NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

GRADUATE SCHOOL OF BUSINESS & GOVERNMENT LEADERSHIP

The Impact of information technology on service delivery: A Case Study of Gaborone Technical College (GTC)

By

Karabo Seloko

Student Number: 16810198

A research proposal submitted in partial fulfilment of the requirements for the Masters degree in Business Administration (MBA), North-West University

Supervisor: Prof N Mavetera

DECLARATION

I, Karabo Seloko hereby declare that this dissertation is the result of my own investigation and research and that this has not been submitted in part or fully for any degree to any University.

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Karabo Seloko Date

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to Professor N Mavetera, my supervisor and role model who has given me inspiration and courage to complete this research. Professor Mavetera has been very helpful, his patience, supervisory skills and knowledge has been influential in the fulfilment of this research.

I am also thankful to my family and friends who gave me moral and financial support to carry out this study.

I would also like to thank Gaborone Technical College Lecturers and Students who assisted me with the information needed to complete my project.

Abstract

The purpose of this study was to establish the role and impact of information technology (IT) in service delivery: a case of Gaborone Technical College. In this study an attempt has been made to show how IT is used as a strategic tool to improve service delivery and how it is rapidly becoming a necessary ingredient for achieving quality within the service sector.

The study adopted both qualitative and quantitative approaches, where qualitative information was captured through open ended questions in the questionnaire and quantitative data was captured through closed ended questions. Subjects in this study comprised of students and lecturers of the Gaborone Technical College. Convenience sampling which is a non-probability design was used to select the respondents, whereby respondents were selected based on their availability and accessibility to the researcher as well as their willingness to take part. This method was used because it is both cost effective and economical to the researcher.

The findings of the study revealed that investment in IT has a positive impact on service delivery especially for teaching, examination processing, student registration, assignments and even communication within the Institution between the students and lecturers.

Key words: Information Technology, IT, Service Delivery, Gaborone, strategic management

Table of Contents

List of Tables

List of Figures

CHAPTER 1

NATURE AND SCOPE OF THE STUDY

1.1 INTRODUCTION

This chapter describes the current state of knowledge (both conceptual and empirical) related to the impact of information technology on service delivery. Also briefly discussed are the social and historical context and the magnitude of the problem globally, regionally and locally.

1.2 BACKGROUND INFORMATION

Gaborone Technical College (GTC) falls under Vocational Education Training (VET) in Botswana. The idea of Training in Vocational Education Training (TVET) in Botswana was conceived around the country's independence in 1966. As noted by Van Rensburg (2002:55), it started with setting up the Botswana Training Centre (BTC). According to the same author Van Rensburg (2002:55), the establishment of BTC then led to the setting up of the Botswana Institute of Administration and Commerce (BIAC) and Botswana Polytechnic. Around the same time as observed by Ankoojee, Gower and McGrath (2005:17) the Brigades were also established. Finally, six technical colleges among them Gaborone Technical College, were set up in 1987.

Looking at the Southern African region, there are limited studies with regard to VET (Ankoojee, 2003:1). In fact as noted by McGrath (2002:415), there are only a few international journal articles, which is a call for concern because VET plays an important role in supporting a country's social and economic development goals. The importance of the role played by VET in an economy can therefore not be ignored.

Vocational Education Centers (VET) if well utilised could play a significant role in a country's social and economic development. As noted by Alone *et al.* (2005:18), such institutions are established with an aim of empowering the citizens, especially the youth, with technical skills

and competencies that promote the spirit of entrepreneurship and in the process, employment and sustainability. According to Wolf (2002:23), it is believed that:

- VET could be used to offer quality technical skills which in return could play a significant role when it comes to improvement in the country's economic performance;
- when individuals in a community lack technical skills and competencies poverty will thrive;
- VET could play a significant role in reducing the increasing of unemployment by transferring technical skills that could enable self-employment and sustenance; and
- Empowering the youth through technical skills transfer impacted through VET could enable the country to tackle the issue of HIV/AIDS.

Having focused on the origin and aim of VET in a country, the other question that we need to address is as to whether such training is relevant in Botswana. According to Ankoojee (2003:8), Botswana is always cited as one of the success stories in Africa. This being the case, it may be surmised that all is well within the country. However, this happens not to be the case because as argued by Ankoojee et al. (2005:12), Botswana continues to encounter inequality, poverty, unemployment and slow diversification from over reliance on diamonds. As noted by Ankoojee (2003:13), these challenges being faced by Botswana could be addressed through empowerment of the nationals with skills that could lead to self-sustenance.

The focus now narrows to GTC. The Institution as mentioned earlier was established alongside six other such institutions in 1987 (Ankoojee et al., 2005:17). As noted by the Republic of Botswana (1997:16), GTC was established so as to perform the following tasks:

- present an opportunity for continuous training to those in employment;
- provide skills to school leavers as well as those in employment;

- enable the offering of self-sustaining skills and competencies to school leavers and in the process promote the entrepreneurial spirit in the country; and to
- empower Batswana so as to be more productive at their workplace.

The Institution, according to Van Rensburg (2002:56), offers technical training in refrigeration, clothing design & textile, hospitality & tourism, hairdressing & beauty, information & commercial technology and electrical engineering. In addition, as noted by the Republic of Botswana (1997:16), GTC has lodging facilities for students who reside outside Gaborone. The Institution is also expanding its activities hence the need to construct extra buildings and acquire more equipment and machinery for the organisation's activities. Currently Gaborone is operating with a population of 650 people, with 500 being students, 96 lecturers and 54 being non teaching and support staff.

The organisation's nature of operations calls for a huge expenditure for information technology purposes. Expenditure on information technology needs to be well organised otherwise the organisation will end up not fulfilling its mandate. A preliminary survey by the researcher has revealed the following:

- Gaborone Technical College spends a lot of money on information technology every year.
- The organisation experiences stock outs and stock piles of unused Information Technology garments.
- The organisation follows a Government prescribed tendering process to source Information Technology services and usually it takes long to replace and buy equipment.
- There are continuous complaints with regard to ineffective Information Technology services at Gaborone Technical College.

Findings from the preliminary survey led to the conclusion that there are problems associated with underutilisation of information technology in relation to service delivery at Gaborone Technical College (GTC). This being the case, the researcher has opted to focus on the impact of Information Technology at Gaborone Technical College.

1.3 PROBLEM STATEMENT

The purpose of this study is to determine problems associated with under-utilisation of information technology in relation to service delivery at Gaborone Technical College (GTC). University administrators around the world are expanding their investment in information technology (IT), specifically the Web technology and Internet in carrying out activities such as teaching, student registration and exam processing (Yang, 2008; Ting, 2005; Chen & Paul, 2003; Huang *et al*, 2004). Likewise, lecturers and students are using the Internet as medium of communication. Lecturers are being requested to make their teaching materials available online on institution's websites for students' accessibility. Students are encouraged to communicate with instructors, or with one another, via email (Chenug and Huang, 2005). However, this is not the case with Gaborone Technical College, much improvement is needed in the Institution eg, there are a limited number of computers, most of the time the Internet is not available and communication with the school is poor as lecturer-student communication does not exist.

Communication via emails is always difficult due to unavailability of the Internet and the limited number of computers in the Institution. This in the long run may affect service delivery within the organisation. Other researchers who informed that IT business' value and service delivery include productivity enhancement, profitability improvement improved work relations, competitive advantage and efficient use of resources at both intermediate level and organisational level, thus also supported this opinion (Prasad 2008; Melville *et al.*, 2004; Deveron 2003; and Kohli 2003). Therefore, the researcher found it worthwhile to investigate this problem at the Institution in order to be able to determine recommendations for this problem to be resolved.

1.4. AIM OF THE STUDY

The purpose of this study is to determine the impact of IT in the service delivery, with particular reference to the educational sectors.

1.5 OBJECTIVES OF THE STUDY

- To examine the role played by information technology on service delivery at GTC.
- To investigate how lack of use of information technology has affected service delivery GTC.
- To assess users' level of satisfaction with information technology services at GTC
- To investigate the success of information technology on service delivery.

1.6 RESEARCH QUESTIONS

- What is the role of information technology on service delivery at Gaborone Technical College?
- How does limited use of information technology affect service delivery in the Institution?
- What is the level of satisfaction of the users of information technology in the Institution?
- What are the successes of the information technology on service delivery in the Institution?

1.7 SIGNIFICANCE OF THE STUDY

This study is relevant because it sought to educate management about the impact of information technology on the delivering of services. Information technology implementation efforts must be carefully planned and assessed over time for their effects on the organisation, its personnel and its services. If the results of the study reveal the anticipated factors as the ones associated with the problem, the recommendations of the study may help the management of the Institution to implement those to solve the problem. This may as well help improve the communication paths within the Gaborone Technical College.

