Office for National Statistics and the OECD conference on Social Capital the Challenge for International Measurement., September 2002 London, United Kingdom.
- OLANREWAJU, S. A. & FALOLA, T. 1992. *Rural development problems in Nigeria*, Avebury.
- ONYX, J. & BULLEN, P. 1997. Measuring Social Capital in Five Communities in NSW. *A Practitioner's Guide*. Coogee, Australia: Management Alternatives Pty. Ltd.
- PATTON, M. Q. 1997. *Utilization Focused-Evaluation: The new century text*, Thousand Oaks, CA, Sage.
- PHILLIPS, R. & PITTMAN, R. (eds.) 2008. *An Introduction to Community Development*: Taylor & Francis.
- PIERCE, J. C. & LOVRICH JR, N. P. 2003. Internet Technology Transfer and Social Capital: Aggregate and Individual Relationships in American Cities. *Comparative Technology Transfer and Society*, 1, 49-71.
- PIGG, K. E. 2003. Applications of Community Informatics for Building Community and Enhancing Civic Society. *Information, Communication and Society*, Volume 4, pp 507-527.
- PIGG, K. E. & CRANK, L. D. 2004. Building community social capital: The potential and promise of information and communications technologies. *Journal of community informatics*, 1, 58-75.
- PORTES, A. 1998. Social Capital: Its Origin and Applications in Modern Sociology.
- PORTES, A. 2000. The Two Meanings of Social Capital.
- PRADO, P. & JANBEK, D. M. 2013. Telecenter Web Portals in Latin American and Arab Nations: A Comparative Analysis. *Journal of community informatics*, 9.
- PROADPRAN, P., SUCHAI, T. & AJIN, J. Thailand's National Digital Divide Strategic Framework. W4A2008-Communication-Co-located with the 17th International World Wide Web Conference, 21-22 April 2008 2008 Beijing, China. ACM, 97-100.
- PROENZA, F. J., BASTIDAS-BUCH, R. & MONTERO, G. 2001. Telecentres for Socioeconomic and Rural Development in Latin America and the Caribbean: Investment Opportunities and Design Recommendations, with special reference to Central America. . Washington D.C.: Inter-American Development Bank.
- PUTNAM, R. 2000. *Bowling Alone: the collapse and revival of American Community*, New York.
- PUTNAM, R. D. 1993. The Prosperous Community. *American Prospect*.
- PUTNAM, R. D. 1995a. Bowling Alone: America's Declining Social Capital. *Journal of Democracy*, 6(1), 65-78.
- PUTNAM, R. D. 1995b. Tuning In, Tuning Out: The Strange Disappearance of Social Capital in America. *Political Science and Politics*, 28(4), 664-683
- QUALITY OF LIFE RESEARCH UNIT 1991. QOL Concepts: The Quality of Life Model. Centre for Health Promotion, University of Toronto.
- QUAN-HAASE, A. & WELLMAN, B. 2004. *How does the Internet affect social capital?*, Cambridge, The MIT Press.
- QUELLO, S. & TOFF, G. 2006. "Economic Gardening: next generation applications for a balanced portfolio approach to economic growth". *The small business economy*. December 2006 ed.: United States Small Business Administration (2006).

- RAO, S. 2003. Information Systems in Indian Rural Communities. *The Journal of Computer Information Systems*, 44, 48.
- RAO, T. P. R. 2004. ICT and e-Governance for Rural Development. In: CENTER FOR ELECTRONIC GOVERNANCE, I. I. O. M., AHMEDABAD, ed. Governance in Development: Issues, Challenges and Strategies, December 2004 2004 Anand, Gujarat, India. India: Institute of Rural Management, 13.
- RAUL, R. 2000. Towards a Training Framework for Telecenter Managers. Ithaca, NY.: Cornell University.
- RAUL, R. & COLLE, R. D. 2002. Themes and Issues in Telecentre Sustainability. *Development Informatics*. Manchester, UK: Institute for Development Policy and Management, University of Manchester, UK.
- RIC PAGO JOHOR 2010. Annual Report 2010. In: MANAGER, T. R. (ed.) *RIC Annual Report*. Pagoh: RIC.
- RICHARDSON, D. & PAISLEY, L. 1998. The First Mile of Connectivity. Advancing Telecommunications for Rural Development Through a Participatory Communication Approach.
- ROBSON, C. 2002. Real world research. 2nd ed. Oxford: Blackwell.
- ROMER, P. M. 2007. Economic Growth.
- ROTHENBERG-AALAMI, J. & PAL, J. 2005. Rural Telecenter Impact Assessments and the Political Economy of ICT of Development (ICT4D). *Berkeley Roundtable on the International Economy*. Berkeley, California US: University of California.
- ROUX, L. C. J. B. 2010. Social informatics vs community informatics : a brief overview of their origins and current status. *Mousaion* [Online], 28. Available: http://www.sabinet.co.za/abstracts/mousaion/mousaion_v28_n1_a3.html.
- SABATINI, F. 2005. The Empirics of Social Capital & Economic Development: A Critical Perspective. *Economic Papers*, 30.
- SABATINI, F. 2007. The Empirics of Social Capital and Economic Development: A Critical perspective. In: OSBORNE, M., SANKEY, K. & WILSON, B. (eds.) *Social Capital, Lifelong Learning and The Management of Place: An International Perspective*. London & New York: Routledge.
- SABATINI, F. 2008. Social Capital and The Quality of Economic Development. *KYKLOS-International Review for Social Sciences*, 61, 466-499.
- SAUNDERS, M., LEWIS, P. & THORNHILL, A. 2009. *Research Methods for Business Students*.
- SCHULLER, T., BARON, S. & FIELD, J. 2000. *Social capital: a review and critic.*, Oxford, Oxford University Press.
- SELVARATNAM, P. D. & TIN, B. P. 2001. Progress of Community Development in Malaysia. *Humanomics*, 17, 77 - 85.
- SERVON, L. J. 2002. *Bridging the Digital Divide: Technology, Community, and Public Policy*, London, Blackwell Publishers.
- SHAMSUL, A. B. 1986. From British to Bumiputra Rule: Local Politics and Rural Development in Peninsular Malaysia. Singapore: Institute of Southeast Asian Studies.
- SHENG, Y. K. Urban Challenges in South-East Asia. Paper presented at the 5th Asia-Pacific Urban Forum, 22-24 June 2011 2011 United Nations Conference Centre Bangkok, Thailand. Organized by the UN Economic and Social Commission for Asia and the Pacific (UN ESCAP).

- SHORT, G. 2001. THE WESTERN AUSTRALIA TELECENTRE NETWORK (WATN). In: COLIN, L. & DAVID, W. (eds.) *PERSPECTIVES ON DISTANCE EDUCATION Telecentres: Case studies and key issues*. Vancouver: The Commonwealth of Learning.
- SILVERMAN, D. 1993. Part one: theory and method in qualitative research. "Beginning Research". *Interpreting Qualitative Data. Methods for Analysing Talk, Text and Interaction*. UK: Londres: Sage Publications.
- SILVERMAN, D. 1998. Qualitative Research: Meanings or practice? *Information Systems Journal*, 8(1), 3-20.
- SIMPSON, L. 2001. Community Informatics and Sustainability: Why Social Capital Matters. *The Journal of Community Informatics*, Vol.1, 1-20.
- SIMPSON, L. 2005. Community Informatics and sustainability: Why social capital matters. *Journal of Community Informatics*, 1, 102-119.
- SINCERO, S. M. 2012. Pilot survey. 21 Jan 2012 ed.
- SINGH, K. 2006. *Rural Development: Principles, Policies and Management*, Sage Publications.
- SOLOW, R. 1957. Technical Change and the Aggregate Production Function. *Review of Economics and Statistics* 39.
- SONGAN, P., AB HAMID, K., YEO, A., GNANIAH, J. & ZEN, H. 2004. Community Informatics: Challenges in Bridging the Digital Divide. Kuala Lumpur.
- STEYN, J., VAN BELLE, J.-P. & MANSILLA, E. V. 2011. *ICTs for Global Development and Sustainability: Practice and Applications*, IGI Global.
- SUMBWANYAMBE, M. 2011. Challenges and proposed solutions towards telecentre sustainability: A Southern Africa case study. In: NEL, A. C., W. (ed.) *IST-Africa Conference*. Gaborone: IST-Africa Conference Proceedings, 2011.
- TABACHNICK, B. & FIDELL, L. 2009. *Using Multivariate Statistics*, Boston, Allyn and Bacon.
- TABACHNICK, B. & FIDELL, L. 2012. *Using Multivariate Statistics*, Pearson Hill.
- TALBOT, L. & VERRINDER, G. 2005. *Promoting health: the primary health care approach*, Elsevier Australia.
- TELECENTRE.ORG 2006. <http://telecentrecommunity.ning.com/notes/History>. www.telecentre.org.
- TELECENTRE.ORG. 2009. *MSSRF workshop on 'Telecentre Managers for Strengthening the Capacity of Social Entrepreneurship'* [Online]. Available: <http://community.telecentre.org/profiles/blogs/mssrf-workshop-on-telecentre> 2010].
- TELECENTRE.ORG 2011. Annual Report: A review of the year 2011. Quezon City, Phillipines: Telecentre org Foundation.
- TELECENTRE.ORG 2012. Telecentre Magazine.
- TEMPLE, J. 1999. The new growth evidence. *Journal of Economic Literature*, vol.37, pp. 112-56.
- THIRUNAU KARASU, S., MOHAMMAD RADUAN, M. A. & PRAKASH, A. 2011. Employment Aspects of Indian Foreign Workers in Manufacturing Sector in Malaysia. . *Man and Society Journal*, 21, 76-96.
- UN-APCICT. 2010. *United Nations-Asia and Pacific Training Centre for ICT for Development* [Online]. Korea: UN-ESCAP. Available: <http://www.unapcict.org/ecohub/resources/browse-resources/telecentres> [Accessed 3 December 2011 2011].

- UN, U. N. 1959. *Aspects of national community development programmes in Asia: four papers prepared by United Nations consultants*, United Nations.
- UN, U. N. 2001. REDUCING DISPARITIES: BALANCED DEVELOPMENT OF URBAN AND RURAL AREAS AND REGIONS WITHIN THE COUNTRIES OF ASIA AND THE PACIFIC. In: PACIFIC, E. A. S. C. F. A. A. T. (ed.). New York: UN.
- UN, U. N. 2006. *Encyclopedia Britannica*.
- UNCTAD, U. N. C. O. S. A. T. F. D. 2011. Implementing WSIS Outcomes: Experience to date and prospects for the future. May 2011 ed.: UN-World Summit on the Information Society.
- UNDP 2001. Human Development Report 2001. *Making Technologies Work for Human Development*. Washington, D.C.
- UNDP, U. N. D. P. 2004. A National Strategic Framework for Bridging the Digital Divide. Putrajaya, Malaysia: Economic Planning Unit, Government of Malaysia.
- UNDP, U. N. D. P. 2010. Millennium Development Goals (MDG). In: UN, U. N. (ed.).
- UNESCAP. 2006. *Expert Group Meeting on Information and Communication Technology (ICT) for Rural Poverty Reduction: Developing National Policies* [Online]. Bangkok. [Accessed 8 January 2009 2009].
- UNIVERSITY OF WISCONSIN, E. O. P. 2003. Enhancing program performance with logic models.
- VAN DEN BERG, H. 2001. How well does Solow's Model explain economic growth? *Economic Growth and Development*. McGraw Hill Irwin, Boston.
- VENKATESH, V., MORRIS, M. G., DAVIS, G. B. & DAVIS, F. D. 2003. User acceptance of information technology: towards a unified view. *MIS Quarterly*, 27(3), 425-478.
- VIJAYALETCHUMY, S., WAN MOHAMMAD, W. M. R. & DANI, N. A. 2011. Economic System of Malay Community: Self Sufficiency to Commercial Economic Level. *International Journal of Business and Social Science*, 2, 216-220.
- W.K. KELLOGG, F. 1998. Logic Model Evaluation Handbook. Michigan USA.
- W.K. KELLOGG, F. 2004. Using Logic Models to Bring Together Planning, Evaluation, and Action Logic Model Development Guide. Michigan, USA.
- WECH-O-SOTSAKDA, C. 2008. *ICT in Community-Based Lifelong Learning Center: Model for Northeast Thailand*. Doctor of Philosophy PhD Thesis, Auckland University of Technology.
- WEISS, C. H. 1998. *Evaluation: methods for studying programs and policies*, Upper Saddle River, NJ, Prentice Hall.
- WHATIS.COM 2005. Definition on Digital Divide.
- WILLIAMS, K. & DURRANCE, J. C. 2008. Social Networks and Social Capital: Rethinking Theory in Community Informatics. *The Journal of Community Informatics*, Vol.4, 1-32.
- WILLIAMS, K. H. 2005. *Telecentres and the provision of community based access to electronic information in everyday life*.
- WILLS, J., PARKER, M. & WILLS, G. 2009. Social and Community Informatics and Social Theories of Networks. Southampton, United Kingdom: University of Southampton.
- WOODHOUSE, A. 2006. Social Capital and economic development in regional Australia: A case study. *Journal of Rural Studies*, 22, 83-94.

- WOOLCOCK, M. & NARAYAN, D. 2000. Social Capital: Implications for Development Theory, Research, and Policy. The World Bank Research Observer.
- WORLD BANK 1999. Knowledge for Development. *World Development Report 1998-99*. Oxford.
- WORLD BANK 2002. www.worldbank.org/poverty/scapital.
- WORLD BANK 2006. Understanding Socio-economic and Political Factors to Impact Policy Change The World. In: DEPARTMENT, S. D. (ed.). Washington, D.C., 20433, USA: The International Bank for Reconstruction and Development.
- WORLD BANK 2010. Malaysian Rural Population (% of total population). In: BANK, W. D. (ed.) 15 December 2011 ed.: World Bank Group.
- YANG, S., LEE, H. & KURNIA, S. 2009. Social Capital in Information and Communications Technology Research: Past, Present, and Future. *Communications of the Association for Information Systems*, 25, 183-220.
- YIN, R. K. 2003. Case study research design and methods. 3rd ed. Thousand Oaks, CA: Sage Publications, Inc.
- ZAITUN AB & CRUMP B 2005. Overcoming the Digital Divide – A Proposal on How Institutions of Higher Education Can Play a Role. *Malaysian Online Journal of Instructional Technology*, vol.2.
- ZHANG, S., ANDERSON, S. G. & ZHAN, M. 2011. The differentiated impact of bridging and bonding social capital on economic well-being: An individual level perspective. *Journal of sociology and social welfare* XXXVIII.
- ZIKMUND, W. G. 1991. *Business Research Methods*, Chicago, The Dryden Press.
- ZULKEFLI, I. & SULAIMAN, A. 2013. Community Technology Project in Malaysia: Kedai.Kom. *Journal of community informatics*, 9.

APPENDICES

APPENDIX 1: Secondary data on rural/urban household use of Internet/ by states

Figure 1: Rural/Urban Household use of Internet (Secondary data)

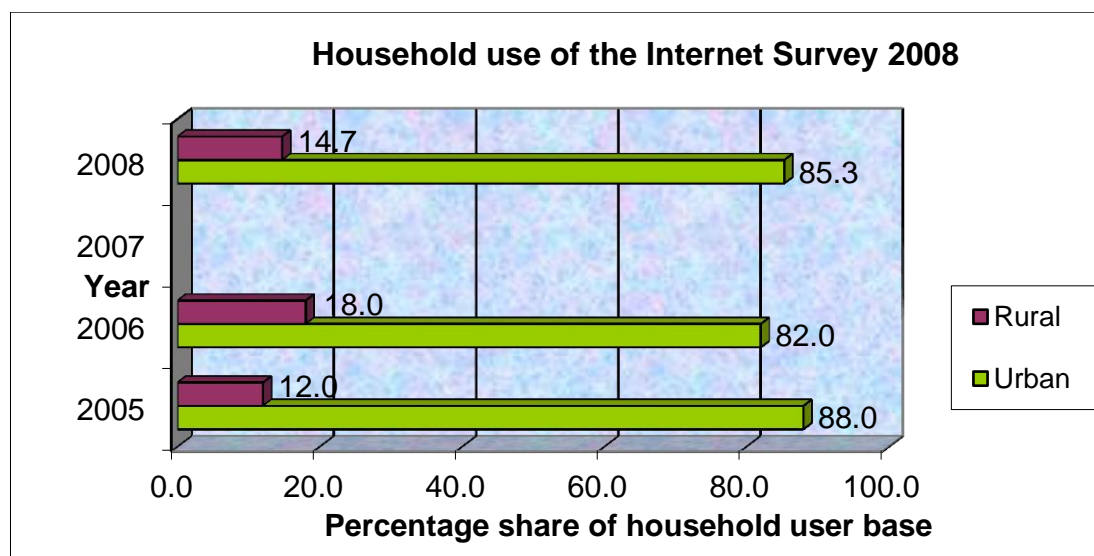


Figure 1: Household use of Internet by strata

Source: Statistical brief, no.7, Malaysian Communications and Multimedia Commission

Figure 2: Household use of Internet by states (Secondary data)

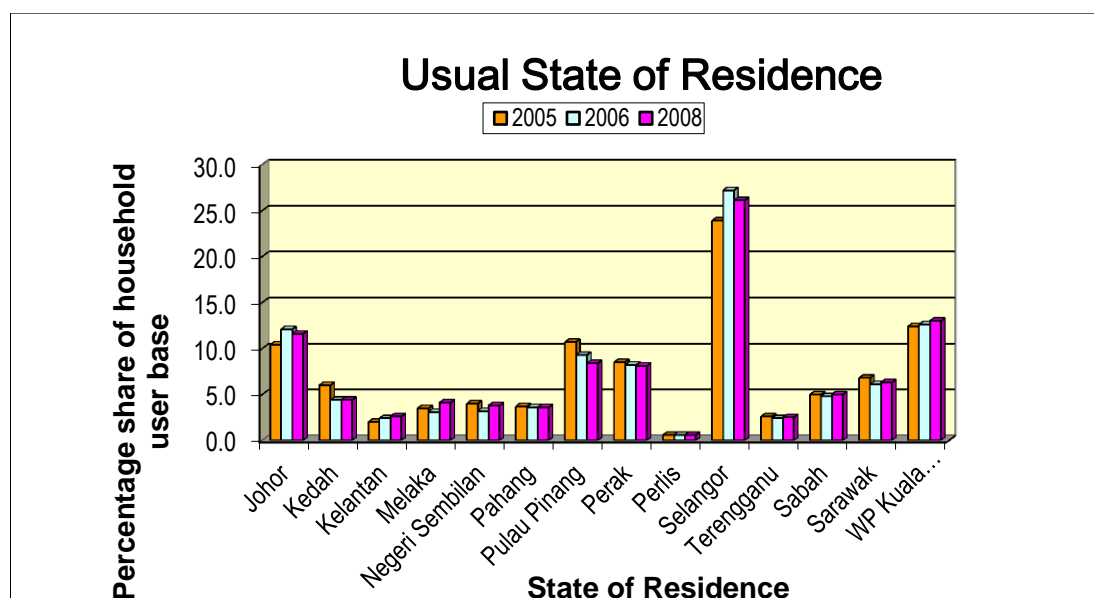


Figure 2: Household use of Internet by states

Source: Statistical brief, no.7, Malaysian Communications and Multimedia Commission

