CHAPTER FOUR

CASE STUDIES

4.1 Introduction

The chapter will deal with each of the ICT centres separately. It will include a description of each centre as well as the observations derived from the use of the research instrument as outlined in the previous chapter. The names of each ICT centre and the exact locality will not be documented, and the ICT centres will be referred to ICT1 through to ICT6.

4.2 The role of TSA in the implementation of the ICT centres

The role of Technikon South Africa (TSA) with respect to each ICT centre was determined by the individual circumstances and needs of each ICT centre. TSA appointed one of its employees to manage the deployment of all the centres, except for ICT2 and ICT6. Here funding from international donors was used to establish the centres. The schools that housed ICT2 and ICT6 asked TSA to assist with operational issues as well as with trying to make these two centres sustainable.

The following terms used in the text refer to the TSA role players that were involved in the ICT centres.

TSA project manager – the TSA staff member who was responsible for the conceptualisation and implementation of ICT 1,3,4 and 5. The TSA project manager was based in Johannesburg at TSA's main campus.

TSA regional director's – the most senior TSA officials who were responsible for the geographic area serviced by a TSA regional office. TSA had nine regional offices throughout South Africa with the intention of providing a better service to TSA students. The TSA regional directors were based at the respective regional offices.

TSA local representative – the person who was directly involved with the ICT centre which was situated in the same geographic area serviced by the local TSA regional office and who was employed by the local TSA regional office. The official was employed to work directly with students and to assist with the deployment of tutors for TSA students. This official usually was considered as the most knowledgeable employee at the regional office about the local region and for this reason was to assist in the deployment of ICT centres in the region.

4.3   Information and Communication Technology Centre one - ICT1

4.3.1   Background

ICT1 was the initiative of a large overseas private corporation and TSA. The overseas corporation was prepared to donate money to establish an ICT centre and relied on TSA to identify an area that would satisfy the donor's requirements for the establishment of an ICT centre. The donor's requirements are outlined below.

- o The centre had to address the information needs of the community and to contribute to the overall economic growth of the community
- o The centre had to be managed on business principles
- o The ICT centre manager had to be selected on the basis of leadership qualities, entrepreneurship skills and acceptance within the community
- o The understanding between the donor and TSA project manager was that the ICT centre had to be self-sustaining and that financial support from the donor and TSA would not be forthcoming, apart from the initial seeding money
- o There had to be buy-in from the community through the community leadership

ICT1 had been in operation since March 2000 and was the second of TSA's ICT centres to be established. The centre had been the focus of much attention from TSA as well as the media because the community centre, of which the ICT centre is part, received an international award for innovation in July 2001. The award resulted in the promotion of the centre and continual interest being shown in the centre by various support groups. This interest has undoubtedly given impetus to the centre's existence, which may prove to be significant.

IMAGE 4-1 A view from ICT1 to the north

The centre is situated in the Limpopo province in a former homeland within a sprawling village. There are approximately 95,000 people living in the area from at least five different ethnic groups. The centre is 21 kilometres from the nearest town, which provides petrol, a few basic services and is on a national road. There is a Vodaphone kiosk within walking distance

of the centre, which is used extensively. There is no electricity supply in the area. Some of the schools have experimented with solar power with little success. Water supply is a problem to most as access to drinking water entails a considerable walk to the watering point. The community as a whole is relatively free of crime. There appears to be strong support for traditional authorities, especially the Chief of the local community. Headmasters are also considered leaders within the community.

4.3.2   Infrastructure of ICT1

ICT1 is situated within a community centre which contains the following services: a bank, a library, a sewing room, small supply shops, a small meeting space, a centre office, a kitchen, a gift shop (limited), toilets, and a traditional building display. Adjacent to the community centre are a health centre (quite comprehensive), a goat pen, chicken pens, a community garden (irrigated), a pig pen, a new orchard, a sports complex including a soccer field, an athletic track and even a tennis court.

The sole source of electricity for the entire community centre is a petrol-powered generator. It appears that the ICT centre is the greatest user of the generator. Problems occur when petrol is needed for the generator, as transport to the petrol station is costly and very inconvenient. ICT1 is expected to pay for the petrol for the generator. As a result the generator frequently runs out of fuel rendering the centre inactive. The manager of the centre remarked to the researcher, 'it is too far and expensive for us to get petrol. We do not have money, we do not

know what to do.'

IMAGE 4-2 The small petrol generator

4.3.3   Services offered by ICT1

ICT1 has six PCs, running Microsoft Office. They are connected to a small server. The small local area network is connected to a modem and a printer allowing each of the workstations access to both the Internet and printing facilities. There is a single telephone line, which is used by the community centre for e-mail and Internet access. These facilities are used

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primarily to type and print letters, to recharge cellular phones, to photocopy and to teach a six-month-long computer course.

4.3.4 Application of the research instrument

The manner in which the instrument was applied to ICT1 is described here, detailing the process, the data sources, data and findings.

4.3.4.1 Conceptualisation phase

4.3.4.1.1 *Site selection*

The TSA project manager and ICT centre manger were interviewed about the centre's infrastructure and access (refer to table 4.1 in the appendix, page ii).
Apart from the donor's indication that the ICT centre should be in a rural area in South Africa, the TSA project manager was largely responsible for determining the site of ICT1. The TSA project manager selected the community centre to house ICT1 after a visit to the community centre prior to the donor's request, since it had been in operation for some time. The TSA project manager indicated that much groundwork had been carried out before the community centre was established and that the requirements for the establishment of a community centre were in line with those of the ICT centre. The project manager argued that the community centre was to assist with economic development in the community and it was therefore considered logical that ICT1 be part of it. There were no other ICT centres in the area. The community centre was meant to service several thousand people.

4.3.4.1.2 *Role players*

The community leaders, the community centre staff and the TSA project manager were identified as role players. As the TSA project manager considered the existing community centre key to the viability of ICT1, the community centre staff were also considered to be role players in the establishment of the ICT centre. The staff of the community centre were instrumental in identifying potential staff candidates for ICT1. Community leaders were identified by the TSA project manager through the community centre and were informed that an ICT centre was going to be established.

4.3.4.1.3 *Community needs*

The researcher tried to ascertain if there was any evidence of some form of research into the community's IT-related needs. There were no such findings and the response from the TSA project manager was that he had based the needs on ICT centres used elsewhere in

Southern Africa. The community needs identified by the TSA project manager were basic computer literacy; access to e-mail; access to the Internet for research purposes; facilities for faxing, typing and printing documents. The centre manager was in agreement with the TSA project manager assessment of the community needs. It was clearly evident that no communication with community leaders or the community itself was undertaken to establish these needs of this particular community. Needs were based on assumptions (refer to table 4.2 in the appendix, page ii).

4.3.4.1.4   Business plan

The TSA project manager indicated that he was responsible for the project plan and supplied the researcher with the necessary documentation. The documentation highlighted the understanding between TSA and the donor that TSA would address the donor's conditions. The donation was used to procure furniture, IT equipment, software and the first year's IT maintenance. Thereafter, the centre had to be self-sustaining and would have to rely on its own ability to generate funds. The TSA project manager had drawn up an expected forecast of income for three years, which showed a twelve per cent increase per year. No motivation for this figure was provided.

Marketing, contingency plans or maintenance were not mentioned in the project plan. The TSA project manager's indicated that the reason for not focusing on these issues was because the community centre was already established and successful.

Although not documented in the business plan, the main objective of ICT1, according to the TSA project manager and the centre manager, was to use technology to address the community's needs and stimulate local economic growth.

The project plan given to the researcher highlighted the importance of income generation in order for ICT1 to survive, although there were no suggestions for how it should be achieved (refer to table 4.3 in the appendix, page iii).

4.3.4.2   Implementation phase

The implementation phase focused on three main issues, namely: the selection of the centre management, third party support, and the actual implementation process.

4.3.4.2.1   Selection of centre management

During the interview with the project manager, it was confirmed that ICT1's manager was selected from a pool of people that were already part of the community centre. The selection

process for the appointment of the centre manager was based on two main considerations: firstly, the incumbent's ability to deal with basic IT issues; and, secondly, the incumbent's appreciation of business. The researcher then asked the TSA project manager a number of questions relating to the selection process (refer to table 4.4 in the appendix, page iii).

The responses to the questions indicated that the primary emphasis for selecting the centre manager was focused on technical ability and secondly, the ability to run ICT1 as a business. This focus was motivated because of ICT1's remoteness from large centres. The centre manager had to be able to deal with technical issues. The business acumen was important due to the intention of ICT1 being able to sustain itself.

The researcher then interviewed ICT1's centre manager whose response to the following questions are tabled below:

Table 4.1   Summary of interview with ICT1's centre manager regarding the management of ICT1

Issue	Response
Is it important to have business skills	B
It is important to understand the needs of the community	A
Is it important to be technically skilled	B
Is it important to have apps knowledge	A
It is important for the centre to make money	A
Is it important to have people skills	B
Is it important to market the centre	B

Legend A – Important; B – Not sure; C – Not important

From the responses tabled above, it was clear that the centre manager acknowledged the importance of understanding what the community needs were and that the centre could only be sustainable if it generated income. The indication was also that the community needed to develop skills on computer applications such as word processing and basic computer skills. Marketing of the ICT1 did not appear to be an issue due to the presence of the community centre.

4.3.4.2.2   Third party support

Third party support refers specifically to IT support and would be managed through a Service Level Agreement (SLA) between the supplier of the IT and ICT1 through the centre manager. The researcher dealt with the issue of third party support during an open discussion with the manager of ICT1 and the TSA project manager. Third party support is particularly important

for ICT1, because of the remote location of the centre. Third party support was considered crucial as both managers realised the risk of not having resources close to ICT1 being so far removed from large urban centres. Third party support for technical issues, including IT and the power generator, was seen as critical to the success of the centre.

The risk of IT failing was dealt with in a service level agreement with the supplier. Though the generator and the provision of petrol for the generator was considered a risk to ICT1, there was no contingency in place. It appeared that it was decided to deal with problems as and when they occurred.

4.3.4.2.3   Implementation process

The researcher needed to be assured that a project plan had been designed and followed for the implementation of the centre. There had to be evidence that a structured and managed approach was used. The TSA project manager could only show a limited number of documents that could be seen as part of a project plan. This included:

- o   Itemised IT equipment and costs
- o   Approval to proceed from TSA management
- o   Correspondence with the IT supplier for delivery of equipment
- o   A date for the official opening of the centre

There was no evidence of a properly documented project plan. The TSA project manager indicated that it was a relatively simple process to implement the centre and, as he himself was involved, did not deem it necessary to follow a strict project management approach. Any problems that were encountered were dealt with by the TSA project manager personally.

4.3.4.3   Evaluation and adjustment phase

The assessment of the evaluation and adjustment phase, part of the research instrument, was applied during three visits over a period of three years.

4.3.4.3.1   First site visit

The first evaluation was done in April 2001, after the centre had been in operation for nearly a year. The centre manager was warned of the visit and was asked, through the TSA project manager, to try and have some of the members of the local community available for an assessment of the services of the centre.

Usage of centre

The centre manager was asked to give an indication of the usage of the centre from the first day of operation to the present (refer to table 4.5 in the appendix, page iv).

The responses indicated that there was no tool in place to accurately measure the usage of the centre. There were problems with the e-mail usage due to the high prices that customers had to pay for sending e-mail. This was the reason for the decline in e-mail usage. Unreliability, which will be addressed later, was also a factor that the centre manger considered as a reason for the poor centre usage.

The following recommendations were proposed by the researcher:

- o Keep a log of centre usage by designing a register, which would include the usage per service, the date and the number of clients
- o The log of centre usage should also serve as a record for calculating income generated

Reliability

Due to the physical location of ICT1, reliability was considered by the researcher as a concern. It was, therefore, important to identify all issues related to the reliability of the IT equipment and the supporting infrastructure. The centre manager was asked to give an account of the overall reliability of the centre's infrastructure (refer to table 4.6 in the appendix, page iv).

All the problems that the centre manager highlighted could be traced back to the unreliable source of power. The power was not managed, in terms of an uninterrupted power supply (UPS). The result was that the petrol generator produced an irregular flow of electricity resulting in damage to the IT equipment. There were also times when the generator suddenly stopped operating. The effect on the IT infrastructure of the erratic power supply was severe. The server and workstations were damaged resulting in the centre being rendered inoperable. The suppliers of the hardware were not prepared to honour the SLA with the centre due to the nature of the power supply.

The situation was further aggravated by the lack of petrol available for the generator. Petrol was only available at the closest town, which was twenty kilometres from the centre. The cost of getting to the town and back was not taken into consideration in the implementation phase, which meant that there were no funds set aside for travelling to purchase petrol.

The following recommendations were proposed by the researcher:

o   The installation of a UPS, which would smooth out the uneven power and, in the event of a sudden power outage, would allow the centre manager time to power off the server and workstations thus avoiding hardware damage

o   The researcher communicated the need to TSA in order to obtain funding for the UPS

o   The centre manager was also urged to maintain a record of power outages and other incidents that have an impact on the reliability of the centre

User perceptions of centre services

The centre manger was then asked to give an indication of the perceptions of the community who made use of the centre. There were no members from the community available for interviews as the centre was experiencing power problems resulting in a broken supply of services. Interviews with the community were required by the researcher which could have helped to confirm the responses from the centre manager (refer to table 4.7 in the appendix, page iv).

The interview revealed that, because of the major problems with the supply of power, the service capacity of the centre was severely affected. It was thus apparent that the centre was not offering a service that could be considered effective, according to the centre manager. It was also clear that the community's problem with the expensive cost of e-mail usage was a result of a lack of planning during the conceptual phase. The centre manager based the cost of using e-mail on the equivalent alternative of using the postal service. Each e-mail message was billed at R10,00 per sent message and as a result the community was not prepared to use the service.

The following recommendations were proposed by the researcher:

o   The researcher recommended that the power problems be resolved as soon as possible and linked to a back-up plan to maintain a reliable supply of electricity

o   The second recommendation was to measure and document users' perceptions. This information could be used to help with the management of the centre and to determine whether the services rendered by ICT1 are in line with what the community really needs

Income generation

Income generation, as noted earlier, underpins the survival of the centre, and the centre manager was aware of its importance. The discussion with the centre manager revealed two noteworthy issues: firstly, there was no system in place to manage the finances of the centre; secondly, the centre manager showed symptoms of SAD (discussed in Chapter Two – 2.10).

The following recommendations were proposed by the researcher:

o   Put a simple system in place to record income

- o   Record all expenditure and make use of the community centre management for assistance in this regard
- o   Treatment of SAD

Summary of recommendations
The following is a summary of the recommendations made after the first visit and the intended effects suggested for improvement to the management of ICT1.

TABLE 4-2 Summary of recommendations after first visit to ICT1

FACTOR	RECOMMENDATION	INTENDED EFFECT
Usage of centre	Create a register that records the use of each centre, including date, time and number of people	To measure the usage of the centre in order to identify trends, growth and highlight problem areas
Reliability of services	Install a UPS; bring the hardware supplier back to honour the SLA	UPS will help to stabilise the centre
	Create a register to record downtime, with reasons	This will be used to track problems and can serve as an input for the creation of an improved model
User perceptions of centre services	Create a customer satisfaction survey	To measure the effectiveness of the centre so as to manage it better and to make adjustments in order to maintain satisfactory service delivery
Income generation and overheads	Install a simple book-keeping system to record income and expenditure	To manage the centre better and to determine the centre's financial viability

4.3.4.3.2   Second site visit

In September 2001, five months after the first site visit, the researcher arrived at the site unannounced. The centre manager was available for discussion. The focus of the second visit was to establish whether the recommendations were applied resulting in any noteworthy changes since the first visit. Positive changes would be in the form of increased usage, an increase in income, increased reliability of the centre and some indication of proof of user satisfaction.

Using the summary of the recommendations provided after the first visit as a point of departure, the researcher wanted to establish whether the suggestions that were made after the first site visit had been implemented, and to identify any other innovations or changes that the centre manager had made.

The following observations were made during the second visit:

The UPS had been installed, made possible with funding by TSA. This had a positive effect in terms of the stability of the power supply and also resulted in the hardware supplier being prepared to honour the SLA. The hardware supplier, however, only had to offer the service for two months as the SLA had expired and the SLA could not be renewed due to a lack of funds. The centre manager voiced his concern regarding the late installation of the UPS ' because the centre has not been able to function for so long because of the power problems. The community is not coming to use the centre as much as they did.'

There was no evidence of any attempts to implement the recommendations with regard to usage of centre, user perceptions and financial management. The centre manager argued that the downtime of ICT1 had resulted in a very low usage and therefore the centre manager did not see the benefit of creating a register.

Shortly before the second site visit, the TSA project manager who was responsible for the conceptualisation and implementation of ICT1 put forward ICT1 as an example for ICT deployment in rural areas, to an international body for consideration for an award. The result was that ICT1 received an award for innovation. This caused renewed interest from the TSA project manager. The ex-TSA project manager was no longer part of TSA and was working in the northern hemisphere. He realised that ICT1 was not functioning as was hoped based on discussions with the centre manager and therefore attempted to assist ICT1 remotely form the Northern Hemisphere. He managed to organize an audit of ICT1 conducted by an international consultant[2]. The findings of the audit revealed the lack of power as being the greatest challenge and proposed that the award could be used for motivating funding from TSA to resolve the power problem. It was clear that the consultant was aware of the community centre's crucial role in the survival of the ICT centre. Solar power was suggested by the consultant as an alternative to the generator. The suggestions provided in the audit are summarised below.

- o Investigate alternatives to the petrol generator for the supply of electricity
- o Investigate ways of training the centre manager in IT
- o Assist the manager of ICT1 in managing the centre by using proven business principles

The findings from the audit report supported the observations made by the researcher during the second site visit.