1.8 PROPOSITION OF THE STUDY

Limited use of information technology is the major contributing factor to the poor service delivery at Gaborone Technical College.

1.9 PLAN OF THE STUDY

Chapter one outlines the main aspects of the research. It is in this chapter that the context of the study is outlined, the objectives of the research are presented, the background of the study and the problem statement is stated, along with the research design and an outline of the value of the research. The second chapter of the research focuses on the literature review for the research. In this chapter, published research work done by other researchers on the research topic is reviewed. Chapter three focuses on the research methodology. The focus in this chapter is on the research methods that will be applied in the research study. This is also where the research tools have been designed. The approach that will be used by the researcher for collecting and analysing data will be outlined in this chapter. All departments will be sampled on a random basis to collect representatives.

1.10 CHAPTER SUMMARY

The significance of information technology lies in its role as a catalytic agent. Today there is no area which has not been influenced by information technology. Information technology mainly

helps to provide timely information and facilitates real-time access to remote databases. The importance of information technology lies in its accessibility and utilisation by users for productivity and decision making. Technology remains one of the primary drivers of change in the ways that people work, seek information, communicate and entertain themselves (Marimuthu & Paraman, 2011).

CHAPTER 2

2 LITERATURE REVIEW

2.1 INTRODUCTION

There are numerous research efforts on IT investments on service delivery. However, understanding IT investments' contribution to business value and service delivery has been challenging and perhaps more challenging in developing countries due to generally less predictable changes in social, political, and economics infrastructure (Roztocki and Weistroffer, 2004). Findings in the work of Ziadi and Knufie (2006) suggested that the impact of ICT on organisations in Tunisia revealed that the Tunisian companies are not yet completely committed to the revolution of the information technology. This lack of initiative is primarily explained by the fact that these new technologies require investments, including development of human resources, which Tunisian companies do not feel ready to provide. Prasad (2008) also conducted a study of the intangible benefits of IT investments in Fiji. The findings indicated that for businesses in developing countries, their IT investments provide intangible benefits, especially at the process level that contributes to business value. In a similar research effort, Roztocki and Weistroffer (2004) presented a framework for evaluating IT investments by integrating the value chain model with activity-based costing in emerging economies, where the primary motivation of the many investments is an improvement of cost structure.

Furthermore, in the work of Roztocki and Weistroffer (2008), a value chain analysis framework was presented for evaluating investments for services. They argued that in order to achieve reliable cost estimation, the framework employs a costing system, which integrates activity-based costing with an economic value-added performance measure. Oliver (2002) emphasised the impact of ICTs on educational practice in higher education, as a tool with the capacity to transformed education from a teacher directed enterprise to more student-centred models. He

also argued that the use of ICT in higher education settings could enhance knowledge creation through increased use of ICT among students. Markel (2001) also discussed the use of ICT tools as a means of fostering interaction and knowledge creation among students through the use of online discussion forums. Cheung and Huang (2005) proposed a framework for assessing Internet usage in university education in Figure 2.1 The framework investigates the impact Internet has on learning and job prospects considering organisational and individual factors, perception, attitude and Internet usage.

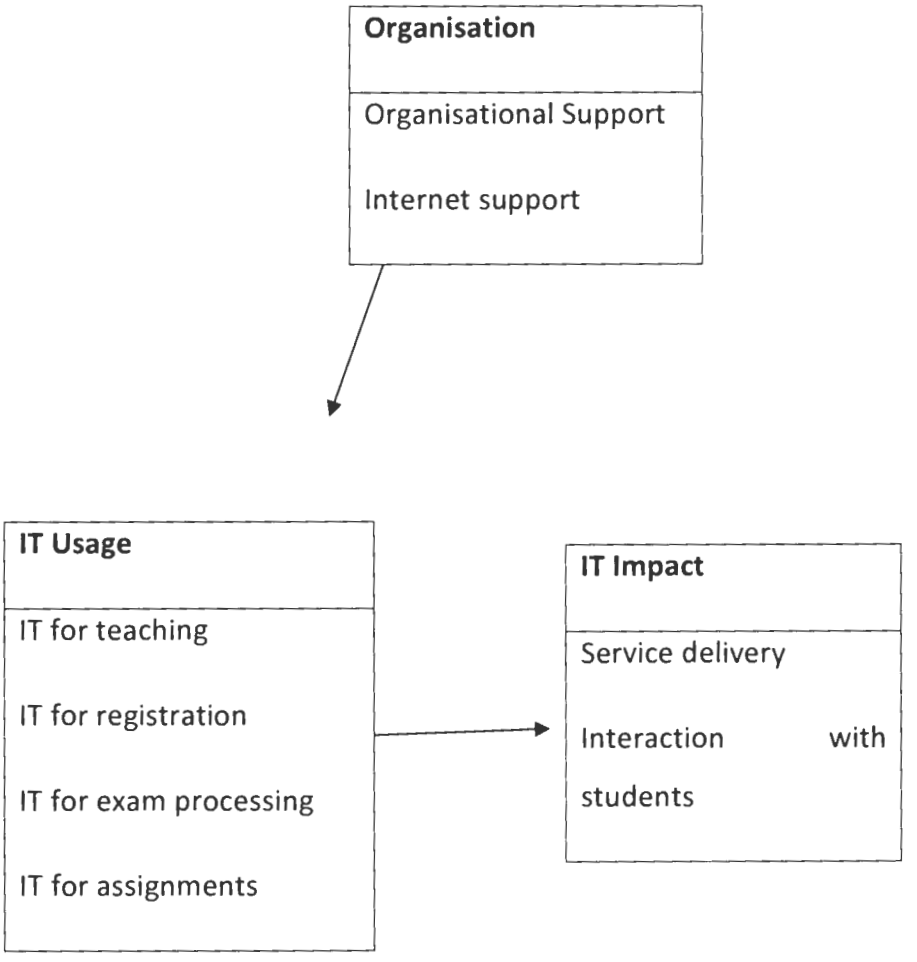

Figure 2.1 The Research Framework

The research framework takes into account organisational factors and IT usage as a factor influencing IT investment on service delivery such as management support, institutional goal, power supply, improved funding and security. The first variable of the framework takes into account the organisational context. Previous research demonstrates that organisational support, IT support and IT skills are important factors that influence internet usage (Anandarajan *et al.*, 1998; Cheung and Huang, 2005). The second variable describes various aspects of Internet usage by the university personnel including the frequency and intensity of Internet use (Cheung and Huang, 2005). The third variable examines the impact of the use of IT on service delivery and interaction with students. In summary, the relationship between the factors specified in the framework was supported. The Internet usage for teaching, registration, examination processing and submission of assignments, had a positive impact on service delivery by the staff. Findings also revealed that there is efficient service delivery and availability of Internet in the Institution to foster online interaction among staff and students.

It is evident from global industries that the use of information and communication technology seems to be the solution to information management problems in most organisations. Therefore learning institutions as organisations are no exception to the rule. Information technology is a wide and varied sector, and is represented in some form in almost all the industries. The IT industry consists of computers, communication mediums, peripherals, electronics-related organisations, software and services. Usage of information technology for the completion of tasks in any organisation, speeds up the processing and information mobility, and also improves the reliability and integrity of information. Information technology impacts on business operations, the achievement of organisational goals and service delivery (Swap and Srivastava, 2011).

A review of literature indicates that the use of IT for improving customer service and customer satisfaction has attracted much recent attention (Bonfield, 1996). Barked and Gupta (1994)

developed a model to describe how IT can be used to improve service performance. They discussed where IT had been or could be used to improve specific service quality dimensions including reliability, responsiveness, competence, access communications, security, understanding and knowing the customers and quality control. The researchers mentioned that in high customer contact services, a firm's ability to deliver quality services depends on its capacity to collect, to process and to distribute information. Soliman & Soar (1997) argued that IT is increasingly being adopted by community and hospital-based providers of health care services, because IT is now available not only to improve the communication of patients' clinical data but also to expedite communication of myriad other information across health care organisations.

2.2 IMPACT OF INFORMATION TECHNOLOGY ON ORGANISATIONS

Information technology will have significant effects on the structure, management and functioning of most organisations. This view is corroborated by Cummings and Worley (2008) when they point out that "IT is redefining the traditional business model by changing how work is performed, how knowledge is used, and how the cost of doing business is calculated. The way an organisation collects, sores manipulates, uses, and transmits information can lower or increase the value and quality of products and services." This is a very strong case for the role of information technology in improving services. After the adoption of new technology the firm demands new patterns of work organisation and effects individual jobs, the formation and structure of groups, the nature of supervision and managerial roles.

