

Development Informatics

Working Paper Series

The Development Informatics working paper series discusses the broad issues surrounding information, knowledge, information systems, and information and communication technologies in the process of socio-economic development

Paper No. 10

Themes and Issues in Telecentre Sustainability

**RAUL ROMAN & ROYAL D.
COLLE**

January 2002

Published **Institute for Development Policy and Management**
by: University of Manchester, Precinct Centre, Manchester, M13 9GH, UK
Tel: +44-161-275-2800/2804 Fax: +44-161-273-8829
Email: idpm@man.ac.uk Web: <http://www.man.ac.uk/idpm>

View/Download from: http://www.man.ac.uk/idpm/idpm_dp.htm#devinf_wp

Educators' Guide from: <http://www.man.ac.uk/idpm/educdi.htm>

Table of Contents

Abstract.....	1
A. ICTs and the Telecentre Movement	2
Clarifying Concepts	2
B. Ten Themes for Telecentre Sustainability	4
C. Key Telecentre Issues	14
The Access Challenge	14
The Role of Training.....	17
The Telecentre as a System.....	18
The Telecentre Research Agenda.....	19
References	19

Themes and Issues in Telecentre Sustainability

Raul Roman & Royal D. Colle

Cornell University, Ithaca, New York²

2002

Abstract

The initiation, diffusion and adoption of the telecentre idea has been an enormously eclectic process, largely devoid of systematic research and planning. The approach has generally been one of pilot projects — trying out models to see what works to achieve a diversity of objectives. In some cases the approach has been simply entrepreneurial, with enterprising business people exploring new opportunities for profit-making.

A range of important issues is linked to the operation and success of telecentres. These include: sustainability, community relevance, government policy, information and communication technology (ICT), research, community partnerships and participation, telecentre objectives, and business planning. Often mentioned but largely undeveloped is the training associated with telecentre management, an issue that relates to all of the issues mentioned.

While each of the issues deserves systematic analysis, this chapter concentrates on sustainability and training. Based on data collected from Australia and South Africa to Hungary and Canada — and from various project documents — we describe some of the strategies being used to sustain telecentres. We put this discussion especially in the context of developing nations because of the intense interest in the early 21st century in incubating telecentres in places where individual connectivity to information access is most problematic.

² Author contacts: Raul Roman (rr66@cornell.edu) & Royal D. Colle (rdc4@cornell.edu), Department of Communication, Cornell University, 338 Kennedy Hall, Ithaca, NY USA

A. ICTs and the Telecentre Movement

The potential of telecentres along with the challenge is evident in a verbal picture snapped in Latin America. The story starts:

Until a brilliant sunny day when the Internet reached his Ashaninka Indian village in central Peru, tribal leader Oswaldo Rosas could think of few benefits modern life had brought to his people.

The story goes on to tell of how through grants from the Canadian government, the local telephone company, and a non-profit organisation, things were changed by the introduction of a computer, portable generator, a satellite dish and a big screen monitor. Rosas and five other tribal leaders received eight weeks of computer training which led to developing their own Ashaninka web site (www.rcp.net.pe/ashaninka). With it they sold their organically grown oranges in Lima, 250 miles away, and boosted tribal revenue 10%. Now, Rosas' hut also doubles as a tribal cybercafe. (Faiola and Buckley, 2000)

So benefits from information technologies are reaching the Ashaninkas in Peru. But almost all of the middle aged women there cannot read or write (a situation common in the poorest Latin American countries), and thus they could miss some of the benefits of ICTs. They are like hundreds of thousands of women all over the world who may be shut out of the Information Society because of their literacy level and their gender. Most will never open the door of a telecentre or push the start button of a computer.

Clarifying Concepts

The Ashaninka case suggests the need to clarify several concepts. We differentiate between *connectivity* and *access*. We use connectivity to refer to the physical availability of information and communication technologies. Access, a more complex matter, refers to the economic, sociological and psychological factors that influence persons' opportunities to use the technologies.