APPENDIX 2: Districts of Malaysia (Secondary data)

Table 1: Distribution of Regions, States and Districts of Malaysia

Regions	States	Districts
Northern	(1) Kedah	(1a) Baling (1b) Bandar Baharu (1c) Kota Setar (1d) Kuala Muda (1e) Kubang Pasu (1f) Kulim (1g) Pulau Langkawi (1h) Padang Terap (1i) Pendang (1j) Pokok Sena (1k) Sik (1l) Yan*
	(2) Penang (Pulau Pinang)	(2a) Penang Island (2b) Seberang Perai (Mainland)
	(3) Perak	(3a) Batang Padang (3b) Hilir Perak (3c) Hulu Perak (3d) Kampar (3e) Kerian (3f) Kinta (3g) Kuala Kangsar (3h) Larut, Matang dan Selama (3i) Manjung (3j) Perak Tengah
	(4) Perlis	(4a) Perlis
	(1) Kelantan	(1a) Bachok (1b) Gua Musang (1c) Jeli (1d) Kota Baharu (1e) Kuala Krai* (1f) Machang (1g) Pasir Mas (1h) Pasir Puteh (1i) Tanah Merah (1j) Tumpat
Eastern	(2) Pahang	(2a) Bentong (2b) Bera (2c) Cameron Highlands (2d) Jerantut (2e) Kuantan (2f) Lipis (2g) Maran (2h) Pekan (2i) Raub (2j) Rompin (2k) Temerloh
	(3) Terengganu	(3a) Besut (3b) Dungun (3c) Hulu Terengganu (3d) Kemaman (3e) Kuala Terengganu

		(3f) Marang* (3g) Setiu
Central	(1) Malacca (Melaka)	(1a) Alor Gajah (1b) Melaka Tengah (1c) Jasin
	(2) Negeri Sembilan	(2a) Jelebu (2b) Jempol (2c) Kuala Pilah (2d) Port Dickson (2e) Rembau (2f) Seremban (2g) Tampin
	(3) Selangor	(3a) Gombak (3b) Hulu Langat* (3c) Hulu Selangor (3d) Klang (3e) Kuala Langat (3f) Kuala Selangor (3g) Petaling (3h) Sabak Bernam (3i) Sepang
Southern	(1) Johor	(1a) Batu Pahat (1b) Johor Bahru (1c) Kluang (1d) Kota Tinggi (1e) Mersing (1f) Muar (1g) Pontian (1h) Segamat (1i) Kulaijaya (1j) Ledang
Borneo/East Malaysia	(1) Sabah	(1a) Interior Division (1b) Kudat Division (1c) Sandakan Division (1d) Tawau Division (1e) West Coast Division
	(2) Sarawak	(2a) Betong Division (2b) Bintulu Division (2c) Kapit Division (2d) Kuching Division (2e) Limbang Division (2f) Miri Division (2g) Mukah Division (2h) Samarahan Division (2i) Sarikei Division (2j) Sibu Division (2k) Sri Aman Division

*Note: *RIC Locations in the Districts*

Source: adapted from Wikipedia and developed for this study 2011

RIC regions/locations/states

Table 2:RIC locations/regions/states (adapted from RIC Pagoh, Johor (2010))

1	Simpang Empat/ Northern/ Perlis	8	Selama/ Northern/ Perak	15	Marang/ Eastern/ Terengganu	22	Beranang/ Central/ Selangor	29	Tanjung Keling/ Central/ Malacca	36	Kota Marudu/ Borneo/ Sabah
2	BukitKayu Hitam/ Northern/ Kedah	9	Kuala Kurau/ Northern/ Perak	16	Kuala Besut/ Eastern/ Terengganu	23	Tanjung Sepat/ Central/ Selangor	30	Labis/ Southern/ Johor	37	Kota Belud/ Borneo/ Sabah
3	Kuala Nerang/ Northern/ Kedah	10	Parit/Northern/ Perak	17	Sungai Koyan/ Eastern/ Pahang	24	Sg. Pelek/ Central/ Selangor	31	Pagoh/ Southern/ Johor	38	Tenom/ Borneo/ Sabah
4	Yan/ Northern/ Kedah	11	Langkap/ Northern/Perak	18	Bukit Goh/ Eastern/ Pahang	25	Sg.Air Tawar/ Central/ Selangor	32	Sg. Mati/ Southern/ Johor	39	Mukah/ Borneo/ Sarawak
5	Kupang/ Northern/ Kedah	12	Tanjung Malim/Northern/ Perak	19	BandarTun Razak/ Eastern/ Pahang	26	Lenggeng/ Central/ Negeri Sembilan	33	Seri Medan/ Southern/ Johor	40	Song/ Borneo/ Sarawak
6	Tasek Gelugor/ Northern/ Penang	13	Kuala Balah/ Eastern/ Kelantan	20	Rasa/ Central/ Selangor	27	Bandar Seri Jempol/ Central/ Negeri Sembilan	34	Bandar Tenggara/ Southern/ Johor	41	Betong/ Borneo/ Sarawak
7	Balik Pulau/ Northern/ Penang	14	Kuala Krai/ Eastern/ Kelantan	21	Hulu Langat/ Central/ Selangor	28	Kota/ Central/ Negeri Sembilan	35	Bandar Penawar/ Southern/ Johor	42	Bau/ Borneo/ Sarawak

APPENDIX 3: Regions descriptive statistics

Table 1: Area and population, Malaysia, 2010

Area	Sq. Km.
Malaysia	330,803
Peninsular Malaysia	132,631
Sabah & Labuan	73,722
Sarawak	124,450

Population	Unit	2010
Malaysia		
Number (Mid-year)	mil	28.3
Growth	% p.a.	1.3
Density	Per sq.km.	85.0

Table 2: Average percentage distribution of household income, Malaysia (RM) 2009

% distribution of household income/stratum	< 1,000	1,000-2,999	3,000-4,999	5,000 and above	
Rural	15.2%	58.8%	15.8%	10.3%	
Mean of monthly household income by regions	Northern RM 2,680	Eastern RM 1,862	Central RM 2,760	Southern RM 1,100	Borneo RM 903

Table 3: Number of employed persons by stratum and gender, Malaysia, 2010 ('000)

Stratum	Total	Male	Female
Rural	3,557.8	2,412.1	1,145.7
Total	11,129.4	7,112.1	4,017.3

Table 4: Number of employed persons by educational attainment and gender, Malaysia, 2010 ('000)

Educational attainment	Total	Male	Female
No formal education	401.9	228.2	173.7
Primary	1,861.1	1,292.9	568.2
Secondary	6,178.9	4,148.2	2,030.7
Tertiary	2,687.5	1,442.9	1,244.6

Table 5: Average percentage distribution of households by items used, regions and rural, Malaysia, 2009(%)

Regions/Rural	Personal computer	Internet subscription
Northern	61.7	24.8
Eastern	40	13.9
Central	60.9	26.9
Southern	21.7	9.3
Borneo	22	7.05

Notes: Population is based on 2000 Population Census

Sources: Economic Planning Unit & Department of Statistics (2010)

APPENDIX 4: Online questionnaire



Section 1: You & Your RIC

Q1 Are you a registered member of RIC?

- ☐ Yes
- ☐ No

Q2 On average how many hours a week do you use the internet?

- ☐ 1 to 5 hours
- ☐ More than 5 hours to 9 hours
- ☐ More than 9 hours to 13 hours
- ☐ More than 13 hours to 17 hours
- ☐ More than 17 hours to 21 hours
- ☐ More than 21 hours

Q3 In what year did you start using the internet?

before 2000	▲
2000	
2001	
2002	
2003	
2004	▼

[Click here to edit choices](#)

Q4 In what year did you start using the RIC?

2003	▲
2004	
2005	
2006	
2007	
2008	▼

[Click here to edit choices](#)

Q5 Which of the following best describes your internet skills? (For example for sending and receiving messages or searching for information)

Non-existent
Beginner
Intermediate
Advanced
Do not know

[Click here to edit choices](#)

Q6 Computer comfortability:

INSTRUCTIONS: Please read each item below and respond to it by choosing one of the responses on the scale from (1) to (7).

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I feel that challenge of learning about computer is exciting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am confident that I can learn computer skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anyone can learn to use a computer if they are patient and motivated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that learning to operate computers is like learning any new skill-the more you practice, the better you become	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I will be able to keep up with the advances happening in the computer field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have difficulty in understanding the technical aspects of computers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It scares me to think that I could cause the computer to destroy a large amount of information by hitting the wrong key	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I hesitate to use a computer for fear of making mistakes that I cannot correct	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like to learn about and use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Strongly Disagree (1) Disagree (2) Somewhat Disagree (3) Neither Agree nor Disagree (4) Somewhat Agree (5) Agree (6) Strongly Agree (7)

computers

I feel computers are necessary tools in both educational and work settings

☐ ☐ ☐ ☐ ☐ ☐ ☐

Q7 Would you be interested in receiving training to improve your internet skills?

- ☐ Yes
☐ No

Q8 What types of training are provided by the RIC?

Please check all that apply.

- ☐ Basic computer/ICT training
☐ Training on Microsoft Office
☐ Basic computer training during school holiday
☐ ICT/computer training for senior citizen/elderly
☐ Other:

Q9 Where do you use the internet most frequently?

- ☐ Home
☐ Work
☐ Friend/Family's house
☐ School/college
☐ Cybercafé
☐ Library (public)
☐ RIC
☐ Mobile
☐ Do not know

Q10 Have you used the RIC to obtain any of the following information?

(This question is about the information that you obtained from using the RIC)

Never Less than Once a Month Once a Month 2-3 Times a Month Once a Week 2-3 Times a Week Daily

Information on ☐ ☐ ☐ ☐ ☐ ☐ ☐

	Never	Less than Once a Month	Once a Month	2-3 Times a Month	Once a Week	2-3 Times a Week	Daily
training/learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information on job opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information about business prospects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information on local events	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Distance learning from home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information on government services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information on 'My health'	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q11 Which of the following activities have you used the RIC for?

(This question is about the activities that you used for RIC)

	Never	Almost never	Rarely	Do not know	Sometimes	Quite often	Very often
Sending & receiving emails	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning, education & training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online shopping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Entertainment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online banking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creating web pages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social networking (social interaction)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q12 What motivates you to use the RIC?

Please check all that apply.

- ☐ Encouragement of friends/family members
- ☐ Encouragement of the supervisor
- ☐ Advertisement/promotion by the community committee
- ☐ Benefits from the services provided
- ☐ Convenient location of centre
- ☐ Other:

Q13 If the internet was to disappear tomorrow what would you miss most?



Q14 Which of the following RIC services did you use most frequently?

Please check all that apply.

- | | |
|--|--|
| <input type="checkbox"/> communication service (telephone calls, emails and internet access) | <input type="checkbox"/> information service (internet searches and information services, e.g.: government information/local events) |
| <input type="checkbox"/> computing service (word-processing, web page design and on-line banking facilities) | <input type="checkbox"/> info mediation service (a community member who is illiterate, or advanced in age, is unable to use the computer without assistance) |
| <input type="checkbox"/> training & education service (basic computer training) | <input type="checkbox"/> other: <input type="text"/> |
| <input type="checkbox"/> basic office service (printing, scanning, binding, laminating and photocopying) | |

Q15 How frequently do you and members of household use the RIC?

	Never	Less than Once a Month	Once a Month	2-3 Times a Month	Once a Week	2-3 Times a Week	Daily
Parents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Siblings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grandparents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
other: (someone in your household besides these members)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="text"/>							

Q16 Since you use the RIC, what type/(s) of contacts have you made and how many?

Please check all that apply.

- | | |
|--|----------------------|
| <input type="checkbox"/> Business contacts | <input type="text"/> |
| <input type="checkbox"/> Social contacts within community | <input type="text"/> |
| <input type="checkbox"/> Social contacts outside community | <input type="text"/> |
| <input type="checkbox"/> Other: | <input type="text"/> |

Q17 How often do you meet your online friends/contacts?

- ☐ Daily

- ☐ Weekly
- ☐ Monthly
- ☐ Yearly
- ☐ Never
- ☐ Other:

Q18 Are you aware of Social Entrepreneurs Club?

- ☐ Yes
- ☐ No

Q19 Are you a member of this club?

- ☐ Yes
- ☐ No

(If your answer for Q19 is No, please proceed to Section 2).

Q20 What are the benefits that you gain from this club?

Please check all that apply.

- | | |
|---|---|
| <input type="checkbox"/> having more social relationships | <input type="checkbox"/> access to production information |
| <input type="checkbox"/> having business networks | <input type="checkbox"/> access to market information |
| <input type="checkbox"/> access to employment opportunities | <input type="checkbox"/> access to finance |

Section 2: Importance of RIC

Q21 This is to know and understand your strength of relationships at RIC (within RIC):

INSTRUCTIONS: Please read each item below and respond to it by choosing one of the responses on the scale from (1) to (7).

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
The usage of RIC results in strong relationship between the users (within RIC community).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are several people online I trust to help solve my problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is someone online I can turn to for advice about making very	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
important decisions							
There is no one online that I feel comfortable talking to about intimate personal problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I feel lonely, there are several people online I can talk to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My interaction online would be a good job references for me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not know people online well enough to get them to do anything important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q22 This is to know and understand your strength of relationships outside RIC:

INSTRUCTIONS: Please read each item below and respond to it by choosing one of the responses on the scale from (1) to (7).

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
RIC usage brings more contact outside RIC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interacting with people online makes it easy for me to hear about new jobs opportunity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interacting with people online makes me interested in things that happen outside of my town	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interacting with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
people online makes me want to try new things							
Interacting with people online makes me having more business contacts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am willing to spend time to support general online community activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online, I come in contact with new people all the time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online relationships are just as strong as my relationships within the community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q23 Have you found a job through the RIC? (If you answered No to this question, go to Q26)

- ☐ Yes
- ☐ No

Q24 Did the job increase your income?

- ☐ Yes, why?
- ☐ No, why not?

Q25 Did the job increase your knowledge & skills?

- ☐ Yes, why?
- ☐ No, why not?

Q26 Are you satisfied with the services provided at the RIC?

INSTRUCTIONS: Please read each item below and respond to it by choosing one of the responses on the scale from (1) to (7).

	Very Dissatisfie d (1)	Dissatisfie d (2)	Somewhat Dissatisfie d (3)	Neutra l (4)	Somewha t Satisfie d (5)	Satisfie d (6)	Very Satisfie d (7)
communication service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very Dissatisfied (1)	Dissatisfied (2)	Somewhat Dissatisfied (3)	Neutral (4)	Somewhat Satisfied (5)	Satisfied (6)	Very Satisfied (7)
(telephone calls, emails and internet access)							
computing service (word-processing, web page design and on-line banking facilities)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
training & education service (basic computer training)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
basic office service (printing, scanning, binding, laminating and photocopying)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
information service (internet searches and information services, e.g.: government information/local events)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
info mediation service (a community member who is illiterate, or advanced in age, is unable to use the computer without assistance)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
speed and reliability of RIC Internet access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

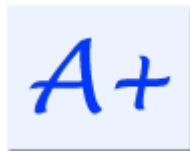
Q27 What do you hope most to gain from using the RIC?

Q28 Do you think RIC will improve:-

INSTRUCTIONS: Please read each item below and respond to it by choosing one of the responses on the scale from (1) to (7).

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
Your income	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your education attainment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your employment prospects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your social relationships in RIC community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your social relationships with people in other communities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q29



Overall, what do you think about the RIC performance?

Section 3: About you

Q30 Age

- ☐ Under 20
- ☐ 20-30
- ☐ 31-40
- ☐ 41-50
- ☐ 51-60
- ☐ 61-70
- ☐ 71-80
- ☐ Over 80

Q31 Gender

- ☐ Male

☐ Female

Q32 Please indicate your highest level of education

- ☐ Never attended school
- ☐ Finished grade 6 (primary school)
- ☐ SRP
- ☐ SPM
- ☐ STPM/Diploma
- ☐ Bachelor Degree
- ☐ Master Degree or higher

Q33 What is your ethnicity?

- ☐ Malay
- ☐ Chinese
- ☐ Indian
- ☐ Other:

Q34 Are you employed?

- ☐ Earned monthly income/wage
- ☐ Self-employed
- ☐ Home duties/chores
- ☐ Student
- ☐ Retired

Q35 Are you renting your accommodation?

- ☐ Yes
- ☐ No

Q36 How long have you lived in your local area?

Q37 Who do you live with?

- ☐ Alone
- ☐ Just partner
- ☐ Just children
- ☐ Partner and children
- ☐ Extended or blended family
- ☐ Friends

☐ Other:

Q38 What is the main source of income for your household?

- ☐ Wages or salary
- ☐ Pension or benefit
- ☐ Other:

Q39 What is your current income?

- ☐ Less than RM1, 000
- ☐ RM1, 001 to RM2, 000
- ☐ RM2, 001 to RM3, 000
- ☐ RM3, 001 to RM4, 000
- ☐ RM4, 001 to RM5, 000
- ☐ RM5, 001 or more

Q40 Social relationships:

INSTRUCTIONS: Please read each item below and respond to it by choosing one of the responses on the scale from (1) to (7).

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I have attended a local community event recently	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am an active member of a local organisation or club other than RIC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My local community feel like home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have make online conversations with friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do go outside my local community to visit my family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am a management committee for the RIC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have been part of a project to organise a new	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

			Neither			
Strongly	Disagree	Somewhat	Agree	Somewhat	Agree	Strongly
Disagree	(2)	Disagree	nor	Agree	(5) (6)	Agree
(1)		(3)	Disagree	(4)		(7)

service in my area

Q41 Which RIC user are you?

