AN APPROACH TO THE IMPROVEMENT OF THE REGISTRATION PROCESS AT A UNIVERSITY OF TECHNOLOGY

R. J. ARDERNE

Cape Peninsula
University of Technology

AN APPROACH TO THE IMPROVEMENT OF THE REGISTRATION PROCESS AT A UNIVERSITY OF TECHNOLOGY

by

RUSSEL JOHN ARDERNE

Dissertation submitted in fulfilment of the requirements for the degree

Master of Technology: Quality

in the Faculty of Engineering

at the Cape Peninsula University of Technology

Supervisor: P.A. McLaren

Co-supervisor: Prof. Dr. J A Watkins D. Phil., D. Com., Ph. D.

Bellville

November 2008

DECLARATION OF COPYRIGHT

"I hereby declare that this dissertation submitted for the degree Magister Technologiae at the Cape Peninsula University of Technology, is my own original unaided work and has not previously been submitted to any other institution or higher education. I further declare that all sources cited or quoted are indicated and acknowledged by a comprehensive list of references".

Russel John Arderne

Signature: 

Date: 2008

DEDICATION

This study is dedicated to my father George and mother Brenda for their unconditional love and support.

ACKNOWLEDGEMENTS

Generosity consists not the sum given, but the manner in which it is bestowed
Oscar Wilde

I would like to express my sincere gratitude and appreciation for their contribution to the following:

- My wife Meagan, for her love and devotion, for her assistance, even though she is also completing her degree.
- My children Mia, Lee and Scott, thanks for your patience.
- My parents Brenda, George, Leonard and Charmaine, thank you for your love and for all you have done for me in my lifetime, especially looking after Scott when we had to go to class.
- My many friends and extended family for their constant encouragement and for keeping my spirits high.
- Very special thanks to Patrick Mclaren, my HOD, without you I would not have completed. Thank you for encouraging and supporting my growth as an academic. The financial and resource support is much appreciated.
- My supervisor Prof Andre Watkins for his unconditional support, motivation, enthusiasm, patience and guidance.
- Colleagues at the Cape Peninsula University of Technology, thank you for keeping me focused on my research, and assisting with the research.
- My dear friends and family Cecilia and Keith Jacobs, very special thanks for your encouragement and assistance.
- Prof Willie Van Ryneveld for his unconditional support, motivation, enthusiasm, patience and guidance.
- Prof Fred Hendricks for his assistance, hospitality and encouragement.
- Marchelle Arries for all her patience and assistance in explaining the application and registration procedure.

Lastly, I would like to acknowledge all the contributors from the following Universities and companies who gave up their valuable time for interviews:

- The Cape Peninsula University of Technology.
- The Department of Transport.
- Integrated Tertiary Software (Pty) Ltd.
- Rhodes University.
- The University of Johannesburg.
- The University of South Africa.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Author: Russel John Arderne

Degree: Magister Technologiae: Quality

Title: An approach to the improvement of the registration processes at the Cape Peninsula University of Technology

University: Cape Peninsula University of Technology

Faculty: Faculty of Engineering

Supervisor: Prof. J. André Watkins

Date: August 2008

Key words: ICT, quality, registration, enrolment, prerequisites, higher education, long queues, frustration, CPUT, automated services, processes

When prospective students decide to register at a university, their first encounter with university life will be the Registration Department. Should the process be inefficient without much regard for the personal wellbeing of the prospective student, it will leave a lasting impression on the student, and more often than not serve as an indication of the manner in which he or she would be treated in the future at the university.

With the need for the Cape Peninsula University of Technology to attract top grade students, the institution needs to improve their registration process. This study attempts to measure students and staff attitudes and perception of the registration process, explore the different processes involved during registration and application, and investigate the different technologies available to improve these processes.

This research attempts furthermore to determine what processes could be put into place to assure that Academics and the Administration Department works together to achieve a mutually beneficial database that could be used to the benefit of the students and the institution alike. This database should be accessed from any computer on the different campuses and be user friendly, to maximise the efficiency and throughput.

The research was mooted due to the fact that at any tertiary institution, it should be mandatory that the office of institutional research should play a major role in successful enrolment management efforts. The more enrolment management professionals know about the characteristics, attitudes, and values of prospective students, the better able they are to design effective recruitment and orientation programs. Persistence studies conducted by institutional researchers can inform strategies to enhance the success of first-year students, and institutional research professionals can examine the impact of various forms of student financial assistance upon matriculation decisions and the academic success. A strong institutional function is a critical element of a sound enrolment management effort.