Telecentre is a rather loosely used word to describe places that offer the public connectivity with computers and networks. We have adopted the concept of telecentre as a public place where people can get a variety of communication services, and where a major part of the operators' purpose is to benefit the community. Thus we use the multi-purpose community telecentre approach suggested by the International Telecommunications Union (ITU) and others. The more narrowly focused cybercafés or Internet kiosks are also important because of their potential to become telecentres as they mature.

With this we offer a brief historical note. The idea of a community sharing computer technology emerged in the 1980s with the introduction of the telecottage in Scandinavia. The initial purpose of telecottages was to fight against marginalisation of remote rural places in the information society. This was before the Internet. In the mid 1990s a new breed of telecottages appeared in Hungary. These were built around social and economic development, computers and the Internet. This was part of a more robust movement that marked the close of the 20th century, with a variety of international organisations supporting the diffusion and adoption of ICTs and telecentres.

Thus, underpinning the telecentre movement have been three related assumptions:

1. Appropriate information can contribute significantly to development.
2. ICTs provide an important and potentially economical way for people to access that information.
3. Telecentres are a viable way to link communities with the information and communication technologies.

B. Ten Themes for Telecentre Sustainability

In addition to talking about telecentres as a movement, it would be appropriate to put them in the context of an experiment. Many projects begin without a firm plan for long-term sustainability. The ITU has emphasised the experimental or research approach to telecentre by labelling its initiatives as “pilot projects” (Ernberg, 1998b), even though there is not much evidence that a systematic research effort is underway. Our research team has visited projects in Canada, Mexico, the U.S., Hungary, South Africa, Australia and India, and we have studied reports from Egypt, Tunisia, Peru, and other countries to discover some of the major themes that emerge from on-going efforts to institutionalise community telecentres. While there are many differences among these operations, we perceive ten themes that may provide starting points for generating *hypotheses* regarding successful telecentres.

1. The power of a national commitment by policy-makers who recognise the value of connecting the people of the country through the modern tools of the Information Society, and follow that commitment with funding and organisational support for multi-year programmes.

The G-8's Okinawa Charter is an example of a international political commitment, but we have yet to see if there will be significant concrete support for its declarations. The Canadian Government went beyond the rhetoric of an Information Society and committed people and funding to making the Internet affordable in rural and urban communities across the nation through its Community Access Program (CAP). With a six year commitment, it made start-up money available and created an infrastructure to help local organisations make it work. While the resources offered are not enough for a complete comprehensive multi-purpose telecentre, the *imprimatur* of the national government combined with some serious money significantly motivated a nation-wide community-based effort that commanded provincial, regional and local participation.

Similarly, in Australia the Federal Government's policy to create the “Networking the Nation” fund has been instrumental in Tasmania's development of 59 Open Access Centres, and a programme in New South Wales to set up 55 multi-purpose “Technology Centres”.

(Short and Latchem, 2000) In South Africa, the 1996 Telecommunications Act created the Universal Service Agency which has been the key actor in establishing and funding telecentres in under-served and rural areas of the country. (Fuchs, 1998)

Besides the direct funding available and the administrative push, a national policy can also be instrumental in providing a favourable regulatory and tariff climate, and in producing the human resources that are vital to a telecentre movement. For example, to support its policy goal of becoming an Information Society superpower, the Indian government doubled the number of persons it would graduate from its technology training institutes. The Egyptian Government's plan for incorporating ICTs in its business and socio-economic development includes — besides Technology Access Community Centres in rural areas — creation of facilities in all its 27 provinces that can train, altogether, 30,000 people annually in computer uses. (Kamel, 2000)

Thus a national policy can give visibility and help mobilise resources for building the infrastructure and programmes that promote access and use of information and communication technologies.

2. The importance of partnerships in translating national policy into action through governmental and non-governmental bodies at the regional and local levels.

