



Preliminaries into problems to access information – the digital divide and rural communities

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Contents

1. [Introduction](#)
 2. [Past research](#)
 - 2.1. [Literacy, training and the digital divide](#)
 - 2.2. [Technology and infrastructure](#)
 - 2.3. [ICTs and the digital divide](#)
 - 2.4. [Summary](#)
 3. [Methodology](#)
 - 3.1. [Demographics](#)
 - 3.2. [Computer literacy](#)
 4. [Summary](#)
 - 4.1. [Answers to research questions](#)
 - 4.2. [Recommendations](#)
 5. [References](#)
-

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1 Introduction

Rural areas in third world countries have a problem accessing information (Yu 2002). The lack of infrastructure in rural areas magnifies the impact of the digital divide on the lives of African

people. This served as motivation to investigate these problems experienced by the residents in Melmoth, Emkhindini Reserve in KwaZulu Natal (South Africa).

The digital divide refers to the gap that exists between individuals who have reasonable opportunities to access technology tools and those who do not have such opportunities. The digital divide breaks along many fault lines including, but not limited to, education, income, ethnicity, geography, infrastructure and disability (Yu 2002).

[top](#)

2 Past research

In urban communities, people have easier access to resources [i.e. libraries and multipurpose community centres (MPCCs)] that can be used to access information. However, in rural areas people have no access due to a scarcity of resources (Warschauer 2002). Houses are scattered and it is difficult to have a centre where people can access information (Computers for Africa, 2004). People living in rural areas also have neither the skills nor the trainers to assist them in the use of these resources (Warschauer 2002). Millward (2003) states that the Internet remains the main source of information but Anding (2003) notes that communities do not know how to decrease the digital divide.

McMillan (2003) (Author, please check this date – it differs from the one in the reference list) supports this by stating that information and other government services are not accessible to everyone because they have no resources. To access resources such as libraries, clinics and Internet cafes, they have to travel long distances. Fell (2002) states that the digital divide is getting wider although telecommunications penetration had risen worldwide. In Westernized countries people use mobile phones that allow them easier access to computers and the Internet but people in developing countries do not have similar freedom (Gennaio 2002). Whelan (2004) reports that people in Africa are denied access to communication (1 in 100 has access to a telephone). Lepage (2004) also states that Africa is lagging behind the rest of the world in developing their ICT. The factors contributing towards a lack of facilities in rural areas include low literacy levels, high rates of unemployment and lower levels of income. Families have to make a decision between buying a computer or having food on the table (Tognetti 2004). People living in urban areas with higher incomes find it easier to access computing facilities and they generally have phones for communication.

Many poor countries have high unemployment rates, are overpopulated and financially unstable and have poor infrastructure. To bridge the digital divide in developing countries, the infrastructure must be improved (Fors 2003). Programmes have been established to conceptualize the digital divide in Africa (Whelan 2004). Whelan also states that Connectivity Africa, for instance, supports research, development and the effective use of ICT in areas such as innovative, low-cost applications and connectivity across regions. Computers for Africa refurbishes second-hand computers and ships them to Africa (Computers for Africa 2004). These computers are given to disadvantaged groups and organizations that work for social development. They state that in Africa there are three computers for every 1000 people. In 2002 the government of New Delhi (India), in collaboration with the Information Technology Corporation, established a project to provide computers for the city's street children (Warschauer 2002). These computers are connected to the Internet (24 hour, seven days a week) through dial-up access to allow learning at their own pace and speed (Warschauer 2002).

SA is regarded as a country that has the best infrastructure in Africa. To bridge the digital divide, SA introduced rural communities to MPCCs, bringing services such as obtaining identity documents, marriage certificates and birth certificates closer to people (Annual Report 2002). Martindale (2002) argues that the digital divide is evident because IT has unwittingly excluded the masses as technology raced on, leaving many behind. Socio-economic circumstances, imbalanced education policies and language barriers are factors forcing this exclusion. In

Johannesburg, a group bridged the digital divide by creating an environment where people could become computer literate, learn about the benefits of technology and access information (Scott 2004). Most computer programs are in English and, to deal with this matter, www.translate.org.za has been set up to translate software into other languages in SA (Martindale 2002). To close the literacy gap, banks have changed the language of their automatic teller machines to a multilingual system. In March 2004 ABSA machines allowed users to select from five different languages in SA.

The SA government is trying to bring services to the people as a way of combating the digital divide by installing MPCCs throughout the country (Annual report 2002). In Soweto, the Ekurhuleni Metro Municipality is fighting the lack of access by participating in the Mindset Network Schools Mayoral Project by providing a programme that delivers courses in, for example, mathematics, physical science and English. It includes TV sets, video recorders, satellite dishes and smart cards (*Sunday Times* 30/05/04:22).