CHAPTER 1: SCOPE OF THE RESEARCH

1.1 INTRODUCTION AND BACKGROUND

The Integrated Tertiary Software (ITS) database system, is a sub-system of the total registration process at the Cape Peninsula University of Technology (CPUT). Although the total registration process has a number of sub-systems feeding into it, previous research on the issue (Arderne, 2004) returned that, "...some of the suggestions regarding improving the registration process at the Technikon from the students doing the survey included: I prefer Internet registration; the process at registration is too long; in my opinion the Internet (to register) might be better; computerize the whole system". These observations have highlighted the ITS as a high priority sub-system for improvement. The reason why the ITS is viewed as a high priority sub-system, is due to the fact that the ITS database links almost every facet of the institution to the registration process.

Currently, there are two ITS databases as a result of a merger by the two former Technikons - Peninsula Technikon and Cape Technikon - into the single Cape Peninsula University of Technology (CPUT). This in itself introduces its own problems as a result of different registration processes which were followed at the former distant campus. The databases from the two institutions have since been merged, resulting in duplicate codes for students, departments and subjects being evident. This causes errors, and unnecessary confusion, and frustration.

Most academic programmes at the institution have their own specific prerequisites (subject, test scores, and/or grade levels that must be completed before taking a specific course, i.e. the student would need to have passed Mathematics 01 to be allowed to do Mathematics 02, co-requisites (a condition about what subject a student is required to take simultaneously in order to enrol for another subject), timetables and subject choices. These details are documented at the various academic departments, but not on the ITS database. As a result, when staff accesses the database to register students, they do not have all the required information that should be on the database, and end up not doing a complete

registration of the students. This then forces students to fill out amendment forms at a later stage, resulting in the absence of the first couple of classes, which also extends the registration process into teaching time.

When registering students, their data would either be entered onto the ITS database or, if previously registered, called up from the database. Firstly, when entering this data, students stand in long queues resulting in frustration not only for students, but also for staff. Secondly, when accessing the data, more often than not the data which was previously amended do not reflect on the system. This could be as a result of a number of issues such as duplicate databases, updates not functioning properly, 'bugs' in the system or operators not performing the necessary tasks properly. Part of the proposed research will be to ascertain why these discrepancies are present, and how they can be overcome as well as to investigate how such changes will improve the quality of the registration process at CPUT. Once the database is set up correctly and procedures are implemented about the correct usage of the database, students would then be able to access information at any computer terminal, do what is required, with staff able to access the same data, causing less delays and mistakes, resulting in shorter queues and less frustration.

Some departments at CPUT have developed their own database programs to help slot students into the various subject classes in their various study programs. While this approach seemingly works well for some departments, it poses a threat to an integrated system. These same departments require students to participate in a departmental registration process, and then repeat the process during the institutional registration process, where students are required to once again stand in long queues waiting for administrative staff to enter subject choices onto a database yet again.

One of the aims of this study is to investigate how such duplication can be avoided by better utilising the ITS as a sub-system of the registration process, and how this in turn should not only improve the registration process for the students, but also for the staff and the institution as a whole.

1.2 THE RESEARCH PROCESS

Remenyi, Williams, Money and Swartz (2002:64–65), explain the research process as consisting of eight specific phases, namely:

- Reviewing the literature.
- Formalising a research question.
- Establishing the methodology.
- Collecting evidence.
- Analysing the evidence.
- Developing conclusions.
- Understanding the limitations of the research.
- Producing management guidelines or recommendations.

According to Collis and Hussey (2003:15), there are six fundamental stages in the research process, namely:

- The identification of the research topic.
- Definition of the research problem.
- Determining how the research is going to be conducted.
- Collection of the research data.
- Analysis and interpretation of the research data.
- Writing up of the dissertation or thesis.

The following process will be followed in this research study:

- The identification of the research topic.
- Reviewing the literature.
- Formalising a research question.
- Establishing the methodology.
- Determining how the research is going to be conducted.
- Collecting evidence.
- Analysing the evidence.
- Developing conclusions.