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[2] The researcher did obtain permission to reveal details regarding the consultant and audit report

Summary of observations made during second visit

- o   The centre was still unable to provide a reliable service
- o   There were indications of a decreased usage of the centre
- o   The centre manager appeared not to be interested in making changes to streamline the processes for managing the centre
- o   The hardware suppliers were no longer available for support
- o   The centre would most certainly have closed down had it not been the recipient of the award for innovation

4.3.4.3.3   *Third site visit*

The third site visit took place in October 2002. The intention was to identify changes based on the recommendations made after the first site visit and to determine if the recommended suggestions by the audit had resulted in positive changes.

The visit revealed that:

- o   There were still problems with the supply of power as the generator was still in use. The solar power that was suggested by the audit report was not implemented
- o   The manager of ICT1 had resigned and left the daily operaitons of the centre to a young community member who had a rudimentary knowledge of IT
- o   There had been a number of community members who had attended short courses at the centre, which generated some income for the centre
- o   There was evidence of record-keeping of courses run and other income-generating services including basic computer training and e-mail usage
- o   Usage of ICT1 did increase
- o   The income generated over a six-month period averaged out to R1,100,00 per month

4.3.4.4   Sustainability phase

After applying the instrument to measure the centre in terms of growth, income, usage, management of costs and community feedback, the following observations were made:

- o   The centre had shown a growth in income and usage
- o   Although the change was small, there was a definite increase in usage, which resulted in an increase in income
- o   The usage was also spread over six months as opposed to spasmodic use indicating a general, overall increase in use and perceived centre reliability
- o   The control of costs could not be measured due to a lack of registers or proper documentation by the centre staff

o There was still no evidence of customer feedback in terms of services

The researcher discussed the potential of ICT1 with an external consultant, who was appointed by the previous TSA project manager to assist with ICT1. The consultant asserted that:

> 'The ICT centre will never be sustainable. It must be seen as part of the community centre and the major reason for the deployment of an ICT centre is so that the community centre staff and leaders can feel good about themselves.'

ICT1 was functioning because of the community centre and had never shown real growth.

4.4 Information and Communication Technology Centre two- ICT2

4.4.1 Background

The data describing ICT2 was collected during interviews with the centre management, the TSA project manager and documentation compiled by the centre management.

ICT2 was the third ICT centre initiative of TSA and was established in July 2000. The TSA project manager responsible for the first ICT centre was also responsible for the planning and deployment of ICT2. It was initially located in an area that was considered by the project manager to be historically disadvantaged. Sensitive to the lack of infrastructure and the resulting challenges highlighted by the lessons learned from ICT1 and not wanting to face similar problems, the TSA project manager made the decision to establish the centre in the nearest town to this disadvantaged community. According to ICT2's manager, the decision to relocate the centre was supported by the community mainly because of a sound and affordable transport system to the town from the rural area. TSA management was concerned about the financial stability of ICT2 and was determined to have the centre close to transport routes and shopping centres, to enable easy access for users. The local TSA management intended also to make use of ICT2 as an additional support centre for TSA students.

The town in which the centre is situated, is the largest in an area with a high population. There are five large secondary schools and seven primary schools in the surrounding area. According to the local government, the illiteracy rate in the neighbouring rural area is considered unacceptable, particularly in the mature group of the population. Unemployment is also a major concern. Access to tertiary education, computers and libraries is almost non-existent for the majority of the rural areas supported by the town.

Other potential users of ICT2 include staff from some of the local mines, local branches of government departments and rural schools.

4.4.2 Infrastructure of ICT2

The surrounding area has a poor infrastructure on every level. There are poor transport facilities; no electricity or easy access to water; and there is a weak communication infrastructure. There are no telephone lines, no cellular phone reception and an absence of newspapers. This forces the community to rely on the town for news and information.

4.4.3 Services offered by ICT2

The centre consists of ten networked PCs connected to a server. The centre initially made use of a thin client architecture which meant that the workstations were really dumb terminals and relied on the server for processing and storage. This proved later to be impractical. There are two networked printers, a fax machine, photocopying and scanning facilities. There is a dial-up Internet connection to a pay phone, so e-mailing facilities are also available. The centre also offers a number of other services which include career guidance, Pre-Registration Assessment (PRA), typing services, registration courses offered by TSA and computer training. The intention was to have TSA play a significant role in the support and rendering of services. Below is a list of TSA services available to the community through ICT2.

- o Introduction to PCs
- o Public management courses
- o Training for trainers
- o Customer care
- o Other computer programmes as requested by the community
- o Basic public financial management courses
- o Capacity-building training
- o Basic management courses
- o End user computing

ICT2 was part of a community centre, which provided a number of services and was already established.

IMAGE 4-4 The secure environment at ICT2

4.4.4   Application of the instrument

4.4.4.1   Conceptualisation phase

The researcher relied heavily on the TSA regional director for information regarding ICT2's conceptualisation phase, as the TSA project manager had resigned from TSA. The regional director also gave approval for the local TSA staff members to become involved in the managing of ICT2. The documentation that the TSA project manager had put together focused mainly on the motivation for the relocation from the original proposed site in the rural area to the town.

4.4.4.1.1   Site selection

The following reasons were given for the selection of the current second site for ICT2:

- o   There was no existing ICT centre or similar services in the area
- o   There is a sound and reliable infrastructure
- o   There is easy access for TSA students with no transport options. Thus ICT2 could serve TSA students as well

The contracted centre manager was interviewed with respect to the physical infrastructure and access (refer to table 4.8 in the appendix, page iv).
It was clear that the physical location for ICT2 was ideally situated in terms of transport systems and therefore easily accessible by the community. It also did not appear to have problems with power supply, access to telephones and the internet. The building housing the centre was secure.

4.4.4.1.2   Role players

Due to the current location of ICT2, the people responsible for the management and running of the site are part of TSA's staff establishment. There was no indication of any other inputs or involvement of stakeholders from the community or other quarters in the initial stages. The first centre manager of ICT2 was a contractor who was appointed from the local community after the centre had been in operation for eighteen months. The contract centre manager was later replaced by a permanent TSA staff member who also had responsibilities at TSA to manage.

The contracted centre manager did indicate that the TSA students had made it known, through the local Student Representative Council (SRC), that they were appreciative of the centre being established in the town. The researcher also identified TSA students as important role players in the success of the centre.

ICT2 had the benefit of local TSA staff and a potential client base comprising of TSA students in the area. The management and running of ICT2 was firmly in the hands of TSA.

4.4.4.1.3   Community needs

The researcher interviewed the contracted centre manager in an attempt to identify his perception of the community needs (refer to table 4.9 in the appendix, page v). According to the contracted centre manager of ICT2, no analysis was undertaken to determine the needs of the community for the old or new site for ICT2. The TSA project manager based his idea of the needs of the community on two assumptions: firstly, there was no other alternative to an ICT centre in the area; and, secondly, the centre should accommodate TSA students. These assumptions according to the contracted centre manager, was the motivation used for choosing both the initial location as well as the relocated site for ICT2.

The centre manager felt that there was a need for basic services such as typing, printing, and access to telephones. He assumed that there was a need for IT training, with his idea based on ICT2 serving TSA students in this regard.

No community needs assessment was undertaken for either the initial location or the relocated site for ICT2. Assumptions were used to base the services that were to be made available for the community. It was also evident that the local TSA students were seen as part of the potential client base which could support ICT2.

4.4.4.1.4   Business plan

The TSA project manager submitted a motivation for the establishment of ICT2 to the management of TSA. The documentation also contained specific information, such as the process to communicate with the community leaders, the resources needed and a financial forecast in terms of expected income generation and expenditure. There was however no evidence of communication with the local community leaders.

The financial forecast was aimed at convincing TSA management that ICT2 would be able to survive and would show real growth. The motivation showed a potential growth over a three-year period of 12 %. The figure of 12 % growth appeared in all of the forecasts for all of the

ICT centres handled by the TSA project manager, even though there was no other supporting documentation available to substantiate this figure. TSA management did not insist on a more concrete motivation to support the TSA project manager's growth figure. The documentation that was forwarded to TSA management showed no provision for marketing, contingencies or maintenance.

The researcher used a set of questions in an interview with the contracted centre manager, (refer to table 4.10 in the appendix, page v) to establish whether the contracted centre manager had done anything to remedy the absence of a business plan which would assist with the stabilisation of ICT2. The results from the interview indicated that the contracted centre manager was of the opinion that:

- o Marketing the centre was essential for the generation of funds
- o Offering relevant courses to the community was essential to the viability of ICT2
- o There was a need to address support issues, as the original support agreement had expired
- o Human resources were being provided by the TSA regional management to maintain ICT2
- o TSA would have to assist with funding in order to stabilise the centre

4.4.4.2   Implementation phase

4.4.4.2.1   Selection of centre management

The TSA regional director decided to make use of TSA staff and to take responsibility for the appointment of the centre manager, particularly as the intention was to also use ICT2 to service TSA students. The contracted centre manager was appointed primarily to stabilise the centre. The researcher interviewed the TSA regional director about the selection process followed for the appointment of the contracted centre manager (refer to table 4.11 in the appendix, page vi).
The responses are summarised below.

- o Business acumen is considered critical for staff responsible for ICT2
- o Technical ability is considered important, but can be acquired from another source
- o Local knowledge is not considered critical and the centre manager need not be accepted by the community as a leader
- o The manager must, ideally, be a problem solver

4.4.4.2.2   Third party support

Third party support was broken down into two major areas: IT support, and academic and training support.

Academic and training support was considered – by the contracted manager and regional director – as the key to a financially viable solution for ICT2. This was due to the number of TSA students needing practical exposure to IT and IT knowledge. The quality of training to be provided by the centre had to be at a level that would result in the centre being used continuously.

Third party support for IT was addressed in a one-year contract with the supplier of the IT equipment. Thereafter it was assumed that the centre should be able to fund third party support. The third party support could be on a time and materials basis or a SLA could be renegotiated, as the initial SLA would expire after a year. In time, the contract manager and assistants would be expected to have sufficient knowledge gained through hands-on experience, to deal with technical issues. The technical expertise at TSA could serve as their back-up.

4.4.4.3   Evaluation and adjustment phase

This ICT centre was measured three times over a period of three years.

4.4.4.3.1   First site visit

The first evaluation was done in June 2001, after the centre had been in operation for over a year, under the control of the contracted centre manager. The contracted centre manger was aware of the impending site visit. The visit preceded a telephonic interview with the regional director. The telephonic interview was an informal discussion which highlighted the regional director's concern regarding the contracted centre manager's inability to manage the centre effectively, and the reliability of the original hardware. The regional director was trying to gain more support from TSA in the form of technical expertise and funding for the replacement of the hardware and software. Reasons given for the contracted manager's inability to manage the centre were vague, and appeared to relate to wanting a person in the position who was more sensitive to the community.

Usage of centre
The contracted centre manager was asked to give an indication of the usage of the centre from the first day of operation to the present. The findings are summarised below.

- o   The number of people using the centre was promising to start with, but was decreasing

- o There were five short IT courses on offer
- o Internet usage was low and appeared not to be a requirement of the community
- o E-mail was used initially but was found not to be a community requirement
- o No other services at the centre were used

The responses indicated that there was no tool in place to accurately measure the usage of the centre other than a record of the courses given and attended. E-mail usage was not as popular as was hoped by to the contracted centre manager.

The following recommendations were proposed by the researcher:

- o Design a register for usage to determine what services are used
- o Try to identify what the community needs are

Reliability
The contracted centre manager was asked to give an account of the overall reliability of the centre's infrastructure, with special emphasis on the IT infrastructure (refer to table 4.12 in the appendix, page vi).

Because of the location of the centre, it was assumed that electricity would not be a threat to the functioning of the centre. The overall response from the contract manager was positive, although there was an acute awareness of the possibility of the server crashing and rendering the centre inoperable.

The system architecture used, was the TSA project manager's suggestion for all the ICT centres. He mentioned during interviews on a number of occasions that he felt that thin client (dumb terminals linked to a server) is the way to go as the user is not sophisticated enough to deal with a fat client (PC) and there is less of a risk to the system as a whole.

The contracted centre manager was also concerned about the type of software that was installed on the server. The software was not widely used and could not be considered a standard. Third party support for the software was limited. The TSA project manager was also responsible for the choice of the software, and when asked by the researcher to motivate his choice, the reply was: 'It is my decision and I have tested it and feel that it is the way to go.'

Although ICT2 was supplied by a reliable power source (ESKOM), TSA regional office insisted that a UPS be connected to the server to allow an uninterrupted flow of power, and act as a back-up. This decision was supported strongly by the suppliers who were also responsible for the support of ICT1.

The following recommendations were proposed by the researcher:

o That while the IT equipment was still functioning reliably, the contracted centre manager should decide what IT equipment and software would be ideal for the environment

o That the contracted manager should build a business case which detailed the costs of replacing the equipment with the relevant infrastructure, should the need arise

User perceptions of centre services
The contracted centre manager and centre staff were asked to give an indication of users' perceptions of the services rendered by ICT2 as the researcher was unable to interview users of ICT2. The general consensus was that the users were satisfied with the services. The only issue of significance was that the TSA students believed that the services should be free. There was a perception that ICT2 was part of TSA and, therefore, the student's fees should cover ICT2 services (refer to table 4.13 in the appendix, page vi).

Income generation and overheads
The contracted centre manager's concerns regarding the future of the centre revolved around the marketing of services. The manager was confident that with a higher usage, the centre would be able to generate sufficient income to sustain itself. Although there was no supporting documentation or other evidence to substantiate the comment, the contracted centre manager was adamant that marketing was the key to success.

The following recommendations were proposed by the researcher:

o The contract manager was to conduct regular surveys that recorded users' perceptions

o The contracted centre manager should design a marketing plan to motivate the need for additional funding from the local TSA regional office

o A model for income generation by identifying services should be put in place that could be considered relevant for the environment

Summary of recommendations
The following table lists the recommendations made after the first visit, and the intended effects for the improvement of the management of the centre.

TABLE 4-6 Summary of recommendations after first visit to ICT2

FACTOR	RECOMMENDATION	INTENDED EFFECT
Usage of centre	Create a register that records the use of each centre, including date, time and number of people	To measure the usage of the centre in order to identify trends, growth and highlight problem areas
Reliability of services	Investigate alternative IT and software options	To determine as accurately as possible what IT infrastructure would be best suited to the environment and users
User perceptions of centre services	Create a customer satisfaction survey	To measure the effectiveness of the centre so as to manage it better and to make adjustments in order to maintain satisfactory service delivery
Income generation and overheads	Develop a marketing plan	To assist with the motivation for advertising the centre's services
	Design a model for income generation based on customer needs	To assist in income generation

4.4.4.3.2   Second site visit

A second visit took place in December 2001, approximately six months after the first visit. The contracted centre manager's contract had lapsed and the centre was being managed by one of the senior academic staff members from the local TSA regional office, who will be referred to as the centre manager. He was the second centre manager. This was viewed as a temporary measure which would end as soon as funding became available for the appointment of a permanent centre manager. The researcher established that the new centre manager had been informed of the interviews between the researcher and the contracted centre manager, as well as the recommendations that were made and agreed to by the contacted centre manager.

The researcher approached the centre manager to establish whether or not the recommendations had been effected, and to assess the status of the centre.

General
The second visit revealed the following:

- o   ICT2 staff were professional in their dealings with clients
- o   The centre was busy and this was considered by the centre manager to be an indication of growth

- o There were problems with unique IT equipment and corresponding software due to a lack of support as the choice of IT equipment and software were not generally used. This was aggravated by the fact that the supplier's SLA had expired, and there was no other affordable support available. Upon further investigation, it was discovered that the supplier had closed down
- o The contracted centre manager had been trying to lobby for funds in order to replace the IT equipment and software with standard software that was commonly used in South Africa
- o The TSA regional director and the centre manager needed funds for the appointment of a permanent or contacted centre manager. These funds were not forthcoming from TSA

Usage of centre

The register was not needed as the accounting records served as a register.

There was no indication of growth.

Reliability

The centre manager highlighted the lack of funds for the replacement of the IT equipment.

Although there were no documented problems, the lack of support indicated a risk.

User perceptions

The centre manager did not think a user satisfaction survey was needed, and relied on the comments made by clients and TSA students.

Income generation and overheads

The manager did not agree that a marketing plan was needed, and appeared to be under the impression that word of mouth, and the fact that TSA students were making more use of the centre, was sufficient to ensure usage and growth.

Growth and sustainability

On the second visit to the centre, an interview was conducted with the centre manager about issues surrounding the growth and sustainability of the centre. Below is a summary of the manager's responses.

- o TSA needs to understand that the centre manager should be on TSA's payroll and needs training and more guidance. The centre manager needs to be accountable for the centre so as to encourage responsibility

- o The centre can grow, but needs to be able to reposition itself to cope with changing needs. More courses should be made available, as well as the subsequent resources

required. The manager is aware of the important role of TSA students, who are the greatest users of ICT2

The centre manager stated to the researcher that:

'… the only possible way an ICT centre can be viable, is if it is part of another organisation or support centre that is itself sustainable. The notion of an ICT centre in less developed areas being sustainable without financial support through subsidy or other means is doubtful.'

The following recommendations were proposed by the researcher:

o   Replace IT equipment and software
o   Appoint a permanent centre manager who will be accountable for the centre's performance
o   Provide more services for TSA students
o   Seek alternative ways of making services to TSA students affordable

Summary of observations made during second visit

o   The centre had definitely shown an improvement since the first visit
o   The importance of having an ICT centre linked to a stable body that could subsidise the centre was apparent
o   The manager was aware of the importance of offering services that were relevant and considered industry standard, especially as far as IT training that satisfied community needs was concerned
o   The importance of the needs of TSA students was realised, and the potential for the centre to serve TSA students was being considered

4.4.4.3.3   Third site visit

A follow-up interview with the centre manager took place in July 2003. There were two major factors that contributed to a significant, positive change in ICT2.
Firstly, the centre manager had obtained permission from TSA management to create a community centre, of which ICT2 was part.
Secondly, ICT2 started to focus more on the TSA students in the area and was primarily running courses that were part of TSA official qualifications.