This argument is supported by Woodward and Perrow (2006) who pointed out that for technology to have a positive impact on the structure should match the new technology. Information technology results in changes to lines of command and authority, and influences the need for reconstructing the organisation and attention to job design. Computer based information and decision support systems influence choices in design of production or service activities, hierarchal structures and the organisations of support staff. Information technology

may influence the centralisation/ decentralisation of decision making and control systems. New technology has typically resulted in a flatter organisational pyramid with fewer levels of management required. In the case of new office technology it allows the potential for personnel at clerical/operator level to carry out a wider range of functions and to check their own work. The result is a change in the traditional supervisory function and a demand for fewer supervisors.

Research studies have addressed information technology's impact from a variety of perspectives (Fairlie, 2006; Brynjolfsson & Hitt, 2000). Increasingly, the relevant question about information technology's impact relates to the nature of the impact and how it occurs. Impact through use is one area of investigation suggested (Torkazdeh & Doll, 1999). Although it is quite obvious that IT system use would lead to some impact, the unanswered question is how? Some authors proposed job-learning as one possible mechanism in this regard (Torkzadea *et al.,* 2009).

As individuals interact with the system applications, they learn about their job, and as a result, become more productive. Information technology plays an important role in job-learning and individual productivity. Because of this, information technology plays a critical role in the expansion of knowledge and learning becomes a new form of labour. Learning is no longer a separate activity that occurs either before one enters the place or in a remote classroom setting. Learning is the heart of productive activity. For the individual, information technology holds promise in terms of job enhancement and the outcome of labour. Information technology impacts on how a job is performed and what the outcome might be. Thus, there is a need for better understanding of the nature and outcome of the interaction between people and technology in an organisational context (Torkzadea *et al.,* 2009).

2.3 HOW TECHNOLOGY IS AFFECTING ORGANISATIONS

According to Sarmento (2005) computer systems play a prime role in the support and delivery of services. For many systems their main role is in enabling service encounters between customers and providers. In health care the role of the information system is service oriented, supporting a range of service encounters between clinics and patients. In many financial services, information systems support the call centre providing the framework within which the operator and customer interact. In retailing, information systems underpin every aspect of the industry, whether taking orders, dealing with transactions or organisations or organising warehouses. Additionally, the information system may replace the human service provider rather than just supporting the service encounter. ATMs, self-service airline ticket dispensers and Internet shopping sites represent services entirely delivered by the computer. Here the service encounter is purely between the computer and customer (Sarmento, 2005).

Since many, if not most information systems are delivering or supporting a service, the study of the service encounter is key to the development of the human-computer interface. If the computer system is supporting a service encounter it would be worth undertaking. It must deliver the required information at the correct point in the encounter and should not dictate the progression or outcome of the encounter. The design of the HCI should be derived from an understanding of the service interaction. In many cases design of the service, using for example, a service blue print (Zeithaml & Bitner, 2003) should precede the design of the computer system and its human interface. Rather than focus on data and data presentation, the focus should be on progression of the service encounter and progression of dialogue. Change is an inevitable part of the operation of all organisations. Today, it is essential for all organisations to adapt to their rapidly changing environment. To remain competitive, organisations must continuously scan their environment and look for better ways of conducting business. It is true that institutions of higher education should not differ from other businesses in the manner in which they adapt to environmental changes; however, the environmental factors that affect them should not be compared to those of other businesses. Information technology is one of

the leading environmental factors that affects all industries and have played a significant role in transforming the higher education industry.

The challenges faced by countries in increasing access to post-primary education, improving quality of education and addressing threats to education systems from pandemics, natural disasters and civil conflicts, need participation of all parties which include higher education institutions. Countries need to strengthen the management of education systems, provide better teaching materials and increase expenditure for training, hiring and management of teachers. For example, an estimated 4.5 million teachers needed in Africa to achieve the MDGs by 2015 (MDGs 2008 ibid.) is a challenge to try to achieve within time left. The contribution of ICTs in achieving these goals and the participation of higher learning institutions in particular cannot be over emphasised as a number of ICT projects are carried out by these institutions. The significance of ICTs is realised in many aspects such as improved access to learning by all (Kaino, 2008), creation of a conducive learning environment by gender (Kaino, 2004; 2006; 2007 and 2008), quality of knowledge delivery (Kaino, 2008), expanded secondary and post-secondary education, reduction of expenditure on training and many others. This is to the advantage of advances in information technology (IT) that have changed ways of communication in education and delivery of knowledge to society. Some new delivery technologies using for example electronic learning (e-learning) in virtual programs, Internet courses' delivery strategies, audio and video communications have changed and challenged ways of knowledge delivery in the education sector.

In education, the delivery of knowledge using ICTs has influenced the design of various curricula programmes nationally and globally in launching of different educational programmes. The current technology for example, allows learners' interaction with the computer screen rather than the teacher. Through the computer network, learners are able to communicate with the instructor on the material and could discuss assignments involved. In this process, learners are able to attend lectures "online". Current technologies in e-learning such as AulaNet, tend to

provide groupware for creation, participation and maintenance of Web-based courses emphasising group learning where individuals shared ideas online (Gay & Lantini, 1995 and Fuks, 2000). It has been argued that ICT was a way to move from elite to mass education through digital media where more learners could get access to education for both campus and distance-learning students (Kennedy, 2001). ICT is seen as a way to promote educational change, improve the skills of learners and prepare them for the global economy and information society (Haddad & Draxler, 2002; Kozma & Wagner, 2005; McNamara, 2003; UNESCO, 2002). ICT is used to improve delivery of and access to education. ICT as focus of learning, tends to improve the understanding of the learner, increase quality of education and thereby increase the impact of education on the economy. While basically ICT based innovations can occur in classrooms, their linkage to national policies is essential to achieve intended social and economic outcomes.

While the benefits of these technologies have been acknowledged there have been some constraints of adoption especially in developing countries. The constraints are many and include access to computers (email and Internet), affordability of computers and connectivity, telephone and electricity infrastructure, computer literacy, expertise, etc. (Davis & Danning, 2001; Oliver et al, 2002; Knowlton & Knowlton, 2001; Sibiya, 2003; Gumbo, 2003). While such problems have been acknowledged, the main reasons behind the slow pace of adoption have been identified as lack of effective policies on ICTs (Kaino, 2008). Many countries have outlined the significance of these technologies and much of these policies have remained on paper without committing enough resources to policies. Some countries like Egypt have acknowledged the significance of investing in ICTs where the influence on a nation's educational and economic developments have been realised (NDP, 2003). In developing countries, there has been some cases where ICT resources have been abundant but remained underutilised (Kaino, 2008). The issue of utilising a fraction of the capacity of existing ICT facilities in developing countries has been noted in past studies (Cawthera, 2002).

2.4 IMPLEMENTATION CONSTRAINTS IN ICT POLICY FRAMEWORK

One of the main obstacles to adoption of ICTs in developing countries in particular, has been identified as ineffective policies in Government departments (Kaino, 2008). While many efforts have been made to stipulate ICT policies, not much have been done on the implementation side and especially on the structures and processes in place. For example, the structure of the Science and Technology (S&T) policy in Botswana (Figure 2.4 below) does not specifically stipulate the ICT policy in schools, colleges and other learning institutions/satellites. Different institutions and departments interpret the policy in various forms for implementation. For example, the Department of Curriculum Development and Evaluation (DCD&E), Ministry of Education, develops curricula and translates the policies, and present them in the school syllabi for implementation. DCD&E is under the Government and Parastatal Institutions in the S&T policy structure. DCD&E stipulates three forms of ICT knowledge involving computers at basic education (primary and junior school levels) and senior school level. From the policy structure, the Ministry of Education seems not to be in control of the implementation of the policy and it was the duty of the Ministry of Communication Science and Technology (MCST) to effect the process through Government departments.

Furthermore, the policy has no gender dimension, not only on ICT but on education as a whole. The latter aspect was observed in many countries in the region as shown by data on access, participation and expenditures on education (Kaino, 2008). To realise the full impact of ICTs, educational policies and programs need to be coordinated with those in other ministries, such as economic development, human resource development, telecommunications, agriculture and rural and urban development. Countries like Singapore and Finland have national plans for implementing ICTs in education. Typically the plans describe the hardware, software, and networking that will be implemented in schools as well as technical support and training of teachers. The national plans should specify measurable goals, authorise and fund specific programs and projects to advance the vision and provide the resources needed to implement

them. The plans should indicate how technology would be coordinated with change in curriculum, pedagogy, assessment, teacher professional development and school restructuring. Policy leadership is key to any successful development strategy, particularly if these efforts are to contribute to economic and social transformation. For example in Finland, successful development was guided by a clear vision of how the availability of new technologies could increase economic productivity, improve the quality of life and enrich the culture (Kozma, 2005).