2.1 Literacy, training and the digital divide

It is understood that, for a nation to develop, the level of literacy must be lifted to bridge the digital divide. People in developing countries have lower levels of literacy compared to those in developed countries (Warschauer 2002). People are not concerned about information because they cannot use it and fall behind (*The Daily* 2003). The Internet is supporting instruction with new models of e-learning, with students at the centre of the learning process. Institutions for learning are placing materials online, becoming agents for change and helping to reengineer the education system by stimulating lifelong learning (Ishaq 2001).

Sehrt (2003) states that organizations have provided programmes that have trained teachers in African, Asian, Latin American and Middle Eastern nations in the use of technology. For e-learning to be successful in the developing world it needs important pillars, that is, a decent infrastructure and the Internet (Sehrt 2003). Warschauer (2002) argues that access to the Internet is like being connected to advance communication media through knowledge and production.

Schooling usually correlates with the income level of the child's parents. It is difficult for children in rural areas to advance in school because people do not have any income (*The Daily* 2003). Tognetti (2004) cites Brynson who argues that it is hard for people who do not speak English to become computer literate because programs are in English. The other factor that contributes towards illiteracy in rural areas is that schools are built a distance away from the community due to land structures.

Training is integral to the sustainability of ICT projects but technology changes and it is necessary for tutors to keep up to date with software trends (Problems that keep the divide in existence 2004). Fors (2003) suggests that the UN, together with IT companies, provide the community with skills to use computers and the Internet. Sehrt (2003) states that computer literacy is a precondition for learners to benefit from technology-based learning as e-learning builds on basic computer skills.

2.2 Technology and infrastructure

The digital divide is a complex concept, as it not only covers access to the Internet; but encompasses anything that accesses information and communication (e.g. computers connected to the Internet, radios and TV). Developed countries are advanced in technology but there is a big gap between them and Africa. The cost of supporting computers and a connection to the Internet is billions of dollars and African countries do not have these funds available. Additionally, the cost of training, support and changes in infrastructure makes ICT projects less desirable than other, more easily solvable, issues (Problems that keep the Divide in existence 2004a).

Warschauer (2002) compares a Professor at the University of California with a high-speed

connection in her office, a student in Seoul who occasionally uses a cyber café, and a rural activist in Indonesia who has no computer or phone line but whose colleagues in her group download and print the information for her. This illustrates the digital divide in three dimensions and shows how people from different backgrounds access information. Mulama (2004) argues that the communication infrastructure in Africa is concentrated in urban areas as 50% of telephone lines are found in the capital cities where only about 10% of Africa's population resides. SA's communication system (TELKOM) is almost entirely digital with microwave and fibre optics serving as main transmission media (Bendi 2002).

2.3 ICTs and the digital divide

Companies, governments and NGOs who help combat the digital divide are aware of the benefits that ICTs can bring to the community. ICTs have the capacity to decrease marginalization and empower people by giving access to information (Jackson 2004). The introduction of ICTs, a factor in combating the digital divide in the community, provides isolated individuals with an opportunity to access information and communicate. Crede and Mause (2004) state that if governments and other stakeholders design and implement effective ICT they may reduce the gap. These strategies need to focus on using ICTs to support development priorities. They argue that special attention needs to be given to provide least-developed countries (Africa) with financial resources, physical infrastructure and a knowledge base to achieve goals.

Crede and Mause (2004) show that a digital divide also exists between males and females. While the number of women in the USA comprise more than 50% of Internet users, women using the Internet is as low as 19% in SA, 13% in the Netherlands and 8% in China. Illiteracy is an obstacle to Internet access and women make up nearly two-thirds of the world's illiterates. By implementing ICTs in working environments, employees are responsible for bringing technological changes into the organization. Some aspects of ICTs in a working environment are as follows (OECD 2003):

- ICTs increase the need for continuous learning;
- the use of ICTs increases externalization of activities;
- ICTs increase accessibility of the Internet for the disabled; and
- ICTs offer job opportunities for women as they make jobs easier to do.

Some aspects of the literature have solved part of the problem, but the following still needs attention:

- How do the computer skills of the community compare with similar communities in other countries?
- Can computer skills help to bridge the digital divide and can this be extended to other communities?
- How can the digital gap be closed in rural areas and by whom must it be accomplished?
- What resources are available to bridge the digital divide?
- Why is bridging the digital divide important?