National policy and national government funding does not necessarily translate into centralised planning and operations. Hungary has demonstrated that a former socialist country steeped in centralised planning could develop a “telecottage” system built on local non-governmental organisations (NGOs) with community ownership and management. It is called a “civic initiative” with its emphasis on local NGOs applying for government telecottage grants and showing that they have the support of local governments or private organisations. Industry Canada built into the CAP application process an explicit recommendation that community organisations proposing access sites seek out partners who can share technical, financial and personnel resources. In some provinces, a partnership with a library opened the way for the CAP site to obtain free computers from a Gates Foundation grant.

In the health field, various international organisations are setting up ICT systems that could be partnered with community multi-purpose telecentres. For example, in 2000, the organisation Health Information for Development (HID) in the United Kingdom laid out a plan to set up — particularly in developing nations — health-information-resource centres called Information Waystations. These are backed by information-collecting-and-processing “hubs” called Staging Posts. The intent is to funnel appropriate health information from nations in the North and the South to individuals and local health workers in developing nations using locally relevant terms. Similarly, the World Health Organisation presented a seven-year plan to establish the Health InterNetwork Project. It is an initiative to facilitate the flow of health information world-wide using Internet technologies. Among its provisions are reliable and relevant local and international public health content and 10,000 to 14,000 new public health information access points, linked with an electronic/Internet-based HealthInterNetwork portal. These efforts and others create significant opportunities for creating partnerships that link specialised areas such as health with telecentre services.

3. The value of having local “champions” (innovators) who can mobilise others (early adopters, opinion leaders) to accept the vision of an ICT telecentre programme.

The main reason for the extraordinary reputation of the Gasaleka Telecentre as one of the most active and vibrant in South Africa is Masilo Mokobane, director of the project. In spite of nagging infrastructure and economic problems, we discovered him to be a telecentre visionary. From the first day, Mokobane has not only been fighting for survival of the centre, but he has been entertaining new ideas to better serve his community through the use of new communication technologies. He personifies what we call a “champion.”

The obscurity and abstractness of the “Information Society” requires the missionary zeal of individuals who can translate and demonstrate the relevance and application of these kinds of concepts to the realities of the community. And for the innovator to be from the community itself increases the credibility of the telecentre initiative. The professional literature on the diffusion of innovations points out the importance of the innovator. “The innovator,”

says Professor Everett Rogers, “plays an important role in the diffusion process: That of launching the new idea in the system by importing the innovation from outside the system’s boundaries” and igniting “early adopters.” (Rogers, 1995)

4. The significant value of community volunteers in operating telecentres

In documents describing its information technology Community Access Program, Industry Canada says: “Volunteers, volunteers, volunteers....a CAP site requires the support of many dedicated and talented volunteers.” In most communities, volunteers offer a variety of benefits to the programmes. They contribute to the day-in, day-out supervision of the facilities — a potential personnel expense that many community-based communication centres could not afford. But the volunteer has deeper significance: the variety of volunteers in a system provides telecentre clientele with models with whom they can identify and feel comfortable. In telecentres throughout the world, one can find high school and college students, retired business people, active school teachers and others providing one-on-one and group training and assistance. Volunteers can also contribute to enlightened decision-making in the telecentre because they reflect a variety of community constituencies.

The challenge for telecentres is to move from largely spontaneous use and management of volunteers to developing an explicit strategic plan for recruiting, training, retaining and rewarding volunteers. Trish Barron in Western Australia’s Telecentre Support Unit summarises the volunteer issue in three words: “Gain, Train, Retain.” The important issue is to find incentives to fit the kind of volunteers available. For some it is the recognition, for others it is free time on the computers, and for others it may be college credits in the local university.

5. The advantages of clusters or networks of telecentres working together in a region to develop and share a variety of resources.

The Western Australia Telecentre Network Support Unit illustrates well what can be done when telecentres are combined in some way so that they share a support system. The Support Unit lobbies, seeks funding, develops initiatives, and carries out a variety of other

management functions for the 76 members of the Network. In Canada, the CAP administrative system includes provision for regional co-ordinators who supervise sites in their geographic areas. In some cases, the co-ordinators have successfully aggregated CAP sites for carrying out joint projects. These projects may involve training, sharing of resources, problem solving, and other activities. In some cases, joint projects to develop locally-relevant information and data bases (for example, French language ones in heavily English language Canada) help sites increase their relevance to their communities.