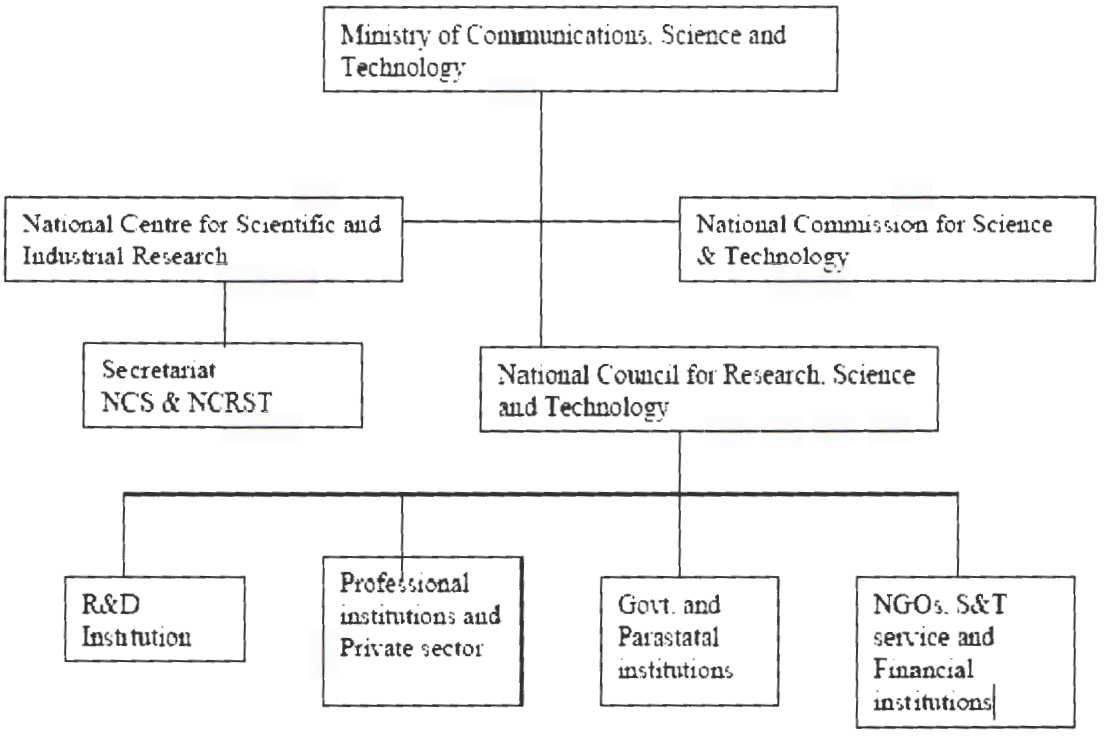

Figure 2.2 ICT policy flow structure in Botswana

2.5 CONTRIBUTION OF ICTS POLICIES TO EDUCATION, SOCIAL AND ECONOMIC DEVELOPMENT

The contribution of ICTs policies to education, social and economic development are premised on ICT policy framework structure illustrated above in Figure 2.3. The framework illustrates how the development framework and a systematic approach to policy formulation can align economic, social and educational strategies. Resulting strategies would differ from country to country. Aligning policies and programs run across factors and sectors and application of framework supports educational, social and economic transformation.

2.6 THE ROLE OF ICT IN ACCELERATING MDGS

ICTs should be used to address social and economic inequalities by extending the ICT infrastructure to rural areas and establish community technology centers. For example, the Internet would allow for inexpensive distribution of resources to remote areas, and for example rural teachers would have access to materials as well as distance learners. Emphasis should be given to deeper understanding of developing technological skills. Equipped with these skills and knowledge, rural learners could be better prepared to use modern agricultural practices or to work in the nearby eco-tourism industry and the like. Remote access to experts can also support adult literacy programs. The plan to succeed should have the policy formulation that aligns economic, social and educational strategies to leverage strengths, coordinate investments and advance national goals and visions.

2.7 CHAPTER SUMMARY

A review of literature indicates that the use of IT for improving customer service and customer satisfaction has attracted much recent attention (Bonfield, 1996). Information technology plays an important role in job learning and individual productivity. Because of this information technology plays a critical role in the expansion of knowledge and learning becomes a new form of labour. To remain competitive, organisations must continuously scan their environment and investigate better ways of conducting business.

CHAPTER 3

3. RESEARCH METHODOLOGY AND DESIGN

3.1 INTRODUCTION

Research Methodology is a collective term for the structured process of conducting research. This chapter describes the researcher's basic research plan. It explains how the research problem was investigated and why particular methods and techniques were used. It also gives a detailed account of the data collection processes employed to obtain data.

3.2 RESEARCH DESIGNS

Research design is the detailed outline of how an investigation will take place. A research design will typically include how data will be collected, what instruments will be employed, how the instruments will be used and the intended means for analysing the data collected (www.businessdictionary.com/definition). The study design is the procedure under which a study is carried out. The study design that was used in this study was a case study which comprised of concepts of both qualitative and quantitative research. Yina (1984) defines the case study research method as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used. The researcher also informs that case study research excels at providing an understanding of a complex issue or object and can extend experience or add strength to what is already known through previous research and detailed contextual analysis of a limited number of events or conditions and their relationships. Case studies are important in decision making and for policy makers.

The case study design that was used in this study consists of both qualitative and quantitative information. This is because the questionnaire that was used contained both open and closed

ended questions to allow some components of data to be measured numerically and elaborate on those through qualitative ones. According to Polit and Beck (2008), a quantitative research design is an explorative, non-experimental, descriptive structure which involves quantifying relationships between variables. A good design should ensure that there is maximum control over factors that affect adversely the reliability and validity of research results (Gwimbi & Dirwai, 2003).

3.3 TARGET POPULATION

The target population for this study was 596 respondents - both the students and personnel of Gaborone Technical College in Gaborone. However, the researcher managed to interview only 296.

3.4 SAMPLE AND SAMPLING PROCEDURE

Polit and Beck (2008) defined sampling as the process of selecting elements which are the basic unit from which data and information will be collected to represent the entire population. The sample for this study was 296 comprising of 200 students and 96 lecturers. Two options of sampling are probability and non-probability. In this study, convenience sampling which is a non-probability sampling method was used to select the respondents. The personnel of Gaborone Technical College who were available and willing to participate during the period of data collection were given the questionnaires to complete. The questionnaire was administered to determine a variety of aspects from respondents which included beliefs, thoughts and knowledge about impacts of technology on service delivery at Gaborone Technical Collage.

3.5. RESEARCH INSTRUMENTS

A questionnaire which consists of both closed and open ended questions was developed based on the literature review and reference was made to the problem identified and objectives set. Gwimbi and Dirwai (2003) informed that a well-designed questionnaire should meet objectives of enquiry and fit between contents and the research problem. It was developed to solicit information from the respondents of Gaborone Technical College. A questionnaire was chosen

because it allows participants to give their views anonymously reducing bias. Polit and Beck (2008) explained that the importance of administering a questionnaire as that it makes it easy to test validity and reliability, it is flexible and may be applied to many different populations within a short time and the same questions are repeated to get valid and reliable answers with minimal resources. Depending on the type of questions, data capturing may be quick if most of the questions are fully structured. However, even though questionnaires were used, the researcher was aware of its limitations. Questionnaires are sharply limited by the fact that respondents must be able to read the questions and respond to them. Thus for some demographic groups conducting a survey by a questionnaire may not be practical. A total of 280 questionnaires were prepared and distributed. For students, 200 questionnaires were administered and 80 for lecturers.

3.6 PILOT STUDY

To ensure that the data collected was valid, the questions in the questionnaire were developed from the study objectives, and to ensure its reliability, prior to the distribution the questionnaire were given to the personnel of the Institute of Gaborone Technical College (GTC) for pre-testing. Airasian and Gay (2000) state that at least one skilled researcher and at least one expert in the study's area of investigation should review a research plan. To ensure that the result of the sample population reveals the intended purpose of the study, the results of the pilot study helped the researcher to organise a structural means to obtain the desired and detailed information on the impacts of technology on service delivery. Pilot testing was also done to estimate the time needed for the actual survey.

3.6.1 Reliability

A good research design should be valid and be able to produce reliable results. Gwimbi and Dirwai (2003) defined reliability as the repeatability and consistency of the findings. A reliable measure does not fluctuate randomly and is used to discover relationships between variables. In this research, quantitative and qualitative designs were chosen to deduce impacts of information technology in the Institution.

3.6.2 Validity

Polit and Beck (2008) defined validity as the ability of an instrument to measure a concept under study and to be able to measure it accurately so that any observed differences are true and not the result of random or constant errors. Instrument validity determines whether an instrument accurately measures what it is supposed to measure. Gwimbi and Dirwai (2003) highlighted types of validity as content that indicates how well an instrument represents all the components of variables being measured. In this study, content validity was ensured by doing a thorough related literature search on which contents of questionnaire and interview guides are based.