2.4 Summary

The ICT revolution and its acceleration rate, along with the explosion in knowledge, are creating changes in information needs among communities. New jobs, an explosion in entrepreneurship, access to education, new models of community building, ease of access to global markets and many more are dividends of this revolution. Yet the benefits of the information age are out of reach for many in developing countries.

[top](#)

3 Methodology

The study was conducted in Melmoth (Emkhindini Reserve, KwaZulu Natal Midlands, South Africa) with a population of about 500. The researchers randomly selected a sample of 200 people by using a quantitative approach to meet the demands of accuracy and reliability. The researchers handed the questionnaires to respondents to complete and allowed the respondents to answer questions freely to ensure a better return rate. The questionnaires consisted of multiple choice and open-ended questions. The researchers received 196 completed questionnaires. All the data were analysed, interpreted and expressed in the form of graphs, tables, percentages and statistical analysis.

3.1 Demographics

Sixty-two per cent of the respondents were males, demonstrating the fact that in rural areas females are not easily accessible. Males are assigned to perform physical work and they are reachable. Some community members were illiterate and found it difficult to complete the questionnaire. The investigation revealed that males in rural areas were more likely to take control as they are regarded as the head of the family. This is in accordance with a statement from *TheDaily* (2003), namely that males are better educated. Blacks largely inhabit the area where the study was conducted (93%), followed by coloureds (4%) and whites (3%). The investigation revealed that the availability of resources was related to policies of the past. White people were not affected by the lack of information access as they had access to computers and a better infrastructure. An outcome of the lack of access to information in the community is the need for knowledge. People, even if they have information, do not know how and where to use information (Warschauer 2002).

Fifty-five per cent of the participants were younger than 20 years of age and were affected by the lack of resources in the community. It was difficult for these learners because some of the material was computerized and they could not access it. There were two schools (a primary and a secondary school) that presented grade 0 to grade 7 and grade 8 to grade 12 respectively, but they had no infrastructure. If learners wanted to use a computer they had to travel to Empangeni or Eshowe where there were computers available to the public. Older people were not concerned about information because they did not know what to use the information for (also supported by Millward 2003). The researchers discovered that the lack of education in the community (16% with higher education qualifications) was a contributing factor to the digital divide.

Most of the better educated were teachers and not *bona fide* members of the community. Scott (2004) notes that the digital divide is applicable to permanent members of the community, and an environment where these people can become computer literate must be established. This is supported by Daly (2004) who argues that African learners and students are failing to understand the current educational system based on technology. As a result they find themselves at a disadvantage in their careers.

3.2 Computer literacy

About 70% of the respondents did not have computer skills. This is because there was no infrastructure and nobody in the community could teach them. Gennaio (2002) states that in third-world countries there are debts to be paid and people do not have funds available for training (e.g. schools write tests on the blackboard because they do not have the infrastructure or resources). Some people in the community did not know what a computer looks like and what it is used for. Another contributing factor to the poor infrastructure was that the geographical situation of the village is not conducive to good infrastructure. There are mountains, dense bushes and rocks and the houses are scattered. Only 30% of the community members had computer skills and about 29% of the respondents had no skills at all. Those who had better computer skills were students or learners who had been taught to use a computer in schools in Melmoth, but few families could educate their children in Melmoth because of the higher school fees.

About 98% of the respondents had no computers. This is because their income was too small to worry about computers (or they did not have the infrastructure). McMillan (2004) notes that services such as electricity and telephones are not accessible to everyone. The data also revealed that elderly people (pensioners) supported most homes while some were dependent on child support grants. Their income was too small to allow them to buy computers. This statement is in agreement with Computers for Africa (2004) that stated that African people are at a disadvantage in terms of ICT.