In Canada and Hungary, telecentre sites themselves have joined together to initiate collaborative projects, achieving some economy-of-scale advantages. These efforts have sometimes resulted in a formal membership body. Architects of telecentre systems can build such support components into their systems, and devise a method for funding them, such as membership fees. One of the major recommendations to the Government of India that came out of a national ICT workshop in Chennai (2001) was that the GOI foster the establishment of an NGO National Association of Telecentres that, among other things, could provide leadership in developing community-relevant information resources that are cost-efficient and affordable.

6. The importance of raising awareness about information and ICTs as a valuable resource for individuals, families, organisations and communities.

Computer giant Bill Gates startled many in the information technology field when he declared in the *Guardian* newspaper that “the world’s poorest two billion people desperately need healthcare, not laptops.” (Helmore and McKie, 2000) And one hears a message around the world: it’s no “field of dreams” — referring to the appearance of telecentres in a community and the absence of a sufficient number of users. Both of these situations reflect that many people may see little significant connection between ICTs and direct benefits to a family’s or a community’s needs. However, there is anecdotal information to suggest that the scepticism may be premature. There’s a story of a woman in India who complained about her vision: she said it was like having a sari over her eye. Through information she obtained at a telecentre about a travelling health team visiting her area, she had a simple operation and removed the “sari” (cataracts). Another anecdote is about the farmer in northern Shaanxi

Province in China who travelled 500 kilometres to an agricultural information centre where he found information online that helped him market his apples and start up a pumpkin export trade.

A recent report in *The New York Times* tells of a district in India's state of Madhya Pradesh where villages bought a computer system and the state picked a young person with at least a 10th grade education to print out and sell information from the state's computer network. The story tells us:

For 25 to 35 cents, villagers buy printouts of documents that they might have spent days trying to get from local bureaucrats: land records, caste certificates and proof of income, among others.

For another 25 cents, any citizen can send a complaint to the state by e-mail — my pension didn't arrive, my child's teacher didn't show up, my village hand pump doesn't work — and the state guarantees a reply within a week. And for 10 cents, a farmer can get a printout listing the prices of any agricultural commodity sold at surrounding markets. (Dugger, 2000:10)

In the village of Bagdi, the farmers collect the day's price lists for wheat, garlic, and other crops and use these to negotiate with middlemen. "If the price he offers suits me, I'll sell to him," says one farmer. "Otherwise I'll take it to market myself."

Government or private sector initiatives targeting popular participation in the Information Society should consider planning vigorous campaigns to illustrate the benefits of information as an important resource for daily living — assuming they, themselves, are reasonably convinced. (Johan Erberg, formerly with the ITU, argues for the relevance of ICT to a nation's health and welfare on a more macro level in Erberg, 1998a).

7. The role of research in creating a viable telecentre enterprise.

There are things we do not see in exploring the telecentre movement. For example, we see relatively little time or resources devoted to research. Telecentre demonstration projects

need to be led by rigorous research or they will be of little use. Systematic evaluation of these experimental projects may be pivotal in encouraging national governments and the private sector to put this issue in their agendas. We mentioned earlier the ITU's multi-purpose telecentre initiative, begun in the late 1990s, which created multi-purpose telecentres and called them pilot projects, making them somewhat research-related. Johan Ernberg, who was instrumental in that history, has raised a list of questions that might be answered by the pilot projects. These range from how do we get international and national organisations to co-operate, to who pays for new telecentres and what is their impact. (Ernberg, 1998b)

Some of Ernberg's list involves quite large and complicated research questions, perhaps appropriate for academic enquiry. But research needs to be done at the individual telecentre level. Telecentre personnel should have simple, reliable tools to use in on-going operations — tools that (1) help them discover and continuously monitor the needs of the community, (2) get a reliable picture of the demographics of the area, (3) systematically monitor on-going operations, and (4) help check systematically on outcomes and consequences. This goes beyond counting the number of users, although this is an important statistic.