The community centre, now referred to as TSA's Information Community Centre, provided the following services:

- o   Seminar rooms
- o   Access to the Internet
- o   Printing and faxing facilities
- o   Extension of the services provided by the local TSA regional office to TSA students
- o   Facilities for Vista distance education students
- o   A second computer room consisting of proper PCs, as opposed to the thin client architecture, enabled larger training classes. These PCs were donated to the centre by Vista University

There were also three new permanent staff members that were on the TSA payroll working at the information centre. They were responsible for the overall running of the centre. The registers indicated that the centre was being utilised between 70 % and 85 % of the time. The centre was advertised on signs in the vicinity. The income generated by the TSA Information Community Centre and ICT2 covered the rent and all other costs, excluding the salaries of the three TSA staff members.

The one concern that the centre manager did have, was the lack of funds for the replacement of the IT equipment.

4.3.4.4   Sustainability phase

In the six months leading up to the third site visit, there was a significant growth in income and usage of the centre. The following changes were evident:

- o   Registers indicating centre usage were implemented
- o   A proper accounting system was in place
- o   The TSA internal audit team had done a thorough audit of the financial controls of the centre and was satisfied that the centre had all the necessary controls in place
- o   Community feedback was measured by the staff responsible for training

ICT2 showed real growth and focused management. TSA played a significant role in supplying the manpower needed to assist with the running of ICT2 and realised the potential of rendering a service to its own students living in the area.

4.5   Information and Communication Technology Centre three - ICT3

4.5.1 Background

ICT3 was initiated by a commercial company that donated a computer laboratory to a school in a deep rural area in South Africa. The donor did not play any role after the IT equipment

was installed in January 2002. It was because of this that the headmaster contacted TSA for assistance with the centre. No other information regarding the donor of the IT infrastructure was available.

The school is a secondary school that has been in operation for a number of years. The school management was aware of the importance of having a computer laboratory and realised the potential of the centre. The headmaster, through the head of the science department, appointed two of the teachers in the science department to run the centre and to instruct the learners in the use of IT. The intention was to extend this service to school-leavers and to train the local community in IT-related skills, such as basic computer literacy, word processing, spreadsheets and typing. The headmaster was also aware of the fact that his staff members were not qualified and had very little exposure to IT.

TSA had a reasonably high profile in the area, as the TSA project manager had previously tried to establish an ICT centre (ICT4) in the vicinity and had made contact with community leaders, including the school's headmaster. The headmaster contacted the TSA regional director for the region, who then sent one of the TSA local senior academics to meet with him and to report back to the regional director. The local TSA regional director contacted the researcher and a visit to the school was organised.

IMAGE 4-3 A view of the school showing some of the classrooms

4.5.2 Infrastructure of ICT3

The school hosting ICT3 is nearby the border of Mozambique, in a large rural settlement. The settlement supports the farming industry and has a number of primary schools. The settlement is also on a major road linking the northern part of Swaziland with Komatipoort and, therefore, the residents have access to a reliable transport system.

4.5.3   Services offered

The purpose of the centre was to provide computer training to the senior pupils of the school and the community at large. Training would consist of basic computer literacy courses up to advanced training in standard desktop applications, such as word processing, spreadsheets, a presentation application and computer based training (CBT) software. The CBT software was geared towards basic mathematics, physical science and biology and was to be used for community members who wished to improve their qualifications. The IT infrastructure included a server, twelve workstations (normal PCs) and a printer. All of these were networked and all levels of software were current and standard. There was no Internet connection, although it was hoped that this could be installed at a later stage.

The services offered at ICT3 were not typical of those of an ICT centre, and were focused more on the needs of the school pupils than the community. In other words ICT3 was really a PC laboratory geared for the training of school children in CBT with a limited number of IT related courses.

4.5.4   Application of the instrument

Although TSA was not involved with the conceptualisation of ICT3 as TSA was contacted after ICT3 was implemented, the research instrument was applied in the same manner as with the other centres that were part of TSA's ICT project.

4.5.4.1   Conceptualisation phase

4.5.4.1.1   Site selection

In an interview the headmaster indicated that the school had been contacted by a donor who wished to make a donation to the school as part of his social responsibility.

The headmaster was interviewed about the site's physical infrastructure, and the following information was obtained:

- o   ICT3 has access to electricity
- o   ICT3 has access to water
- o   ICT3 has ablution facilities
- o   The school has telephone lines, but ICT3 does not

- ICT3 is a part of the school, which is situated close to main the transport routes for taxis and buses
- ICT3 is secure and safe from the elements

4.5.4.1.2   Role players

Role players included the school staff who dealt with ICT3 and TSA staff members who were expected by the headmaster to assist with ICT3. The school's role players included the headmaster, the head of the science department and two teachers. The TSA role players were the local TSA regional office representative and some TSA academics from the IT programme group.

4.5.4.1.3   Community needs

According to the headmaster, there was no evidence that a process had been adopted by the donor to ascertain the needs of the community. The donor expected the headmaster to make use of the IT equipment in the most effective manner to assist the school pupils and the community at large. The donor had laid down no conditions for use. No other support would be forthcoming from the donor.

The headmaster had expectations for ICT3 to fulfil the following needs of the community:

- To make use of the centre's potential to generate income from service provision
- To provide programmes for school-leavers
- To provide programmes for TSA students
- To provide services to school children
- To offer e-mail, typing and faxing facilities, and possible telephone access

4.5.4.1.4   Business plan

Apart from a number of ideas, and the headmaster's intention for the centre to be able to generate income, there was no indication of a business plan for ICT3. The headmaster was sensitive to the importance of a business approach in order for ICT3 to be sustainable. The headmaster acknowledged the fact that his staff who were allocated to the centre needed training in order for them to become effective.

The researcher was made aware of the teachers' dissatisfaction regarding the fact that they had to undergo training when one of the teachers remarked: 'I have taught myself a little about IT. I am now able to train members of the community as I know more than they do.' There appeared to be a culture within the school teaching staff that a teacher did not require a qualification in a discipline, but only some basic knowledge, in order to teach that discipline.

The questions relating to a business plan and responses were documented by the researcher and are summarised below (refer to table 4.14 in the appendix, page vii).

- o That a financial model for income generation would be based on community needs
- o Marketing would depend initially on word of mouth
- o A number of staff would be used to in the running of ICT3 ensure consistency
- o TSA would assist the headmaster in ICT3's planning

It was clear that the headmaster had considered the importance of skills within the centre as well as including TSA and its students in the plan.

4.5.4.2 Evaluation and adjustment phase

4.5.4.2.1 Second site visit
The researcher, together with the TSA regional academic, met a second time in November 2002 with the headmaster and the centre staff. The focus was on the IT infrastructure, support and the capabilities of the school's support staff.

The following observations were made:

- o The centre had burglar proofing and was secure
- o There was no danger of dust, rain or any other damage from the elements
- o Cabling for the network was neat and had been done by professionals
- o Power was considered stable and no problems were experienced, but there was no UPS
- o Workstations were acceptable and standardised
- o Printers and servers were acceptable
- o Operating software was acceptable
- o Client software was standard
- o Support was not seen as an issue because of the modern and new equipment
- o Problems were experienced with using the software due to a lack of knowledge
- o Of major concern was the fact that although the teachers were trained in the sciences, they had very little knowledge of the software, operating system and hardware

These observations were discussed with the headmaster, who indicated that he was aware of the issues regarding the teachers' lack of IT knowledge. The headmaster's expectation was that TSA would assist in supporting the teachers as well as provide general IT support.

ICT3 had not been used.

The following recommendations were proposed by the researcher:

- o Offer certified training courses with recognised diplomas/certificates
- o Try to satisfy the needs of TSA students in the area
- o Have the teachers trained and certified in IT as soon as possible
- o Establish what is needed for CBT for the schools pupils
- o Speak to the relevant people at TSA to obtain help with the above recommendations.

Table 4.4 Summary of recommendations

FACTOR	RECOMMENDATION	INTENDED EFFECT
Usage of centre	Offer certified training courses with recognised diplomas/certificates. Speak to the relevant people at TSA to obtain help. Establish what is needed for CBT for the schools pupils	To address needs of users of the ICT3 Establish how many TSA students live close to ICT3 and identify needs that can be addressed by ITC3. To assist pupils with some subjects offered at the school
Reliability of services	Have the teachers trained and certified in IT as soon as possible	To ensure that the services and training are up to standard

4.5.4.2.2   Third site visit

The follow-up meeting took place nine months later, in July 2003. The headmaster had resigned and the school was under the leadership of the head of the science department, in an acting capacity. The researcher used the recommendations made on the second visit as a framework for assessing the status of ICT3.

Table 4-5 Outcomes of recommendations suggested for the improvement of ICT3

RECOMMENDATION	ACTION
Contact TSA academic staff	Contact was\made and problem discussed.
Train the trainer	Three teachers were nominated and underwent training on TSA's end user computing as well as basic computer maintenance
Certify the trainers	Two out of the three passed an examination and were seen by TSA's academia as able to train.
Make use of TSA students in the area	Had trained twenty eight TSA students

Enquire about CBT software	Had not done this as the headmaster had been driving the project and then left.

Table 4.3

The TSA academic staff made it clear to the school that TSA would only give training to the nominated school staff, test the staff for competency and would be available telephonically for support relating to the specific training given, but would not be involved further.

The number of people that had made use of ICT3 had increased from a few to 28. The acting headmaster was more concerned about the stability of ICT3 in terms of usage, recognition by the community and throughput of students than about the income generated. The acting headmaster told the researcher: 'once we are sure that we can offer a service that is seen by the community as worthwhile, only then will we look at the generation of income.'

A major concern was the cost of the course. People within the community could not afford the fee charged and were comparing the cost of the course with similar courses offered in urban areas. The researcher established that the academic staff added a twenty per cent surcharge to the normal cost of the course. The normal cost was the same as the course offered by TSA. The surcharge had to be passed on to the end user who then also had to pay an additional fee to cover the school's overheads.

4.5.4.3   Sustainability phase

The instrument could not really be used effectively to determine whether ICT3 had the potential to become sustainable as the new centre management was not driving ICT3 with the same enthusiasm as the headmaster had. There appeared to be apathy on the part of the new centre management which seemed to effect the other centre staff.

ICT3 showed no growth after the initial indications of potential and in fact the centre appeared to be in a state of stagnation.

4.6   Information and Communication Technology Centre four - I CT4

4.6.1 Background of ICT4

ICT4 was the third of four ICT centres that was managed by the TSA project manager. TSA was prepared to set aside an amount of money that would cover the procurement of IT equipment. As with the previous ICT projects, the TSA manager had to find a rural area that was considered in need of an ICT centre. The original site that was decided upon was in a rural area.

The supplier of the equipment voiced concerns about the site, so ICT4 was relocated to the largest town in the province. The supplier's concerns will be discussed in detail later.

4.6.2   Infrastructure of ICT4

Electricity was not available at the time of the first site visit, but was within 50 metres of the centre. Although there was no telephone connection, there is a satellite telephone system 700 metres away from the centre. The centre is opposite a secondary school and close to a village. There is access to water at the centre which is within walking distance from a tarred road.

4.6.3   Services offered at ICT4

One of the more critical considerations for choosing the location of the centre, after interviewing the project manager, was the issue of sustainability. The centre had to be sustainable and, therefore, the services offered by the centre had to be in demand. The staff and pupils of the eight secondary schools and twenty primary schools were seen as potential clients to which services such as Internet access, e-mail, copying and typing of documents would be useful. The centre would also be used as a provider of faxing, photocopying and telephone facilities.

In addition to these services, the centre would offer basic computer training, in the form of end user computing, typing skills and elementary word processing.

4.6.4   Application of the instrument

4.6.4.1   Conceptualisation phase

4.6.4.1.1   Site selection

The project manager identified a community centre as the site in a rural area close to the border of Mozambique which satisfied the conditions of TSA. According to the documentation compiled by the project manager, the centre was to be located in an existing community centre. The region to be serviced by the ICT centre was considered deeply rural and the culture of the community was influenced by strong tribal values. The tribal authorities played a significant role in the lives of the people living there. The population of the rural area was estimated to be 249,591, of which 84% were unemployed.

The site satisfied the conditions defined by TSA management in that it was in a rural area that did not have access to any similar type of services offered by an ITC centre. The local TSA

representative was interviewed about site selection, and the responses are summarised below.

- o The site for the ICT4 would have access to electricity through the community centre within a month as the community centre was waiting for the local electricity supply commission to connect the centre to the main supply grid
- o The site has access to water
- o The site has ablution facilities
- o There is no telephonic access at the community centre but the understanding from the local TSA representative was that there were plans for the centre to be connected in the future
- o There is a Telkom satellite connection within 700 metres of the centre
- o The site is close to a transport infrastructure, which includes taxis and buses
- o The centre is in a secure building: it is part of community centre and safe from the elements

4.6.4.1.2   Role players

According to the project manager, the role players included top management from TSA, the local TSA regional director, the local TSA representative and the community. The community role players included the local tribal authority, who represented three major tribal groups. The TSA role players include the TSA project manager, the local TSA representative and the local TSA regional office.

4.6.4.1.3   Community needs

Community needs were identified in discussions with the TSA project manager and the local TSA regional office. The project manager worked through the local TSA staff to identify the relevant community leaders and to set up communication channels with them. The senior management of TSA visited the proposed site in July 2000, before the community leaders were approached. Senior management wrote letters to the local tribal authority indicating TSA's commitment to community development. The understanding was that the ICT centre would provide a number of services and that the community could expect to see benefit of the centre in economic development. TSA management stated in one of the letters to the local tribal leadership that 'It is TSA's belief that since technology is the way to go these days, rural communities should not be left behind in this interesting and powerful route in life.'[3]

There were also TSA students in the vicinity that could benefit from the centre, according to the TSA's senior management. The researcher discussed the content of these letters with the

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[3] Source of documents in the care of TSA archives and may not be made available

local TSA regional director, and understood that an immense expectation was created that was shared by the community at large.

4.6.4.1.4 Business plan

The researcher recovered documentation which included the business plan for ICT4. As with two of the other ICT centres that TSA funded, the process followed by the TSA project manager was to submit a motivation for the funding to TSA management. The funding was approved after the site selection, community needs assessment and identification of role players were documented. The document describing the business plan revealed the following:

- o The centre would be managed on the same principle as ICT1, i.e. it would be self-sustaining
- o TSA would only donate the start-up funds for the centre
- o The local TSA regional office would provide 'distance' supervision
- o Based on the large number of schools in the area, the assumption was that there would be large client base to draw from
- o Services required were assumed to be Internet access, e-mail access, telephone, typing and faxing facilities

A projected income statement was included in the plan, which showed a 14% growth per annum with a projected profit of 3.2 % after the second year and 6.6 % at the end of the third year. There was no other evidence to support the projected income statement other than a reference to the large number of schools and the number of people living in the community. The business plan highlighted the importance of income generation in the survival of the centre.

As the local TSA representative was involved in the conceptualisation of ICT4 with the project manager, he was asked a number of questions pertaining to the business plan and in particular to the sustainability of the centre. The responses to which are summarised below.

- o The centre has no financial model
- o The centre has no marketing plan
- o Third party support and succession planning would be left to the centre staff
- o Communication with the community would take place through the identified community leaders
- o ICT4 would be staffed by members of the community with assistance from the local TSA office

4.6.4.2 Evaluation and adjustment phase

The plans for ICT4 were not implemented because of the hardware supplier's concern about the lack of power. Therefore, the implementation phase of the instrument could not be applied to the initial site as there was no implementation took place. The researcher took the opportunity to visit the proposed site to assess the situation and better understand the decision not to implement ICT4.

4.6.4.2.1   First site visit to the initial site for ICT4

The first visit took place in March 2001 and the TSA local representative was interviewed. According to the local TSA representative the TSA project manager had made use of an external consultant to assist in trying to determine whether ICT4 would be financially viable at the initial site. The consultant's report[4] given to the researcher was negative and advised against the proposed model of ICT4 being implemented as there was no proper business case to support the financial viability of the centre.

The local TSA representative, when interviewed by the reseacher, was concerned about the approach that was used by the TSA project manager in the initial setting up of ICT4, and commented that 'TSA must be cautious, as we have come in with a technology push and are creating expectations in the minds of the community which we may not be able to satisfy.'

The TSA representative was also concerned that the community would not be able to satisfy the expectations of TSA by sustaining the centre. The TSA representative understood the community well, as he had grown up there, and made the following comments regarding the needs of the community and the potential of an ICT centre:

- o The community needed IT training in general, and especially for school-leavers
- o IT programmes would need to be defined based on guidance from experts
- o The community was definitely aware of the importance of IT
- o General services offered by ICT centres, such as e-mail, typing facilities, lamination and photocopying, were always in demand
- o There were a substantial number of TSA students who would benefit from the centre
- o Community members would pay for the centre services if they were affordable
- o The centre could investigate the possibility of partnerships

4.6.4.2.2   Second site visit

The second contact made by the researcher with the local TSA representative took place in September 2001, six months after the original meeting. The meeting again took place at the

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[4] Consultants report may not be made available

proposed site of ICT4. The community centre was operational but there was no ICT centre. The TSA representative confirmed that the centre had been moved to the largest town in the province and was housed in the local TSA regional office. The ICT centre, however, was not operational.

According to the local TSA representative, when interviewed by the researcher, on the instruction of the project manager, the tribal authorities and community leaders were simply informed by the TSA representative of the decision to relocate ICT4. The representative said to the researcher: 'It was terrible; the community leaders were so upset that I am afraid to show my face in the community.'

IMAGE 4-4 The community centre in the original location for ICT 4

The researcher asked the TSA representative how the community would react, should TSA decide to try and erect an ICT centre in the area in the future. The reply was: 'the community would not consider speaking to us until the centre was physically there and functional.'

The researcher proceeded to the regional office to investigate the relocated ICT4. The researcher noted that the centre had hardly been used. The regional director was then interviewed.

The regional director confirmed what the local TSA representative had said about the relocation of ICT4. The regional director indicated that the TSA project manager had donated two old PCs that TSA had deemed old technology to the community in an attempt to apologise to the local authorities for the sudden relocation of ICT4. The local TSA staff had no idea if the PC's had been used or even where they were.