Figure 1 Where information is accessed

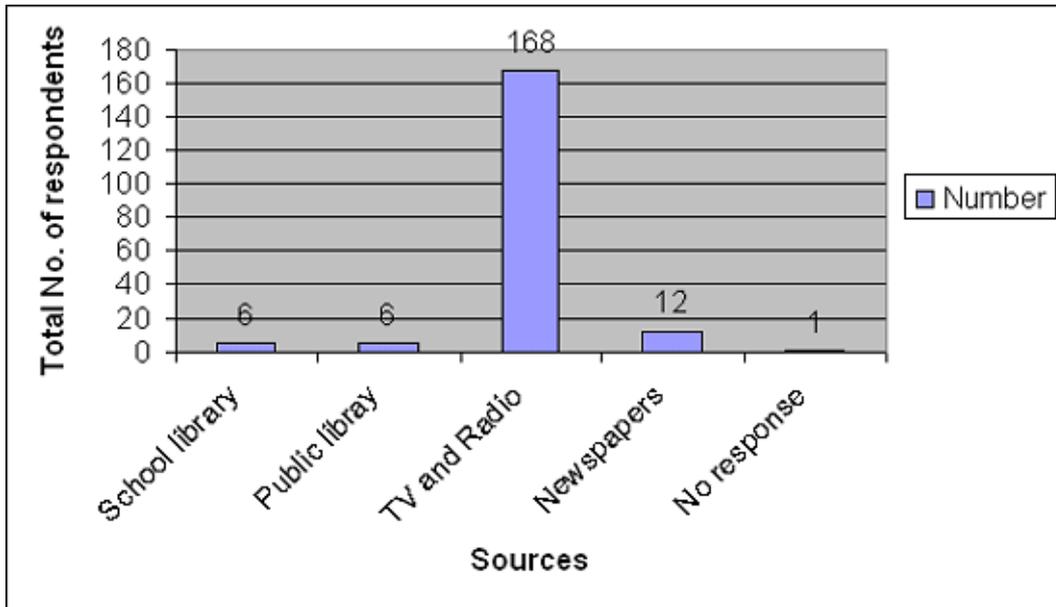


Figure 1 indicates that most respondents used television and radio to get information (87%). The public library was in Melmoth and it was difficult for people to travel to it. Schools in the village do not have libraries and learners get their information from teachers. McMillan (2002) notes that governmental news services are not accessible to everyone and the result is that people in rural areas use radio and TV to stay up to date with information.

Table 1 Regular use of information

Regular use of information	Number
Never	16
Daily	112
Weekly	43
Monthly	16
No response	6

Nearly 60% of the respondents who took information seriously listened to the news but did not use the information (Table 1). People need to change their minds so that they start using resources and realize the benefits. This is supported by Computers for Africa (2004) that promotes social development and literacy. There was a 92% unemployment rate and the findings of the study revealed that most respondents were not working because:

- the level of education was low in the community;
- there was no infrastructure and it was difficult to establish a small business;
- there were no community projects that would help them to use the land they have; and
- there was no community outreach program to educate people.

The unemployed people in the community contributed to the lack of information access. Ninety-five per cent of the respondents believed that by providing access to computers it would solve problems. Although most of them did not know computers they believed that computers can help close the digital divide. The research also found that respondents were willing to learn to use computers because they thought that computers could improve their lives. The majority of respondents believed that computers would provide them with some skills and easier access to information.

Computers can empower the community as they play a role in business and provide education via the Internet. Computers in rural schools can also close the gap between rural learners and urban learners. This is in agreement with Sehrt (2003) who argues that, for e-learning to be successful in the developing world, it needs to build on two pillars: the existence of infrastructure and access to the Internet.

Table 2 Gender and computer skills

		do you have pc skills?			
		yes	no	spoilt response	no response
gender	male	42	75	1	2
	female	19	52		2

Table 3 Gender and level of education

		level of education					
		no formal education	primary education	secondary education	tertiary education	other	no response
gender	male	3	5	100	7	1	4
	female	3	4	57	9		

There were more males with computer skills than females (Table 2). The correlation between gender and computer skills is 0,087, which is close to 0. This indicates a weak correlation between these variables (gender and computer skills are independent). Having computer skills does not depend on gender because any person can learn to use a computer regardless of gender. There is a weak negative correlation (-0,082) between gender and level of education (Table 3). This is close to 0, meaning that these variables are independent. Gender has nothing to do with education because both males and females attend school. So there is no contribution of gender to education, meaning all should have equal access to information. There is, however, a significant positive correlation, (0,672) between computer skills and the level of understanding. This is supported by Warschauer (2002) where he argues that if you grew up with computers you understand them better.

Table 4 Gender and amount willing to spend on computer training (per month)

		how much will you spend per month on pc training?				
		R100 or less	R101-R200	R301-R400	R401 or more	no response
gender	male	39	22	23	30	6
	female	17	9	22	23	2

Table 4 shows that females were willing to spend more money on computer training than males. The reason for this is that females were more concerned about satisfying needs for their families but, to catch up, they have to spend their money on themselves. To solve this problem, government needs people who can educate and tell them about the importance of computer skills. The correlation is 0,106, which indicates a positive correlation. These two variables do not

possess a stronger relationship between them and displays no casualty – anybody can thus spend any amount of money on computer training.