Face validity refers to justification of the study. It is weak when having little practical or theoretical relevance to the real world situation (Gwimbi & Dirwai, 2003). According to Polit and Beck (2008), face validity is a judgment done to determine whether an instrument appears to measure what it is supposed to measure. It considers if the tool is readable and checks clarity of the content. This was done in this study through pilot testing when the questionnaire was administered to a small group of respondents before actual data collection, to get a general impression about the kind of answers that could be expected. Gwimbi and Dirwai (2003) defined analytical validity as the ability to realise if correct data analysis methods are chosen to avoid wrong conclusions. In this research, data analysis was done using both quantitative and qualitative analysis tools such as descriptive statistics and Statistical Package for Social Science version 19 and a statistician was engaged to help with analysis of data.

3.6.2.1 External validity

According to Gwimbi and Dirwai (2003), external validity is when results obtained in a study can be generalised to other people and settings. Generalisation is reached by considering the degree of confidence in sample findings in relation to population and whether similar findings can be obtained at other times and places. In this research external validity was influenced by the sampling method used, namely convenience sampling, therefore findings cannot be generalised to other settings.

3.7 DATA PREPARATION AND ANALYSIS

When the questionnaires arrived from the field, they were checked for completeness and only the questionnaires which were 75% answered were considered and captured into Microsoft Excel while qualitative data obtained from open ended questions were analysed using content analysis whereby only responses that are relevant to the questions were considered and the rest were discarded. The qualitative data was then reported qualitatively in the report while the quantitative data was exported to the Statistical Package for Social Sciences version 19 for analysis.

3.8 ETHICAL CONSIDERATIONS

All research designs should consider ethics of participants - that is how sensitive the issue might be to the respondents. Gwimbi and Dirwai (2003) defined ethics as the acceptable moral principles developed by individuals or groups which govern the conduct of research with regard to sampled subjects, respondents and all stakeholders of the research process. In carrying out a research, it is the responsibility of the researcher to protect the respondents from harm and provide them with adequate information on the importance of research and enable them to withdraw whenever they want to.

3.8.1 Permission for study

The main aim is to assess the impact of information technology on service delivery at Gaborone Technical College therefore written permission to conduct the study will be sought and obtained from the Principal. Copies of consent forms providing information on the nature, purpose and research process, assuring respondents confidentiality of data and information provided, was prepared and issued to sampled respondents prior to commencing the study. Respondents were given an option to fill in the questionnaire or decline, and extra time was given so as not to rush the subjects. Interviewees were also given options to write down their answers and allocated more time as a way of encouraging them to express themselves freely.

3.8.2 Respect for human dignity

Respect refers to an individual's right to voluntarily take part in a study. Subjects should be given full information on the nature of study and risks attached so that they can make informed decisions to participate or not. Their decisions should not be influenced by other people or factors. Only when these conditions are satisfied, consent is obtained (Polit and Beck, 2008). In this research, all subjects were informed verbally and through consent forms about the benefits of the study.

3.8.3 Freedom from harm

A research involving humans may cause physical, psychological, social or economic harm. A researcher should ensure any harm to study subjects is minimised and that there is a balance between risks and benefits (Polit & Beck, 2008). In this study, respondents were encouraged to participate so as to make contributions and suggestions to ensure effective use of technology in providing good service to the customers.

3.8.4 Anonymity, confidentiality and justice

Anonymity refers to a situation where the researcher cannot link data to respondents. This is when privacy is respected and identities kept anonymous. Justice is the fair treatment of all respondents (Polit and Beck, 2008). The researcher indicated clearly and stressed verbally on first meeting to the respondents that they are not supposed to write their names in order to maintain anonymity and confidentiality of their information. The participants were told that participating in the study is voluntary, hence they could decide to quit at any stage. However, taking part in the study was emphasised. Participants were informed that at the end of the study, the results would be shared with them as a way of appreciation as well as giving them feedback about the results.

3.9 CHAPTER SUMMARY

This chapter discussed methodology employed in the data collection process on the research. It also described fully the overall plan of how the whole research was carried out including research designs used, method of data collection and analysis of the results.

CHAPTER 4

4. DATA ANALYSIS AND RESULTS

4.1 INTRODUCTION

This chapter presents statistical results of the data obtained by a questionnaire from students and lecturers in Gaborone Technical College in Botswana.

4.2 DEMOGRAPHICAL DATA

The distribution of the subjects who participated in the study was that, about 70.5% were lecturers while 29.5% were students amongst which 63.7% were females and 36.3% males.

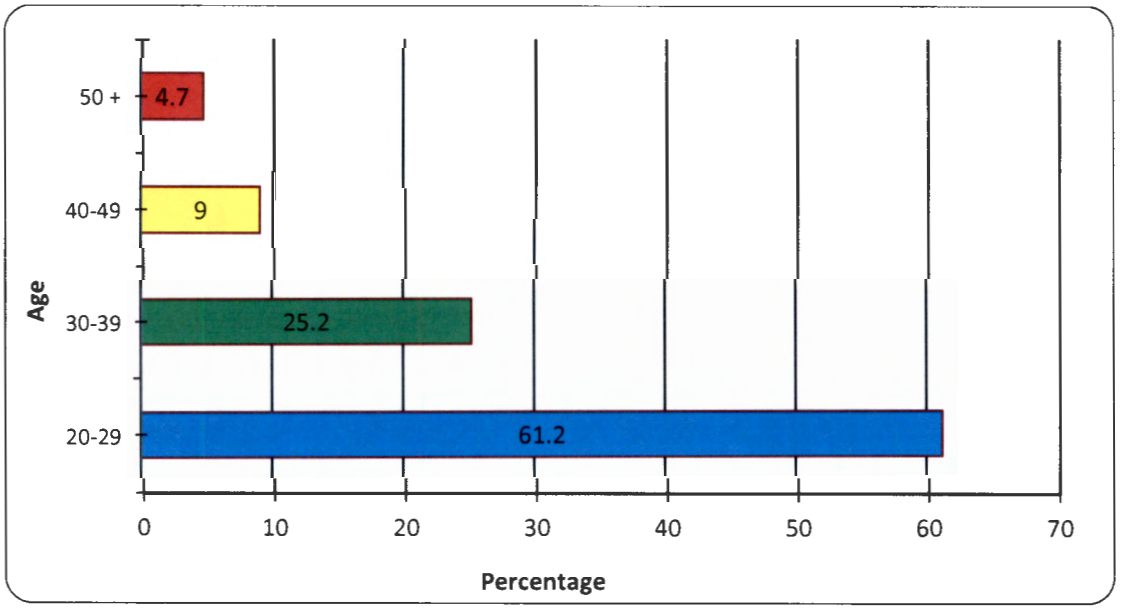

Figure 4.1. Respondents' age

Figure 4.1 above shows that the majority (61.2%) of the respondents who participated in the study were of the age 20-29 years of which the most were the students while the other 38.8% may come from other mature students and lecturers. Looking at the age of the participants, those participants of the age 20-29 should consider the use of technology most useful in

delivering services. One can expect them to use different modes of technology such as the use of Internet for research, the use of intranet to communicate with their lecturers, the use of e-learning strategies, for example the mode for access of course materials.