1.3 BACKGROUND TO THE RESEARCH PROBLEM

A previous study (Arderne, 2004), has shown that the registration process at CPUT is problematic and causes great frustration for students and staff. The main objective of this research study is to improve the quality of the registration process at CPUT, with special reference to the role of the ITS system. There are a number of secondary objectives flowing from the overall objective of this research, namely:

- Students must be able to register online from any computer that is connected to the Internet.
- Web interface must be designed to allow for online registration and applications.
- Students must be able to pay for registration and application, using the same web interface.
- Students must be able to do course applications from any computer that is connected to the Internet.
- Students must be able to check what their outstanding balance is from any computer that is connected to the Internet.
- Students must be able to check prerequisites and co requisites for the subjects that they wish to do from any computer that is connected to the Internet.
- Students must be able to check their examination and progressive marks on any computer that is connected to the Internet.
- Students should not have to spend more time than what is absolutely necessary to register at CPUT.
- Queues for registration must be shortened, (only students with special cases should have to stand in queues).
- Students should not need to walk from building to building to register.
- Single, updated and clean database must be created.
- Academic, Information and Communication Technology (ICTS), registration, finance and examination departments should work together continuously to improve the registration process.
- A documented procedure of how to use the ITS system, should be created

- When changes are made to the ITS system, change control forms must be filled out, so as to inform all concerned about the change.

1.4. RESEARCH PROBLEM STATEMENT

Against the above background, the research problem for this dissertation reads as follows: "The poor quality of the registration process for students at the Cape Peninsula University of Technology, adversely impact on the organisations' efficiency".

1.5. THE RESEARCH QUESTION

The research question to be researched within the ambit of this dissertation, reads as follows: "How can the registration process at the CPUT be automated to the extent that online facilities would be available to students, which would improve the adverse current inefficient processes?"

1.5.1 Investigative questions

In support of the research question, the following investigative questions will be researched:

- How can online registration mitigate the quality issues associated with the registration process of students?
- Should the current database be setup for staff and students to capture data and do queries?
- How can a single, clean and updated database be created as opposed to merging the current databases?
- How can the Academic, Information and Communication Technology (ICTS), Registration, Finance and Examination departments work together to continuously improve the registration process?

1.6. THE RESEARCH DESIGN AND METHODOLOGY

Case study research will form the primary research method for this study. Falling primarily within the phenomenological (qualitative) paradigm, case study research can be equally applied within context of the positivistic (qualitative) paradigm. According to Yin (2003:19), research design can be defined as, "... the logical sequence that connects the empirical data to a study's initial research question and ultimately, to its conclusions. Colloquially, a research design *is an action plan from getting from here to there*, where *here* may be defined as the initial set of questions to be answered, and *there* is some set of conclusions (answers) about these questions". Some of the more salient aspects of case study research described by Yin are listed below for ease of reference:

- A case study is an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.
- Case study research aims not only to explore certain phenomena, but also to understand them in a particular context.
- 'How' and 'why' questions are explanatory, and likely to be used in case study research.
- A case study illuminates a decision or set of decisions – why they were taken, how they were implemented, and with what result.
- The case study as a research strategy comprises an all-encompassing method – with the logic of design incorporating specific approaches to data collection and data analysis. In this sense, the case study is not either a data collection tactic or merely a design feature alone, but 'a comprehensive research strategy'.
- Case study research uses multiple methods for collecting data, which may be both qualitative and quantitative.
- A case study is typically used when contextual conditions are the subject of research.

According to Collis and Hussey (2003:66), case studies are often described as exploratory research used in areas where there are few theories or a deficient body of knowledge. In addition, the following types of case studies can be identified:

- **Descriptive case studies**: Where the objective is restricted to describing current practice.
- **Illustrative case studies:** Where the research attempts to illustrate new and possibly innovative practices adopted by particular companies.
- **Experimental case studies**: Where the research examines the difficulties in implementing new procedures and techniques in an organization and evaluating the benefits.
- **Explanatory case studies:** Where existing theory is used to understand and explain what is happening.

The research will attempt to be illustrative in nature, attempting to formulate strategies, which can be used as a framework to improve process efficiency at CPUT.