Table 5 Age and computer skills

		do you have pc skills?			
		yes	no	spoilt response	no response
age	19 or younger	31	75	1	1
	20-29	26	40		3
	30-39	3	4		
	40-49	1	1		
	50 or above		7		

Most of the affected respondents were young. The statistics show that many people under the age of 30 did not have computer skills (Table 5). Most of these were people who were educated or were currently learning at schools in the village where there were no resources. This should be kept in mind by the government when it plans to reduce the digital divide. Most respondents were unemployed because the level of education in the community was poor. The correlation is weak ($-0,075$). This means that there is no relationship between the two variables. This would affect the digital divide and help to increase it. This is in agreement with Computers for Africa (2004) who argues that low education ensures a big gap.

Most of the younger respondents were prepared to pay to learn how to type, play computer games and use the Internet. It seems that older people in the community were not interested in computers (few of them were willing to spend money on computer training). The elderly were of the opinion that ICTs were for the young, leading to a lack of interest in using the Internet (Millward 2003). There is a positive correlation ($0,181$) between age and the amount people are willing to spend on computer training as younger people are the ones who want to learn about computers. Therefore this should help the government to identify those who could help to reduce the digital divide.

[top](#)

4 Summary

People living in rural areas are lagging behind in the use of the Internet. This research investigated the effects of the digital divide in rural areas. It used the Melmoth community at Emkhindini Reserve (KwaZulu Natal Midlands) as a population. The first objective was to explore the role that can be played by the government and other NGOs in empowering the community with resources. Another objective was to discover what can be done by communities to empower themselves by building their own resources and realizing their potential.

Lack of information access is a complicated problem in rural areas and the researchers reviewed literature to discover items that can shape understanding about the lack of information access. They also investigated strategies that are currently used to deal with the difficulties of accessing information in rural areas using ICT and how these strategies can be applied in SA. One of the goals of the SA government has been to empower communities, but it has not yet been met. The government is addressing other challenges rather than paying attention to the poor.

It seems that there is no direction for the empowerment of communities in rural areas. There is evidence that the government is also failing to address the problem of information access in the Emkhindini community. This was supported by 70% of the respondents noting that they had no computer skills and their situation was not improving. The problems of poor education and a high rate of unemployment in rural areas has been a contributing factor to poor information access. It has been found that 92% were unemployed and the majority of the respondents associated their

status of poor information access with shortage of resources in the community.

4.1 Answers to research questions

How do computer skills in the community compare to communities in other countries?

The study discovered that only 30% of the community members had computer skills. In India, computers were connected to the Internet and street children were given 24 hour access. The government needs to improve the situation in SA.

How can computer skills help to bridge the digital divide and can this be extended to other communities?

Computers connected to the Internet are main sources of information and therefore bringing computers to the community will help them to learn computer skills (Computers for Africa 2004). There is no doubt that computers in the community can make a difference as Yu (2002) emphasizes. Communities that lack knowledge and technology have difficulty in competing and will become poor and isolated.

How will the gap in the digital divide be closed in rural areas and by whom?

This can be done by:

- equipping young people with the necessary technology literacy skills;
- ensuring that schools and communities equip individuals with the technology skills they will need; and
- ensuring that adequate funding is provided for schools and communities that will allow them access to technology resources to address the needs of communities.

All members in the community and the government are responsible for combating the digital divide.

Why is bridging the digital divide important?

By bridging the digital divide the community will benefit as follows:

- It will help them acquire knowledge and enhance educational systems;
- it will enable them to catch up with developed countries by leapfrogging stages of technological development;
- it will allow less developed countries to effectively meet development goals, such as poverty reduction, health and education; and
- it will promote recognition from the international community, thus attracting foreign tourists and investors and enabling the country to benefit from global e-commerce (Yu 2002).

What resources are available?

The findings of the study reveal that in the rural community there were no resources.

4.2 Recommendations

- People in rural areas, affected by the lack of information, should develop a strategy that needs less attention from government and focuses more on what they can do themselves to combat the digital divide. They should manage their own resources properly.
- The SA government should revisit the objective of empowerment for poor people who are lagging behind in the use of technological devices. Special attention should be paid to find

solutions that will help neutralize problems associated with information poverty.

- About 92% of the unemployed at Emkhadini (Melmoth Community) were young people from the local school. ICTs should help people to empower themselves with skills and a better educational background.
- All recommendations can be achieved by mobilizing people in the community to play a meaningful role in fighting information poverty in the village.

This study argued that the lack of information access in rural areas is magnified by a lack of infrastructure. People in rural areas who are willing to get information have no choice other but to listen to the radio or watch television because public libraries and newspapers are not available in rural areas. As a result, people in rural areas have no access to information and the digital divide increases. The recommendations might help to reduce the gap but will not erase it completely.

[top](#)

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