8. Telecentres need long term sustainability and business plans that fit the culture of the community.

Most telecentres operate in a not-for-profit mode, but that does not mean not-for-income. Typically donor agencies reduce or discontinue financial support for telecentres after an initial incubation period. Few of the telecentres across Australia have guaranteed on-going funding. Western Australia is the exception where the state government has incorporated telecentre support into at least a four year commitment — to 2003. (Short and Latchem, 2000)

Other programmes in Australia and the Hungarian system have been innovative in developing income-producing activities to support telecentre operations. Among the telecottages in Hungary, there are more than 50 different services offered to the community. These range from blood-pressure measurement (provided by 25% of the telecottages in

1999) to computer games (offered by 94%) and social services assistance (44%). In Hungary, a major source of support for telecottages are the contracts that they obtain from government agencies, thus becoming (for a fee) extensions for government services. (Bihari and Jókay, 1999) The Queensland Open Learning Network's Learning Centres offer training courses which are paid for by trainees' employers or by the individuals themselves. Businesses and industry groups pay for use of the teleconferencing facilities, and institutions in the community pay membership fees to the Centres.

In contrast, would be the telecentres that get three years of government funding but with a leadership that makes no current effort toward independent income generation. Such centres are expected to expire after the public funding ends.

In our research on telecentre training (in which we surveyed a panel of experts from around the world), one of the most frequently suggested areas of training for telecentre managers was in the area of business planning aimed at making telecentres self-sufficient and sustainable. (Roman, 2000)

In approaching the issue of sustainability, telecentres face the question of how they can generate income yet serve those in the community who cannot afford to pay for "public goods" kinds of services (like access to health information). Some centres use the income from user fees and other income services to make public goods affordable or free. (We have used the name Communication Shop to denote the commercial possibilities of community-based communication "shops.": see Colle, 2000.)

9. Focusing on information services rather than on computers and the Internet alone to build a local institution more fully woven into the fabric of the community, with a larger base for generating income.

This theme is closely related to the previous one. One of the lessons learned during the early stages of the Western Australia Telecentre Network was "that to look upon these centres as simply educational providers or access centres was a flawed model." (Short and Latchem, 2000) Visiting the rural telecentre in Gingin (Western Australia), one can see a variety of

services, including a bank. Similarly, others — like those in Canada’s CAP, in the Community Learning Centres (CLC) supported by the U. S. Agency for International Development, and the Hungarian telecottages — take the position that telecentres need to be significantly more than computers and the Internet to meet fully the potential of these institutions. “A robust centre,” say some, “will provide a range of traditional, non-electronic resources as well.” (Dorsey, Hess and Fuchs, 2000) Tasmania’s Open Access Centres offer services to local businesses, act as gateways to Federal and State Government online services, and provide lifelong learning and training opportunities. (Short and Latchem, 2000)

Mature telecentres must be in the information and communication business (or the community development business), not only the computer and Internet business. They can systematically assess community information needs and the communication needs of other local organisations, and be creative and entrepreneurial in dealing with these needs. It is this broader approach to the Information Society that helps centres become more firmly woven into the fabric of the community and puts them on the road to self-sufficiency.

10. Participation as an important goal that requires a strategic approach.

With widespread interest in the “digital divide” issue, broad-based community participation may become part of the telecentres’ mandate. This may present a challenge in reaching out to ethnic minorities, women, children and the elderly who are often on the minus side of the divide. Sometimes the “learning” label on a centre, or the technology, or its location in a library or school intimidates those who might benefit from the services. So physical connectivity may not equal sociological access.

It is generally accepted that conscientious attention to participation can yield benefits in such activities as assessment of information needs, planning, and operations. The value of participation is woven throughout the Industry Canada philosophy and procedures for CAP. This is illustrated, for example, in its emphasis on volunteers, and the requirements that applicants have local councils and show evidence of community support. It is also illustrated by comments by CAP site people who say that they know participation is important but they

have not worked on it yet. One of the most under-appreciated aspects of the participation issue is that it is not a spontaneous phenomenon.