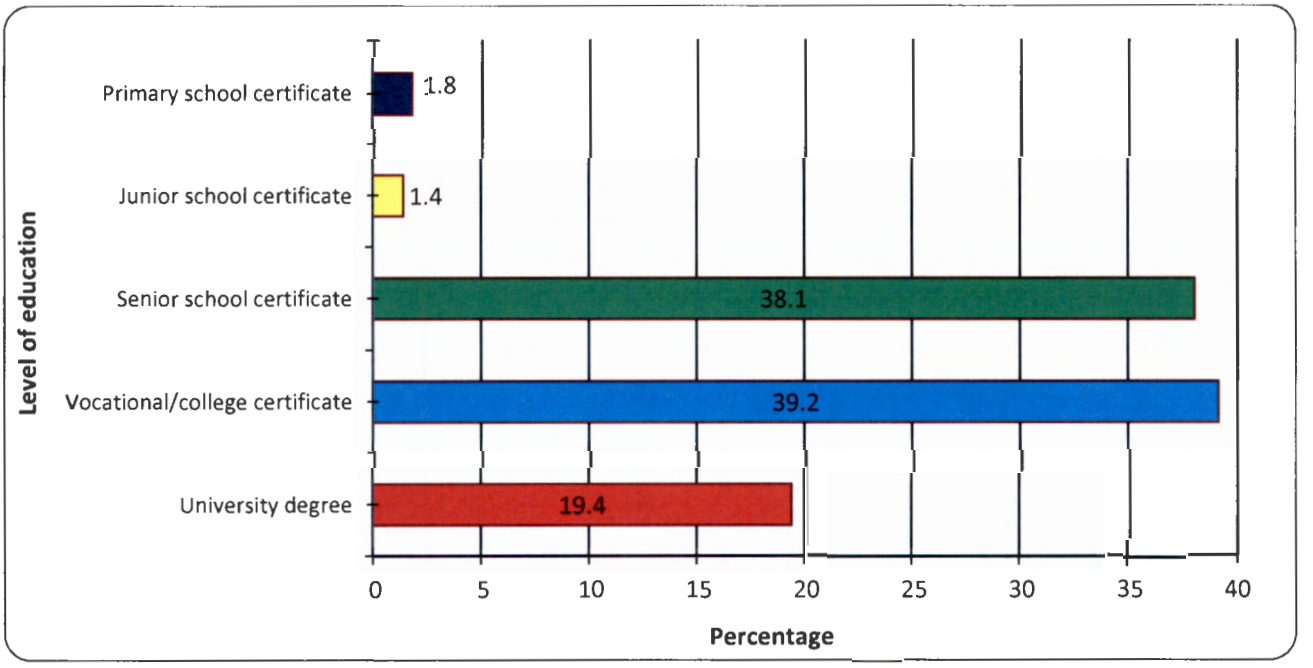

Figure 4.2: Education level

With regard to educational attainment, most of respondents (77.3%) have obtained either a vocational\college certificate or a senior school certificate. About 3.2% have obtained either a junior or a primary certificate. These are probably those students who have not yet completed their studies. The other 19.4% came from those participants who have a University degree and would be the lecturers. Regarding the level of education of the respondents, this reveals why the use of technology may not be considered as the most effective method of communication within the Institution in delivering services, especially between the lecturers and the students.

When asked about the length of time they have been in GTC, about 50.4% indicated that they have been in the Institution only for at most 6 months, 19.1% for 12 months while 30.6% have been in the Institution for more than 12 months.

This section seeks to determine the lecturers' level of proficiency in IT. Lecturers were asked to indicate the extent to which they are proficient in the hardware and software categories selected and the following responses were gathered.

Table 4.1: Level of proficiency in IT

Category	Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree
Basic hardware	4.8	7.2	14.5	19.3	54.2
Microsoft Word	1.2	1.2	9.6	28.9	59.0
Microsoft Excel	1.2	1.2	9.6	28.9	59.0
Microsoft PowerPoint	7.2	7.2	7.2	18.1	60.2
Use of Internet	2.4	1.2	8.4	25.3	62.7

The results in Table 4.1 indicated that the majority (60%) of the respondents across all the categories agreed and strongly agreed that they were proficient in the use of software. This is Microsoft Word, Excel and PowerPoint. However, there are some who indicated that they are not proficient with these soft- and hardware as indicated by those who disagreed and strongly disagreed. It is indeed a concern to discover that at a college level, there are some lecturers who are not capable of using some of these soft- and hardware effectively. This may negatively affect service delivery to students in a convenient way. Due to this incompetency, this may lead to under-utilisation of information technology in service delivery within the Institution. At college level, students should be able to receive the notes, assignments, announcements and any other important messages through such modes of communication. This is supported by Oliver (2002) who emphasised the impact of ICTs on educational practice in higher education, as a tool with the capacity to transform education from a teacher directed enterprise to more

of student-centered models. He also argued that the use of ICT in higher education settings could enhance knowledge creation through increased use of ICT among students.

Table 4.2: Teaching aids

Questions	Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree
Do you use a computer/laptop to conduct class?	12.0	9.6	18.1	14.5	45.8
Do you use PowerPoint to illustrate to learners?	12.0	9.6	15.7	14.5	48.2
Do you use a projector to conduct class?	9.6	13.3	14.5	16.9	45.8
Do you use a white board to illustrate to learners?	2.4	0	8.4	38.6	50.6
Do you use pointing devices to illustrate to learners?	12.0	15.7	19.3	14.5	38.6

Regarding the use of a computer or laptop to conduct classes, more than 50% across all the questions indicated that they use computers/laptops to conduct classes, PowerPoint to illustrate to learners, projectors, white board as well as pointing devices. Above all, white board markers seem to be the most common to the majority of the lecturers as indicated in Table 4.2 above. However, there are also some lecturers who indicated that they do not make use of the mentioned teaching aids. At tertiary level, most of the mentioned teaching aids need to be employed in order to allow various teaching strategies. If the instructors at tertiary level can encourage the use of technology to the students, this may also reduce their workload as most

of the information could be uploaded onto the Web and students could access it at their own time. Cheung and Huang (2005) proposed a framework for assessing Internet usage in university education. The framework investigates the impact of Internet on learning and job prospect considering organisations as well as the individual factor - perception, attitude and Internet usage. Results showed that students preferred to do their school work and hear about any school activities through the Web/email. Students also indicated that they preferred to receive assignments that involve them in research, since this encourages independent learning.

Table 4.3: The role/effect of information technology on service delivery

Statement	Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree
Electronic tools help my students to learn the course.	0	3.6	8.4	43.4	44.6
In planning a course I consider electronic tools to help students achieve course educational goals.	1.2	2.4	7.2	45.8	43.4
If the college were to commit more resources to support information technology for teaching, it could improve the effectiveness of my teaching.	0	0	6.0	50.6	43.4
Computers help me to keep learner records.	0	2.4	2.4	55.4	39.8
I use a computer to prepare lesson plans.	1.2	0	2.4	56.6	39.8
I use a computer to prepare learner progress reports.	1.2	1.2	3.6	54.2	39.8
I use a computer to receive correspondence from other departments.	4.8	3.6	9.6	39.8	42.2
I use a computer to communicate	8.4	10.8	12.0	30.1	38.6

with regional office.					
I use a computer to keep teaching and work information.	0	2.4	9.6	42.2	45.8

When asked on the role or effect of IT on service delivery, most of the respondents across all the statements were of the view that indeed IT plays a major role in delivery of services. Results in Table 4.3 above also revealed that even though respondents believe that IT plays a major role in the delivery of services, it is unfortunate to them because of limited resources, as not all of them seem to be able to use computers for several activities including correspondence with other departments or with regional offices. Yang (2008) examined the impact of Information Communication Technology (ICT) on higher education among tertiary teachers and students. The study also explored the issues that emerged from the implementation of ICT in higher education information as an essential commodity in well-managed organisations. The report revealed that it is evident from global industries that the use of information and communication technology seems to be the solution to information management problems in most organisations and therefore learning Institutions as organisations are no exception to the rule. Comparing the information from other researchers and the results from this study, it can be concluded that IT indeed plays a major role in the delivery of services. It is now evident that at GTC this affect there is a gap that needs to be closed. There is a limited utilisation of IT within the Institution.

Table 4.4: Level of satisfaction by the users on information technology in the Institution

Statement	Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree
I am happy with IT usage in the College	14.5	19.3	19.3	20.5	26.5

I am competent in using IT tools.	9.6	18.1	19.3	21.7	31.3
IT tools makes my teaching easy.	3.6	4.8	10.8	43.4	37.3
IT improves my service delivery	1.2	2.4	12.0	45.8	38.6

When asked about their level of satisfaction in information technology at Gaborone Technical College, some respondents indicated that they were satisfied while others were not. The respondents who indicated that they were satisfied could be those who find it not necessary to be innovative and they may be used to their communication level, hence not concerned about change, whereas those who are not satisfied are those respondents who believes that service delivery can be improved by improving and encouraging the use of technology at Gaborone Technical College. Generally looking at the results in Table 4.4, the level of satisfaction with information technology in the Institution is not satisfying hence a need to improve it so that both the lecturers and students can realise the importance of subscribing to technology in the Institution.

Table 4.5: The successes of the information technology on service delivery in the Institution

Statement	Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree
Use of IT simplifies my work	1.2	1.2	7.2	53.0	37.3
Use of IT professionalise my work(presentations, neatness, organised)	0	2.4	2.4	54.2	41.0
A computer assists me in drawing a timetable for classes and assessments.	2.4	2.4	2.4	2.4	2.4
A computer helps to simplify management of the college (Records and assets)	0	6.0	7.2	45.8	41.0
Computers improve my learners understanding.	0	1.2	4.8	44.6	49.4
I use a computer to prepare scheme of work.	0	3.6	3.6	49.4	43.4
I use a computer to receive work from students electronically.	9.6	10.8	7.2	32.5	39.8
I use a computer to communicate with other lecturers from other colleges.	6.0	3.6	9.6	38.6	42.2

From table 4.5 we can deduce that most of the lecturers indicated that they use computers in most of their day to day activities and they agreed that it helps them a great deal. This clearly indicates that given enough resources, the level of satisfaction with IT services will improve

since Gaborone Technical College community is willing to subscribe to technology and this may improve the situation at the college.