Other information from the interview with the regional director is noted below.

o   The relocated centre was to be used for TSA students

- o The intention was to use the relocated centre to produce income for the TSA regional office and it was to be used as a PC laboratory
- o It was understood that there would be no further financial assistance form TSA and therefore the relocated centre had to ensure that all overheads accruing to the centre would be covered by the generation of income
- o Challenges identified by the regional director were
    - o a lack of technical expertise, especially as the IT equipment was not considered standard
    - o a lack of available expertise to run an ICT centre
    - o no business model for the centre
- o The physical site
    - o was secure
    - o had access to all the amenities not normally found in the rural areas
    - o had access to telephones
    - o was easily accessible due to the relocated centre being situated in the middle of the town, close to a sound transport system
    - o Third party support could be dealt with remotely due to the availability of connectivity

4.6.4.2.3   Third site visit

The researcher visited the centre (still referred to as ICT4) at its new location and was granted a second interview with the regional director in September 2003.

ICT4 had not been used for the following reasons:

- o The IT equipment was unstable
- o There was no available support for the IT equipment
- o No funding was available for the replacement of the workstations, and until the equipment was replaced, the regional director would not be prepared to use ICT4
- o The competition in the town was also a concern. According to the regional director, in order to compete with the other ICT centres in the vicinity, TSA would have to change its way of dealing with courses that were to be used for income generation at ICT centres and make them affordable

4.6.5   Sustainability of ICT4

The researcher had to focus on the relocated site for ICT4 as the initial site was never used for the ICT centre. The relocated site showed very little indication of use and no indication of

growth. There was also no evidence of a plan for the relocated site. Due to the relocation and little use of ICT4. the researcher was not able to ascertain the potential of the ICT4.

From what would appear to have been a sound approach applied by the project manager when identifying and communicating with the local leadership for the initial site for ICT4, the initial site may have proven to be ideally situated especially as there seemed to be local support.

4.7   Information and Communication Technology Centre five - ICT5

4.7.1   Background of ICT5

ICT5 was the only ICT centre that was outside the borders of South Africa. It was the first ICT centre to be implemented by TSA and was the initiative of the TSA project manager due to an international company wishing to donate money for an ICT centre as part of their social responsibility. The donor's conditions were that it should ideally be placed in an area that did not have the means to deploy an ICT centre. The donor wanted the centre to be used to assist a previously disadvantaged university by offering ICT services to the university and surrounding community. The donor also indicated that the funding for ICT5 would only be sufficient to keep ICT5 in operation for three months thereafter the donor's expectation was that ICT5 had to be able to sustain itself after the seeding money from the donor had been exhausted.

4.7.2   Infrastructure of ICT5's environment

ICT5 is located at the local university. Although the country has been independent for many years, the infrastructure is typical of a developing country in Africa with little indication of growth.

The national provider for communication which has the monopoly, was slow to react to requests for new data and communication lines. In the main town, there is one cyber café which provides access to the Internet through a normal telephone line. The university has a connection to the Internet which was unable to satisfy any Internet need due to the low bandwidth. The town is considered the economic hub of the country and has a population of 400,000.

4.7.3 Services offered

The TSA project manager supplied the researcher with information about the centre's proposed services and conditions. The main driver for the creation of ICT5, apart from the donor's requirements, was the desire to create a profitable, self-sustaining centre through the alignment of service provision with local needs. This was emphasised when the initial discussions with the role players took place, when it was made clear that the majority of clients should be small businesses and the town community.

IMAGE 4-5 ICT5 students busy with a course

The following is a list of services that were to be offered by ICT5:

- o Basic computer training
- o Typing of documents
- o Faxing facilities
- o E-mail facilities
- o Internet facilities
- o Telephone communication
- o Lamination of documents
- o Printing of documents

4.7.4   Application of the instrument

4.7.4.1   Conceptualisation phase

4.7.4.1.1   *Site selection*

The following points are a summary of the interview with the project manager pertaining to the site selection of ICT5:

- o The site addressed the donor's requirements that a previously disadvantaged university in a developing area within Southern Africa should host the centre
- o The centre was secure
- o There were amenities available typical of a small university
- o The site was easily accessible to the community because of the location of the university within the town
- o The site had access to telephonic communication
- o There were no problems with power

4.7.4.1.2   Role players

The role players consisted of some of the university staff and the TSA project manager. It was decided that the university would be responsible for the appointment of the centre manager and for the running and maintenance of the centre and that the centre manager would be paid a salary based on the income that ICT5 generate.

4.7.4.1.3   Community needs

The TSA project manager indicated that ICT5 would facilitate an effective way of training through the use of CBT and would offer other services and benefits such as access to photo copying, lamination and telephonic services. This information, as well as the process to be followed for the implementation of ICT5, was conveyed to the role players from the university and community at a workshop. It was essential that the role players understood how the donor's funds would be spent and what the expectations of the donor and TSA were, especially in terms of ICT5 becoming independent after the first three months.

More interviews were conducted at the workshop with some of the community representatives who were identified by the university role players on request of the project manager. The purpose of these interviews was to establish whether there was a formal needs assessment process. The responses are summarised below.

- o The centre is considered to be a provider of programmes for school-leavers in an attempt to stimulate economic growth
- o There were no computer facilities at the university
- o There appears to be very little awareness of IT within the community
- o Services such as typing, photocopying and e-mail would be used by small businesses

- o TSA students could use the centre, although the number of local TSA students resident in the town was not known
- o There was no indication of the needs of schools for IT
- o The centre could help with the university's outreach programme to other areas within the country

4.7.4.1.4   Business plan

There was no evidence from the documentation of a business plan, apart from a motivation written by the project manager to the donor and TSA management. The TSA project manager made it clear that the university would be responsible for the creation of a business plan. The TSA project manager communicated this expectation to the donor as well. It was also communicated to the role players at the workshop.

The documentation supplied by the TSA project manager confirmed that TSA would be responsible for the   procurement of all the furniture, IT equipment and the first year's IT maintenance for ICT5. The documentation also highlighted the donor's expectation that ICT5 would be self-sustaining. The TSA project manager had drawn up an expected forecast of income for three years, which showed a 12% increase per year. No reason was given for this figure.
No provision had been made for marketing, contingencies or other issues. The motivation made it clear that establishing a common understanding between all the stakeholders of the centre's objectives was key. The main objective of ICT5 was to provide access to IT and telecommunications for the local community and the university students.

There was also no evidence of a financial model for income generation. During the workshop, the project manager was interviewed to find out what was considered to be the most suitable approach for ICT5. The outcome of the interview is summarised below.

- o There is no financial model, but it is suggested that the outreach programme will be used as input for the deployment of courses currently run by the IT department at the university
- o The centre should provide services, including faxing, laminating, photocopying, Internet use, e-mail and typing services
- o The income generated will be an indication of the effectiveness of the centre
- o Marketing of the centre will be done through the university
- o Staffing of the centre would be the responsibility of the university and, hopefully, with the assistance of the TSA project manager
- o The main objective, as far as the project manager was concerned, was for ICT5 is to be self-sustaining

The workshop took place at the university under the chair of the TSA project manager. Senior representatives from the university were present, as well as members of the community. The project manager used the workshop to communicate the conditions for the donation and to entrench the understanding of sustainability.

4.7.4.2   Implementation phase of ICT5

4.7.4.2.1   Selection of centre management

One of the issues discussed at the workshop was the identification and appointment of a person who would act as the centre manager and it was decided that the university would identify a student who was studying an IT course at the university to run the centre. The salary of the centre manager would be funded by the donor for the first three months, after which the centre managers salary would come from income generated by ICT5. The TSA project manager also indicated that during the first three months, he would keep in contact with the centre and assist where possible.

A student from the university was identified to run the centre. The selection process was investigated through an interview with the project manager and the outcomes summarised below.

- o   Business acumen is considered imperative, especially as the centre had such a high profile and is expected to be self-sustaining within three months
- o   The incumbent needed to be technically capable, as there was no immediate technical support
- o   Knowledge of the community was not seen as a real issue, but could be important from the community's point of view
- o   Problem-solving skills were not considered a requirement

4.7.4.2.2   Third party support

Third party support was not regarded as an issue, according to the TSA project manager, as the company which supplied the equipment to the ICT centre had a one-year SLA with the centre. The supplier had negotiated with a local IT company in the town who would act on its behalf.

4.7.4.2.3   Implementation process

The implementation process was one of the outcomes of the workshop. The TSA project manager took it upon himself to deal with the implementation of ICT5, which included the procurement of the equipment and furniture, investigation of alternatives to connectivity to the Internet and, finally, the installation of the IT equipment by the supplier.

Some of the university staff who attended the workshop indicated to the researcher that they were concerned about the expectations of the donor. One of the senior university staff members made a remark to one of the TSA staff members which conveyed their concern:

> 'TSA must make one thing understood: if this project is a failure, do not even attempt to bring in similar projects in the future as we will not be interested. Remember, even though it is a sound idea, the project must be sensitive to the needs of our country and the resources at our disposal.'

4.7.4.3   Evaluation and adjustment phase

4.7.4.3.1   First site visit

The first site visit took place in April 2000 with the local TSA representative, six months after the centre opened its doors. The student who was appointed as the centre manager no longer worked at the centre and had been replaced by the daughter of one of the senior managers of the university. The reason for the replacement of the centre's manager was because there was no money for a salary for the centre manager, according to the local TSA representative, as no funds had been generated by ICT5 under the management of the student.

The visit also revealed that the centre was not being used for its initial purpose; the only service that was used was the telephone. The PC's were idle, there was no Internet connectivity and no e-mail facility. The researcher asked the TSA project manager what actions the TSA project manager would take to address the situation. The TSA project manager also had a responsibility to report back to the donor on the progress of the centre.

The TSA project manager indicated that the following steps had been taken:

o   As the national provider was not responding to the demands for connectivity, the manager had contacted a company that dealt with radio links that could be used to establish connectivity from South Africa
o   The centre was idle mainly because the outreach programme of the university was not making use of the centre

o He suggested that TSA students resident in the area make use of the centre

o He suggested that the local TSA regional office try to assist in getting the centre operational from a technical perspective

The university staff confirmed the problems with service delivery from the national telecommunications supplier and that there was little likelihood of the centre getting a connection within the foreseeable future.

4.7.4.3.2 Second site visit

The follow-up visit took place in May 2001. Although the centre had been used a few times for practical exercise by IT students at the university according to the centre manager. Connectivity was still an issue, as the suggestion made by the TSA project manager was illegal. The national telecommunications body did not allow communication through any other body. The researcher suggested that the centre make use of the South African tertiary network, UNINET, through the university. The university was a member of UNINET.

The local TSA regional office, close to the border of the country where the centre was located had managed to attract TSA students who were studying subjects that had an IT practical component and were able to do use the centre for the practical component. Although the students were few, this was a source of some activity for the centre.

The researcher proposed the following recommendations.

o Market the centre in the town in an attempt to attract more clients

o Encourage the centre manager to make use of the local TSA representative to market the centre to local TSA students

o Make use of UNINET for connectivity to the Internet

Table 4.6 Summary of recommendations

FACTOR	RECOMMENDATION	INTENDED EFFECT
Usage of centre	Market the centre Market centre through TSA	Attract users from the community and small business as intended initially to use ICT5. TSA students living close to ICT5 could use ICT5 thereby increasing usage.
Reliability of services	Make use of UNINET	Ensure a reliable and managed connectivity to the Internet.

4.7.4.3.3   Third site visit

A third site visit, in November 2002, revealed that the centre had not made progress since the second site visit. The TSA project manager in an other interview made it clear to the researcher that the centre was managed by the university and that it had been given an opportunity to make the centre work. The TSA project manager told the researcher:

> '…I am not taking responsibility for the centre. The centre together with the
> university had a golden opportunity to generate funds and make use of
> technology. They were also told that they had to make it work. It is their problem.'

The local TSA regional office tried to assist, by making local TSA students aware of ICT5, but a political incident between South Africa and the country where ICT5 was located, made it difficult for South Africans to work in the country. The local TSA representative confirmed that ICT5 was not operational by saying:

> '…you will not find a single fingerprint on any of the keyboards of the centre. In
> order to make the centre break even, it would have to be used 43% of the day
> for thirty days a month.'

4.7.5   Sustainability of ICT5

ICT5 showed a steady decline in usage since its implementation. There was no indication of growth and the situation was aggravated by difficulties in trying to connect to the internet and the political situation. No business plans were in place to assist with management of the centre. Even with the intervention of the local TSA regional office, there appeared to be evidence of the centre being able to show an improvement.

4.8   Information and Communication Technology Centre six- ICT6

4.8.1 Background

The centre is situated at a secondary school in a rural area close to the Swaziland border. A large computer company donated an entire computer laboratory to the school in February 1998. The donation included 40 workstations, two servers and two printers, all of which are networked. Each workstation is based on a thin client architecture and was connected to a communication system which can be used by a tutor. The purpose of the laboratory was to assist in the education process of the pupils of the school The intention was to have a tutor assist each individual PC user, should the need arise, without disruption to the rest of the

class. The application software included programs for word processing, spreadsheets and a number of CBT packages that dealt with physical science, mathematics and biology.

According to the headmaster, the computer vendor donated the IT infrastructure and equipment to the school for two reasons: firstly, the IT equipment was to be used for teaching IT skills to pupils in the senior classes; and, secondly, the centre was to be used for teaching basic computer skills to school-leavers. School-leavers were to be trained after school hours and would be expected to pay a nominal fee. The community centre adjacent to the school would be instrumental in marketing the services of the ICT centre and would manage the administrative side of ICT6.

A teacher from the school was nominated, together with two colleagues, to maintain the centre and to deal with all training issues. ICT6 was secure, had no problems with unreliable electricity and was supported by a well-installed infrastructure of cabling servers and printers.

The headmaster was made aware of the presence of TSA by the local TSA regional office. The TSA office was contacted by the headmaster for assistance in two areas: technical expertise, and the possible formation of a partnership. TSA had no input into the conceptualisation or implementation of ICT6 and was only contacted in July 1999 by the headmaster for assistance.

4.8.2 Infrastructure of ICT6's environment

The school is within walking distance of a community centre and is easily accessible by a good tar road. The community centre was an initiative of the local government to assist with the region's economic development. There are no other ICT centres in the area, including at the community centre. Power is available, although ICT6 has no connection to a telephone line. There is a Vodaphone kiosk within walking distance of the school, which is the closest public telephone to the school. There is a clinic nearby and six schools in the area. The population that is serviced by the community centre is approximately 30,000, of which the majority of people are below the age of twenty.

IMAGE 4-9 The view of the community centre from the school.

IMAGE 4-6 Some of the senior pupils making use of the centre

4.8.3 Services offered by ICT6

The services available to the community were originally focused on the school-leavers and the senior pupils of the school. Pupils would make use of the centre to improve their skills in the sciences, mathematics and English. The community members would be able to make use of the centre for basic computing, including word processing, spreadsheets and typing skills. There was no computer related subject that was offered by the school when the centre was opened. There was also no intention to offer access to the Internet or include other typical services of an ICT centre such as faxing, typing of letters or telephonic communication.

4.8.4 Application of the instrument

The local TSA regional office requested that TSA's central campus do an assessment of ICT6 and make recommendations to the local TSA office as well as the school principal in July 2000. The visit was made by the local TSA regional office representative, the researcher, TSA technical staff and the school's management staff.

4.8.4.1 Conceptualisation phase

TSA was not involved in the conceptualisation of ICT6 and the donor was not available for interviews. The instrument was used to assess the actual site, role players' involvement as well as the expectations of the school's headmaster. The headmaster and the local TSA representative were interviewed.

4.8.4.1.1   Site selection

According to the headmaster the donor's only requirements for the location of ICT6 were that:

- o   The site must have access to a reliable supply of electricity
- o   The site must have access to water and ablutions
- o   There is no telephone line connected to the centre, but the school does have connectivity
- o   The site is close to a community centre
- o   The site is close to a transport system: taxis, bus stops and main roads

4.8.4.1.2   Role players

Initially the role players and stakeholders were the school staff and pupils. The school headmaster did, however, indicate that there was a possibility that the school may extend the services of the centre to the community through the community centre. The management of ICT6 was given to the science teachers who were to make use of the system to assist pupils in mathematics and science. The teachers were also expected to run the centre from a support aspect and deal with technical issues.

4.8.4.1.3   Community needs

There was no documentation to suggest an attempt to determine the community needs. There was also no evidence of any marketing of ICT6. The headmaster was interviewed about the centre's potential in the community (see table 4.15 in the appendix, page vii).

It was evident from the interview with the headmaster that he believed that the centre could play an important role in economic growth in the area through the provision of education for school leavers in particular. The emphasis according to the headmaster was on IT training. The headmaster also indicated that his views were based on the potential of other ICT centres.
The schools pupils would also make use of the centre but acknowledged that the centre needed to generate income to maintain service provision.

4.8.4.1.4   Business plan

Although there was no business plan, the headmaster was sensitive to the potential of a computer centre but admitted that he needed assistance to realise the potential of an ICT centre. The researcher asked the headmaster a number of questions to try and ascertain what was understood and seen as important to ensure the financial viability of the centre. The responses are summarised below.

- o There is no financial plan, but this can be dealt with later by asking the community centre for assistance
- o There is no marketing plan, but the community centre and word of mouth will be used for marketing
- o IT support is an issue. It is hoped that the equipment will last for a few years before maintenance is needed; guidance is needed from TSA
- o Partnerships with TSA and the community will be discussed
- o Staffing is not seen as a problem, as the science teachers will be involved
- o Services will focus on basic computer training for the community and the CBT software for the school pupils

4.8.4.2 Implementation phase

4.8.4.2.1 *Selection of centre management*

As indicated by the headmaster, the school's science teacher would manage the centre. The instrument was used to try and understand the headmaster's views on the profile of the person who would run the centre on a commercial basis. The responses are summarised below.

- o Business acumen is important if the centre is to make money
- o Technical ability is considered the most important attribute, especially considering the centre's remote location
- o Local knowledge is not seen as an issue but the community must respect the centre staff

4.8.4.2.2 *Third party support*

The teachers responsible for the centre made it evident that they were not confident enough to train the community, although they were able to assist pupils with the CBT software. The researcher also ascertained that the teachers were not technically skilled at all and had never been exposed to computers before. They were in the process of teaching themselves.