Part of the problem results from the ambiguity of the participation *concept*, and the need to translate it into concrete action terms. It is not something that managers do naturally. Telecentre management need to develop an explicit participation strategy in the planning stages. The strategy should address at least the following questions:

Why is participation important to this project? Among the answers might be: because it conveys a sense of community ownership; it provides indigenous wisdom; it helps reflect community values and needs; it provides important resources, such as volunteers or technical expertise, at a favourable cost.

Who should participate? It is not enough to say “the community.” Who should receive attention because of the possibility they will be marginalised — like women, poor people, minorities, the elderly?

How might people participate? The easy answer is to say that all can participate through use of the ICT facilities. But there are other potential dimensions of community participation in a telecentre: volunteers who oversee daily operations, tutors who give lessons, advisory groups for different aspects of the operations, people who provide links to other community organisations, and people who manage particular data bases and add value to information resources.

How much participation should be sought? Is maximum participation the goal, or should there be a target called *optimal* participation? It is not hard to imagine that there can be a situation where there is too much participation.

When should participation take place? It probably should begin no later than the time in the planning when participation itself is being considered. Being specific about the timing avoids the “we haven’t got to that yet” explanation.

What incentives can be offered? (Or, how do you get people to participate?)

Money and public recognition are important, but so too are special privileges regarding use of telecentre facilities or discounts from shops in the community (which is a way that merchants can participate).

C. Key Telecentre Issues

The Access Challenge

Much of the attention regarding ICTs and telecentres deals with “connectivity” — that is, putting people in touch with the communication hardware. There is ample evidence to suggest that the sustainability of telecentres depends on recognising the dimensions of access, because without sufficient access, telecentres will not be able to justify their existence, nor be demand-driven. We offer the following list of most prevalent obstacles to access.

1. Literacy. No matter how “wired” a country becomes, without basic literacy, the major benefits of ICTs will be lost. Even in the USA, one observer notes that almost a quarter of American adults will remain off-line — not because they do not have physical attachments to a computer but because they cannot read what is on the screen. (Biggers, 2000)

The problem is more severe in other parts of the world where illiteracy rates are significantly higher. It is especially severe in the case of women. We noted earlier the problem of middle aged women in Peru. In Mexico, 12% of women are not literate. Women’s rates of illiteracy can run as high as 75% in some countries — effectively ensuring their position on the negative side of the digital divide. (Olster, 2000).

2. Relevance. Telecentres need to be relevant to their clientele, and two aspects of relevance influence access. Much of the information available via electronic networks may not meet communities’ needs for local information on agriculture and health and nearby

markets. A telecentre may also lose relevance if information is in unfamiliar languages or dialects. For example, while there are hundreds of thousands of web page listings under “health” on the Internet, the material is useless to many because most of it is in English. Additionally, there are two related problems: one is that many of those pages may have questionable content. The second is that few telecentres or web page hosts do systematic research on a community’s information needs and wants. They tend to *sell* rather than *serve*.

A case in India shows how the staff of a “village knowledge centre” dealt with the issues of literacy and relevance. The M.S. Swaminathan Research Foundation was convinced that the local people had the capacity to absorb the new communication technology, but the question was: “Can people get the information they need and want in the way they want it?” (Shore, 1999). The centres it established demonstrated ingenuity, creativity and sensitivity in developing their information products. In one case, because some villagers were not literate, computer network information such as weather reports was downloaded as audio files. These were then played on loudspeakers in front of the centres. In addition, project volunteers in the villages built their own data bases to go with those external sources to provide information on agricultural, health and government programmes for low income people. In some places, linking telecentres and community radio increases the relevance and credibility of both media. (Dagron, 2001)

3. The culture of information. As we mentioned earlier, telecentres in a community are not like the field of dreams in Iowa. “Field of Dreams” was a popular U.S. motion picture about an avid baseball fan who was also a farmer. He built a baseball field in the middle of his corn acreage hoping that baseball immortals would return there to once again play ball. Voices told him: “Build it and they will come.” In the film, he did build — and they did come! But for telecentres they might not come — because not everyone spontaneously understands the value of information. Take the case of a woman from Kathmandu who says: “our priorities are hygiene, sanitation, and safe drinking water.” How is having access to the Internet going to change that? Or the government official who must weigh the value of information against the need for roads, schools and clinics.