Table 4.6: Problems associated with the use of information technology on service delivery at Gaborone Technical College

Statement	Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree
Non availability of electricity affects the use of IT in college.	2.4	4.8	8.4	57.8	26.5
Limited IT resources affect service delivery in the college.	4.8	6.0	3.6	60.2	25.3
Lack of IT skills affects service delivery.	4.8	1.2	3.6	65.1	25.3
Network failure interrupts service delivery.	6.0	1.2	1.2	67.5	24.1

The results of the sample revealed the problems faced by the lecturers at GTC regarding information technology and delivering services to the students. Across all the statements, most of the lecturers agreed with the statements revealing how limited IT resources, lack of IT skills and network failures contribute to the problem at the Institution. Some researchers indicated that the usage of information technology for the completion of tasks in any organisation, speeds up the processing and information mobility, and also improves the reliability and integrity of information (Swapnil & Srivastava, 2011).

Lecturers were also asked to share their opinion on problems they experienced regarding information technology in the Institution and the following were the common suggestions: Provide lecturers with access to wireless connection, install backup system for use in times of blackout, IT systems should be kept up to date, offer training on IT to lecturers, the college should buy their personnel laptops to use during lessons.

SECTION C: Students

Table 4.7: Availability and accessibility of IT to students at the college

Questions	Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree
Do you have computer laboratories in your college?	1.5	1.0	3.1	28.1	66.3
Are computer laboratories in your college sufficient for use by all learners?	21.4	26.5	20.9	8.7	22.4
Are computer laboratories in your college equipped with computers?	5.6	12.8	13.3	21.4	46.9
Are most computers in your college in a working condition?	9.7	25.0	26.0	9.2	30.1
Is the number of computers enough for the whole class to use at once?	15.3	19.9	8.7	19.4	36.7
Are learners allowed to use computers when they need	10.7	14.3	17.3	16.3	41.3

information on the Internet?					

The result shows that there are computer laboratories at Gaborone Technical College but there are not sufficient for use by all learners. Furthermore respondents reported that laboratories are equipped with computers but they are not in a good working condition. Respondents were also asked if the numbers of computers were enough to be used by the whole class at once. These results indicate that the use of technology at the Institution is very limited as both students and lecturers have indicated on various aspects and this has affected delivery of services negatively for both the students and the lecturers as there is no smooth communication thorough email or the Web. Therefore this does not only affect the students and lecturers but also the Institution at large in terms of delivery of services and effective communication within the Institution.

Table 4.8: The benefits of IT to students at the college

Questions	Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree
Do you usually need Internet to do your challenging school work?	2.1	1.0	1.0	62.1	33.8
Do you prefer Internet to text books for doing school work?	4.1	4.6	24.6	39.5	27.2
Does Internet help you improve your performance at school?	1.5	0	6.7	47.2	44.6

Do you use Internet to find other methods of solving a subject content problem?	1.0	1.0	11.8	40.0	46.2
Do you use a computer to receive notes and tasks from your lecturers?	20.0	30.8	15.4	9.7	24.1
Do you use computers to communicate with other students in the college?	36.4	28.2	16.4	4.6	14.4
Is your learning better facilitated using PowerPoint?	8.7	17.4	33.3	21.0	19.5
Does a computer make your learning easy?	1.5	.5	8.2	47.2	42.6

It is evident from the results in Table 4.8 that the respondents find it necessary to make use of information technology. Across all the questions asked, most of the respondents indicated that they really need to use IT services to communicate as it makes life easier. This indicates that there is indeed a problem with the use of IT within the Institution that is mostly associated with the insufficient number of computers and lack of Internet connectivity. This may leave both students and lecturers with no available resources to use hence compromise the quality of learning. Students and lecturers indicated that this problem affect effective communication amongst them and even with other Institutions. Students also indicated that their academic performance could be improved if resources were made available and wireless network provided, as this may result in enough computers.

4.3 CHAPTER SUMMARY

This chapter provided a summary of the results from the respondents on different presentations. The results were analysed objectively in that questions from the same objective were put together. This section summarises the findings from the study and provides the overall picture of how the variables which were measured in the study are related. The findings indicate that information technology has a positive impact on service delivery and that limited IT resources and lack of skills is affecting service delivery negatively at Gaborone Technical College.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The aim of this study is to explore the impact of information technology on service delivery by using Gaborone Technical College as a case study. It sought to establish whether Gaborone Technical College was delivering any benefits from using information technology in rendering its services. To this end both qualitative and quantitative data were collected from a total of 80 lecturers and 200 students. Conclusions, recommendations and limitations encountered while conducting the study are discussed in this chapter.

5.2 FINDINGS FROM THE STUDY

Results from the study revealed that IT forms indeed an integral part in delivering of services. The overall responses from the respondents indicated that IT is needed and is also useful in any organisation for better services to the clients. Therefore the situation at the GTC needs to be improved as indicated by the results, namely that most of the areas need to be improved especially those that affect student learning directly as the core primary role of the Institution is to produce competent products that will lift up the country in different areas. Provision of adequate resources may help both lecturers and student to better their performance and thus uplift the name of the Institution. Overall, respondents were not satisfied with the impact of IT in delivering services. A review of literature shows that more research is needed on the impact of IT-based services on customer perceived service quality.

5.2.1 FINDINGS FROM THE LITERATURE

- Torkzadea *et al.* (2009) in his report informed that information technology impacts on how a job is performed and what the outcome might be, hence there is a need for better understanding of the nature and outcome of the interaction between people and technology in an organisational context.

- Oliver (2002) emphasised the impact of Information Communication Technology (ICTs) on educational practice in higher education as a tool with the capacity to transform education from a teacher directed enterprise to more of student-centered models. He also argued that the use of ICT in higher education settings could enhance knowledge creation through the increased use of ICT among students.

- Markel (2001) also discussed the use of ICT tools as a means of fostering interaction and knowledge creation among students through the use of online discussion forums.

- Cheung and Huang (2005) on their proposed framework observed that the relationship between factors specified in the framework was supported. The framework revealed that Internet usage for teaching, registration, examination processing and submission of assignments had a positive impact on service delivery by the personnel. Findings also revealed that there is efficient service delivery and availability of Internet in the Institution to foster online interaction among personnel and students.

5.3 ANSWERS TO RESEARCH QUESTIONS

The findings show that information technology has a positive impact on service delivery and that limited IT resources and lack of skills affect services delivery negatively at Gaborone Technical College. It is evident from the results that there is a lot that need to be done in the Institution in terms of providing enough resources to execute various tasks. Results from the study revealed that there are limited resources in the Institution therefore this affects both the students and the lecturers negatively and hence affect learning. Provision of adequate resources may help both lecturers and students to better their performance and thus uplift the

name of the Institution. Overall, respondents were not satisfied with impact of IT in delivering services. A review of literature shows that more research on the impact of IT-based services on customer perceived service quality is needed. An opportunity to go beyond the current state of knowledge presents itself in developing and testing the conceptual framework which links the attributes of IT based services, the variables affecting customers' evaluation of such services and the dimension of service quality.

5.4 CONCLUSION

The proposition that "limited use of information technology is the major contributing factor to the poor service delivery at Gaborone Technical College" has been supported by the results of the study. The findings shows that information technology has a positive impact on service delivery and that limited IT resources and lack of skills affect service delivery negatively at Gaborone Technical College. Findings also revealed that efficient service delivery and availability of Internet in the Institution fosters online interaction among personnel and students. Based on evidence emanated from this study, it can be concluded that the impact of IT investment in GTC is significant to the service delivery in the Institution. However, for further studies the opinion of administrative and academics could be analysed separately since the usage and access of IT might be the same for the two groups. It is important to note that while many expect IT to make a positive contribution to improve service, it should be remembered that IT is a tool people use, not a strategy. People are emotional and select the logic they want to apply based on their feelings. However, technology alone does not guarantee success. Overall, the review of literature shows that more research on the impact of IT-based services on customer perceived service quality is needed. An opportunity to go beyond the current state of knowledge presents itself in developing and testing the conceptual framework which links the attributes of IT based services, the variables affecting customers' evaluation of such services and the dimension of service quality.

5.5 RECOMMENDATIONS

- Gaborone Technical College must hire more trained IT personnel who can assist the college.
- As an interim solution to the problem of lack of IT skills, it is recommended that GTC should take its personnel for farther studies, short courses and conduct workshops of IT skills.
- Buy more computers to cater for all learners in the college.
- It is recommended that lecturers make use of IT in the college - they should issue electronic notes and assignments. They should also receive electronic work from students to reduce the number of students coming to their office to collect notes and submit assignments.
- Gaborone Technical College management should emphasise the importance of IT to its community.
- Educate all lecturers on information technology and ensure their understanding of its importance.
- Gaborone Technical College must review the computers every year in order to repair or replace damaged ones.
- Updates of software in GTC should be monitored regularly.
- Introduction of Microsoft access should be done to GTC management to help with their data base management e.g. keeping record of books in the libraries with their IDs and

allow easy access of books by the users. This will also help to keep annual records and students' records more easily.