[Click here to edit choices](#)

APPENDIX 5: Interviews and site visits schedule at MICC, WG and RICs

JADUAL TARIKH LAWATAN & INTERVIEW DI KPKK, WG & PID – 2010 (SITE VISITS AND INTERVIEWS SCHEDULE AT MICC, WG & RICS – 2010)

Tarikh & Masa (Date & Time)	Contact Persons:	Lokasi/PID (Location/RIC)	Tujuan (Purpose/reasons)
22nd Feb.2010 (Mon.) Masa(Time): Jam 10 pagi (10 a.m.)	(1) Pn Faudziah binti Mohd Amin - KPSU(JD) Communication Sector, Ministry of Information, Communications and Culture <i>Kementerian Penerangan, Komunikasi dan Kebudayaan</i> Tel: 603-26127614 @ 03-26123614 @ 03 – 2612 8202 email: faudziah@kpkk.gov.my (2) En Shamsul bin A.Bakar – Penolong Setiausaha(<i>Secretary assistant</i>) Tel: 03 – 2612 8218 email: shamsul@kpkk.gov.my	Alamat(Address): Aras 1, Bangunan Sultan Abdul Samad, Jalan Raja 50506 Kuala Lumpur, Malaysia. Tel : 03-26127600 Fax : 03-26935114 @ Tingkat 16, Menara TH Perdana 1001 Jalan Sultan Ismail 50694 Kuala Lumpur	Interview
23rd Feb.2010 (Tues.) Masa: Jam 10 pagi (10 a.m.)	(1) Pn Asfalaila binti Abu Bakar Head of Community Development h/p:012-3026756 Tel : 03-2026 2008 Fax :03-2031 5001 email: asfalaila@warisanglobal.com (2)En ZulfikarMochamad Rachman Head of Department TelecentreExcellence Tel : 03-2026 3001 Fax : 03-2031 5001 H/P : 012-3026645	Alamat/Address: Warisan Global Sdn.Bhd. 1st Floor, Wisma Eng Choon No. 55-59 Jalan Ampang 50450 Kuala Lumpur	Interview

	email: azul@warisanglobal.com		
1st & 2nd Mar.2010 (Mon.& Tues.)	(1) Manager (2) Assistant manager	Northern 1	Interview & visit
4th & 5thMar.2010 (Thurs.& Fri.)	(1) Manager (2) Assistant manager	Northern 2	Interview & visit
8th & 9thMar.2010 (Mon. & Tues.)	(1)Manager (2) Assistant manager	Northern 3	Interview & visit
11th & 12th Mar.2010 (Thurs. & Fri.)	(1)Manager (2) Assistant manager	Northern 4	Interview & visit
14th & 15th Mar.2010 (Sun. & Mon.)	(1) Manager (2) Assistant manager	Eastern 1	Interview & visit
17th & 18th Mar. 2010 (Wed. & Thurs)	(1) Manager (2) Assistant manager	Eastern 2	Interview & visit
22nd & 23rd Mar.2010 (Mon. & Tues.)	(1) Manager (2) Assistant manager	Eastern 3	Interview & visit
29th & 30th Mar.2010	(1) Manager (2) Assistant manager	Eastern 4	Interview & visit

(Mon.& Tues.)			
1st & 2nd Apr.2010 (Thurs. & Fri.)	(1) Manager (2) Assistant manager	Southern	Interview & visit
5th & 6th Apr.2010 (Mon.& Tues.)	(1) Manager (2) Assistant manager	Central 1	Interview & visit
8th & 9th Apr.2010 (Thurs .& Fri.)	(1) Manager (2) Assistant manager	Central 2	Interview & visit

Jadual terperinci mengenai lawatan & interview ke PID (akan di laksanakan selaras dengan PID yang lain)

Detail schedule on interviews and site visits at RICs (will be implemented consistently with the other RICs)

Masa(Time): Day 1 Jam 10.00 pagi – 12.00tgh <i>(10-12 noon)</i>	Contact person/ person in-charge: Manager/Wakil <i>(representative)</i>	Tujuan(purpose): Observations/Pemerhatian - Kelas computer(<i>computer class</i>)
Jam 12.00 – 1.00 tgh <i>(12-1 p.m.)</i>	Manager/Wakil <i>(representative)</i>	Lawatan ke PID & KUS (tempat-tempat usahawan bergiat & beroperasi) <i>Visit to RICs & SEC (entrepreneurs operational locations)</i>
Jam 2.00 – 3.00 petang <i>(2-3 p.m.)</i>	Manager	Interview
Day 2 Jam 10.00 – 10.30pagi <i>(10-10.30 a.m.)</i>	Bukan/Bekas pengguna PID <i>(RIC non-users & ex-users)</i>	Interview Saya memerlukan 3 atau 4 orang untuk kumpulan bukan pengguna atau bekas pengguna PID. <i>(I need 3 or 4 people for RIC non-users or ex-users group)</i>
Jam 11.00 – 2.30 petang <i>(11-2.30 p.m.)</i>	Manager/Wakil <i>(representative)</i>	Observations - Kursus latihan @ Kursus/aktiviti lain yang berkaitan <i>(training courses @ other relevant activities)</i>
Jam 2.45 – 3.30 petang <i>(2.45-3.30 p.m.)</i>	Manager/Wakil <i>(representative)</i>	Follow-up interviews

APPENDIX6: Interview questions for program managers and non-users/ex-users

Interview questions for managers/assistant managers

Part A: Demographics

Gender: Male [] Female []
Bachelor Degree in _____
Age: _____
Location/RIC site: _____

Part B: Program goals

- (1) What do you think the main goals of RIC are? Can that be achieved?
 - (2) How long have you worked/assisted at RIC?
 - (3) a) How do you find working at RIC?
b) What particular reasons that make you choose to work at RIC?
c) Do you enjoy working at RIC?
 - (4) a) Have you ever work with other RICs/telecentres before?
b) What is it that RIC has that the other telecentres do not have?
-

Part C: Inputs (RIC services)

- (1) What are main activities/programs offered at this centre?
 - (2) How do you decide what services to offer?
 - (3) What are the most widely used services at your centre?
 - (4) Do the users make use all of these services? Why or why not?
 - (5) How often do you contact/interact with Warisan Global (WG)?
-

Part D:Outputs

- (1) a) What does Social Entrepreneurs Club contributes to the users?
b) Did the club provide benefits to the users?
 - (2) a) Do you find any relationships are built among these users?
b) Were these relationships built through the RIC?
-

Part E:Intermediate Outcomes

- (1) a) What are the types of training held at the RIC?
b) Is it applicable to all RIC users?
 - (2) a) How many users participate for each training courses?
b) Do RIC provide any training for the trainers/supervisors? What sort of training?
 - (3) What are the differences in joining RIC to users in terms of (from what you see):
 - a) Their skills
 - b) Their jobs
 - c) Their social relationships
-

- d) Their business opportunities
 - e) Their health
- (With examples)
-

Part F: Ultimate Outcome

Individuals' quality of life

- (1) a) What are the benefits/advantages gains by the RIC users?
 - b) Do you measure the benefits? How?
 - (2) Do you have any suggestion/s on how to improve the RIC services and programs?
-

Interview questions for officer at Warisan Global (WG)

Part A: Demographics

Gender: Male [] Female []

Level of education: _____

Age: _____

Part B: Inputs (RIC services)

- (1) How do you manage the RIC services?
 - (2) What sort of major/main problems facing the RICs?
 - (3) Do the supervisors/operators frequently contact WG or MOICC (the Ministry) to tackle problems related to these RIC services?
 - (4) Is there some sort of monitoring and evaluation being done?
-

Part C: Intermediate Outcomes

- (1) a) How was the response to the activities from Global Entrepreneurship Week (GEW)?
 - b) Does all of the RIC involved in GEW?
 - c) Does WG evaluate the results from GEW? How?
-

Part D: Ultimate Outcome:

Individuals' quality of life

- (1) a) Is there any differences between these RICs? Why?
 - b) What would be your impressions regarding the differences between RICs?
 - (2) What are the factors that would improve individual users' quality of rural life (QoRL)?
 - (3) How would you measure the improvement on QoRL as a result of the RIC program?
 - (4) What do you think are the outcomes /benefits from the RICs?
 - (5) Do you think the RIC is successful? Why or why not?
-

Part E: Program goals

- (1) What are the main goals of RICs?

- (2) In what year did WG started collaborating with MOICC (under RIC program)?
How did it start?
- (3) a) What is the main purpose of this collaboration?
b) Any particular reason/(s)?
- (4) What are the main tasks of WG to assist RIC programs?
- (5) Do WG plan and develop the activities and programs for RIC? Why?
-

Interview questions for officers at Ministry of Information, Communication & Culture (MICC)

Part A: Demographics

Gender: Male [] Female []

Level of education: _____

Age: _____

Part B: Ultimate Outcome:

Individuals' quality of life

- (1) Could you please give a brief background of RIC (in terms of rationale and importance of RIC)?
- (2) a) What are the benefits of RICs?
b) Is the RIC is more beneficial to users in terms of their quality of life? Does the RIC enable users to help themselves?
- (3) a) What features of the RIC is responsible for the greatest number of benefits?
b) How can these features be strengthened and replicated?
- (4) What are the problems of RICs?
- (5) a) Are there drawbacks to the RIC? Who suffers as a result?
b) Is there an impact on employment/income/education/social capital or other factors?
- (6) If and how access to RICs produces benefits to the individuals and communities they serve?
- (7) a) Who (which parties) will be involved in ongoing monitoring of the RIC?
b) Are there any improvements from the program? What are the improvements?
- (8) Do you think the program should continue (renew)?

Part C: Program goals

- (1) What is the main goal of RIC?
- (2) Do you think that this main goal will achieve? Why?
- (3) Is there any monitoring and evaluation being done for the RIC?

Interview questions for RIC non-users and ex-users

Part A: Demographics

Gender: Male [] Female []

Level of education: _____

Age: _____

Location/RIC site: _____

Part B: User characteristics

- (1) a) Are you aware of RIC?
b) Do you know that there is a RIC at your place?
c) What do you know about RIC?
- (2) Have you joined the RIC before? Why or why not? (Yes, proceed to Q3; if no, proceed to Q4)
- (3) What are the reasons for leaving the RIC?
- (4) Do you have any interest to join the RIC?
- (5) If you got more information about the RIC at your place, would you keen to become the member/user?
- (6) a) Do you think that you have the computer skills?
b) Would you like to learn about computer/internet?
- (7) a) How long have you been in your local community?
b) Have you made any contacts? Was it a business or social relationships?

Part C: Outputs

- (1) Have any of your family member/(s) joined the RIC? Why do you think he or she have joined the centre?
- (2) From your own opinion as Non-RIC user, what are the benefits of having an RIC?

APPENDIX 7: General observations from 11 RIC site visits

Table 1: A summary of observations made during interviews (perceptions of the RIC Program)

No. of interviewees	Types of interviewees	Summary of interviews	Impressions (observed)
11	RIC managers	<ul style="list-style-type: none"> Want more programs and activities for the centre. Continuous improvement of RICs. Need more resources/government funding to upgrade RIC facilities and infrastructure from upcoming budget. 	<ul style="list-style-type: none"> Appears to be a strong relationship between the attitude and personality of the RICs' managers and the success of the RICs. The success of the RIC depends heavily on the managers. He/she is responsible in the whole operation of the RIC from the management aspects and networking as well.
7	Non RIC-users/ex-users	<ul style="list-style-type: none"> The mains reasons that they do not use the RIC; are: (1) they find it difficult to travel to the RIC-problem with no transportation. (2) Working on full-time basis-RIC operating only during office hours (3) time constraint-no time to visit the RIC. 	<ul style="list-style-type: none"> The users have the interest in RIC. Some of them know what RIC is and the information flows from mouth-to-mouth (especially from friends/relatives that are RIC users).
1	Director from the ministry (MICC)	<ul style="list-style-type: none"> RIC is a successful government project. Each RIC have its own uniqueness and ways on how it can be develop and sustain. 	<ul style="list-style-type: none"> The ministry always change and so do the people involved within the project. Too many government agencies involved project has become more complicated. Too many telecentres adopted, as if they are competing against each other. No fund is given to RICs for operations purposes.
1	Officer from Warisan Global (WG)	<ul style="list-style-type: none"> The centre needs to be monitor and evaluate. The managers are trained on capacity building and social entrepreneurship. 	<ul style="list-style-type: none"> A good training program for RICs.
5	RIC management committees	<ul style="list-style-type: none"> RICs should be located in convenient sites. Government funding to realise RIC projects/programs. Working interrelated with the managers to develop and sustain the 	<ul style="list-style-type: none"> Some of the leaders and committees are very supportive and willing to give time and energy to attend activities at the RIC and also very much involved in promoting the RIC by conducting events

		RIC programs.	<p>and meetings at the same place.</p> <ul style="list-style-type: none"> • Too busy with their full-time job. • They received no incentives or benefits from participating in RIC, yet it is a volunteering tasks.
--	--	---------------	---

Table 2: A summary of observations and visits at RICs

Location/Region	Duration/Activities
RIC-Northern	<p>March 2010 (10am to 4pm)</p> <p>*1)Day1-observed the training courses on Microsoft Office/users attending daily classes -Observed Workshop for internet usage</p> <p>*2)Day2-visited the entrepreneur's business venue -Visited 'Nur' House under the Ministry of Women & Family Development</p> <p>*3)Day3-interviewed the manager</p> <p>*4)Day4-interviewed the RIC non-users and the committee -Interviewed & visit the RIC president</p>
RIC-Eastern	<p>March 2010 (10am to 4pm)</p> <p>*1)Day1- Observed users attending daily classes - Observed workshop on Face book - Observed Workshop on Blog</p> <p>*2)Day2- Interviewed RIC non-users & the RIC president</p> <p>*3)Day3- Interviewed the RIC committee & visited entrepreneur's shop</p> <p>*4)Day4 – Interviewed the manager</p>
RIC-Southern	<p>April 2010 (10am to 4pm)</p> <p>*1)Day1- Observed users attending daily classes</p> <p>*2)Day2- Interviewed RIC committees & the club committees</p> <p>*3)Day3- Visit entrepreneurs' site (business operations) & interviews (RIC non-users)</p> <p>*4)Day4-Interviewed the manager</p>
RIC-Central	<p>May 2010 (10 am to 4pm)</p> <p>*1)Day1- Observed users attending daily classes -Training course on Microsoft Excel for Women (Housewife)</p> <p>*2)Day2-Interviewed the manager</p> <p>*3)Day3- Interviewed the entrepreneurs & visit the sites</p> <p>*4)Day4 –Interviewed the RIC non-users & the RIC committee</p>

(1)RIC-Northern: –

***(a) Training course**

- from the observation, these users are regular users to this RIC. They know well about the facilities and services. Registered users can use the internet for free; whereas, the non-registered users will need to pay at a minimum fees.
- normally, they are the users with basic and intermediate knowledge about ICT. They can get direct assistants from the manager and assistant manager at the centre.
- it shows participants' interest in learning and understanding the course.
- involving students at the age of 18 years old
- 2-hour course
- the manager assists the participants (one-to-one session)
- using facilities such as LCD projector & screen, computers, laptop and printer

Workshop for internet

- observed the workshop on internet. The workshop is for the users without any knowledge and skill about internet. They are the beginner, with zero knowledge. This workshop took about 2 to 3 days, it depends how the responds and results from the users feedback. On the first day of the workshop, the participants were enthusiastic and eager to learn. They will ask the trainer (manager), each time they do not know about something. It shows their interest to know more about internet. The target group for the workshop is the secondary school students (male and female) at the age of between 13-15 years old. The majority were male students.

***(b) Visit entrepreneur's site (business operations)**

- rented a shop lot for the club. They are selling the entrepreneurs' club products and services. The club's committee had posted a banner in front of the shop and in the RIC portal and Face book. These are part of the promotion and advertising. They had also produced a pamphlet or brochures and distributed to the communities.
- lack of information regarding how to expand and market the products
- lack of courage to expand the business
- having the skills to produce and make the products (which is unique), but de-motivate to explore business needs to go further

Reasons:

- 1) Lack of support from the RIC and the government (in terms of financial)
- 2) Afraid of having more demand than supply, because of having less workers/assistants

Visit 'Nur' House under the Ministry of Women & Family Development

- this house is to assists the women and their families; especially the single mother (single parent). They had organised many activities for the women and made them participate in such activities. Indirectly, this organisation will encourage these women to join and participate at RICs.

***(c) Interviewed the manager**

- the manager is passionate about the RIC. Starts the interview from the history of RIC until how the RIC had developed in the area. It seems that the manager know a lot about the centre, committed, had a lot of plan for the centre to be sustained and regards the centre as the community entity. The manager will always find a way to generate income and fund for the RIC.

***(d) Interviewed RIC non-users & the committee**

- They are having the interest to use the RIC; as the user has been using the RIC for quite some time. Reasons for not using it:

- 1) The location (far)
- 2) No transportation
- 3) Lack of time (time consuming)
- 4) Working (full-time)

- this user is no longer using the RIC, because got a job in town and the place is located far from the RIC. Before this, the user had used the internet at RIC to search jobs, especially jobs online.

-the committee & club's committee were committed with the programs organised by RIC. They are willing to cooperate, generate ideas, provide information and create financial sources for the RIC.

(2) RIC-Eastern:-

***(a) Users attending daily classes**

-they are the school leavers that wish to learn something that they are lacking of or do not have the opportunity to learn when they were in school.

-the users are mostly youngsters attending basic courses from different sessions. They are the regular users. They had been assisted by the assistant manager. The classes are based on the module/syllabus given to each user. It starts from the theory to the exercises given in the manual.

Workshop on Face book

-Some of the participants already had the understanding about the Face book, but yet willing to learn more about it so that will feel that he/she will not be left behind. They wish to learn and know more about it. They realised how important it is to their daily lives. Even though, they are only about 18 to 23 years old.

Workshop on Blog

-This workshop attended by the youngsters. The following week, will be the workshop again, but for the elderly. They even organised a competition for the most entertaining and creative Blog among the local communities. This is based on category of age; therefore it will be a category of group age, the elderly, the youngsters, the children and etc.

***(b) Interviewed RIC non-users & the president**

-the user is graduated from a university (Bachelor Degree), therefore, no longer becomes the user. But do visit the RIC to find friends and add contacts (networking) and also to visit the manager. Hence, would also like to participate and assist at RIC, where needed. Therefore, act as a volunteer to the community.