4.8.4.3 Evaluation and adjustment phase

Although TSA was not involved with ICT6, the researcher was informed by the local TSA regional director that TSA would assist the school in getting ICT6 to an operable level.

4.8.4.3.1   First site visit

In July 2000 the researcher was asked by the local TSA regional director to make recommendations that could assist ICT6 in becoming operable.

The recommendations proposed by the researcher are listed below:

o   Ensure that the teachers are able to master the software products that were used for CBT including the basic word processing and spreadsheet software
o   Technical problems could be phoned through to the TSA computer services department in an attempt to resolve them telephonically together with the school staff
o   Identify possible ways in which the community centre could assist with marketing the centre to the community
o   Keep records of usage
o   Ensure that the community can afford the services offered by ICT6

Table 4-7 Summary of recommendations ICT6

FACTOR	RECOMMENDATION	INTENDED EFFECT
Usage of centre	Keep records of usage. Identify possible ways in which the community centre could assist with marketing the centre to the community	To record usage to indicate growth or a decrease in usage. To increase ICT6 usage and to assist with the centre sustainability.
Reliability of services	Ensure teachers are able to use the CBT software and are also able to use the other software used for training. Technical problems should be phoned through to the TSA computer services department.	Ensure that users can be trained and assisted by teachers responsible for the running of ICT6. So as to maintain an acceptable uptime of equipment.
Income generation and overheads	Ensure that the community can afford the services offered by ICT6	To sustain usage of ICT6

4.8.4.3.2   Second site visit

The researcher returned for a follow up visit in January 2001, six months after the initial visit. The headmaster had resigned and was replaced by one of the teachers in an acting capacity. The teachers responsible for ICT6 and the acting headmaster were interviewed so that the

researcher could assess the progress of the centre (refer to table 4.16 in the appendix, page viii).

Very little usage of ICT6 was evident. There appeared to be a need for the internet and e-mail. The pupils were hardly making use of the ICT6's CBT software either. It was clear that the centre was not being used by the community and pupils at the school were not taking full advantage of the centre.

During the discussion on usage it became apparent that the centre had experienced a number of technical problems resulting in downtime. The staff were unable to deal with the technical problems. TSA had sent technical staff in an attempt to resolve these problems. However, according to the technical staff, the equipment was so outdated that, even in a large town, expertise would be difficult to come by.

The acting headmaster requested that TSA assist with continued technical support. A technical audit carried out by the TSA technical staff revealed that the servers were unstable and that as the technology was outdated the operating systems were no longer supported by industry.

The researcher recommended that to the acting headmaster the following:

- o Try to get additional funding so as to replace the equipment with modern technology
- o Investigate making use of the community centre for assistance
- o Consider the recommendations made after the first site visit

4.8.4.3.3   Third site visit

The third visit took place in January 2002, one year after the second visit. The acting headmaster had been replaced by a permanent headmaster, who was interviewed by the researcher. The following observations were made.

The centre had hardly been used, as the teachers were not able to deal with the demands of maintaining the technology. The headmaster indicated that for the centre to become functional it needed permanent technical staff who understood the technology. The school could not rely on the science teachers to fulfil this role. They had no formal training and were unable to get training.

The school had been without electricity since the local authorities had cut the power when the account was not paid. The headmaster indicated that the annual grant received from the Department of Education for running the school was not enough to cover the electricity account. The Department expected the school to cover all expenses not covered by the grant

from the Department of Education with school fees. This was a problem, as the majority of pupils were unable to pay.

The focus had shifted away from the centre, according to the headmaster, mainly because of the change in leadership at the school, problems with power and a lack of expertise.

4.8.5   Sustainability

ICT6 was chosen by a donor because it appeared that the physical location was stable in terms of security and power. The school was also located in a rural area with no other access to ICT services.

The school had received the technology with no guidance on how to use the technology. When the schools management realised the possibility of realising ICT6's potential for income generation, there appeared to be an expectation that TSA would play a more active role in assisting the school.

ICT6 had three major setbacks which impacted significantly on its potential, these were, outdated technology, a changing school management and a lack of funding to maintain the basic needs for the school.

4.9   Conclusion

The physical location of each of the six ICT centres were in areas that had no access to ICT services. In all cases there was no evidence that the respective communities had asked for ICT services. It was also apparent that there was an appreciation expressed by the respective centre staff and community leaders of the potential of ICT centres especially in the enabling of people through IT training.

Challenges that the centres were faced with included identifying people with the ability to manage the centres, being able to become sustainable within a relatively short period of time. Challenges with respect to the actual locations of the centres were largely confined to remote support, a reliable supply of electricity and access to the internet and e-mail.

In all instances, the ICT centres were located in areas with a population large enough to have a significant impact on each centre if the centre was operable consistently and could maintain service delivery. All centres were close to or part of a community centre, in a town or school. All centres were physically secure and safe from the elements.

The following chapter will discuss the findings of each ICT centre.

CHAPTER FIVE

FINDINGS and DISCUSSIONS

5.1   Introduction

This chapter will examine and interpret the data collected from each ICT centre, as detailed in the previous chapter. The factors that lead to each centre's success or failure will be identified. These factors will be grouped together and used as indicators of each centre's potential to become sustainable. The research instrument will form the broad framework according to which findings for each centre will be discussed.

5.2   ICT1

5.2.1   Analysis of data

5.2.1.1 Conceptualisation

It was evident that there was little need for an ICT centre in the region, a fact confirmed by the lack of buy-in from the community. There was no evidence suggesting that the community required an ICT centre, but rather it appeared to be a case of an IT push from TSA.

An income generation forecast was compiled based on the assumption that the community's use of the centre would generate sufficient funds to support it. An assumption was made that the large number of schools in the area would result in a demand for the centre services.

The choice of location for ICT1 was the result of a donor wishing to put an ICT centre in an area where people did not have access to such a centre. There was no demand for such services in the area at the time.

The decision to house ICT1 in an existing community centre meant that ICT1 was able to take advantage of the community centre's amenities as well as the fact that the centre was known to the greater community.

5.2.1.2 Implementation

One of the problems that ICT1 faced from the beginning was the lack of a reliable power source. This impacted severely on the service provision of the centre, as it was rendered inoperable for long periods of time. This also had an effect on the reputation of the centre, as the community considered ICT1 to be unreliable.

The staff responsible for ICT1 were not trained to deal with business issues. A lack of business understanding and appreciation of the importance of a competitive approach meant that the centre did not charge market-related prices for the use of e-mail and would not lower prices to become more competitive.

No real consideration was given to the supply of electricity during the implementation phase, even though it was evident that the unreliable electricity supply had a negative effect on ICT1 in its early stages. At this time, ICT1's success was also hampered by the lack of expertise shown by the centre staff, who were not able to manage and run the centre. Both these issues were apparent to the project manager responsible for the conceptualisation and implementation of ICT1.

5.2.1.3 Adjustment

The power supply problem could have been partially resolved through the provision of fuel for the generator. Although this was made known to TSA, the problem was not addressed and there was still no reliable electricity source.

A lack of technical expertise impacted on the training of people working at the centre and support of IT equipment, especially as one of the conditions for the success of ICT1 was the local expertise. Again, this was communicated to TSA with no result.

Issues fundamental to the centre's operation were identified quickly and communicated to TSA. No attempts were made by TSA to remedy the situation.

5.2.1.4 Sustainability

There was no indication of sustained usage of the ICT centre or income generation. There was no indication that the centre was properly managed. The only indication of change was the fact that the community centre received an award for innovation, which had the effect of renewing interest from third parties.

5.2.2 Factors for success or failure

The factors listed below influence the centre's potential to become sustainable.

Factors for success :

- o The position of ICT1 at the community centre meant that ICT1 was able to remain in operation longer than it may otherwise have been able to. Although there was no official partnership between the community centre and ICT1, the latter was able to take advantage of the infrastructure and get exposure from its position within the community centre

Factors for failure:

- o A lack of a reliable supply of electricity resulted in lengthy down times for the centre. The unreliable power supply also damaged the IT equipment. These two factors alone contributed significantly to ICT1's inability to render a service
- o No community needs assessment was carried out, which meant that the services that ICT1 provided may not have satisfied the community's needs. There was no guarantee that the community had committed to and shared a need for ICT1
- o There was no business plan, which meant that there was no real indication of the potential of ICT1 and whether the idea of implementing an ICT centre in the region was viable
- o A lack of proper planning of the day-to-day operations of ICT1 was also evident in the staff's inability to deal with the managing of the centre
- o Employing staff with no training aggravated ICT1's inability to operate smoothly and this was especially apparent in crisis situations
- o A 'box drop' approach was used by the initiator, who did not ensure that the centre could run independently without a third party's assistance; ultimately, ICT1 could not operate alone

5.2.3 Conclusion

Based on the above-mentioned factors at ICT1, the following pertinent points have emerged:

- o ICT1 showed that it was not able to be financially viable
- o The community's needs were not identified and therefore could not be addressed with any certainty
- o There was no indication of community involvement

- o The centre's lack of usage pointed to its inability to become viable and sustainable
- o ICT1's business plan and motivation was based on assumptions and, therefore, the types of services made available at the centre were more than likely inappropriate
- o The staff received no training, resulting in ineffective deployment of technology at ICT1
- o Although the donor's expectations were that the centre be independent and functional after the seeding money had been exhausted, there was no proper assistance from a third party to help achieve this result
- o The community centre proved to be crucial to ICT1's survival as it provided an infrastructure. The community centre had a relatively high profile within the community, resulting in a steady flow of people who were then exposed to ICT1. ICT1 also attracted international attention via the community centre

ICT1 could not be considered effective or sustainable.

5.3 ICT2

5.3.1 Analysis of data

5.3.1.1 Conceptualisation

The decision to locate ICT2 at its current site was based on the site's sound infrastructure, secure building and ease of access to the centre for TSA and Vista students. ICT2 was also part of an existing community centre, thus ensuring a greater degree of stability and exposure to existing patronage.

No community needs assessment was undertaken because it was assumed that the centre would service TSA students and the community, since there was no other equivalent service provider of ICT services in the area.

Staff at the centre were dependent on the local TSA regional office for assistance in terms of first line support for centre management and the day-to-day running of the centre. The appointment of a centre manager with business sense helped to stabilise the centre initially.

No evidence of a business plan was available due to the change in the intended site. This shortcoming was managed by the centre manager, who identified ways to make ICT2 operable.

After the relocation from the original proposed site, ICT2 appeared to have made the best use of the available resources and had the benefit of support from the local regional TSA office.

5.3.1.2 Implementation

As a result of the decision to relocate ICT2, no marketing to the potential market or communication with the community in the new location was undertaken. This impacted upon the community's use of ICT2.

Another immediate problem that ICT2 had to overcome was that the IT equipment was not standard and required training for use, which was not locally available. As ICT2 was relocated to the town during the conceptualisation phase, the centre would have had to try and render a service on a 'hit and miss' basis, a fact confirmed by the absence of a business and marketing plan. Third party support from local IT vendors, as well as the support from TSA, assisted the centre to a small degree. The contracted centre manager, however, proved to be inadequate in running the centre. A permanent centre manager was appointed from the local TSA regional office who appeared to make a difference to the centre's stability.

The staff from the local TSA office understood the importance of a business approach for the implementation of ICT2 and began focusing on TSA students as potential clients for the centre.

The staff, not faced with problems with respect to power and having a sound infrastructure surrounding the centre, could concentrate on the running of the centre.

5.3.1.3 Adjustment

The partnership with TSA and Vista University, which resulted in the establishment of an information centre, appeared to be another reason for the improvement in the centre's usage. ICT2 continued to improve when a market was identified and the necessary resources provided to satisfy its needs. The staff of ICT2 were then trained with the necessary skills.

The adjustment and evaluation phase of the centre was a continual process, managed by ICT2's staff and supported by the local TSA regional office.

5.3.1.4 Sustainability

ICT2 showed real growth and potential as a reliable provider of relevant services to the community. Although the centre was not able to operate independently, it was evident that the centre was considered a viable option within a partnership.

5.3.2 Factors for success or failure

The following factors influenced the centre's sustainability.

Factors for success:

- o ICT2 was located in an existing community centre in an area that had access to transport
- o TSA assisted on a continued basis with technical support and the day-to-day running of ICT2
- o Local vendors provided third party support
- o A permanent manager was appointed for ICT2 who had an understanding of business and knowledge of the community and TSA
- o Partnerships with TSA and VISTA were developed
- o The staff employed to work at ITC2 were trained
- o TSA and Vista University students were identified as a potential market

Factors for failure:

- o There was no business plan
- o No indication of community involvement or needs community needs assessment was evident
- o Non-standard IT equipment was installed

5.3.3 Conclusion

ICT2, after a difficult start due to a lack of direction, a lack of a needs analysis and a lack of skills, managed to become viable and proved that there was a strong possibility of sustainability. The major contributing factors for the turnaround were the following:

- o The local TSA regional office took responsibility for ICT2
- o An information centre was created that included third partners, TSA and Vista University
- o The local TSA management outlined a focus and a clear vision for the centre, identifying and defining issues that were understood by ICT2, such as the target clientele and the need to offer relevant services
- o The formation of a partnership meant that TSA could channel a steady flow of clients to ICT2 through the local student base

- o ICT2 was ideally situated in a secure environment in an area with a good infrastructure, access to power, protection from the elements, and access to IT support

ICT2, through the adoption of the approach outlined above, could be considered sustainable.

5.4 ICT3

5.4.1 Analysis of data

5.4.1.1 Conceptualisation

The conditions imposed by the donor of ICT3's IT equipment resulted in a physical location that was secure, provided access to electricity and a potential client base, namely the school and the local community. It was also understood that the school would take responsibility for the management and running of ICT3.

Even though there was no business plan or any further assistance form the donor, the headmaster attempted to build ICT3 around possible opportunities that would lead to income generation.

5.4.1.2 Implementation

As the headmaster was considered part of the local leadership, he also had the respect of the community. The headmaster had an understanding of the needs of the community as well as the profile of the average school-leaver. He was also sensitive to the challenges that might render the centre inoperable, such as an absence of the skills and support required for the delivery of a service within the local environment.

A key factor in the initial success of the centre was the fact that the headmaster realised that the centre needed specific resources to be able to deliver a service. He therefore made use of a third party to assist with the training of teachers, who were in turn to train the community members and TSA students, using existing TSA-accredited training programmes.

The headmaster was also aware of the need for marketing to ensure a steady stream of clients and thus ensure a source of income.

5.4.1.3 Adjustment

The key to the initial success of ICT3 was the fact that the headmaster adopted a business-oriented approach within the context of the local constraints.

The greatest setback to ICT3 was the resignation of the school headmaster. This slowed down ICT3's momentum. Based on the original planning and groundwork that had been spearheaded by the headmaster, ICT3 managed to limp along, although it was clear that it was not showing any signs of growth and there was a steady decline in the number of clients. The high costs of the course offered by ICT3 also impacted on potential clients. The replacement for the headmaster appeared to lack the profile needed to drive ICT3.

5.4.1.4 Sustainability

ICT3 showed the potential in the early stages to grow and generate income. ICT3 never realised this potential.

5.4.2 Factors for success and failure

The following factors influenced the centre's sustainability.

Factors for success:

- o   The physical location of ICT3 (a school) was secure, had access to electricity and was accessible
- o   A significant contribution was made by the headmaster in terms of
    - o   leadership
    - o   vision
    - o   an appreciation of the need to run ITC3 on business principles
- o   A partnership was formed with TSA
- o   ICT3's trainers were trained and evaluated
- o   There was an understanding of the community's needs

Factors for failure:

- o   The centre was poorly managed after the departure of the headmaster
- o   Non-competitive prices were set for some services
- o   Marketing and the search for potential clients were discontinued

5.4.3 Conclusion

It is clear that the centre's initial success was due solely to the manner in which the headmaster managed ICT3. The contributing factors that had the greatest impact on ICT3 are:

- o The headmaster was part of the local leadership, understood the environment and had an appreciation for the community's needs. Therefore, the ICT centre had ownership and buy-in at an influential level
- o The business-oriented approach identified the importance of partnerships and making use of a product (IT course designed by TSA) that would address part of the community's needs
- o The headmaster insisted that the centre staff be qualified and had the centre staff assessed, thereby ensuring a recognised standard
- o The school that housed ICT3 was part of an existing infrastructure in the village, which meant that ICT3 was accessible and that access to communication and shops was not an issue for potential ICT3 clients

ICT3 showed the potential to grow and to become sustainable. The impact of the resignation of the headmaster meant that the necessary skills and drive needed for ICT3's continued growth had left with him. ICT3 cannot be considered viable or sustainable.

5.5 ICT4

5.5.1 Analysis of data

5.5.1.1 Conceptualisation

ICT4's initial location was to be in a remote part of South Africa, close to the Mozambique border. As the decision to relocate the site for ICT4 was made after the conceptualisation phase, the discussion will focus on the conceptualisation of ICT4 and therefore on the initial site.

The role players at the original site proposed for ICT4 were identified and comprised the local leadership. There was good communication between the TSA management and local leadership which also resulted in community expectations of the potential benefits of ICT4. According to the local TSA representative, there was buy-in from the community and local ownership of the project.

No community needs assessment was carried out for ICT4. TSA management communicated with the local tribal leadership and informed them of the benefits of an ICT centre.

5.5.1.2 Implementation

The result of the sudden relocation of ICT4 left doubt in the minds of both the tribal leadership and the community members who were aware of the deployment of the centre. A lack of trust was perhaps the greatest issue which would surely manifest itself should TSA or any other party attempt to establish an ICT centre in the area again.

The research revealed that the new site for ICT4 had hardly been used. As the centre was relocated at the last possible moment, no needs assessment or feasibility study was carried out. There could be no justification for the deployment of ICT4 in the town, especially as there were other providers of ICT services in the town close to the relocated ICT centre.