4. The cost of information. The African Development Forum estimates that the cost of an hour's use of the Internet in Chad is US\$10.50 (and the Gross Domestic Product per person is US\$187). The cost of the Internet hour in Uganda is US\$8.40 and in Angola it is US\$6.00. (Black, 1999). The average monthly cost of Internet service in Africa is the equivalent of US\$240 compared to the USA, at about US\$20. (Olster, 2000) In Latin America competition and government efforts are reducing Internet costs. In Brazil, devaluation of the currency and competition reduced Internet rates from US\$40 a month in 2000 to roughly US\$10. In Chile, government regulations in 1999 forced rates down by 70%, from US\$55 to US\$15 (Faiola and Buckley, 2000). Yet the cost can be substantial, given the economic condition of those who might benefit most from telecentre services.

5. Technophobia. When ICTs are present, some members of any population demonstrate a reluctance to use that technology. They may be anxious or they may be fearful about the new technology, and that technophobia raises a barrier to broader use of ICTs, including those that are telecentre-based.

6. Complexity of ICT protocols. Like technophobia, the psychological stress of manoeuvring through less than user-friendly Internet and computer procedures can be intimidating and presents an obstacle to access. The farmer confronted by rows of mysterious icons, and procedures in which a misplaced dot can prevent connecting may well consider other options for his or her time.

7. Power. Power is a factor in two ways. First there is the problem of ordinary electrical power and telephone lines. That is a connectivity-related issue. But there is also the problem of community power and who has control of the ICTs. For example, those in power may discourage or obstruct the community's use of technology because of potential challenge to their authority. In Mexico recently (June 2000) we asked a school girl in a telecentre if her teacher encouraged her to use a computer for her school work. "No," said the girl, "the teacher is afraid of the computer because we might learn something she doesn't know." Such power issues can be extended to nation states.

The Role of Training

Underlying many of the issues raised in our discussion of the sustainability themes and access problems is the issue of training telecentre staff members, including the manager. This is often acknowledged as one of the most important factors in the success or failure of a telecentre. Fuchs comment sums it up: “Without knowledgeable, community oriented telecentre staff who really want to share the tools and capacity of the Information Society, no telecentre can hope to succeed.” (Fuchs, 1998).

Yet, the published literature and online discussions suggest that little systematic effort has gone into designing, testing and evaluating training for telecentre management and operational staff. Training for telecentre staff has, to a large extent, focused particularly on operating the hardware and software of computers and networks. Yet training is the key to reaching out to the community and strategically building a clientele that can make a telecentre demand-driven. Skills like needs analysis techniques, marketing, methods for training the community, production of software and “value-added” practices address the kinds of access issues discussed earlier.

Telecentre personnel may need to train personnel in other organisations such as agricultural co-operatives and community health clinics to help build the recognition that the telecentres can support these organisations and their members with relevant information resources. The lack of attention the health system itself has paid to the potential of telecentres as a partner in health education and health communication programmes complicates the matter. Up to this point, relatively little training has been available for health workers on how to incorporate public Internet sites or telecentres into systematic and continuous efforts to improve community health.

However, there are some positive signs. For instance, an initiative in Africa is on the right track. In 1999, the Regional Information Technology Training Centre (RITTC) based in Kenya started basic information and communication technology training for health professionals. The three-day curriculum included email, CD-ROM, web and Internet technologies. Hundreds of applicants competed for 70 training slots for the first workshop.

With this kind of training, one would assume that these health professionals will have the skills to employ ICTs for getting information that they can pass on to their constituents. Equally important, they will have the self-confidence to guide their constituents toward telecentres to obtain information on an “as needed” basis. Properly trained telecentre staff can take similar initiatives in their own communities.