-Interviewed the RIC president

-started becomes the president in 2003. The president does seem to know a lot about the RIC. Hence, do concern about the RIC, by encouraged and informed the elderly to join the RIC and also realised the changes to the community since the existence of RIC.

***(c) Interviewed the committee & visit entrepreneur's shop**

-the committee had shared the experienced and work closely with the manager.

-It was a nice shop. The user becomes the entrepreneur and owns a shop to expand the business. It was a good start for the entrepreneur to develop the skills. The entrepreneur used to be the RIC user, but choose not to become one, because was too busy with the business.

-this is the site of producing local products. The products are sold to markets, retailers, stalls, night markets and even exports to some other states across Malaysia. The entrepreneur made his/her own packaging and labelling. The entrepreneur is the RIC user and the member of Social Entrepreneur's Club. The entrepreneur even managed to have the products to be promoted on the RIC portal and website. They are in the process of creating the Blog and Face book for the business.

***(d) Interviewed the manager**

(3) RIC-Southern:-

***(a) Users attending daily classes** – they are very keen to learn ICT.

***(b) Interview RIC committees** – most of the facilities sponsored by the local leaders - The leaders and committees are very supportive and willing to give time and energy to attend activities at the RIC and also very much involved in promoting the RIC by conducting events and meetings at the same place.

The community also actively participated to assist the RIC to be successful by promoting, attending and managing the RIC. Majority of the community members are aware of the services offered as the head of the village also promote and advertise the benefits of RIC to the community via the talks at the mosque and local gatherings such as wedding receptions.

Interview the club committees

-they had promoted the club to the users and entrepreneurs. They had assisted the new and existing entrepreneurs in so many different ways. The club provides a lot of benefits to the club members and the club itself. They had a regular meeting on every Saturdays and always invited new members. The benefits of the club will be shared among them.

***(c) Visit entrepreneurs' site (business operations) & interviewed RIC non-users**

-it is a Small and Medium scale Industry (SMI), with not much of the equipment used were not really based on technology, only a few staffs, with a small amount of capital n profit. This entrepreneur had the plan and ambition to expand the business and try to make use of the technology. Hopefully, the RIC will assist the entrepreneur in terms of ICT and other related sources.

***(d) Interviewed the manager**

(4) RIC-Central:-

***(a) Users attending daily classes**

-not much of activities and programs are going on at this RIC. The manager seems as if lacking of ideas and less initiative for the RIC to develop. As if the manager has already give up with the initiative of RIC and did not seem to solve the problem. This RIC shows lack of interaction between manager and users and create the environment of not so friendly.

Training course on Microsoft Excel for Women (Housewife)

-this is interesting, because the assistant manager arranged the training specifically for the housewives user. They are very keen to learn and explore the use of Excel. This was the first time they had the opportunity to learn Excel. While their children were in school, they went to the RIC to attend the courses. The duration of the course depends how fast the participants can cope and learn Excel. Normally, 1 to 2 months.

***(b) Interviewed the manager**

***(c) Interviewed the entrepreneurs & visit the sites**

-the entrepreneurs have shared their experienced and agreed with the Club and believed that the club would help them in the future. Sometimes it is due to the time constraints that makes them could not turn up for the meetings and anything related to the club.

***(d) Interviewed the RIC non-users**

- They are having the interest to use the RIC; as the user has been using the RIC for quite some time. Reasons for not using it:

- 1) The location (far)
- 2) No transportation
- 3) Lack of time (time consuming)
- 4) Working (full-time)

APPENDIX 8: Issues on site visits observation

Issues from site visits observation

Site/Locations :		RIC			
Northern	Eastern	Southern	Central		
Facilities:					
-4-10 Computers functioning		√	√	√	√
-Toilet is unavailable – shared toilet with Post Office or most of the time uses the toilet at the petrol station and mosque nearby		√		√	√
-Toilet is available – located behind/at/inside the centre Had extend the building – bigger space			√		
-Basic office supplies		√	√	√	√
Services:					
-5-20 services available		√	√	√	√
-Computer usage, internet access, basic computer training, Printing, Information mediation (typing letters; etc) ICT consultation service & entrepreneurs, e-govt & e-services applications, website, blog local community digital storytelling, community program management, e-perolehan registration, repairing computers, selling computers & laptop & computer accessories, streamyx and bluehyppo registration, Photostat, fax, laminate, binding, rubber stamp, advertising and banner and anything related to information technology. Scanning, burn CD, design wedding card, name card, advertising local entrepreneurs' products, and selling ICT accessories. Passport photographs service. Streamyx registration with wireless, typing service, &		√	√	√	√

pamphlets etc., renting advertisement, board space and rent projector, etc.
 Digital camera usage, typing services, teaching and guide in IT and as a centre for the women to exchange ideas.
 selling CDR, CDRW, diskette 3 1/2", design printing and e-pay.

***Activities/program:**

-Training course/workshop	√	√	√	√
-Visit entrepreneur's site (business operations) & interview	√	√	√	
-Interview RIC non-users	√	√	√	√
-Visit Social Entrepreneurs Club Shop	√			
-Visit 'Nur' House under the Ministry of Women & Family Development	√			
-Interview with the committee & club's committee	√	√	√	√
-Workshop on internet Usage	√			
-Interview & visit the RIC president		√		
-Workshop on Face book		√		
-Workshop on Blog		√		
-Interview the Club President	√	√	√	
-Training course on Microsoft Excel for Women (Housewives)	√			
Number of users (monthly):				
-100-200 average	√	√	√	
-100-300 average	√	√	√	√
Shows good responds	√	√	√	√

APPENDIX 9: Ethical clearance approval letter



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OFFICE OF RESEARCH AND HIGHER DEGREES

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Ethics Officer

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Monday, 15 February 2010

Marhaini Mohd Noor
Faculty of Business,
USQ Toowoomba Campus

Dear Marhaini,

Thankyou for submitting your project below for human ethics clearance. The Chair of the USQ Human Research Ethics Committee (HREC) recently reviewed your responses to the HREC's conditions placed upon the ethical approval for the below project. Your proposal meets the requirements of the *National Statement on Ethical Conduct in Human Research* and full ethics approval has been granted.

Project Title	ASSESSING THE IMPACTS OF RURAL INTERNET CENTRE PROGRAMS ON QUALITY OF LIFE IN RURAL AREAS OF MALAYSIA
Approval no	H10REA012
Period of Approval	08/02/2010 – 08/02/2011
HREC Decision	Approved

The standard conditions of this approval are:

- conduct the project strictly in accordance with the proposal submitted and granted ethics approval, including any amendments made to the proposal required by the HREC;
- advise the HREC (email: ethics@usq.edu.au) immediately if any complaints or expressions of concern are raised, or any other issue in relation to the project which may warrant review of ethics approval of the project;
- make submission to the HREC for approval of any amendments, or modifications to the approved project before implementing such changes;
- in the event you require an extension of ethics approval for this project, please make written application in advance of the end-date of this approval;
- provide the HREC with a written "Annual Progress Report" for every year of approval. The first progress report is due 12 months after the start date of this approval (by 08/02/2011);
- provide the HREC with a written "Final Report" when the project is complete;
- if the project is discontinued, advise the HREC in writing of the discontinuation.

For (c) to (f) proformas are available on the USQ ethics website: <http://www.usq.edu.au/research/ethicsbio/human>

Please note that failure to comply with the conditions of approval and the *National Statement on Ethical Conduct in Human Research* may result in withdrawal of approval for the project.

You may now commence your project. I wish you all the best for the conduct of the project

Yours sincerely

William Farmer
Ethics Officer
Office of Research and Higher Degrees

**APPENDIX 10: Permission letter to conduct research at RIC/PID
from Ministry of Information, Communications and Culture
Malaysia**



کمنترین فتراغن، کومونیکاسی دان کیودایان ملیسیا
KEMENTERIAN PENERANGAN, KOMUNIKASI DAN KEBUDAYAAN MALAYSIA
(MINISTRY OF INFORMATION, COMMUNICATIONS AND CULTURE MALAYSIA)

KPKK:SKom.KM 600-2/5 (24)
Date : 2 February 2010

URGENT BY POST

Marhaini Mohd Noor
No 15, Harrison Court, Darling Heights,
4350 Toowoomba,
Queensland Australia.

Dear Madam,

PERMISSION FOR RESEARCH AT PUSAT INTERNET DESA (PID), MALAYSIA

The above matter is referred and your email earlier is related.

2. I would like to thank you for your interest in doing research at our selected Pusat Internet Desa (PID). PID is one of the model telecentres undertaken by the Malaysian government to bridge digital divide between the rural communities and the urban folks.
3. We will ensure that the selected PID manager/assistant PID will try their best to comply with the tentative dates associated with the interview outlined by your dearself, unless it falls within our get together and gathering planned in Mac 2010. If it falls on the same date then we will inform you before hand so you may change accordingly. We will inform your dearself immediately, once the date is confirmed. The tentatively dates are on 5 – 7 March 2010 involving all personnel related to PID and our top management.
4. In doing your research relating to PID, I just hope a copy of it will be extended to us for our record keeping and reference.

5. Lastly, hope you have a pleasant interview and your research will be carried out smoothly.

Thank you.

"1 MALAYSIA; RAKYAT DIDAHULUKAN, PENCAPAIAN DIUTAMAKAN"

Your faithfully,



(FAUDZIAH MOHD AMIN)

For Secretarial General,
Ministry of Information, Communication and Culture
Malaysia

Note: Some of the findings that you may find is the relatively old desktop PCs that need to be replaced and the limited space area to cater for the increased interest of the community to participate in the PID activities.

APPENDIX 11: Data analysis on RIC Inputs

Table 1: RIC Internet speed and reliability across regions

ANOVA

RIC service satisfaction-speed and reliability of RIC Internet access

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	19.287	4	4.822	2.358	.055
Within Groups	394.632	193	2.045		
Total	413.919	197			

Post Hoc Tests

Multiple Comparisons

RIC service satisfaction-speed and reliability of RIC Internet access

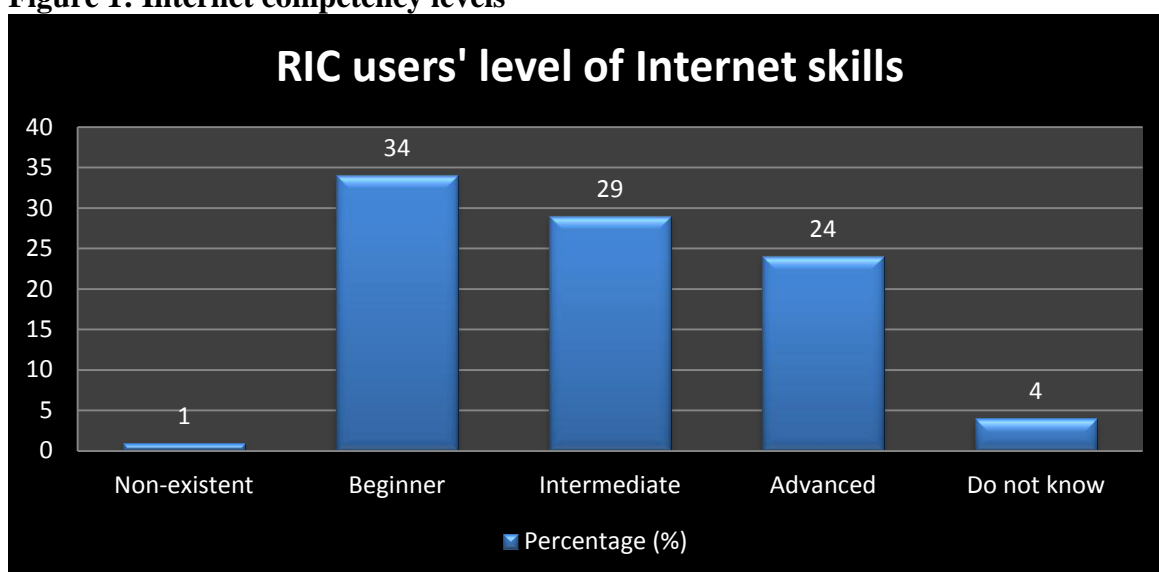
Tukey HSD

(I) RIC RegionsMean	(J) RIC RegionsMean	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Central	Southern	-1.015	.350	.033	-1.98	-.05
	Eastern	-.410	.327	.720	-1.31	.49
	Northern	-.504	.354	.614	-1.48	.47
	Borneo	-.667	.416	.498	-1.81	.48
Southern	Central	1.015	.350	.033	.05	1.98
	Eastern	.605	.279	.197	-.16	1.37
	Northern	.511	.310	.470	-.34	1.37
	Borneo	.348	.379	.889	-.70	1.39
Eastern	Central	.410	.327	.720	-.49	1.31
	Southern	-.605	.279	.197	-1.37	.16
	Northern	-.094	.285	.997	-.88	.69
	Borneo	-.256	.359	.953	-1.24	.73
Northern	Central	.504	.354	.614	-.47	1.48
	Southern	-.511	.310	.470	-1.37	.34
	Eastern	.094	.285	.997	-.69	.88
	Borneo	-.163	.384	.993	-1.22	.89
Borneo	Central	.667	.416	.498	-.48	1.81

	Southern						
	Eastern						
	Northern						

*. The mean difference is significant at the 0.05 level.

Figure 1: Internet competency levels



APPENDIX 12: Data Analysis information and communication functions vs Demographic characteristics using Tukey Tests

Table 1: Post Hoc Tests

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Information functions – usage	under 20	20-30	-1.26598 [*]	.21599	.000	-1.8257	-.7063
		31-50	-1.93657 [*]	.32959	.000	-2.7907	-1.0825
		over 50	-1.57293 [*]	.51283	.013	-2.9018	-.2440
	20-30	under 20	1.26598 [*]	.21599	.000	.7063	1.8257
		31-50	-.67059	.33827	.198	-1.5472	.2060
		over 50	-.30695	.51845	.934	-1.6504	1.0365
	31-50	under 20	1.93657 [*]	.32959	.000	1.0825	2.7907
		20-30	.67059	.33827	.198	-.2060	1.5472
		over 50	.36364	.57513	.922	-1.1267	1.8540
	over 50	under 20	1.57293 [*]	.51283	.013	.2440	2.9018
		20-30	.30695	.51845	.934	-1.0365	1.6504
		31-50	-.36364	.57513	.922	-1.8540	1.1267
Communication functions – usage	under 20	20-30	-2.11179 [*]	.31005	.000	-2.9152	-1.3083
		31-50	-2.60547 [*]	.47314	.000	-3.8315	-1.3794
		over 50	-.46748	.73618	.921	-2.3752	1.4402

20-30	under 20	2.11179*	.31005	.000	1.3083	2.9152
	31-50	-.49368	.48560	.740	-1.7520	.7647
	over 50	1.64431	.74425	.124	-.2843	3.5729
31-50	under 20	2.60547*	.47314	.000	1.3794	3.8315
	20-30	.49368	.48560	.740	-.7647	1.7520
	over 50	2.13799	.82561	.050	-.0014	4.2774
over 50	under 20	.46748	.73618	.921	-1.4402	2.3752
	20-30	-1.64431	.74425	.124	-3.5729	.2843
	31-50	-2.13799	.82561	.050	-4.2774	.0014

*. The mean difference is significant at the 0.05 level.

Table 2: Post Hoc Tests

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Current income	(J) Current income	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Information functions – usage	less than RM1,000	RM1,001 to RM2,000	-1.25765*	.23594	.000	-1.8149	-.7004
		RM2,001 or more	-1.46108*	.37313	.000	-2.3423	-.5799
	RM1,001 to RM2,000	less than RM1,000	1.25765*	.23594	.000	.7004	1.8149
		RM2,001 or more	-.20342	.40308	.869	-1.1554	.7485
	RM2,001 or more	less than RM1,000	1.46108*	.37313	.000	.5799	2.3423
		RM1,001 to RM2,000	.20342	.40308	.869	-.7485	1.1554

Communication functions – usage	less than RM1,000	RM1,001 to RM2,000	-1.84034 [*]	.34445	.000	-2.6538	-1.0269
		RM2,001 or more	-1.74458 [*]	.54474	.005	-3.0311	-.4581
	RM1,001 to RM2,000	less than RM1,000	1.84034 [*]	.34445	.000	1.0269	2.6538
		RM2,001 or more	.09577	.58846	.986	-1.2940	1.4855
	RM2,001 or more	less than RM1,000	1.74458 [*]	.54474	.005	.4581	3.0311
		RM1,001 to RM2,000	-.09577	.58846	.986	-1.4855	1.2940

*. The mean difference is significant at the 0.05 level.