5.5.1.3 Adjustment

The site visits to the new location of ICT4 revealed no activity. The site could therefore not be evaluated and adjusted according to the research instrument. The reason given for the inactivity of ICT4 was that the hardware was not stable and, as a result, the local regional director was not prepared to use the technology.

The local regional director was aware of the competition in the proximity of ICT4 and gave no indication of how it would be possible to generate income from ICT4. The local regional director's argument was based on the lack of a business plan, unstable technology, a lack of personnel to assist with the running of the centre and the competition from the existing suppliers of ICT services in the town. It appeared that there was no desire from the local regional director to carry on with the implementation of ICT4.

Competition was an issue for TSA for the first time in the implementation of ICT centres. The new location had shown no evidence of planning for the relocation of ICT4 and appeared to be a last-minute attempt by TSA to make use of the technology as it had paid for.

5.5.1.4 Sustainability

ICT4 showed no signs of usage and therefore cannot be considered as potentially sustainable.

5.5.2 Factors for success and failure

The following factors influenced the centre's sustainability.

Factors for success:

> The initial location for ICT4 had potential for the following reasons:

> - o   There was an effort to identify the local authorities
> - o   There was buy-in from the local community and its leadership
> - o   The local authorities were made aware of the potential and benefits of an ICT centre
> - o   The centre was to be located in an exciting community centre

Factors for failure:

- o   No needs assessment was carried out
- o   ICT4 was suddenly relocated
- o   There was no ownership of the relocated centre

5.5.3 Conclusion

The ICT4 conceptualisation phase highlighted a number of significant issues, which are listed below.

- o   A landscape audit was not carried out, which would have reported that the community was in a deep rural area that did not have access to a solid infrastructure in terms of transportation, electricity, housing or running water, and this proved inadequate for ICT4
- o   The initial motivation for ICT4 was based on the assumption that the number of schools and potential school-leavers would constitute a steady flow of users who would pay for the services. A proper needs assessment would have revealed that this was not the case. A community profile could have indicated what was needed and how best to approach the implementation of a centre in the community
- o   A certain amount of trust had been built between TSA and the community leaders, which lead to expectations, on the part of the community, of the potential benefits of ICT4. The impact of relocating ICT4 before the centre went live was significant. The community as a whole felt betrayed and was not likely to participate so readily in the future, should another ICT centre be attempted by TSA or any other organisation wanting to implement an ICT solution

ICT4 must be considered as a total failure.

5.6   ICT5

5.6.1   Analysis of data

5.6.1.1 Conceptualisation

The approach used was typical of organisations that use the 'box drop' approach. The 'box drop' implies that a basic IT infrastructure would be installed and the recipient would be left alone to make use of the IT equipment and software without further assistance from the donor. There was no attempt to determine community needs. There was also no business plan, financial forecast, or landscape audit to determine services and risks. Role players to assist in the implementation of the centre were identified through the local university.

5.6.1.2 Implementation

The issues that proved to be challenges to the implementation of ICT5 are outlined below.

- o   TSA chose non-standard software to be used in the centre and support was not available in the country for that software
- o   There was an absence of service providers for IT support in general, as well as no providers of access to the Internet and other services
- o   Legislation governing connectivity to networks for all types of communication was strictly the domain of the national communications supplier, and applications made to this governing body for connectivity to ICT5 would take an unreasonable length of time
- o   TSA lacked exposure to the local culture and an understanding of the community as a whole and, therefore, the approach used to communicate with the role players was not suitable
- o   There was no evidence that a landscape audit was carried out

5.6.1.3 Adjustment

Attempts were made to get an Internet connection through the university but were unsuccessful. Attempts were also made to make use of the partnership agreement with the local TSA office. This partnership, however, had no effect on the centre because it was located in another country, which made communication and site visits costly and time consuming.

5.6.1.4 Sustainability

ICT5 at no time showed any evidence of effectiveness or sustainability. This was aggravated by the fact that the centre was located in another country, where the legislation and culture were different to that of other areas in South Africa that TSA had been exposed to when implementing the other ICT centres.

5.6.2 Factors for success and failure

The following factors influenced the centre's sustainability.

Factors for success:

- o Locating the centre at the local University guaranteed a secure environment for ICT5
- o The location of ICT5 meant there was the potential to form partnerships with the university and to take advantage of the student population of the university

Factors for failure:

- o No landscape audit was carried out that would have identified the unique environmental factors which impacted on ICT5's ability to become viable
- o There was no understanding of the unique conditions within the country
- o No business plan was drawn up
- o Non-standard software was deployed in the centre
- o No community ownership of ICT5 was evident
- o There was no community involvement in or buy-in of ICT5

5.6.3 Conclusion

ICT5 perhaps illustrates the worst-case scenario of ICT centre deployment in a developing community. There was a lack of understanding and appreciation on the part of the initiators of ICT5, especially of local conditions and culture. There were no business plans or a framework that could be used by the recipients of ICT5 to assist with the managing of ICT5.

ICT5 showed no potential to grow or to become sustainable.

5.7   ICT6

5.7.1 Analysis of data

5.7.1.1 Conceptualisation

There appeared to be a number of similarities between ICT6 and ICT5 in the approach that was used for the implementation of these centres. Although TSA was not involved in the project until two years after the implementation of ICT6, it was revealed that ICT6 was a result of another 'box drop'.

5.7.1.2 Implementation

There was no indication that a needs analysis had been carried out. No partnerships were formed or had been considered. It would appear that the donors only considered the location in terms of security and access to the community. The recipients of ICT6 had received no guidance, business plan, or project plan to assist with the running of ICT6.

5.7.1.3 Adjustment

The school's management was aware of the possibility of using ICT6 to generate income and to contribute to the economic growth of the community. Suggestions had been made that the school build partnerships with the local community centre and TSA, but these had fallen through. This situation was aggravated by the continual replacement of the headmaster, who appeared to be the only individual able to drive the centre. The staff were not properly trained or skilled, rendering the centre even less effective. No attempt was made to address this situation.

5.7.1.4 Sustainability

It would appear that ICT6 had the potential to become effective and sustainable due to its location, as it was close to main transport routes and within walking distance from the community centre. The school employed staff who could be trained and who showed enthusiasm for the centre. The centre, however, did not show usage and subsequently had no chance of sustainability.

5.7.2 Factors for success and failure

The following factors had an impact on the centre's sustainability.

Factors for success:

- o The physical location of ICT6 within the school meant that it was secure and had access to electricity
- o The learners from the school and the community had easy access to ICT6
- o Some members of the school management was aware of the importance of using ICT6 to generate income and of making use of partners to assist with the running of ICT6

Factors for failure:

- o School management was replaced on a regular basis
- o There was a lack of drive and direction for ICT6
- o Non-skilled staff were managing ICT6
- o Outdated technology was deployed at ITC6
- o There was no third party support for the technology
- o There was a lack of funding to run the school

5.7.3 Conclusion

The organisation that made the donation indicated to the school that the donation was part of its social responsibility and that no further assistance would be forthcoming. The initial audit revealed that the donated IT infrastructure had already been outdated at the time of the donation and one could conclude that the organisation was more concerned with its image and perceived goodwill towards the community than with the recipient benefiting from the donation.

ICT6's situation was aggravated by an ever-changing school management, a lack of technical skills among the staff, a lack of ownership of ICT6 and the absence of partnerships.

ICT6 had the potential to become known and used within the school and the community. The location of ICT6 was ideal in terms of the proximity to a well-established community centre and transport routes and because it was housed in a secure location.

ICT6 was never used to assist the community and never showed any significant usage and, therefore, cannot be considered sustainable.

5.8 Overall conclusions for all six ICT centres studied

Five out of the six attempts to effectively deploy ICT centres proved not to live up to the expectations of the initiators of those centres. The only centre that did show signs of

becoming sustainable was still unable to operate completely independently and had to rely on some support from TSA.

The following is a summary of factors that contributed to the success and failure six ICT centres and thus their potential for sustainability.

5.8.1 Factors for success

- o Two centres, ICT2 and ICT3, formed partnerships with third parties that could assist with running the centres, training of centre staff and addressing the needs of the third party through the use of the centres
- o A sound infrastructure, in terms of the physical location of the centre, that ensured security, a reliable supply of power and access to telephones for support, was a necessity
- o In the case of ICT3, the community leadership owned the centre
- o In the case of ICT3, an informal needs analysis was carried out by the headmaster
- o Service provision was aligned with the needs of the community through partnerships in terms of support, as in the case of ICT2
- o There was a realistic business approach based on the realities that faced the centres as in the case of ICT2 and ICT3
- o Centre staff were trained, in the cases of ICT2 and ICT3
- o ICT1 and ICT2 became part of an existing community centre

5.8.2 Factors for failure

- o No community needs analysis was undertaken for any of the ICT centres. The community needs were assumed by the initiator and therefore it would have been highly improbable that alignment of services provided by the ICT centres with community needs could have taken place
- o A landscape audit was never carried out in order to ascertain what the status was in terms of electricity supply, access to telephone lines, cultures, local legislation, or other issues which could impact on the success of an ICT centre implementation
- o Those who implemented the ICT centres did not involve community authorities to get ownership from the community and its influential members
- o No business plans were in place to assist with the managing of the centres, including proper financial forecasts based on community needs. There was also no guidance for those left to do the day-to-day managing of the ICT centres
- o No partnerships with service providers or local government were formed, which could have assisted with ensuring that the centres were utilised

5.9   Conclusion

This chapter examined and interpreted the data collected from each ICT centre. The data related to each ICT centre was analysed and factors influencing each centre's success or failure were identified. These factors were grouped together as factors for success and for failure. The factors mentioned had the greatest influence on each centre's ability to become sustainable.

The chapter concluded with a final summary of the significant factors that impacted on the sustainability of all the centres.

The following chapter will attempt to address the research question based on the findings.

CHAPTER SIX

SUMMARY and CONCLUSIONS

6.1   Introduction

This chapter will attempt to address the research question and the aims of the research. The chapter will also pose questions as to why many attempts at deploying ICT centres in Southern Africa have met with failure and why the expectations for ICT centres have not been realised.

6.2   Addressing the research question and research sub-aims

The extent to which the research question and sub-aims of the research have been addressed will now be discussed. The conclusion reached will be used to suggest an approach (which will be outlined in Chapter Seven) that can be used for the implementation of ICT centres, specifically in developing areas in Southern Africa.

6.2.1 Sub-aim one

Sub-aim one of the study was to establish how each ICT centre was implemented and to identify what criteria were used for the deployment of each centre

Chapter Four describes in detail how each centre was implemented including the criteria used for the establishment of each centre. Below is a summary of the most significant criteria used for the implementation of each ICT centre.

- o   The donors' requirements should be satisfied. These requirements were
  - o   that an ICT centre must be deployed in a rural area
  - o   that there must be no other ICT centre in the area
  - o   that the centre had to be housed or be part of an existing infrastructure, as was
  - o   the case for ICT1, ICT3, ICT5, ICT6
- o   The regions identified for the implementation of the six ICT centres are considered developing areas
- o   All ICT centres had to be self-sufficient once the centre was implemented or, in certain instances, once the seeding money or part of the donation had been used up

There was no indication that for any of the six ICT centres that a community needs analysis or a detailed landscape audit was carried out. It is highly unlikely that an ICT centre will be successful in a rural area unless the deployment of the centre is aimed at addressing specific

community needs that have been identified by the initiators of the centres which was confirmed by the findings of this study.

No proper business plans were evident and in the cases where a financial forecast was used to motivate the implementation of centres, it was based on assumptions.

ICT3 and ICT6 are examples of organisations adopting a 'box drop' approach in order to satisfy their social responsibilities. In both these cases, the intention was that the schools would be able to make use of the donations and that the surrounding communities and schools would benefit accordingly.

ICT1, ICT2, ICT4 and ICT5 were implemented by the same individual over a number of years. The question that must be asked is why the individual had not altered the implementation model especially as three of the four centres were failures and the third was successful only because of a partnership with TSA and Vista University. Peled (2001) maintains that the continued transfer of IT to developing communities by organisations and individuals through ICT centres that showed very little evidence of success, could be as a result of hidden agendas on the part of the individuals involved. This observation is also supported by work done by (Clark, 2002; Myers and Young, 1997; Berg, 1993).
It should have been apparent to those who were responsible for the implementation of the four ICT centres noted above, that there was a need for reevaluating the implementation strategy, especially as the implementation of the centres took place over a number of years and that there was sufficient evidence to suggest that these centres were failing to live up to expectations. Much criticism has been leveled at donors responsible for the financial contribution to ICT centre projects as well as those consultants appointed by the donors. The arguments centres mainly around the question of how the donor and consultant will benefit as there is no ownership or any long term interest for the donor or consultant (Schoen. 2002; Pahad, 1998; Heeks, 2002; Colle & Raul, 1999; Berg, 1993).

6.2.2   Sub-aim two

Sub-aim two was to determine how effective the ICT centres are perceived to be and to evaluate the level of success or failure of these projects.

The standards used in this study to determine the effectiveness of each centre over time were derived from usage and income generation which is considered by many as an acceptable measure (Benjamin, 2003). Benjamin (2003) also refers to the ability to pay salaries to ICT centre staff and the perceived effectiveness of the centre by the community and centre staff as additional features by which to assess the effectiveness of the ICT centre.

Sustainability in the context of this study was seen as essential in the medium to long-term and that the ICT centre should be able to continue operating without major intervention from third parties (Troubdridge, 2003;Hulbert, 2002; West, 2002).

Indicators of success or failure, as applied to the six ICT centres, are described here. ICT4, ICT5 and ICT6 never showed any signs of usage or income generation. Although these three ICT centres had the potential to offer services, they must be considered failures, according to this standard.

ICT1 and ICT3 both showed signs of usage. ICT1 also showed the ability to generate a little income. Both these centres, after what could have been described as a promising beginning, did not continue to show growth.

ICT2 had a modest beginning in terms of usage and did not generate much income. However, ICT2 then increased its usage and the income generated increased accordingly. Although not sustainable on its own, ICT2 can be considered effective because it continued to show growth (see Table 6.1 in the appendix, page viii).

Criteria such as quality of service could only be measured at ICT2 because of the stability of the centre. The quality of service rendered by ICT2 was a function of the standard of the courses offered and the perceived capabilities of the centre staff and the centre itself. Interviews with some of the ICT2 centre users revealed that quality was not an issue, although the costs of some of the courses was identified as a concern.

6.2.3 Sub-aim three

Sub-aim three was to identify the factors that contribute to the success or failure of the identified projects.

This is possibly the most critical issue for the formulation of an approach for the implementation of ICT centres. With the exception of ICT2, all the other ICT centres were failures. Had TSA not assisted ICT2, in all likelihood it would also have failed.

The factors common to the failed ICT centres are the following.

- o   No community needs analysis was undertaken and so the centre did not know if the services it was to render would be appropriate
- o   No landscape audit was carried out in order to identify obstacles such as legislation constraints, cultural factors and infrastructure shortcomings, all of which would impact on how the ICT centres should have been implemented
- o   There was never any community involvement

- There was no request from any community for an ICT centre and consequently no buy-in from or ownership by the community of the centres
- Little emphasis was placed on training the centre staff, resulting in the inability of the centre to render an acceptable service
- The centre staff did not display any business acumen, with the exception of those at ICT2 and ICT3
- No business plan was evident.
- In most cases, no beneficial partnerships were formed

6.2.3.1 Needs analysis and landscape audit

The landscape audit should ideally be carried out once the needs analysis has been completed. When the needs of the community are understood, then only should the obstacles, challenges and profile of the community be identified and analysed in order to be used as input for a framework for the design of an ICT centre.

The importance of a needs analysis before an ICT centre is implemented and the need to focus on people as opposed to IT for technology transfer is supported by many (Grossberg *et al,* 2001; Acacia II Prospectus, 2001; Schoen, 2002; Sharhan, 2000; Ouma-Ongango, 1997; Venkatesh *et al,* 2003). Much has been documented regarding the importance of understanding the local conditions with respect to infrastructure, legal requirements, access to communication and the Internet when deploying ICT centres in developing areas. It is also clear from literature that conditions in seemingly similar environments can differ significantly form each other and that each project aimed at setting up ICT centres should considered as unique. This means that the project team responsible for the deployment of the centres must be fully aware of the prevailing conditions and adapt their respective approaches to ICT implementation accordingly. Not only is a thorough understanding the local condition crtical for effective ICT centre deployment but possibly more importantly is the identification and understanding of community needs that should be addressed by the ICT centre. There is overwhelming evidence throughout the developing world that the rendering of appropriate services is key to the centres long term viability and sustainability. (Sabien, 2002; Fuchs, 2000; Thamizoli & Balasubramanian, 2001; Conradie, 1998b; Pahad, 1998; Nulens & Van Audenhove, 1999; Kirkman, 1999; Benjamin, 2000;).

The findings of this study showed no intention by those responsible for the centre implementation to address either the unique local conditions or the identification of community needs. The only exception was in the case of ICT2 where the centre management acknowledged the need for being sensitive to local conditions and community and this showed in the partial success of this centre.

It is evident that when planning the implementation of ICT centres, a significant amount of consideration must be given to a needs analysis of the community and their involvement, failing which, ICT centres seem likely to fail.

The research highlighted that services provided by ICT centres must be aligned with the needs of the community, especially if they are to be paid for. Although it is generally accepted that IT enables economic growth and development, IT must also be seen in terms of other priorities and, more importantly, must be linked to opportunities. TSA had assumed that services provided by the centres would be used by the community. It seems as if the question that arises is 'why should services be paid for if there is no need for them?'

ICT1 through to ICT6 all showed that there was no evidence of a proper needs analysis being conducted. It appeared that communities were being given a solution to a problem of which they were never aware. The fact that developed countries are guilty of selling solutions to problems that marginalised communities did not perceive as problems in the first place, is one of the major reasons for the low incidence of successful ICT centres (Schoen. 2002; Pahad, 1998; Heeks, 2002; Colle & Raul, 1999).