- Gaborone Technical College should invite Botswana Bureau of Standards to introduce ISO 2008 and monitor the quality performance of the tool and equipment and to timely send its personnel to IT workshops and short courses to update them.
- Gaborone Technical College should buy the generators for power supplement for the Internet and IT stools to be always on and also increase the capacity of the Internet in the school for adequate use.

5.6 LIMITATIONS OF THE STUDY

This study has several limitations, firstly the study only concentrated on one Technical College in Botswana, while future research could examine the sensitivity of the finding over multiple Technical Colleges across Botswana.

Secondly this study was limited to the views and opinions of lectures and students of Gaborone Technical College, excluding non-teaching and support staff. The researcher was fully employed so she did not have enough time to concentrate on the study and to consult respondents during the working days.

Financial constraints: The researcher's supervisor was in South Africa (Mafikeng) while the study was conducted in Botswana (Gaborone) and sometimes the researcher had no money to cover travelling expenses to go for consultations.

The questionnaire was used to gather perceptions and opinions of students and lecturers on the issues under the study and may therefore lack objectivity.

5.7. RECOMMENDATIONS FOR FUTHER STUDIES

The study was limited to the impact of technology on service delivery at Gaborone Technical College. For future studies, it is therefore recommended that service quality and customer satisfaction be explored to determine the effectiveness of information technology on them.

Gaborone Technical College is one of the biggest vocational colleges in Botswana with the state of art facilities. The college's experience with the use of information technology can provide valuable lessons to other vocational colleges as well as the ones which are about to be opened in Botswana. The current study was conducted under limited time and financial constraints. This study was limited in scope due to small sample size. Non-teaching and support staff were not represented at all in this research; therefore it would be substantial to explore what a bigger and more comprehensive survey would reveal.

5.8 CONCLUDING REMARKS

The aim of the study was to investigate the impact of information technology on service delivery at Gaborone Technical College. This study revealed that information technology remains one of the primary drivers of change in the ways that people work, search for information, communicate and entertain themselves. Respondents from the study showed that there is a problem with the use of the few computers at the college as most of them are not functioning well. This problem can be addressed by selling all the old computers at the college and buy new computers. They can also outsource IT maintenance to IT companies. The literature review indicated that as individuals interact with system applications, they learn about their jobs, and as a result become more productive.

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7. APPENDICES

7.1 APPENDIX 1

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

Questionnaire for Academic Research

(In partial fulfilment of the requirements of Masters in Business Administration)

This tool will assist the researcher to assess the level of information technology within Gaborone Technical College in order to establish how this may affect service delivery. Your participation in this study will be greatly appreciated as this may help improve the situation if that may be revealed as a problem.

Please answer all the questions by ticking the category that best reflects your view [√]

Instructions

i. **All the information you provide will be treated in the strictest confidence**

ii. **Questions should be answered in a fair and consistent manner**

iii. **Section A and B must be answered by lecturers and section A and C by students.**

SECTION A: (Demographics)

1. Gender

a. Male ☐

b. Female ☐

2. What department are you in?

Key Skills ☐

Business ☐

Construction ☐

Hospitality ☐

Electrical Engineering ☐

Hair Dressing & Beauty Therapy ☐

Clothing and Textile ☐

Information Technology ☐

Special Needs ☐

3. Occupation

a. Lecturer ☐

b. Student ☐

4. What is your age?

20-29 ○ ☐

30-39 ○ ☐

40-49 ○ ☐

50+ ○ ☐

5. Your Educational background

Primary certificate ○ ☐

Junior/middle school certificate ○ ☐

Senior school certificate ○ ☐

Vocational/college certificate ○ ☐

University degree ○ ☐

Other _____

6. How long have you been in Gaborone Technical College?

0- 3 months ☐

4-6 months ☐

7 -12 months ☐

13-24 months ☐

25

Section B (LECTURERS)

7. I am very proficient in the following:

	Category	**1 Strongly Disagree**	**2 Disagree**	**3 Neutral**	**4 Strongly Agree**	**5 Agree**
	Basic hardware					
	Microsoft Word					
	Microsoft Excel					
	Microsoft PowerPoint					
	Use of internet					

Other (specify) _____

Teaching Aids

	Questions	**1 Strongly**	**2**	**3**	**4 Strongly**	**5 Agree**

		Disagree	Disagree	Neutral	Agree	
8	Do you use a computer/laptop to conduct class?					
9	Do you use PowerPoint to illustrate to learners?					
10	Do you use projector to conduct class?					
11	Do you use white board to illustrate to learners?					
12	Do you use pointing devices to illustrate to learners?					

Use of IT

	Statement	**1 Strongly Disagree**	**2 Disagree**	**3 Neutral**	**4 Strongly Agree**	**5 Agree**
13	Electronic tools help my students to learn the course.					
14	In planning a course I consider electronic tools to help students achieve course educational goals.					
15	If the college were to commit more					

	resources to support information technology for teaching, it could improve the effectiveness of my teaching.					
16	Computers help me to keep learner records.					
17	I use computer to prepare lesson plans.					
18	I use computer to prepare learner progress reports.					
19	I use computer to receive correspondence from other departments.					
20	I use computer to communicate with regional office.					
21	I use computer to keep teaching and work information.					

User Satisfaction

	Statement	**1 Strongly**	**2**	**3**	**4 Strongly**	**5 Agree**

		Disagree	Disagree	Neutral	Agree	
22	I am happy with IT usage in the College					
23	I am competent in using IT tools.					
24	IT tools makes my teaching easy.					
25	IT improves my service delivery					

Benefits

	Statement	1 Strongly Disagree	2 Disagree	3 Neutral	4 Strongly Agree	5 Agree
26	Use of IT simplifies my work					
27	Use of IT professionalize my work(presentations,neatness,organized)					
28	A computer assists me in drawing timetable for classes and assessments.					
29	Computer helps to simplify management of the college(Records and assets)					
30	Computers improve my learners understanding.					

31	I use computer to prepare scheme of work.					
32	I use computer to receive work from students electronically.					
33	I use computer to communicate with other lecturers from other colleges.					

Problems

34	**Statement**	**1 Strongly Disagree**	**2 Disagree**	**3 Neutral**	**4 Strongly Agree**	**5 Agree**
35	Non availability of electricity affects the use of IT in college.					
36	Limited IT resources affect service delivery in the college.					
37	Lack of IT skills affect service delivery.					
38	Network failure interrupts service delivery.					

Other comments:

SECTION C :(STUDENTS)

Availability and Accessibility

	Questions	1 Strongly Disagree	2 Disagree	3 Neutral	4 Strongly Agree	5 Agree
39	Do you have computer laboratories in your college?					
40	Are computer laboratories in your college sufficient for use by all learners?					
41	Are computer laboratories in your college equipped with computers?					
42	Are most computers in your college in working condition?					
43	Is the number of computers enough for the whole class to use once?					
44	Are learners allowed to use computers when they need to for information on the internet?					

Benefits

	Questions	1 Strongly Disagree	2 Disagree	3 Neutral	4 Strongly Agree	5 Agree
45	Do you usually need internet to do your challenging school work?					
46	Do you prefer internet than text books for doing school work?					
47	Does internet help you improve your performance at school?					
48	Do you use internet to find other methods of solving a subject content problem?					
49	Do you use a computer to receive notes and tasks from your lecturers?					
50	Do you use computers to communicate with other students in the college?					
51	Is your learning better facilitated using PowerPoint?					
52	Does a computer make your learning easy?					

Other comments:

_____

_____

_____

_____

_____

THANK YOU!!!!!!!!

7.2 APPENDIX 2

DYNAMIC MANAGEMENT & BEAUTY CONSULTANTS (BK)
Esselen str 71
Potchefstroom
2531
Tel: (018) 293-3046
CK 95.17794\73

October 15, 2013

To whom it may concern

Re: Letter of confirmation of language editing

The dissertation "*The Impact of information Technology on service delivery: A Case Study of Gaborone Technical College (GTC)*" by Karabo Seloko (16810198) was language, technically and typographically edited. The sources and referencing technique applied was checked to comply with the NWU Harvard reference style. The dissertation is written in English (UK). Final corrections and printing layout remains the responsibility of the student.

Antoinette Bisschoff

Officially approved language editor of the NWU
Member of SA Translators Institute (SATI) Member no. 1001891