Table 3: Post Hoc Tests

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Highest level of education	(J) Highest level of education	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Information functions – usage	finished grade 6 (primary school)	SRP	2.10714	1.11901	.416	-1.1140	5.3283
		SPM	1.40496	.85631	.573	-1.0600	3.8699
		STPM/Diploma	.26667	.87363	1.000	-2.2481	2.7815
		Bachelor Degree	.08929	.89720	1.000	-2.4934	2.6719
		Master Degree or higher	.00000	1.33747	1.000	-3.8500	3.8500
	SRP	finished grade 6 (primary school)	-2.10714	1.11901	.416	-5.3283	1.1140
		SPM	-.70218	.74457	.935	-2.8455	1.4411
		STPM/Diploma	-1.84048	.76443	.159	-4.0409	.3600
		Bachelor Degree	-2.01786	.79126	.115	-4.2955	.2598
		Master Degree or higher					

	Master Degree or higher	-2.10714	1.26883	.559	-5.7596	1.5453
SPM	finished grade 6 (primary school)	-1.40496	.85631	.573	-3.8699	1.0600
	SRP	.70218	.74457	.935	-1.4411	2.8455
	STPM/Diploma	-1.13829*	.25582	.000	-1.8747	-.4019
	Bachelor Degree	-1.31567*	.32739	.001	-2.2581	-.3733
	Master Degree or higher	-1.40496	1.04453	.759	-4.4117	1.6018
STPM/Diploma	finished grade 6 (primary school)	-.26667	.87363	1.000	-2.7815	2.2481
	SRP	1.84048	.76443	.159	-.3600	4.0409
	SPM	1.13829*	.25582	.000	.4019	1.8747
	Bachelor Degree	-.17738	.37033	.997	-1.2434	.8886
	Master Degree or higher	-.26667	1.05877	1.000	-3.3144	2.7811
Bachelor Degree	finished grade 6 (primary school)	-.08929	.89720	1.000	-2.6719	2.4934
	SRP	2.01786	.79126	.115	-.2598	4.2955
	SPM	1.31567*	.32739	.001	.3733	2.2581
	STPM/Diploma	.17738	.37033	.997	-.8886	1.2434
	Master Degree or higher	-.08929	1.07830	1.000	-3.1933	3.0147
Master Degree or higher	finished grade 6 (primary school)	.00000	1.33747	1.000	-3.8500	3.8500
	SRP	2.10714	1.26883	.559	-1.5453	5.7596
	SPM	1.40496	1.04453	.759	-1.6018	4.4117

			STPM/Diploma	.26667	1.05877	1.000	-2.7811	3.3144
			Bachelor Degree	.08929	1.07830	1.000	-3.0147	3.1933
Communication functions – usage	finished grade 6 (primary school)	SRP	SRP	-.48810	1.49167	.999	-4.7820	3.8058
			SPM	-1.51318	1.14149	.771	-4.7990	1.7727
			STPM/Diploma	-3.59048*	1.16457	.028	-6.9428	-.2382
			Bachelor Degree	-4.35714*	1.19599	.005	-7.7999	-.9144
			Master Degree or higher	-4.16667	1.78288	.184	-9.2988	.9655
	SRP	finished grade 6 (primary school)	SRP	.48810	1.49167	.999	-3.8058	4.7820
			SPM	-1.02509	.99253	.906	-3.8822	1.8320
			STPM/Diploma	-3.10238*	1.01900	.031	-6.0356	-.1691
			Bachelor Degree	-3.86905*	1.05477	.004	-6.9053	-.8328
			Master Degree or higher	-3.67857	1.69139	.254	-8.5474	1.1902
	SPM	finished grade 6 (primary school)	SPM	1.51318	1.14149	.771	-1.7727	4.7990
			SRP	1.02509	.99253	.906	-1.8320	3.8822
			STPM/Diploma	-2.07729*	.34101	.000	-3.0589	-1.0957
			Bachelor Degree	-2.84396*	.43641	.000	-4.1002	-1.5877
			Master Degree or higher	-2.65348	1.39238	.402	-6.6615	1.3546
	STPM/Diploma	finished grade 6 (primary school)	STPM/Diploma	3.59048*	1.16457	.028	.2382	6.9428
			SRP	3.10238*	1.01900	.031	.1691	6.0356
			SPM	2.07729*	.34101	.000	1.0957	3.0589

	Bachelor Degree	-.76667	.49366	.630	-2.1877	.6544
	Master Degree or higher	-.57619	1.41137	.999	-4.6389	3.4865
Bachelor Degree	finished grade 6 (primary school)	4.35714*	1.19599	.005	.9144	7.7999
	SRP	3.86905*	1.05477	.004	.8328	6.9053
	SPM	2.84396*	.43641	.000	1.5877	4.1002
	STPM/Diploma	.76667	.49366	.630	-.6544	2.1877
	Master Degree or higher	.19048	1.43741	1.000	-3.9472	4.3281
Master Degree or higher	finished grade 6 (primary school)	4.16667	1.78288	.184	-.9655	9.2988
	SRP	3.67857	1.69139	.254	-1.1902	8.5474
	SPM	2.65348	1.39238	.402	-1.3546	6.6615
	STPM/Diploma	.57619	1.41137	.999	-3.4865	4.6389
	Bachelor Degree	-.19048	1.43741	1.000	-4.3281	3.9472

*. The mean difference is significant at the 0.05 level.

Table 4: Summary of significant difference between the groups of education level

Levels of Education (groups)	Sig.
Between SRP and STPM/Diploma holder	.031
Between SRP and Bachelor Degree holder	.004
Between SPM and STPM/Diploma holder	.000
Between SPM and Bachelor Degree holder	.000
Between STPM/Diploma and Primary School holder	.028
Between Bachelor Degree and Primary School holder	.005

Table 5: Post Hoc Tests

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Employment	(J) Employment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Information functions -usage	Earned monthly income/wage	Self-employed	.27482	.34497	.931	-.6751	1.2247
		Home duties/chores	1.01972	.55205	.350	-.5004	2.5398
		Student	1.54863 [*]	.22356	.000	.9330	2.1642
		Retired	-1.41566	.81731	.417	-3.6662	.8349
	Self-employed	Earned monthly income/wage	-.27482	.34497	.931	-1.2247	.6751
		Home duties/chores	.74490	.59926	.726	-.9052	2.3950
		Student	1.27381 [*]	.32302	.001	.3843	2.1633
		Retired	-1.69048	.84992	.275	-4.0308	.6499
	Home duties/chores	Earned monthly income/wage	-1.01972	.55205	.350	-2.5398	.5004
		Self-employed	-.74490	.59926	.726	-2.3950	.9052
		Student	.52891	.53860	.863	-.9542	2.0120
		Retired	-2.43537	.95295	.083	-5.0594	.1887
	Student	Earned monthly income/wage	-1.54863 [*]	.22356	.000	-2.1642	-.9330
		Self-employed	-1.27381 [*]	.32302	.001	-2.1633	-.3843
		Home duties/chores	-.52891	.53860	.863	-2.0120	.9542

		Retired	-2.96429 [*]	.80829	.003	-5.1900	-.7386
	Retired	Earned monthly income/wage	1.41566	.81731	.417	-.8349	3.6662
		Self-employed	1.69048	.84992	.275	-.6499	4.0308
		Home duties/chores	2.43537	.95295	.083	-.1887	5.0594
		Student	2.96429 [*]	.80829	.003	.7386	5.1900
Communication functions - usage	Earned monthly income/wage	Self-employed	1.22034	.51624	.130	-.2012	2.6419
		Home duties/chores	1.75095	.82612	.216	-.5238	4.0257
		Student	2.24944 [*]	.33455	.000	1.3282	3.1707
		Retired	1.17272	1.22308	.873	-2.1951	4.5406
	Self-employed	Earned monthly income/wage	-1.22034	.51624	.130	-2.6419	.2012
		Home duties/chores	.53061	.89677	.976	-1.9387	3.0000
		Student	1.02910	.48338	.212	-.3019	2.3601
		Retired	-.04762	1.27187	1.000	-3.5498	3.4546
	Home duties/chores	Earned monthly income/wage	-1.75095	.82612	.216	-4.0257	.5238
		Self-employed	-.53061	.89677	.976	-3.0000	1.9387
		Student	.49849	.80599	.972	-1.7209	2.7179
		Retired	-.57823	1.42605	.994	-4.5050	3.3485
	Student	Earned monthly income/wage	-2.24944 [*]	.33455	.000	-3.1707	-1.3282
		Self-employed	-1.02910	.48338	.212	-2.3601	.3019

Retired	Home duties/chores	-.49849	.80599	.972	-2.7179	1.7209
	Retired	-1.07672	1.20958	.900	-4.4074	2.2540
	Earned monthly income/wage	-1.17272	1.22308	.873	-4.5406	2.1951
	Self-employed	.04762	1.27187	1.000	-3.4546	3.5498
	Home duties/chores	.57823	1.42605	.994	-3.3485	4.5050
	Student	1.07672	1.20958	.900	-2.2540	4.4074

*. The mean difference is significant at the 0.05 level.

Table 6: Post Hoc Tests

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) RIC Regions	Mean	(J) RIC Regions	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Information functions -usage	Central		Southern	.18326	.37549	.988	-.8507	1.2173
			Eastern	-.73602	.35167	.227	-1.7044	.2324
			Northern	-.38753	.38068	.847	-1.4358	.6608
			Borneo	-.90703	.44690	.256	-2.1377	.3236
	Southern		Central	-.18326	.37549	.988	-1.2173	.8507
			Eastern	-.91928*	.29985	.021	-1.7450	-.0936

		Northern	-57080	.33340	.429	-1.4889	.3473	
		Borneo	-1.09029	.40738	.061	-2.2121	.0315	
	Eastern	Central	.73602	.35167	.227	-.2324	1.7044	
		Southern	.91928 ⁺	.29985	.021	.0936	1.7450	
		Northern	.34849	.30633	.786	-.4951	1.1920	
		Borneo	-.17101	.38553	.992	-1.2327	.8907	
	Northern	Central	.38753	.38068	.847	-.6608	1.4358	
		Southern	.57080	.33340	.429	-.3473	1.4889	
		Eastern	-.34849	.30633	.786	-1.1920	.4951	
		Borneo	-.51950	.41217	.716	-1.6545	.6155	
	Borneo	Central	.90703	.44690	.256	-.3236	2.1377	
		Southern	1.09029	.40738	.061	-.0315	2.2121	
		Eastern	.17101	.38553	.992	-.8907	1.2327	
		Northern	.51950	.41217	.716	-.6155	1.6545	
	Communication functions - usage	Central	Southern	1.29437	.53981	.120	-.1921	2.7809
			Eastern	.04982	.50556	1.000	-1.3424	1.4420
Northern			.86643	.54727	.510	-.6406	2.3735	
Borneo			-.66667	.64246	.838	-2.4358	1.1025	
Southern		Central	-1.29437	.53981	.120	-2.7809	.1921	
		Eastern	-1.24456 ⁺	.43107	.035	-2.4316	-.0575	
		Northern	-.42794	.47930	.899	-1.7478	.8919	
		Borneo	-1.96104 ⁺	.58565	.009	-3.5738	-.3483	

Eastern	Central	-.04982	.50556	1.000	-1.4420	1.3424
	Southern	1.24456*	.43107	.035	.0575	2.4316
	Northern	.81662	.44038	.346	-.3961	2.0293
	Borneo	-.71648	.55425	.696	-2.2427	.8098
Northern	Central	-.86643	.54727	.510	-2.3735	.6406
	Southern	.42794	.47930	.899	-.8919	1.7478
	Eastern	-.81662	.44038	.346	-2.0293	.3961
	Borneo	-1.53310	.59254	.077	-3.1648	.0986
Borneo	Central	.66667	.64246	.838	-1.1025	2.4358
	Southern	1.96104*	.58565	.009	.3483	3.5738
	Eastern	.71648	.55425	.696	-.8098	2.2427
	Northern	1.53310	.59254	.077	-.0986	3.1648

*. The mean difference is significant at the 0.05 level.

APPENDIX 13: Perceptions of Employment Opportunities & type of contacts made

Table 1: **Proportion of RIC users' perception knowledge & skills, employment opportunity and income gained by age**

Age groups	Knowledge & skills (%)	Employment opportunity (%)	Income gained (%)
< 20 (n=28, 19, 21)	37	33	35
20-30 (n=32, 27, 27)	42	48	45
31-50 (n=13, 11, 11)	17	19	18
> 50 (n=3, 0, 1)	4	0	2

Table 2: **Percentage type of contacts made at RICs by age groups**

Age groups	Business contacts (%)	Social contacts within community (%)	Social contacts outside community (%)	Other contacts (%)
< 20	(21) 10	(44) 72	(34) 37	(50) 12
20-30	(56) 27	(40) 66	(47) 52	(29) 7
31-50	(17) 8	(12) 19	(14) 15	(21) 5
> 50	(6) 3	(4) 7	(5) 5	(0) 0
Total	48	164	109	24

APPENDIX 14: Data analysis on factor analysis and individual social capital components

Table 1: Factor analysis vs. bonding capital

Correlation Matrix ^a						
		SC_BO1-The usage of RIC results in strong relationship between the users	SC_BO2 -There are several people online I trust to help solve my problems	SC_BO3 -There is someone online I can turn to for advice about making very important decisions	SC_BO4 - When I feel lonely, there are several people online I can talk to	SC_BO5 - My interaction online would be a good job references for me
Correlation	SC_BO1-The usage of RIC results in strong relationship between the users	1.000	.406	.342	.345	.402
	SC_BO2 -There are several people online I trust to help solve my problems	.406	1.000	.755	.479	.564
	SC_BO3 -There is someone online I can turn to for advice about making very important decisions	.342	.755	1.000	.604	.541
	SC_BO4 - When I feel lonely, there are several people online I can talk to	.345	.479	.604	1.000	.467
	SC_BO5 - My interaction online would be a good job references for me	.402	.564	.541	.467	1.000

Sig. (1-tailed)	SC_BO1-The usage of RIC results in strong relationship between the users		.000	.000	.000	.000
	SC_BO2 -There are several people online I trust to help solve my problems	.000		.000	.000	.000
	SC_BO3 -There is someone online I can turn to for advice about making very important decisions	.000	.000		.000	.000
	SC_BO4 - When I feel lonely, there are several people online I can talk to	.000	.000	.000		.000
	SC_BO5 - My interaction online would be a good job references for me	.000	.000	.000	.000	

a. Determinant = .132

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.784
Bartlett's Test of Sphericity	Approx. Chi-Square	398.296
	Df	10
	Sig.	.000

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.995	59.890	59.890	2.995	59.890	59.890
2	.742	14.849	74.739			
3	.552	11.045	85.784			
4	.493	9.865	95.650			
5	.218	4.350	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component
	1
SC_BO3 -There is someone online I can turn to for advice about making very important decisions	.863
SC_BO2 -There are several people online I trust to help solve my problems	.849
SC_BO5 - My interaction online would be a good job references for me	.772
SC_BO4 - When I feel lonely, there are several people online I can talk to	.752
SC_BO1-The usage of RIC results in strong relationship between the users	.606

Extraction Method: Principal Component Analysis.

Reliability-BONDING CAPITAL

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.831	.828	5

Inter-Item Correlation Matrix

	SC_BO1-The usage of RIC results in strong relationship between the users	SC_BO2 - There are several people online I trust to help solve my problems	SC_BO3 -There is someone online I can turn to for advice about making very important decisions	SC_BO4 - When I feel lonely, there are several people online I can talk to	SC_BO5 - My interaction online would be a good job references for me
SC_BO1-The usage of RIC results in strong relationship between the users	1.000	.406	.342	.345	.402
SC_BO2 -There are several people online I trust to help solve my problems	.406	1.000	.755	.479	.564
SC_BO3 -There is someone online I can turn to for advice about making very important decisions	.342	.755	1.000	.604	.541
SC_BO4 - When I feel lonely, there are several people online I can talk to	.345	.479	.604	1.000	.467
SC_BO5 - My interaction online would be a good job references for me	.402	.564	.541	.467	1.000

Table 2: Factor analysis vs. bridging capital

		Correlation Matrix ^a							
		SC_BR1 - RIC usage brings more contact outside RIC	SC_BR2 - Interacting with people online makes it easy for me to hear about new jobs opportunity	SC_BR3 - Interacting with people online makes me interested in things that happen outside of my town	SC_BR4 - Interacting with people online makes me want to try new things	SC_BR5 - Interacting with people online makes me having more business contacts	SC_BR6 - I am willing to spend time to support general online community activities	SC_BR7 - Online, I come in contact with new people all the time	SC_BR8 - Online relationship s are just as strong as my relationship s within the community
Correlation	SC_BR1 - RIC usage brings more contact outside RIC	1.000	.563	.532	.439	.369	.385	.493	.345
	SC_BR2 - Interacting with people online makes it easy for me to hear about new jobs opportunity	.563	1.000	.655	.519	.399	.426	.486	.410
	SC_BR3 - Interacting with people online makes me interested in things that happen outside of my town	.532	.655	1.000	.687	.493	.598	.581	.471
	SC_BR4 - Interacting with people online makes me want to try new things	.439	.519	.687	1.000	.446	.563	.488	.601
	SC_BR5 - Interacting with people online makes me having more business contacts	.369	.399	.493	.446	1.000	.501	.526	.477
	SC_BR6 - I am willing to spend time to support general online community activities	.385	.426	.598	.563	.501	1.000	.621	.649

	SC_BR7 - Online, I come in contact with new people all the time	.493	.486	.581	.488	.526	.621	1.000	.679
	SC_BR8 - Online relationships are just as strong as my relationships within the community	.345	.410	.471	.601	.477	.649	.679	1.000
Sig. (1-tailed)	SC_BR1 - RIC usage brings more contact outside RIC		.000	.000	.000	.000	.000	.000	.000
	SC_BR2 - Interacting with people online makes it easy for me to hear about new jobs opportunity	.000		.000	.000	.000	.000	.000	.000
	SC_BR3 - Interacting with people online makes me interested in things that happen outside of my town	.000	.000		.000	.000	.000	.000	.000
	SC_BR4 - Interacting with people online makes me want to try new things	.000	.000	.000		.000	.000	.000	.000
	SC_BR5 - Interacting with people online makes me having more business contacts	.000	.000	.000	.000		.000	.000	.000
	SC_BR6 - I am willing to spend time to support general online community activities	.000	.000	.000	.000	.000		.000	.000
	SC_BR7 - Online, I come in contact with new people all the time	.000	.000	.000	.000	.000	.000		.000
	SC_BR8 - Online relationships are just as strong as my relationships within the community	.000	.000	.000	.000	.000	.000	.000	

a. Determinant = .01

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.867
Bartlett's Test of Sphericity	Approx. Chi-Square	835.802
	Df	28
	Sig.	.000

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.621	57.765	57.765	4.621	57.765	57.765
2	.897	11.209	68.974			
3	.609	7.618	76.592			
4	.554	6.928	83.520			
5	.415	5.191	88.711			
6	.394	4.919	93.629			
7	.319	3.988	97.617			
8	.191	2.383	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component
	1
SC_BR3 - Interacting with people online makes me interested in things that happen outside of my town	.832
SC_BR7 - Online, I come in contact with new people all the time	.807
SC_BR6 - I am willing to spend time to support general online community activities	.787
SC_BR4 - Interacting with people online makes me want to try new things	.786
SC_BR8 - Online relationships are just as strong as my relationships within the community	.768
SC_BR2 - Interacting with people online makes it easy for me to hear about new jobs opportunity	.730
SC_BR5 - Interacting with people online makes me having more business contacts	.686
SC_BR1 - RIC usage brings more contact outside RIC	.668

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Reliability-BRIDGING CAPITAL

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.891	.894	8

Inter-Item Correlation Matrix

	SC_BR1 - RIC usage brings more contact outside RIC	SC_BR2 - Interacting with people online makes it easy for me to hear about new jobs opportunity	SC_BR3 - Interacting with people online makes me interested in things that happen outside of my town	SC_BR4 - Interacting with people online makes me want to try new things	SC_BR5 - Interacting with people online makes me having more business contacts	SC_BR6 - I am willing to spend time to support general online community activities	SC_BR7 - Online, I come in contact with new people all the time	SC_BR8 - Online relationships are just as strong as my relationships within the community
SC_BR1 - RIC usage brings more contact outside RIC	1.000	.563	.532	.439	.369	.385	.493	.345
SC_BR2 - Interacting with people online makes it easy for me to hear about new jobs opportunity	.563	1.000	.655	.519	.399	.426	.486	.410
SC_BR3 - Interacting with people online makes me interested in things that happen outside of my town	.532	.655	1.000	.687	.493	.598	.581	.471
SC_BR4 - Interacting with people online makes me want to try new things	.439	.519	.687	1.000	.446	.563	.488	.601
SC_BR5 - Interacting with people online makes me having more business contacts	.369	.399	.493	.446	1.000	.501	.526	.477
SC_BR6 - I am willing to spend time to support general online community activities	.385	.426	.598	.563	.501	1.000	.621	.649
SC_BR7 - Online, I come in contact with new people all the time	.493	.486	.581	.488	.526	.621	1.000	.679
SC_BR8 - Online relationships are just as strong as my relationships within the community	.345	.410	.471	.601	.477	.649	.679	1.000