6.2.3.2 Local ownership and the formation of partnerships

The community's ownership of and involvement in ICT projects are key to their success. Communities that are given an ICT centre may feel that the centre will be managed for them and may show no intention of involvement (Conradie *et al,* 2003). Therefore, a centre must be driven by the local community (Khumalo, 1998). The danger of the 'box drop' approach is has shown clearly there is no real ownership by the community, which manifests itself in the failure of the centre. Communities should be able to decide for themselves, with guidance, what they need.

There were no initial partnerships put in place to assist with the implementation of each ICT centre.

ICT centre partnership with existing organisations or bodies in developing areas is considered essential in order for ICT centres to become sustainable in the medium to long term (World Summit, 2003). Partnerships which address skills transfer in the initial stages of an ICT centre are key and this was evident with ICT3 (Whelan, 2002).

The importance of identifying and forming strong partnerships when dealing with advancement projects in developing countries was highlighted in the final report of the outcomes of the World Summit on Sustainable Development, hosted in Johannesburg in 2002 (Whelan, 2002; Kyle, 2002; Hutchison, 2001; Fuchs, 2000; Sabien, 2000; Short, 2000).

There is strong evidence to suggest that ICT centres can only survive through partnerships and being part of the community (Kyle, 2002; Hutchison, 2001; Fuchs, 2000; Sabien, 2000; Short, 2000). Although the study revealed no indication of partnerships in the early stages of all six ICT centres, the three centres that attempted to form partnerships showed an improvement in service delivery. Again the only two centres that were still operating were those that had indeed continued to be part of a partnership.

6.2.4   Sub-aim four

Sub-aim four was to implement suggested changes in order to address the problems of ineffectiveness of ICT centres.

ICT2, ICT3 and ICT6 were the only centres that reacted to suggestions made by the researcher. In the case of ICT3, the headmaster implemented suggestions which resulted in a positive start and set the centre up for growth. ICT2 showed significant changes, while the attempts of ICT6 were thwarted by an absence of leadership and funding. Although TSA was aware of problems, it did not react and move to resolve these issues. Some of the centres could have been rectified and become effective. For example in the case of ICT1, fixing the unreliable supply of electricity could have stabilised the centre and enabled it to offer a continual service. Such interventions are stressed by Burgelman (1992), who maintains that the project manager, or the body responsible for IT implementation, must proactively address problems as soon as possible after they are identified (Lillie, 2004).

6.2.5   Sub-aim five

Sub-aim five was to monitor and review those ICT centres that have made changes for effectiveness.

The research instrument measured those centres which reacted to the suggestions made by the researcher and, in the case of ICT3, where the headmaster initiated changes.

ICT2 and ICT3 showed the greatest number of the suggested changes implemented, while ICT1 and ICT6 showed minor changes.

6.2.6   Sub-aim six

Sub-aim six was to draw up a conclusion that will indicate whether ICT centres can be sustainable in Southern Africa.

ICT2 showed the strongest indications that an ICT centre could become sustainable.

Using criteria such as usage and income generation to measure success, it was proven that an ICT centre can become sustainable. An ICT centre could be part of a community centre or have strong alliances with a third party. In these cases, the ICT centre must be able to show sustained usage and income generation. The centre could then be considered partially sustainable.

An example of an ICT centre that was considered sustainable more recently, is the Universal Service Agency centre (USA) that opened its doors in Gaseleka in the Northern Province of South Africa. This centre was able to address the community needs which were determined before the implementation of the centre and which resulted in services that the community wanted to use and were prepared to pay for. The centre was profitable to the extent that it was able to cover all expenses (Latchem & Walker, 2001).

6.3   Conclusion

This chapter attempted to determine how the research question and its sub-aims were addressed through the research. The chapter identified criteria that were considered by the researcher to be most significant in determining the success or failure of ICT centres.

In conclusion, the most important contributing factors identified that may lead to the realisation of the potential of an ICT centre in a developing area are the following:

- o A comprehensive identification of the community needs that will be serviced by the ICT centre (Conradie *et al,* 2003; Heeks, 2002; *Gáspár, 2002*)
- o An understanding and knowledge of the environment in order to identify potential obstacles that may appear when implementing and running the centre (Etta, 2004; Schoen, 2002; Vaihia, 2002; Zelkowitz *et al,* 1998)
- o Buy-in and ownership from all stakeholders within the community (Jellema & Westerveld, 2003; Sabien, 2002; Short, 2000; Grossberg et. al., 2001)
- o Partnering with local organisations in order that the ICT can benefit from additional and already established resources so as to maintain the centre (Mphahlele & Maepa, 2003; Clark, 2002; Whelan, 2002)
- o IT and managerial skills as a prerequisite for the centre staff to enable them to manage the ICT centre effectively (Rowan, 2000)

The following chapter will suggest an approach that could be used to implement sustainable ICT centres in Southern Africa.

CHAPTER SEVEN

RECOMMENDATIONS

7.1 Introduction

This chapter will address the final aim of the research, which is to create an informative instrument that could be used to assist in the establishment of sustainable ICT centres in developing areas in Southern Africa. The findings of this research as well as the model that will be proposed are developed from the basis of the research and views of the theory presented in Chapter Two.

7.2 The recommended model

Based on the literature review and the findings of the research, it was decided to take Heeks Information-Centred Approach as a departure point order to propose a model for sustainable ICT centre implementation in rural Southern African (Heeks, 2002). Although no empirical evidence could be found to indicate that the Heeks Information-Centred Approach has been applied successfully, the Heeks Information-Centred Approach is based on a dialogical/participatory approach that recognizes the role of the community in the implementation of ICT centres. The Heeks Information-Centred Approach also addresses most of the problems regarding ICT centre implementation as highlighted in this study and provides a framework that can be meaningfully adapted to develop an approach for ICT centre deployment in developing areas in Southern Africa.

The purpose for the deployment of an ICT centre is to enable users of the centre to gain access to relevant information, access to communication and, in some instances, access to IT training and IT services. Heeks maintains that information is at the core of any attempt to deploy ICT centres in developing communities (Allen & Thomas, 2000).

The factors that were identified as contributors to effective ICT centre deployment are largely supported by Heeks as critical in ICT centre deployment. The factors, as presented in the research findings and supported by the Heeks Approach, are listed below (Heeks, 2002a).

- o An awareness of the notion that many people and donors consider ICT centres as the means to permit leapfrogging to the information economy resulted in ICT 'hype'
- o Money appears to have been the incentive for many consultants, vendors and academics to be part of ICT centre implementation
- o The plethora of writing on ICT centre implementation has not factored development realities into the process of ICT centre implementation

- o   ICT centres can only be understood together with the role of information within development
- o   Information must be considered before technology in ICT centre deployment
- o   The strong influence of specific local socio-cultural factors which can impact on the deployment of ICT centres
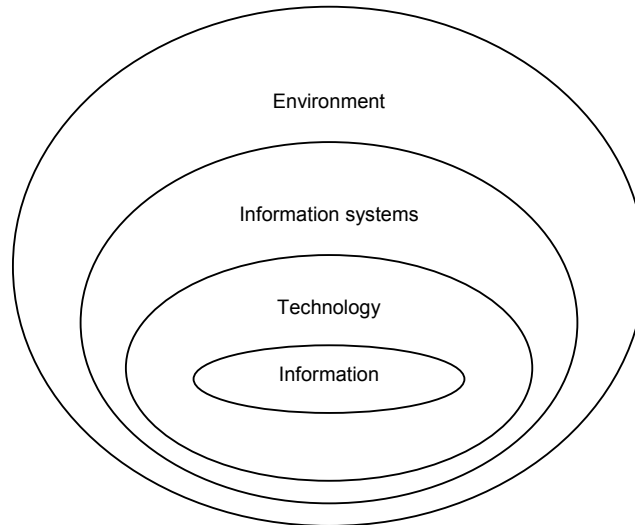
FIGURE 7-1 The Heeks Model

The Heeks approach is based on the community's needs for information and consists of four elements. In the centre of the model is information, which Heeks maintains is the driving force when attempting to transfer technology to developing countries. Heeks (Allen & Thomas, 2000) stresses the importance of information in decision making and the role of information in knowledge and knowledge transfer.

The second element is the appropriate technology required to give access to the information and includes ICT centres, networks, software, hardware, etc.

Information systems, the third element in the Heeks Model refers to the manner in which the information is made available through people and processes. In other words it is the bringing together of technology, people and community needs in the building of a solution to address the community needs.

The environment is the final element and refers to markets, socio-cultural, political, economic and technical aspects which influence the way in which the model will be applied (Heeks, 2000).

Challenges identified in the literature review with respect to technology transfer to developing economies have to some extent been identified by the Heeks model. Through the Heeks model, factors that should be considered as crucial for successful technology transfer are included. These factors include assessing environmental factors, (referred to in chapter 2, page 24), organizational factors (referred to in chapter 2, page 29).

Although the Heeks model stresses the importance of information and sees information as the centre of the suggested approach for ICT centre deployment, it places no emphasis on community involvement in ICT centre deployment. Yet, the findings of this study in all instances indicated that because the community was neither involved in the needs assessment nor at a later stage of the centre's life, there was a corresponding lack of ownership. The study indicated that ICT4 and ICT6 were examples where the lack of community involvement in the needs assessment was a major contributing factor to the failure of the two ICT centres.

The study has also shown that a thorough understanding of environmental and socio-cultural issues is also necessary for the planning of an ICT centre. For example, in the case of ICT5, ICT4 and ICT1, a lack of knowledge of the physical location as well as the community leadership played a significant role in the failure of these centres to become effective. Although the Heeks approach recognises the importance of socio-cultural factors, it does not consider these factors by determining community needs.

The researcher made the decision to adapt the Heeks Approach in order to suggest an approach for ICT implementation in Southern Africa. This recommended model intends to place community involvement as the driver for the initial phase of the needs assessment. It is also the intention of the recommended model to identify those factors that could influence the identification and understanding of community needs. In other words, the identification of environmental and other factors in the initial phase must be used to structure the solution for information and ICT service delivery.

The following diagram is a graphical representation of the recommended model adapted from the Heek's model.
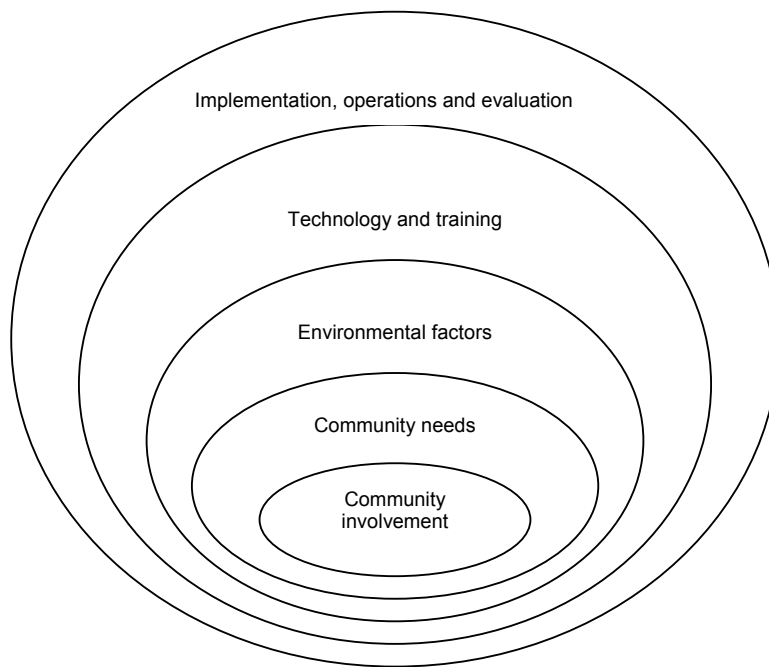
FIGURE 7-2 Recommended model adapted from the Heek's Model

The adapted model, based on Heeks, suggests an approach that could be used for the implementation of an ICT centre. This approach extends from the conceptualisation of an ICT centre through to the evaluation of the ICT centre in an attempt to assist with maintenance of the centre. The following section describes each stage of the model in more detail.

7.2.1 Community involvement

The placement of community involvement at the centre of the recommended model shows how necessary it for successful ICT centre implementation. The literature review, as well as the results of the research, have indicated that the community has to play a critical role in the determination of the community's needs (Freire, 2004; Conradie, 1998a; Heeks, 2002a; Malan, 1999; Snyman & Snyman, 2002). The community, in the initial stages of the planning and conceptualisation of the ICT centre, must take ownership of the centre and understand how it will address the community's needs (Snyman, 2002; Conradie, 1998a). In other words, the potential of the ICT centre must be communicated to and accepted by the community (Brown, 2001).

Identification of influential people in the region who can assist in the conceptualisation of the centre is the first step to achieving community involvement. The research findings showed that the exclusion of influential people and stakeholders can result in the failure of an ICT centre.
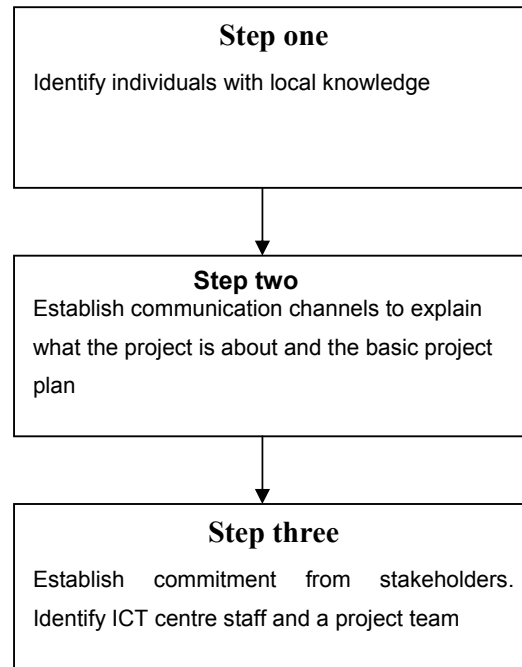
In the case of ICT3, the headmaster's involvement contributed largely to the initial success of the centre. The headmaster was an influential member of the community and was able to get community involvement. ICT4 showed huge potential because the community was involved in the planning stages. ICT5 and ICT6 were examples of centres where the community was not involved in the initial stages and neither of these two ICT centres showed any indication of being able to operate effectively. In all other cases, where there were no stakeholders included in the conceptualisation phase, the centres struggled from the beginning to establish themselves.

The process of ensuring community involvement consists of three steps.

- o **Step one** is the actual identification of people that would be considered local leadership in the region and other individuals who will add value to the conceptualisation phase by sharing local knowledge. These individuals could, for example, point out pertinent issues relating to the culture and customs of the community which may have an impact on the implementation of an ICT centre

- o **Step two** focuses on the setting up of reliable communication channels between the initiators of the centre and the stakeholders. The purpose of reliable communication channels is to ensure a regular and open transfer of ideas and to ensure that the ICT centre project progresses smoothly

- o **Step three** focuses on acceptance of the ICT centre project through discussions with the community. It is at this stage that the potential benefits of the ICT centre are made known to the community. Once commitment to the project is in place, the intention would be to identify the ICT centre staff and put a project team together consisting of the community centre leadership, ICT centre staff and the project initiator

The following figure is a graphical representation of the process used to ensure the community's involvement.

```
┌─────────────────────────────────────────┐
│              Step one                    │
│                                          │
│  Identify individuals with local knowledge│
│                                          │
│                                          │
└─────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────┐
│              Step two                    │
│  Establish communication channels to explain│
│  what the project is about and the basic project│
│  plan                                    │
└─────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────┐
│             Step three                   │
│  Establish  commitment  from  stakeholders.│
│  Identify ICT centre staff and a project team│
│                                          │
└─────────────────────────────────────────┘
```

FIGURE 7-3 Process of ensuring community involvement

If it is not possible to reach the third step, it is unwise to continue with the project. Instead, alternative regions should be identified that would benefit from an ICT centre.

The success of this stage of the model can be measured by the levels of commitment of the local stakeholders, the community's understanding of the outcomes and potential benefit of the centre, and an appreciation by the local community and leadership of the work involved. In order to identify those factors which could indicate a lack of commitment from the community, the following signs should be looked for:

o   The community does not react to requests from the project team
o   The community does not attend regular project meetings
o   The community is hostile towards the project and shows a lack of enthusiasm
o   The community shows signs of SAD syndrome

7.2.2 Community needs

As the community needs analysis is crucial to the conceptualisation of an ICT centre, a great deal of time should be set aside to do a proper needs analysis. The success of the centre depends on its accuracy (Benjamin, 2003).

It is important that the findings of the needs analysis are agreed upon by the ICT centre task project team and the community, and that the value and benefits of the ICT centre are communicated to the community. It is critical that the needs analysis is done by the project team together with members of the community.

The research findings have shown that because no needs analysis was undertaken in any of the six centres, there was no reliable way to ascertain how effective the centre's services were. A centre's lack of usage is usually the result of its inability to provide a needed service and cause the centre' to struggle to become viable and sustainable (Annan, 2000; Van Audenhove, 1999). In other words, first identify the needs and then use ICT to help with addressing the needs.

The process of needs analysis can be split up into two steps.

o The **first step** deals with the selection of the task team that will carry out the needs analysis. The ICT project team does not necessarily have to do the actual needs analysis, although the community must represented on the team selected to carry out the needs analysis

o The task team could make use of guidelines to assist with identifying needs. These guidelines may suggest the following elements and the team must give reasons for the need if it is identified:

o The need for access to telephones
o The need for access to the Internet
o The need for access to e-mail
o The need for access to library services
o The need for access to IT training (specify what kind of training)
o The need for access to printing and photocopying services

o The guidelines should also record the frequency of each service need (refer to Table 7.2 in the appendix, page ix).

o The task team is encouraged to make use of open discussions and open-ended interviews with the community in order to allow the people to voice needs that the project team may not have identified.

o The **second step** in the needs analysis ratifies the findings of the needs analysis with the community leadership.