Our research into what specific kinds of training are most needed by telecentre staff led us to propose a list of training modules. These included:

1. Principles of communication for development
2. The role of telecentres in development
3. The role of the telecentre manager
4. Basic computer skills
5. Strategies for telecentre sustainability
6. Information production skills
7. Needs assessment and evaluation skills
8. Training skills
9. Human resource management
10. Marketing and public relations

The Telecentre as a System

As we collected data on telecentres and read the literature, we were struck by how interdependent different aspects of telecentre operations appear to be. Telecentres are *systemic* entities composed of interrelated elements, including: research (feasibility studies, needs analysis, evaluation), organisational planning (for example, clarification of telecentre goals and objectives), the challenges of sustainability, community social structure and demographics, capacity-building (regarding both the community and the telecentre), partnerships, participation and staffing, and various other elements. Each element is linked in some important way with each other element. For the formulation of a grounded theory of telecentres, the possibility of a systemic approach should be seriously considered.

The Telecentre Research Agenda

To conclude, it is clear that, because of their connection with community development and social change, and with the dramatic telecommunications innovations of the 21st century, telecentres will be a topic for research and development for several decades ahead. We suggest that for the immediate future there are nine major issues that invite R&D attention. These are drawn principally from the foregoing discussion:

1. Access and connectivity
2. Relevant content
3. Practical community-level research methods
4. Building community and agency awareness and training regarding ICTs
5. Business planning
6. Collaboration among agencies, including neighbouring ICT and telecentre projects
7. Extending telecentre benefits to those beyond the connectivity
8. Integration of media and telecentre services
9. Cost-effective technical infrastructure including satellite and wireless linkages

References

Bihari, G. and Jókay, C. (1999). *Telecottages in Hungary, The Experience and the Opportunities*. I.G.E. Ltd., Budapest.

Colle, R. (2000). "Communication Shops and Telecenters in Developing Nations," in Gurstein, M. (ed), *Community Informatics: Enabling Communities with Information and Communications Technologies*, Idea Group Press, Hershey, PA.

Dorsey, S., Hess, J. with Fuchs, R. (2000). *Information, Communications and Education (ICE) Technologies for the Development of Accelerated Participation in the Information Economy*, Academy for Educational Development, Washington, DC.

Dragon, A.G. (2001). "Kothmale Community Radio," in *Making Waves, Stories of Participatory Communication for Social Change*, The Rockefeller Foundation, New York, 127-132.

Dugger, C.W. (2000). "Connecting Rural India to the World," *The New York Times*, May 28.

Ernberg, J. (1998a). "Telecommunications for Sustainable Development," in Richardson, D. and Paisley, L. (eds), *The First Mile of Connectivity*, Food and Agriculture Organisation of the United Nations, Rome, 112-139.

Ernberg, J. (1998b). "Empowering Communities in the Information Society: An International Perspective," in Richardson, D. and Paisley, L. (eds), *The First Mile of Connectivity*, Food and Agriculture Organisation of the United Nations, Rome, 191-211.

Faiola, A. and Buckley, S. (2000). "Poor in Latin America Embrace Net's Promise," *The Washington Post* Available online: <http://www.washingtonpost.com> (March 2000)

Fuchs, R. (1998). *Little Engines that Did, Case Histories from the Global Telecenter Movement*, International Development Research Centre, Ottawa.

Helmore, E. and McKie, R. (2000). "Gates Loses Faith in Computers," *The Guardian*, November 5.

Kamel, S. (2000). "Egypt Goes Online," *Information Technology in Developing Countries*, Vol. 10, No. 32 (December), 8-10.

Rogers, E. (1995). *Diffusion of Innovations*. The Free Press, New York.

Roman, R. (2000) *Towards a Training Framework for Telecenter Managers*, unpublished MS Thesis, Cornell University, Ithaca, New York

Roman, R. and Colle, R. (2001). "Digital Divide or Digital Bridge, Exploring threats and opportunities to participation in telecenter initiatives", *Techknowlogia*, May-June.

Short, G. and Latchem, C. (2000). "The Australian Telecentre Experience", in *Telecenters Around the World*, William Murray (Ed.), ITU, Geneva.