Table 3: Factor analysis vs. LCA

		Correlation Matrix ^a						
		SC_SR1-I have attended a local community event recently	SC_SR2-I am an active member of a local organisation or club other than RIC	SC_SR3-My local commu nity feel like home	SC_SR4-I have make online conversati ons with friends	SC_SR5 -I do go outside my local communi ty to visit my family	SC_SR6-I am a managem ent committee for the RIC	SC_SR7-I have been part of a project to organise a new service in my area
Correlation	SC_SR1-I have attended a local community event recently	1.000	.563	.453	.439	.436	.312	.412
	SC_SR2-I am an active member of a local organisation or club other than RIC	.563	1.000	.526	.426	.389	.510	.555
	SC_SR3-My local community feel like home	.453	.526	1.000	.396	.314	.304	.357
	SC_SR4-I have make online conversations with friends	.439	.426	.396	1.000	.515	.286	.421
	SC_SR5-I do go outside my local community to visit my family	.436	.389	.314	.515	1.000	.274	.411
	SC_SR6-I am a management committee for the RIC	.312	.510	.304	.286	.274	1.000	.729
	SC_SR7-I have been part of a project to organise a new service in my area	.412	.555	.357	.421	.411	.729	1.000
Sig. (1-tailed)	SC_SR1-I have attended a local community event recently		.000	.000	.000	.000	.000	.000
	SC_SR2-I am an active member of a local organisation or club other than RIC	.000		.000	.000	.000	.000	.000
	SC_SR3-My local community feel like home	.000	.000		.000	.000	.000	.000

SC_SR4-I have make online conversations with friends	.000	.000	.000		.000	.000	.000
SC_SR5-I do go outside my local community to visit my family	.000	.000	.000	.000		.000	.000
SC_SR6-I am a management committee for the RIC	.000	.000	.000	.000	.000		.000
SC_SR7-I have been part of a project to organise a new service in my area	.000	.000	.000	.000	.000	.000	

a. Determinant = .065

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.822
Bartlett's Test of Sphericity Approx. Chi-Square	531.192
Df	21
Sig.	.000

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.597	51.392	51.392	3.597	51.392	51.392
2	.999	14.271	65.664			
3	.769	10.990	76.654			
4	.547	7.817	84.470			
5	.465	6.643	91.114			
6	.372	5.311	96.424			
7	.250	3.576	100.000			

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.597	51.392	51.392	3.597	51.392	51.392
2	.999	14.271	65.664			
3	.769	10.990	76.654			
4	.547	7.817	84.470			
5	.465	6.643	91.114			
6	.372	5.311	96.424			
7	.250	3.576	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component
	1
SC_SR2-I am an active member of a local organisation or club other than RIC	.804
SC_SR7-I have been part of a project to organise a new service in my area	.785
SC_SR1-I have attended a local community event recently	.723
SC_SR4-I have make online conversations with friends	.688
SC_SR6-I am a management committee for the RIC	.687
SC_SR3-My local community feel like home	.661
SC_SR5-I do go outside my local community to visit my family	.655

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Reliability-LOCAL COMMUNITY ASSOCIATION

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.840	.841	7

Inter-Item Correlation Matrix

	SC_SR1-I have attended a local community event recently	SC_SR2-I am an active member of a local organisation or club other than RIC	SC_SR3-My local commu nity feel like home	SC_SR4 -I have make online conversa tions with friends	SC_SR5-I do go outside my local communit y to visit my family	SC_SR6-I am a manage ment committ ee for the RIC	SC_SR7-I have been part of a project to organise a new service in my area
SC_SR1-I have attended a local community event recently	1.000	.563	.453	.439	.436	.312	.412
SC_SR2-I am an active member of a local organisation or club other than RIC	.563	1.000	.526	.426	.389	.510	.555
SC_SR3-My local community feel like home	.453	.526	1.000	.396	.314	.304	.357
SC_SR4-I have make online conversations with friends	.439	.426	.396	1.000	.515	.286	.421
SC_SR5-I do go outside my local community to visit my family	.436	.389	.314	.515	1.000	.274	.411
SC_SR6-I am a management committee for the RIC	.312	.510	.304	.286	.274	1.000	.729

Inter-Item Correlation Matrix

	SC_SR1-I have attended a local community event recently	SC_SR2-I am an active member of a local organisation or club other than RIC	SC_SR3-My local commu nity feel like home	SC_SR4 -I have make online conversa tions with friends	SC_SR5-I do go outside my local communit y to visit my family	SC_SR6-I am a manage ment committ ee for the RIC	SC_SR7-I have been part of a project to organise a new service in my area
SC_SR1-I have attended a local community event recently	1.000	.563	.453	.439	.436	.312	.412
SC_SR2-I am an active member of a local organisation or club other than RIC	.563	1.000	.526	.426	.389	.510	.555
SC_SR3-My local community feel like home	.453	.526	1.000	.396	.314	.304	.357
SC_SR4-I have make online conversations with friends	.439	.426	.396	1.000	.515	.286	.421
SC_SR5-I do go outside my local community to visit my family	.436	.389	.314	.515	1.000	.274	.411
SC_SR6-I am a management committee for the RIC	.312	.510	.304	.286	.274	1.000	.729
SC_SR7-I have been part of a project to organise a new service in my area	.412	.555	.357	.421	.411	.729	1.000

APPENDIX 15: Data analysis on LCA vs. Demographic characteristics using one-way ANOVA and Tukey tests

Table 1: Tukey LCA vs. Age

ANOVA					
LCAMean					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	31.545	3	10.515	8.579	.000
Within Groups	239.002	195	1.226		
Total	270.547	198			

Post Hoc Test

Multiple Comparisons							
Dependent Variable:LCAMean							
			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I) Age	(J) Age					Lower Bound	Upper Bound
Tukey HSD	under 20	20-30	-.69689 [*]	.17165	.000	-1.1417	-.2521
		31-50	-1.05789 [*]	.26194	.000	-1.7367	-.3791
		over 50	-.59361	.40756	.466	-1.6497	.4625
	20-30	under 20	.69689 [*]	.17165	.000	.2521	1.1417
		31-50	-.36100	.26884	.537	-1.0577	.3356
		over 50	.10328	.41203	.994	-.9644	1.1710
	31-50	under 20	1.05789 [*]	.26194	.000	.3791	1.7367
		20-30	.36100	.26884	.537	-.3356	1.0577

	over 50	.46429	.45708	.740	-.7201	1.6487
over 50	under 20	.59361	.40756	.466	-.4625	1.6497
	20-30	-.10328	.41203	.994	-1.1710	.9644
	31-50	-.46429	.45708	.740	-1.6487	.7201

*. The mean difference is significant at the 0.05 level.

Table 2: Levene's and Robust Tests

Test of Homogeneity of Variances

LCAMean

Levene Statistic	df1	df2	Sig.
3.761	3	195	.012

Robust Tests of Equality of Means

LCAMean

	Statistic ^a	df1	df2	Sig.
Welch	8.974	3	51.503	.000

a. Asymptotically F distributed.

Table 3: Tukey LCA vs. Level of Education

ANOVA

LCAMean

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	26.525	5	5.305	4.196	.001
Within Groups	244.022	193	1.264		
Total	270.547	198			

Multiple Comparisons

Dependent Variable:LCAMean

			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
(I) Highest level of education	(J) Highest level of education						
Tukey HSD	finished grade 6 (primary school)	SRP	.61905	.85880	.979	-1.8531	3.0912
		SPM	1.06297	.65719	.588	-.8288	2.9547
		STPM/Diploma	.39365	.67049	.992	-1.5364	2.3237
		Bachelor Degree	.20238	.68858	1.000	-1.7797	2.1845
		Master Degree or higher	.47619	1.02647	.997	-2.4786	3.4309
	SRP	finished grade 6 (primary school)	-.61905	.85880	.979	-3.0912	1.8531
		SPM	.44392	.57144	.971	-1.2010	2.0888
		STPM/Diploma	-.22540	.58668	.999	-1.9142	1.4634
		Bachelor Degree	-.41667	.60727	.983	-2.1647	1.3314
		Master Degree or higher	-.14286	.97379	1.000	-2.9460	2.6603

SPM	finished grade 6 (primary school)	-1.06297	.65719	.588	-2.9547	.8288
	SRP	-.44392	.57144	.971	-2.0888	1.2010
	STPM/Diploma	-.66932*	.19633	.010	-1.2345	-.1042
	Bachelor Degree	-.86059*	.25126	.010	-1.5839	-.1373
	Master Degree or higher	-.58678	.80164	.978	-2.8944	1.7208
STPM/Diploma	finished grade 6 (primary school)	-.39365	.67049	.992	-2.3237	1.5364
	SRP	.22540	.58668	.999	-1.4634	1.9142
	SPM	.66932*	.19633	.010	.1042	1.2345
	Bachelor Degree	-.19127	.28422	.985	-1.0094	.6269
	Master Degree or higher	.08254	.81258	1.000	-2.2565	2.4216
Bachelor Degree	finished grade 6 (primary school)	-.20238	.68858	1.000	-2.1845	1.7797
	SRP	.41667	.60727	.983	-1.3314	2.1647
	SPM	.86059*	.25126	.010	.1373	1.5839
	STPM/Diploma	.19127	.28422	.985	-.6269	1.0094
	Master Degree or higher	.27381	.82756	.999	-2.1084	2.6560
Master Degree or higher	finished grade 6 (primary school)	-.47619	1.02647	.997	-3.4309	2.4786
	SRP	.14286	.97379	1.000	-2.6603	2.9460
	SPM	.58678	.80164	.978	-1.7208	2.8944
	STPM/Diploma	-.08254	.81258	1.000	-2.4216	2.2565
	Bachelor Degree	-.27381	.82756	.999	-2.6560	2.1084

*. The mean difference is significant at the 0.05 level.

Table 4: Levene's Test

Test of Homogeneity of Variances

LCAMean			
Levene Statistic	df1	df2	Sig.
.807	5	193	.546

Table 5: Tukey LCA vs. Income

ANOVA

LCAMean					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	37.274	2	18.637	15.659	.000
Within Groups	233.273	196	1.190		
Total	270.547	198			

Multiple Comparisons

Dependent Variable:LCAMean

			Mean	Std. Error	Sig.	95% Confidence Interval	
	(I) Current income	(J) Current income	Difference (I-J)			Lower Bound	Upper Bound
Tukey HSD	less than RM1,000	RM1,001 to RM2,000	-.88050 [*]	.17799	.000	-1.3009	-.4601
		RM2,001 or more	-.98039 [*]	.28149	.002	-1.6452	-.3156

	RM1,001 to RM2,000	less than RM1,000	.88050*	.17799	.000	.4601	1.3009
		RM2,001 or more	-.09989	.30408	.942	-.8180	.6182
	RM2,001 or more	less than RM1,000	.98039*	.28149	.002	.3156	1.6452
		RM1,001 to RM2,000	.09989	.30408	.942	-.6182	.8180

*. The mean difference is significant at the 0.05 level.

Table 6: Levene's Test

Test of Homogeneity of Variances

LCAMean

Levene Statistic	df1	df2	Sig.
.719	2	196	.489

Table 7: Tukey LCA vs. Employment

ANOVA

LCAMean

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	35.270	4	8.817	7.271	.000
Within Groups	235.277	194	1.213		
Total	270.547	198			

Multiple Comparisons

Dependent Variable:LCAMean

			Mean			95% Confidence Interval	
			Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
(I) Employment	(J) Employment						
Tukey HSD	Earned monthly income/wage	Self-employed	.33612	.27510	.739	-.4214	1.0936
		Home duties/chores	.61813	.44024	.626	-.5941	1.8304
		Student	.93785 [*]	.17828	.000	.4469	1.4288
		Retired	.27119	.65178	.994	-1.5235	2.0659
	Self-employed	Earned monthly income/wage	-.33612	.27510	.739	-1.0936	.4214
		Home duties/chores	.28200	.47789	.976	-1.0339	1.5979
		Student	.60173	.25759	.138	-.1076	1.3110
		Retired	-.06494	.67778	1.000	-1.9313	1.8014
	Home duties/chores	Earned monthly income/wage	-.61813	.44024	.626	-1.8304	.5941
		Self-employed	-.28200	.47789	.976	-1.5979	1.0339
		Student	.31973	.42951	.946	-.8630	1.5024
		Retired	-.34694	.75994	.991	-2.4395	1.7456
	Student	Earned monthly income/wage	-.93785 [*]	.17828	.000	-1.4288	-.4469
		Self-employed	-.60173	.25759	.138	-1.3110	.1076
		Home duties/chores	-.31973	.42951	.946	-1.5024	.8630

Retired	Retired	-.66667	.64458	.839	-2.4416	1.1083
	Earned monthly income/wage	-.27119	.65178	.994	-2.0659	1.5235
	Self-employed	.06494	.67778	1.000	-1.8014	1.9313
	Home duties/chores	.34694	.75994	.991	-1.7456	2.4395
	Student	.66667	.64458	.839	-1.1083	2.4416

*. The mean difference is significant at the 0.05 level.

Table 8: Levene's Test

Test of Homogeneity of Variances

LCAMean

Levene Statistic	df1	df2	Sig.
1.817	4	194	.127

Table 9: ANOVA social capital vs. regions

ANOVA

SC-Mean

	Sum of Squares	df	Mean Square
Between Groups	4.506	4	1.127
Within Groups	213.504	193	1.106
Total	218.010	197	

APPENDIX 16: Data analysis on multiple regression and assumptions

Table 1: Economic benefits multiple regression

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.699 ^a	.489	.484	.869	.489	94.310	2	197	.000	1.794

a. Predictors: (Constant), RIC improve-income, RIC improve-education attainment

b. Dependent Variable: RIC improve-employment prospects

ANOVA^b

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	142.434	2	71.217	94.310	.000 ^a
	Residual	148.761	197	.755		
	Total	291.195	199			

a. Predictors: (Constant), RIC improve-income, RIC improve-education attainment

b. Dependent Variable: RIC improve-employment prospects

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.858	.372		2.304	.022	.124	1.592					
	RIC improve-education attainment	.448	.071	.366	6.322	.000	.309	.588	.579	.411	.322	.773	1.294
	RIC improve-income	.381	.049	.446	7.702	.000	.283	.478	.621	.481	.392	.773	1.294

a. D Dependent Variable: RIC improve-employment prospects

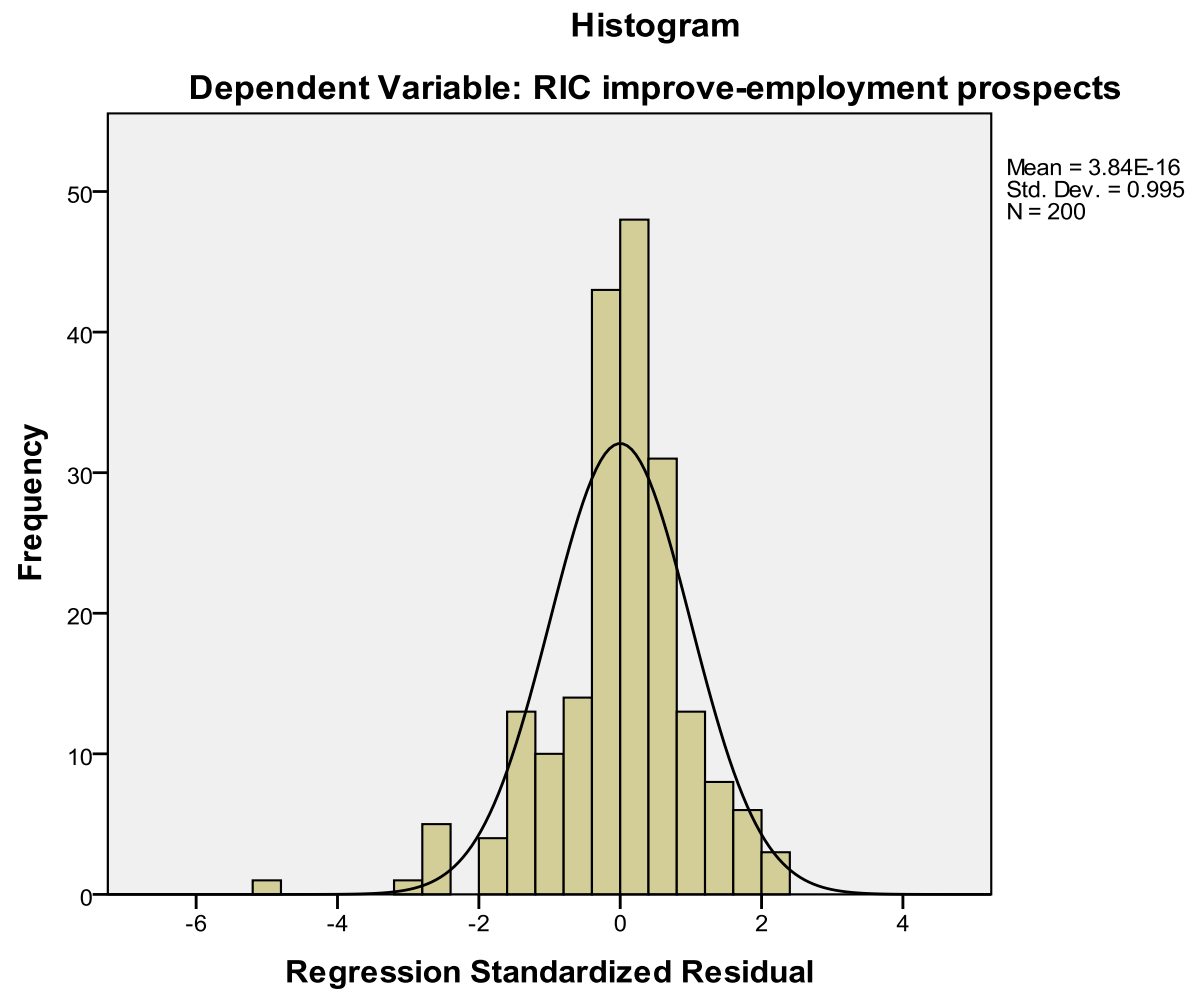
Collinearity Diagnostics^a

Model Dimension		Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	RIC improve-education attainment	RIC improve-income
1	1	2.944	1.000	.00	.00	.01
	2	.043	8.300	.17	.04	.90
	3	.013	15.021	.82	.96	.09