The following figure is a graphical representation of the process used to do a needs analysis.
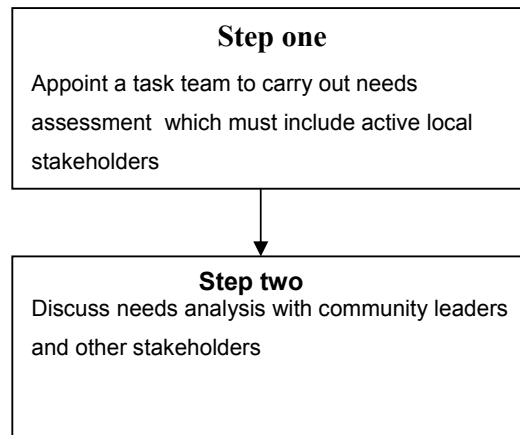
FIGURE 7-4 Process of identifying community needs

After the community needs are understood and agreed upon by the community and those responsible for implementing the ICT centre, the information required to address those needs is then defined (Benjamin, 2003). It is important for the task team to ensure that the community understands the role an ICT centre plays in information within development (Heeks, 2002).

The research findings determined that ICT2 and ICT3 were able to identify and understand the community information needs after the implementation of the two respective centres. ICT2, the most successful of the six ICT centres, was able to deliver a service which was needed by the community. This was achieved after the centre's management had specifically focused on the community's needs, even though the centre had been in operation for some time. ICT3 was also able to identify and understand what was required by the community in a similar manner to ICT2 and showed indications of success in the initial stages.

7.2.3 Environmental factors

Environmental factors that could impact on the project plan for the ICT centre implementation have to be identified. This should take place once the community needs analysis has been completed and agreed upon.

Environmental factors are identified in order to establish what obstacles, challenges and areas of assistance are present for the implementation of an ICT centre **(**Mphahlele & Maepa, 2003). Although much has been written about the importance of factors such as culture, legislation, and physical issues relating to the deployment of technology in developing areas (Sassen, 2002; Wjinbeek 2000; Bidoli, 2003; Jensen, 2002; Mancome, 2002; Melody, 2003), there is very little evidence in the literature to suggest how this should be achieved.

The research findings indicate that a landscape audit should be carried out to identify the environmental factors which will impact upon the implementation of an ICT centre. A landscape audit is a process used to identify those factors that could impact on the operations and effectiveness of an ICT centre. Typically, a landscape audit would examine the physical location intended for the deployment of the centre regarding the support structures, infrastructure, legislation, and cultural issues in which the centre would operate (refer to Table 7.3 in the appendix, page ix).

The research identified a need for a complete landscape audit in all cases studies. ICT1, for example, showed that the poor supply of power resulted in the centre's inability to render a reliable service, which also impacted on the third party's lack of willingness to honour the service level agreements for the hardware. ICT3, ICT5 and ICT6 did not have access to third party support and ICT5 was not able to connect to the internet. ICT4, ICT5 and ICT6 were not able to make use of partners. The ability of ICT1, ICT2 and ICT3 to form partnerships proved to be a major contributing factor in the partial success of these centres.
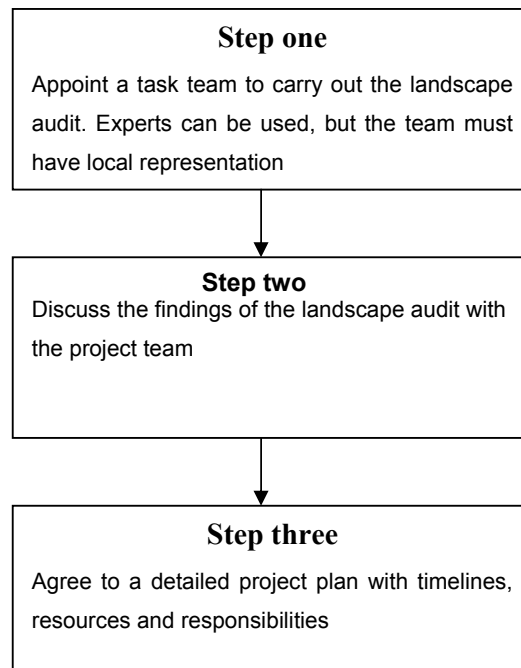ICT5 was unable to address the Internet connectivity problem due to legislation constraints which were never identified prior to the implementation of the centre.

The landscape audit comprises three steps.

- o **Step one** is the identification of the team to carry out the landscape audit. Third parties can be used as this can be a faster way to complete the process. However, the team that will carry out the landscape audit must be aware of the community's needs. The most critical points to investigate during the audit are the following:

    - o The community profile, which gives an indication of the distribution of age, qualification and income

- o   The infrastructure supporting the region in the proximity of the proposed location for the ICT centre in terms of access to the centre, power supply to the centre and the building that would house the ICT centre
- o   The number of service providers and what services they provide as well as their physical location
- o   Legislation and laws that may impact on the operations of the ICT centre
- o   The culture and customs of the community which could influence management styles and training methodologies and the way services will be used
- o   Possible partners, such as other organisations in the area or community centres.
- o   For example, should an ICT centre be located close to an existing community centre, the community centre could be used to attract the people to the ICT centre ICT1 and ICT2 showed the importance of being in a partnership. ICT centre partnership with existing organizations or bodies in developing areas is considered essential in order for ICT centres to become sustainable in the medium to long term (World Summit, 2003). Partnerships can also address skills transfer in the initial stages of an ICT centre (Kusakabe, 2004), a fact illustrated by ICT3

- o   **Step two** refers to the presentation of the findings to the project team in preparation for the third step. In step two, the project team must be satisfied that the findings of the landscape audit are understood and must highlight any potential problems. In other words, the findings of the audit must be evaluated and analysed to ensure that when implementating the ICT centre, all the factors are considered that could influence its effectiveness

- o   The **third step** flows from the previous two steps and results in the drawing up of a project plan with the required resources, responsibilities and timelines for the implementation of the ICT centre

The figure on the following page is a graphical representation of the process used to carry out a landscape audit.

```
┌─────────────────────────────────────────┐
│                Step one                   │
│                                           │
│   Appoint a task team to carry out the    │
│   landscape audit. Experts can be used,   │
│   but the team must have local            │
│   representation                          │
└─────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────┐
│                Step two                   │
│   Discuss the findings of the landscape   │
│   audit with the project team             │
│                                           │
│                                           │
└─────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────┐
│               Step three                  │
│                                           │
│   Agree to a detailed project plan with   │
│   timelines, resources and                │
│   responsibilities                        │
└─────────────────────────────────────────┘
```

FIGURE 7-5 Process of carrying out the landscape audit

7.2.4 Selection of technology and training

The selection of the appropriate technology and training will depend on the outcomes of the needs assessment and the landscape audit. The technology best suited to the environmental factors should be put in place to facilitate the information needs of the community (Rowan, 2000).

Procurement of equipment and training of centre staff should be a mechanical exercise, provided the outcomes of the previous steps are used as a framework. The framework should serve as guidelines for the specific types of equipment and software that must be obtained, as well as the scope and kind of training to give the centre's staff.

The process of selecting technology and training comprises three steps.

o **Step one** refers to the actual procurement of the IT equipment. Critical factors to consider when purchasing the IT equipment and especially the software are listed below.

   o Software must be the standard for South Africa. In other words, the software must be considered the norm and be in general use

o   Software that is considered specialist software for CBT (computer based training), must also be standard but, more importantly, must be serviceable. There must be support available within reasonable time frames, taking the physical location of the centre into consideration

The hardware must be standard so that any hardware vendor can support it. The choice of PCs, as opposed to thin client solutions, will be dependent on the requirements identified in the needs analysis and on the level of local expertise. The support for the hardware should also be readily available within the context of the centre's physical location.

In the cases of ICT1, ICT5 and ICT6, the choice of technology was not considered standard and was difficult to support. This was aggravated by the location of the three ICT centres. Software and applications must also be standardised in order for the community to benefit from standard practice with regard to the choice of applications.

The research found that the ICT centres making use of IT equipment and software not considered the norm were faced with support issues, which impacted on the ability of the centres to render reliable services. Guidance may be needed and should be sought through the project team who can contact third parties for advice should they not have the technical skills to determine what technology should be purchased. This is also the step where third parties are identified who can support the technology.

o   **Step two** deals with the selection and training of the centre staff about how to use the technology and how to identify and communicate technical problems to third party support and suppliers. The suppliers of the technology should be used for the training.

The centre staff must be chosen as early as possible, trained and should participate in the implementation process. The research confirmed the need for training of the centre staff, especially when dealing with technical issues and the need for a business approach. ICT1, ICT5 and ICT6 were examples of centres that did not have the technical expertise and business skills necessary because of a lack of staff training. This contributed to an initial lack of progress in these three centres.

The criteria for selecting the centre staff should focus on the following elements (refer to Table 7.1 in the appendix, page viii):
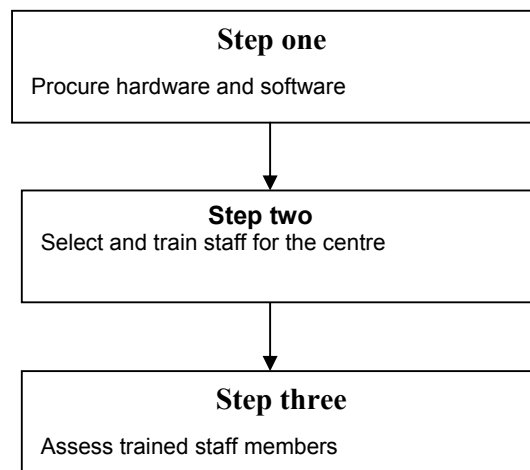o   An appreciation for a business focus in order that the centre is to be managed on business principles

o An ability to understand technical problems so as to identify and describe technical problems to remote technical support
o The ability to work with people and to have networking skills with in the community
o Acceptance by the community

The training of the centre's staff is critical to its continued operation. Each staff member must undergo training and assessment after training to ensure that he/she is able to perform. Provision should also be made for redundancy and back-up and continued training should also be considered as part of the normal operations of the centre.

o The **third step** is where the centre staff are assessed after training. Again, the trainers of the staff should also be used to assess the centre staff. ICT3 was the only centre that insisted on training of the staff including as well as the evaluation of the staff after the training was completed. This was evident in the quality of the services offered to the users of ICT3. ICT2 was fortunate in that the staff were already trained and, therefore, able to render quality services as well.

The following figure is a graphical representation of the process used for the procurement of hardware and software as well as the selection, training and assessment of the centre's staff.

Step one

Procure hardware and software

Step two
Select and train staff for the centre

Step three

Assess trained staff members

FIGURE 7-6 Process of procuring technology and training

7.2.5 Implementation, operations and evaluation

In the evaluation stage of the proposed model, the effectiveness of the ICT centre is measured from time to time during the centre's life.
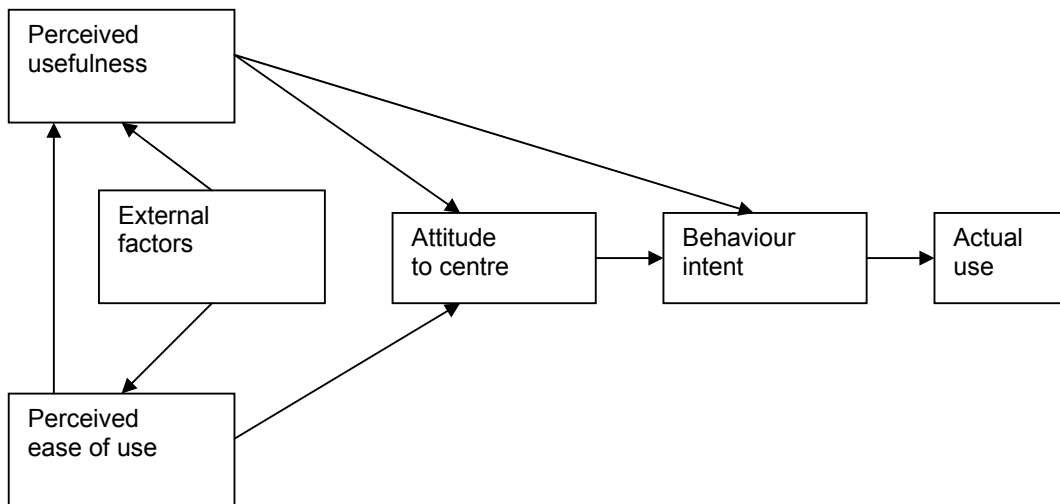
The CSIR Information Economy Model, shown below, is one of the more relevant approaches that could be used to determine the effectiveness of an ICT centre within the Southern African context, as it was developed in South Africa (Van Rensberg, 1997).

The CSIR model highlights the importance of the ICT centre's ability to add value to the user of the centre. In other words, the community must be convinced that there is something to be gained from using the centre and have a requirement that needs to be satisfied. The recommended model addresses this through the community involvement and community needs analysis stages, as the community will only use the centre's services if the perception is that the services are what the community wants.

The CSIR model also illustrates the link between actual usage of the centre and the reason for wanting to use the centre's services. The model clearly shows how perceived usefulness and perceived ease of use translate into the user's attitude towards the centre and the eventual actual usage. The recommended model determines the usage of the centre through the evaluation phase.

External factors which can have an influence on the centre's perceived usefulness and ease of use by the user are the environmental factors discussed above. The landscape audit is the approach in the recommended model to identify the environmental factors in order for the centre to manage these factors.

The following figure illustrates the CSIR Information Economy Model.

FIGURE 7-7 The CSIR Information Economy Model
Source: (Van Rensberg, 1997)

The model is based on the actual usage of the centre, as influenced by its perceived usefulness and ease of use by the community. Once the community considers the centre services to be useful and easy to access, the attitude of the community towards the centre impacts on the usage of the centre.

The importance of being able to monitor the perceived ease of use and usefulness of the centre is key in the determination of why the centre is not delivering a service. Information relating to these two measurements can be used to adjust the reasons for the community's perceptions in order to increase the centre usage.

ICT2 was the only centre which measured usage of the centre and also attempted to establish reasons for the increased usage. Although none of the other ICT centres showed that attempts had been made to identify problems in the community, they showed an awareness of the need for this feedback.

Information gathered in the evaluation phase can be applied to the marketing of the ICT centre, and the formation of partnerships can also assist in the marketing of the centre.

The centre's operations should adhere to the template designed for the specific management of ICT centres, which should be used in the evaluation process to measure services. For example, sensible and practical considerations relating to the prices of services rendered must be considered, as services must be competitively priced and affordable. The following should be done when managing an ICT centre (refer to Table 7.4 in the appendix, page x):

- o   Measure and manage the income generated linked to the actual services rendered
- o   Record all expenditure against the specific related cost
- o   Monitor and record the usage of the centre's services individually
- o   Keep a register of the types of problems and the frequency of these problems

It is important to hold regular meetings with the local leadership and the community centre management to monitor progress and growth, so as to maintain general support for the centre. The centre manager must be responsible for arranging these meetings.

7.2.6   Conclusion to the recommended model

In conclusion, the recommended model deviates from the Heeks approach by placing the community at the centre. With community involvement, the needs assessment is carried out, which is supported by a complete and thorough understanding of the environmental factors. The project plan is then drawn up which must address the findings of the needs assessment and landscape audit. After this, the procurement of the technology is aligned with the findings

of the needs assessment. Thereafter, the centre's staff are selected, trained and assessed. Finally, the evaluation of the ICT centre should take place on a continual basis. The community should play a significant role throughout the entire process.

The recommended model is aimed at improving the manner in which ICT centres have been deployed in Southern Africa by taking into account those factors which have been identified as obstacles to successful ICT deployment (Sassen, 2002; Bidoli, 2003). Norms of the prevailing culture and local conditions must also be considered (Adedeji *et al,* 1991; Ouma-Onyango, 1997; Melody, 2003; Jensen, 2002; Vaihia, 2002) when attempting to transfer technology in developing areas. By including the community's involvement, the model intends to address these issues from the initial stages of the life cycle of an ICT centre and ensure that the deployment of the ICT centre should not be transferred in a mechanical way (Mohan, 1990; Davis *et al,* 1998; Wjinbeek, 2000; Macome, 2002). The model uses the community's involvement to ensure that the ICT centre services are adapted to meet the needs of the local community and that its contribution is best suited to meaningful development (Michel, 1997). Finally, the model uses a bottom-up approach which has been shown to be more successful than a top-down approach (Colle, 2001). Many theorists support the notion of a bottom up approach when attempting to bridge the digital divide and using a modified Heeks approach and that the research has intended to show that community needs should be seen as the point of departure when given priority when deploying technology for economic improvement in developing areas (Whelan, 2002; Kyle, 2002; Fuchs, 2000; Sabien, 2000; Short, 2000).

7.3   Limitations of the research

There were two major limitations of this research. Firstly, very little communication with the users of the six ICT centres meant that the determination of the effectiveness of the centres was based on the amount of centre usage by the community and income generation. Due to the inability of most of the centres to render a continual service, the community was not available for interviews. It would have been useful to document the perception of the community in an effort to gain a user perspective, as this may have contributed to the findings of the research.

Secondly, the subjective position of the researcher due to the researcher's association with TSA, may have impacted on the findings of the research. This appears not to be a major concern, as it was evident that five of the six ICT centres were failures due to the lack of usage, activity and growth. Reasons for ICT failure identified from the findings of the study are also supported by the literature review.

7.4   Opportunities for further research

Further research could focus on the community in terms of its values, needs and aspirations and how people perceive the intended usefulness of ICT centres. This could be linked to a study that attempts to determine why organisations implement ICT centres. Further research could also try to determine how organisations make provision for sustainability centres, especially as there are so many failed attempts at ICT centre implementation (Snyman and Snyman, 2004).

7.5   Conclusion

In conclusion, this longitudinal study has identified the following factors as important for ensuring ICT centre sustainability in developing areas in South Africa:

- o   The identification and understanding of community needs
- o   Provision of relevant ICT services to address the community needs
- o   A thorough understanding of the environment
- o   Formation of partnerships
- o   Local ownership of the ICT centre
- o   The adherence to sound management principles
- o   The appointment of the appropriate staff

Adhering to these factors will assist in the long-term success of the centre.

Local knowledge underpins the understanding of the environment. Therefore, it is of concern that so many attempts at implementing ICT centres by organisations are not successful, especially as a considerable amount of documentation relating to ICT centres in developing areas exists.