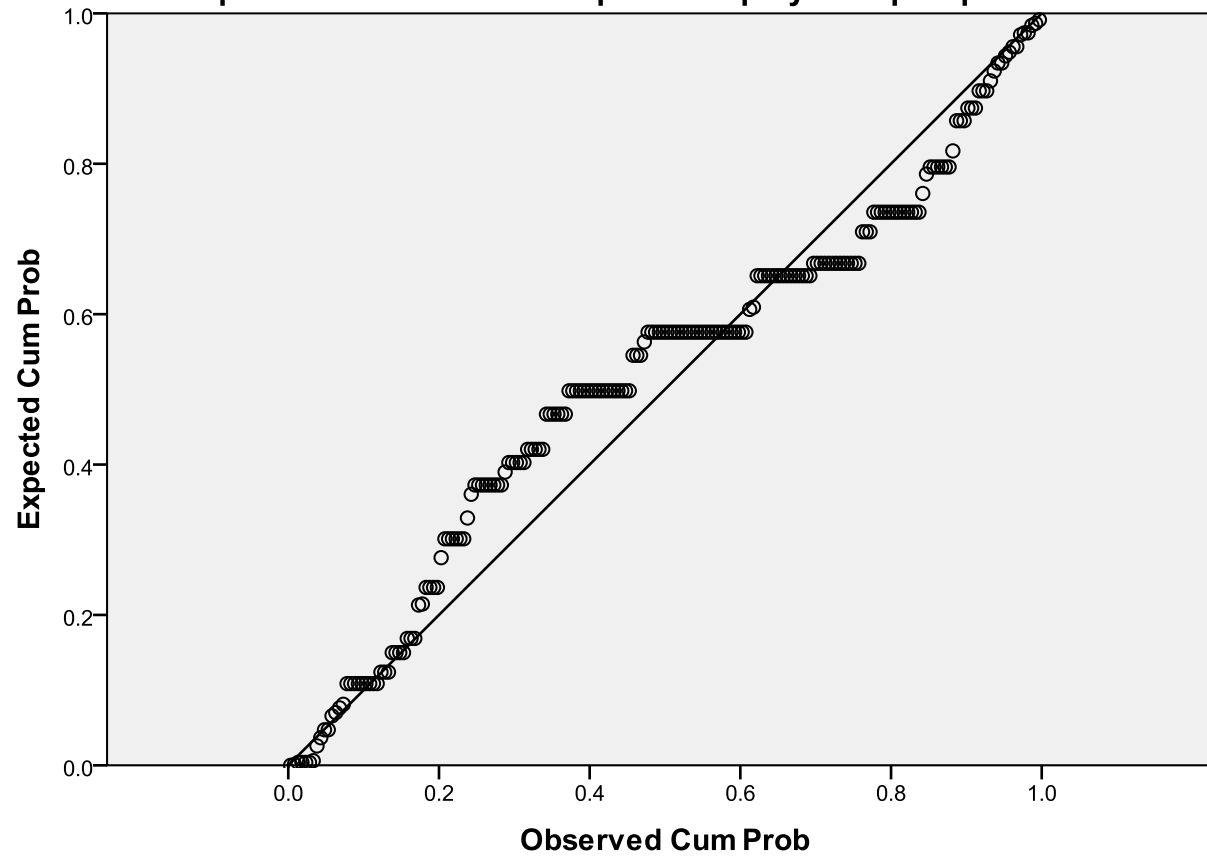
Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	RIC improve- education attainment	RIC improve- income
1	1	2.944	1.000	.00	.00	.01
	2	.043	8.300	.17	.04	.90
	3	.013	15.021	.82	.96	.09

a. Dependent Variable: RIC improve-employment prospects



Normal P-P Plot of Regression Standardized Residual
Dependent Variable: RIC improve-employment prospects



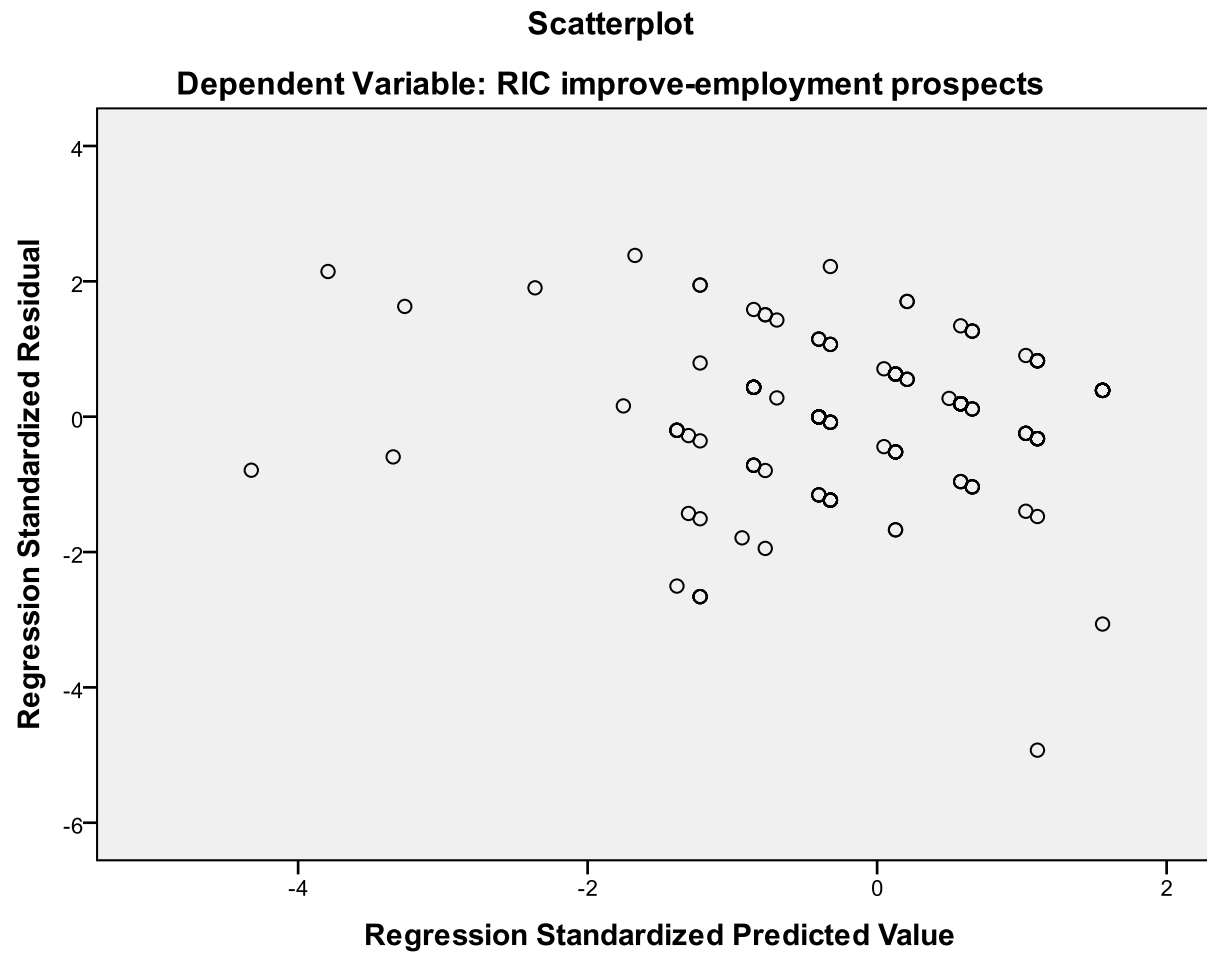


Table 2: Perceived benefits multiple regression

Model Summary ^b										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.705 ^a	.497	.473	.68864	.497	20.639	9	188	.000	1.972

a. Predictors: (Constant), RIC location, LCAMean, Highest level of education, Gender, BOMean, Age, Current income, Employment, BRMean

b. Dependent Variable: PB-Mean

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	88.088	9	9.788	20.639	.000 ^a
	Residual	89.155	188	.474		
	Total	177.244	197			

Predictors: (Constant), RIC location, LCAMean, Highest level of education, Gender, BOMean, Age, Current income, Employment, BRMean

b. Dependent Variable: PB-Mean

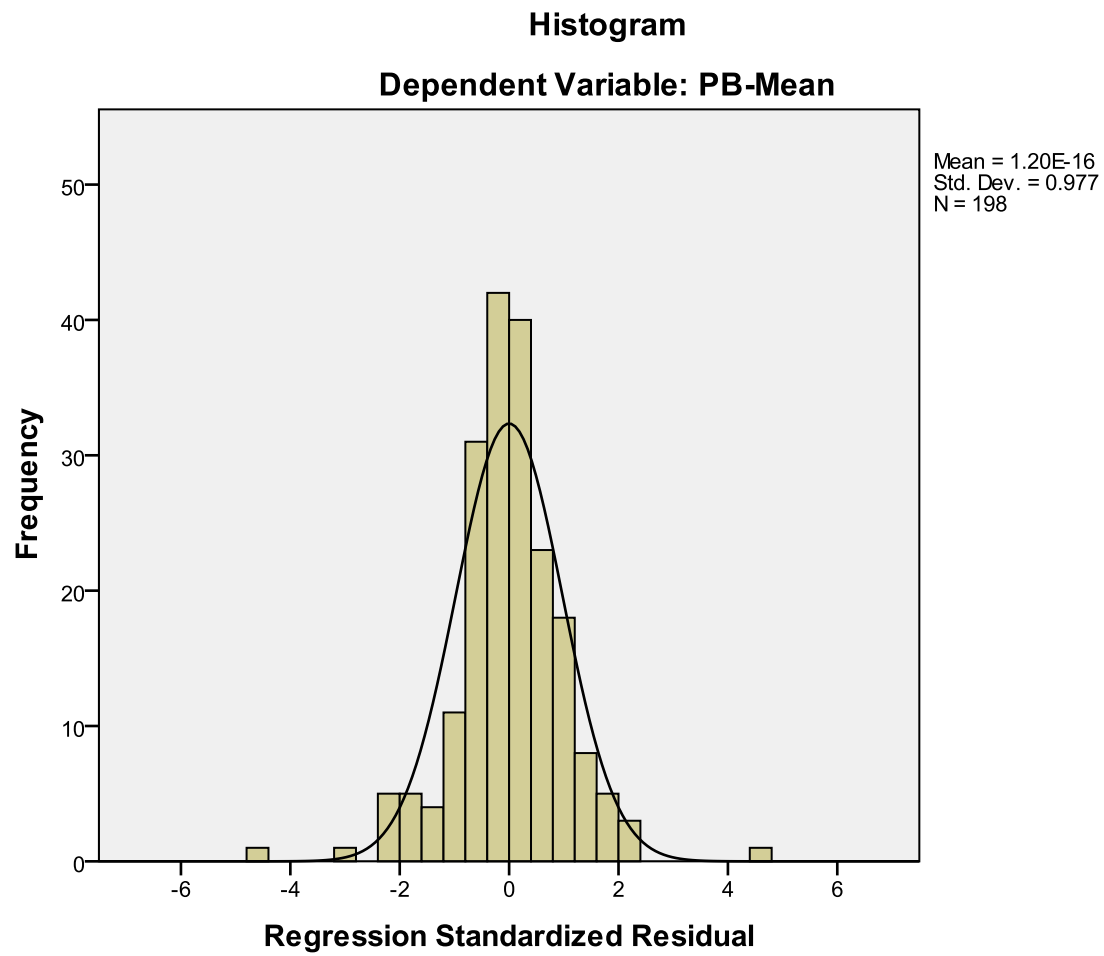
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.327	.592		2.241	.026	.159	2.495					
	BOMean	.395	.081	.429	4.870	.000	.235	.555	.659	.335	.252	.345	2.898
	BRMean	.265	.086	.273	3.065	.002	.094	.435	.634	.218	.159	.337	2.965
	LCAMean	.067	.051	.082	1.318	.189	-.033	.167	.350	.096	.068	.684	1.462
	Age	.104	.074	.090	1.404	.162	-.042	.251	.098	.102	.073	.656	1.524
	Gender	.087	.117	.040	.743	.458	-.144	.317	-.047	.054	.038	.919	1.088
	Current income	.146	.104	.100	1.402	.162	-.059	.351	.104	.102	.073	.530	1.885
	Highest level of education	-.121	.072	-.106	-1.698	.091	-.263	.020	.044	-.123	-.088	.687	1.456
	Employment	.066	.054	.095	1.212	.227	-.041	.173	-.108	.088	.063	.435	2.300
	RIC location	.008	.005	.080	1.509	.133	-.002	.018	.129	.109	.078	.959	1.043

a. Dependent Variable: PB-Mean

Collinearity Diagnostics^a

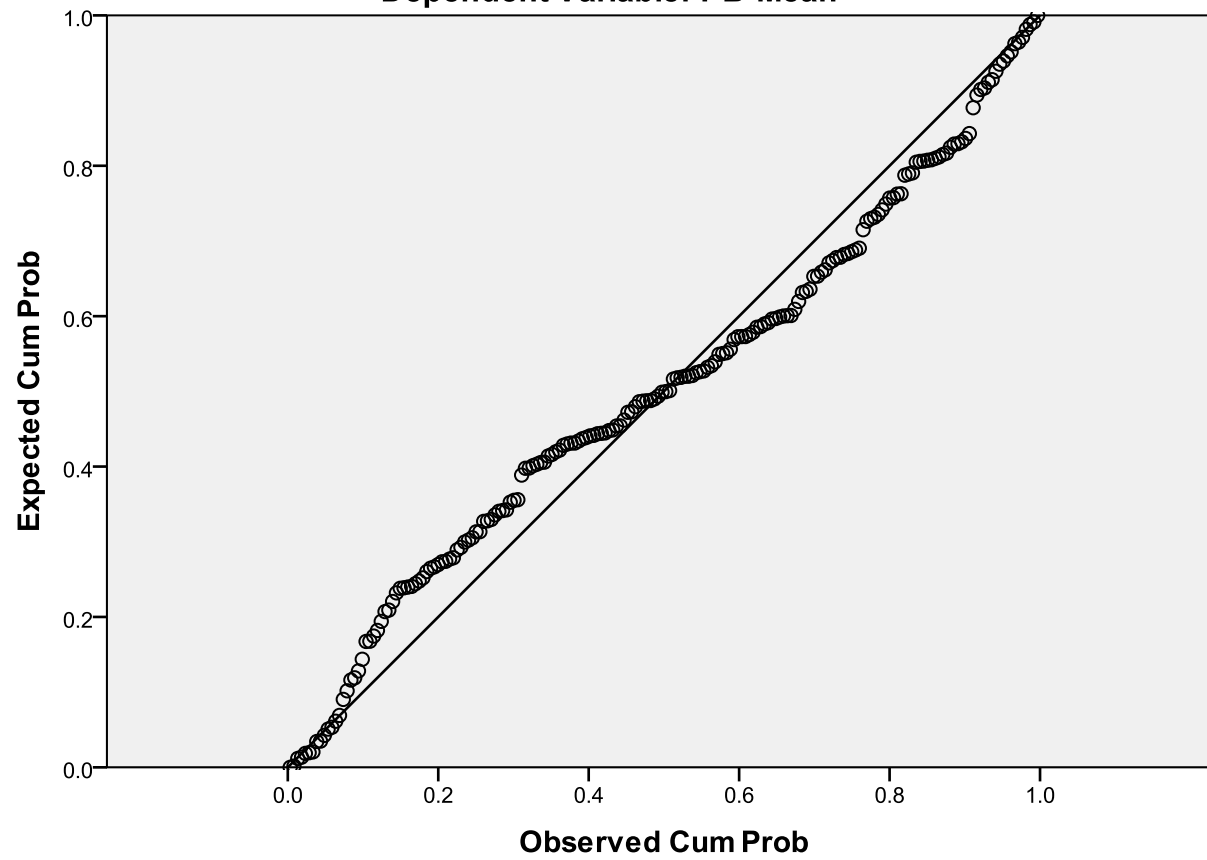
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions									
				(Constant)	BOMean	BRMean	LCAMean	Age	Gender	Current income	Highest level of education	Employment	RIC location
1	1	9.134	1.000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
	2	.368	4.979	.00	.00	.00	.00	.07	.00	.05	.00	.11	.00
	3	.172	7.298	.00	.00	.00	.00	.00	.01	.01	.00	.01	.90
	4	.116	8.884	.00	.00	.00	.00	.66	.00	.25	.00	.01	.00
	5	.079	10.764	.00	.03	.02	.17	.04	.17	.13	.00	.02	.01
	6	.059	12.398	.00	.01	.01	.03	.04	.34	.25	.00	.39	.00
	7	.034	16.300	.00	.04	.03	.71	.01	.27	.01	.06	.01	.01
	8	.025	19.133	.01	.05	.03	.05	.06	.05	.26	.62	.02	.00
	9	.007	36.362	.13	.64	.83	.00	.00	.02	.01	.02	.05	.00
	10	.006	40.010	.87	.24	.08	.03	.12	.13	.03	.29	.37	.07

a. Dependent Variable: PB-Mean



Normal P-P Plot of Regression Standardized Residual

Dependent Variable: PB-Mean



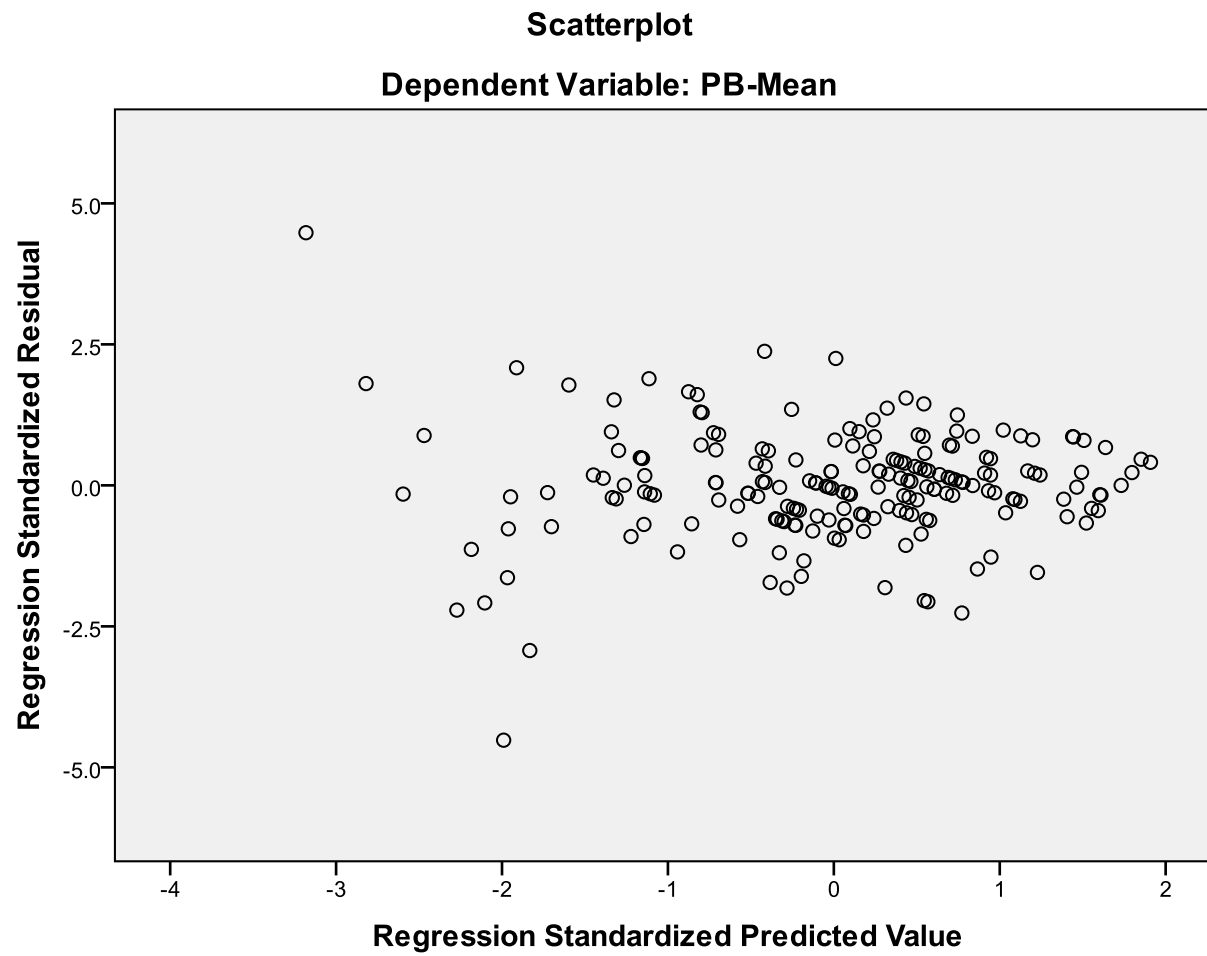


Table 3: Services satisfaction multiple regression

Model Summary ^b										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.584 ^a	.341	.309	.73495	.341	10.797	9	188	.000	1.905

a. Predictors: (Constant), RIC location, LCAMean, Highest level of education, Gender, BOMean, Age, Current income, Employment, BRMean

b. Dependent Variable: SS-Mean

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.489	9	5.832	10.797	.000 ^a
	Residual	101.549	188	.540		
	Total	154.038	197			

a. Predictors: (Constant), RIC location, LCAMean, Highest level of education, Gender, BOMean, Age, Current income, Employment, BRMean

b. Dependent Variable: SS-Mean

Coefficients^a

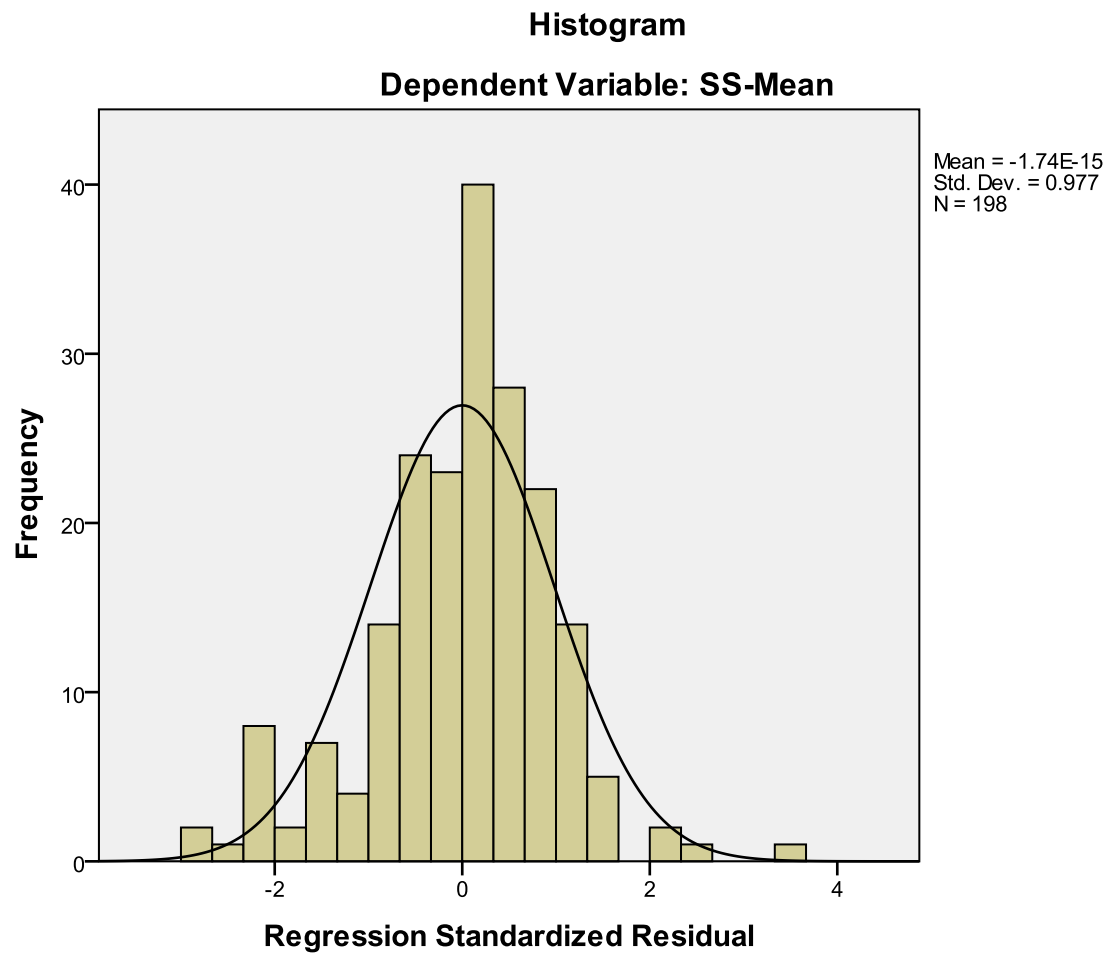
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3.199	.632		5.062	.000	1.953	4.446					
	BOMean	.452	.087	.526	5.221	.000	.281	.623	.566	.356	.309	.345	2.898
	BRMean	.035	.092	.039	.383	.702	-.147	.217	.470	.028	.023	.337	2.965
	LCAMean	.046	.054	.061	.847	.398	-.061	.153	.274	.062	.050	.684	1.462
	Age	.105	.079	.097	1.327	.186	-.051	.262	.090	.096	.079	.656	1.524
	Gender	.034	.125	.017	.277	.782	-.211	.280	-.047	.020	.016	.919	1.088
	Current income	-.006	.111	-.004	-.054	.957	-.225	.213	.035	-.004	-.003	.530	1.885
	Highest level of education	-.123	.076	-.115	-1.607	.110	-.273	.028	.004	-.116	-.095	.687	1.456
	Employment	-.005	.058	-.008	-.092	.926	-.119	.109	-.103	-.007	-.005	.435	2.300
	RIC location	-.001	.005	-.006	-.105	.916	-.011	.010	.035	-.008	-.006	.959	1.043

a. Dependent Variable: SS-Mean

Collinearity Diagnostics^a

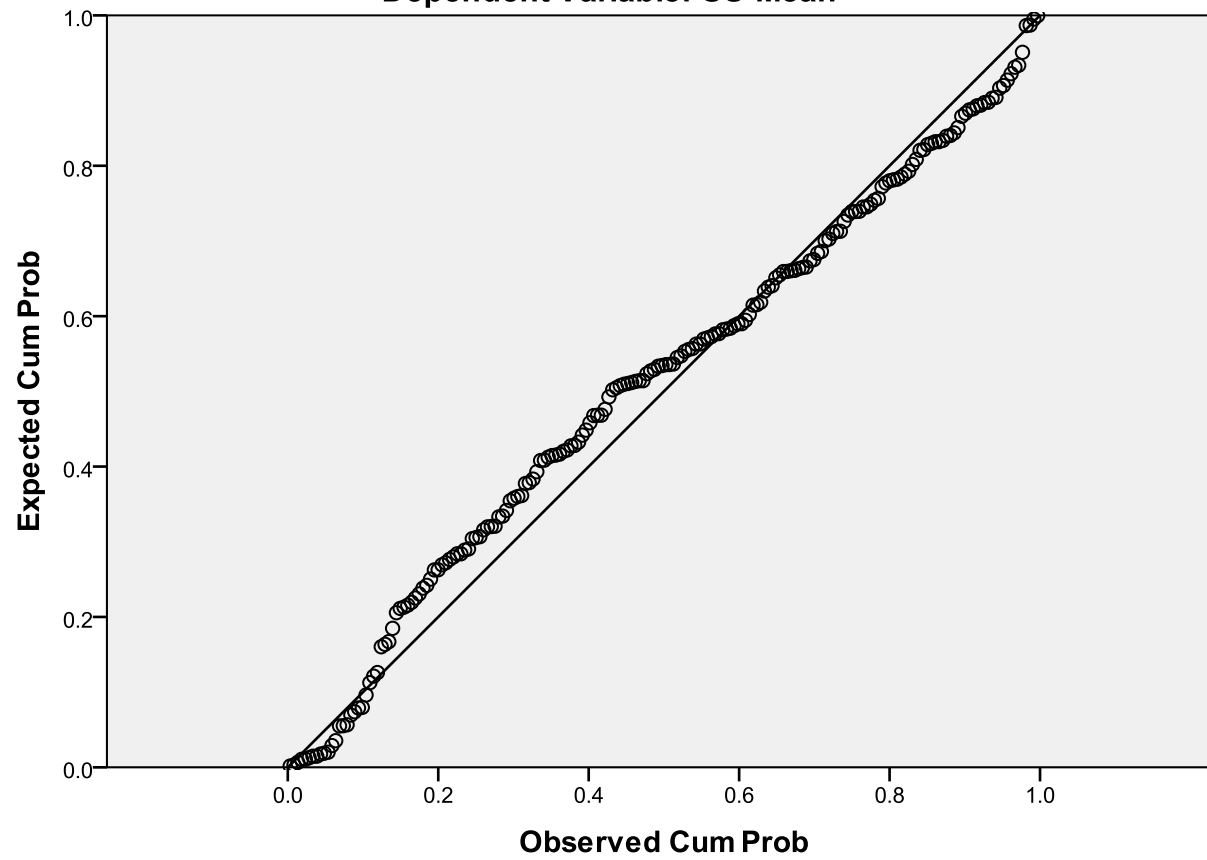
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions									
				(Constant)	BOMean	BRMean	LCAMean	Age	Gender	Current income	Highest level of education	Employment	RIC location
1	1	9.134	1.000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
	2	.368	4.979	.00	.00	.00	.00	.07	.00	.05	.00	.11	.00
	3	.172	7.298	.00	.00	.00	.00	.00	.01	.01	.00	.01	.90
	4	.116	8.884	.00	.00	.00	.00	.66	.00	.25	.00	.01	.00
	5	.079	10.764	.00	.03	.02	.17	.04	.17	.13	.00	.02	.01
	6	.059	12.398	.00	.01	.01	.03	.04	.34	.25	.00	.39	.00
	7	.034	16.300	.00	.04	.03	.71	.01	.27	.01	.06	.01	.01
	8	.025	19.133	.01	.05	.03	.05	.06	.05	.26	.62	.02	.00
	9	.007	36.362	.13	.64	.83	.00	.00	.02	.01	.02	.05	.00
	10	.006	40.010	.87	.24	.08	.03	.12	.13	.03	.29	.37	.07

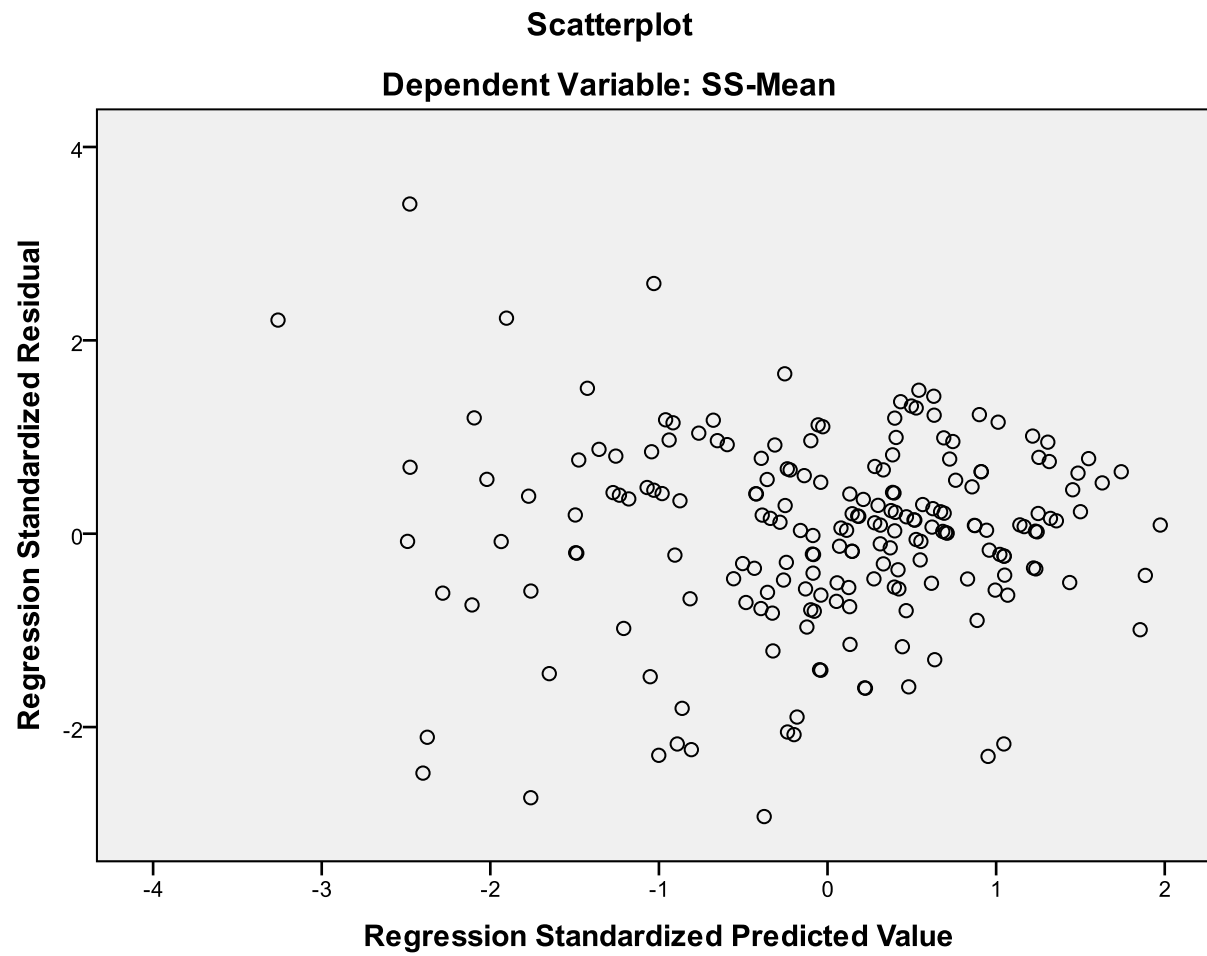
a. Dependent Variable: SS-Mean



Normal P-P Plot of Regression Standardized Residual

Dependent Variable: SS-Mean





APPENDIX 17: Photos during site visits at 11 RICs (2010)





Training sessions



Training sessions



Workshops



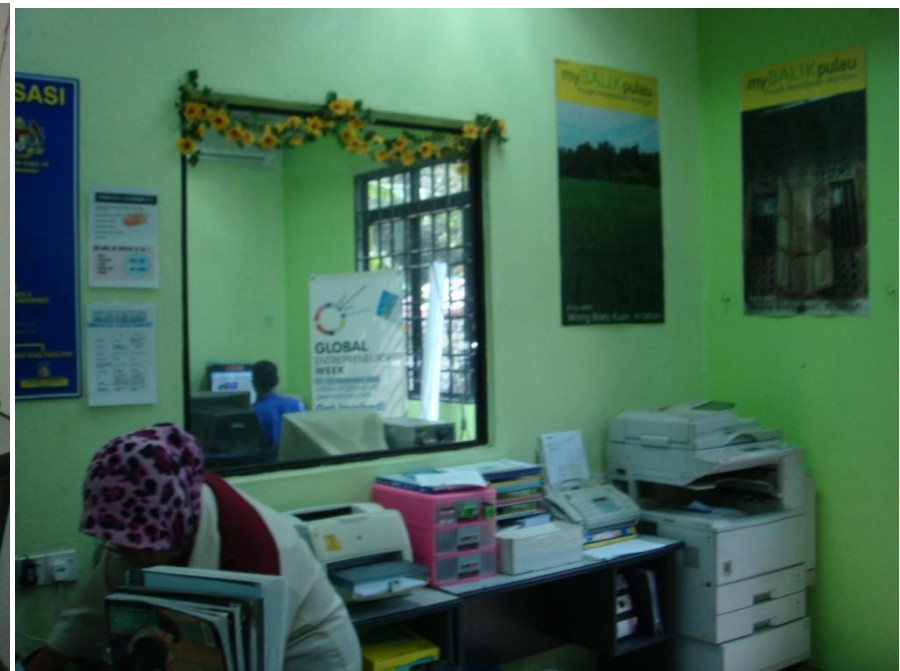
SEC Activities



SEC Activities



SEC Activities



ICT-based services



ICT-based services



ICT-based services