Yin (2003:20–27), emphasises the following five components of a research design, which are especially important for case studies:

- **Study questions**: The case study is most likely to be appropriate for 'how' and 'why' questions, which calls for the initial task being to clarify precisely the nature of the study questions.
- **Study propositions**: A study proposition directs the attention to something that should be examined within the scope of the study. For greater clarity, the proposition points to the, 'reason for the study'.
- **Unit of analysis**: Should the case study involve a specific person being studied, say a person representing a specific diversity case, the individual being studied is the primary unit of analysis. The tentative definition of the unit of analysis is related to the way in which the initial research questions were formulated.
- **Linking data to propositions**: A number of ways are open to students to link data to propositions. An approach suggested by Yin is that of 'pattern matching', whereby several pieces of information from the same case may be related to some theoretical proposition.
- **Criteria for interpreting findings**: If the different 'patterns' are sufficiently contrasting, the findings can be interpreted in terms of comparing at least two rival propositions.

1.6.1. The survey design and methodology

The survey design and methodology is elaborated upon within the ambit of Chapter 4. Primary data will be collected via two sources, namely:

- **A survey using questionnaires:** The concept of 'survey" is defined by Remenyi *et al.* (2002:290) as, "... the collection of a large quantity of evidence usually numeric, or evidence that will be converted to numbers, normally by means of a questionnaire". A questionnaire is a list of carefully structured questions, chosen after considerable testing with a view to elicit reliable responses from a chosen sample. The aim is to establish what a selected group of participants do, think or feel. A positivistic approach suggests structured 'closed' questions, while a phenomenological approach suggests unstructured 'open-ended' questions.
- **Interviews:** According to Cooper & Schindler, (2006:204, 208, 210-211), three types of interviews are identifiable:
  - **Unstructured interview:** No specific questions or order of topics to be addressed, with each interview customised to each participant.
  - **Semi- structured interview:** Generally starts with a few specific questions, which is then followed using the individual's tangents of thought with interviewer probes.
  - **Structured interview:** Similar to a questionnaire to guide the question order and the specific way the questions are asked, but the questions generally remain open-ended.

In this research study, unstructured interviews will be conducted.

1.7. RESEARCH ASSUMPTIONS

The researcher assumes that:

- The Cape Peninsula University of Technology student database will not be made available to the researcher.
- The Cape Peninsula University of Technology IT database staff would not avail themselves to assist in the study.

- A conceptual model serving as an approach to the improvement of the registration processes at the Cape Peninsula University of Technology would serve as a basis for a user requirement specification. This approach would serve as an alternative to a coded program, which is not incumbent of the business requirement functional specifications of the university, is costly to develop and test, and would serve no purpose to the benefit of the university.

1.8. RESEARCH CONSTRAINTS

1.8.1 Limitations

The case study is conducted at the Cape Peninsula University of Technology and may not be suitable to other higher tertiary institutions requirements.

The degree of confidentiality provided in the questionnaires will influence the degree of openness and willingness to provide accurate information, as well as the quantity and quality of information.

Non-co-operation could be caused by one of the following:

- Failure to realize the value of participation or the value of the research.
- Fear or resistance against interviews or questionnaires due to personal reasons.
- Sensitive issues related to the topic that may be embarrassing or intrusive.
- Insufficient knowledge or exposure to the topic of concern.
- Incorrect interpretation of questions.

1.8.2 Delimitations

The scope of the research will be limited to interviews and questionnaires in Cape Peninsula University of Technology, UNISA, University of Johannesburg and Rhodes University.

1.9. CHAPTER AND CONTEXT ANALYSIS

The following chapter and content analysis will pertain to this research study:

- **Chapter 1 - Scope of the research:** Provides a holistic background to the proposed research to be conducted within the ambit of this dissertation.
- **Chapter 2 - A holistic perspective of the research environment:** In this chapter, the registration process currently applicable at the Cape Peninsula University of Technology are elaborated upon in detail.
- **Chapter 3 – Streamlining the registration process and influencing factors – A literature review:** In this chapter, a literature review will be conducted on the concept of process management
- **Chapter 4 – Student and employee registration survey design and methodology:** In this chapter, the research design and methodology will be elaborated upon, for data collection and analysis of results.
- **Chapter 5 - Interpretation of data and analysis of results:** In this chapter, the statistical analysis of the results gleaned from Chapter 4 will be analysed and interpreted.
- **Chapter 6 – Conclusion and Recommendations:** In this chapter, the research will be concluded and final analogies drawn. The chapter will include recommendations, which will mitigate the research problem and provide an answer to the research question.

1.10. KEY RESEARCH OBJECTIVES

The key research objectives with this research study are:

- To identify key inhibitors to the current registration process within Cape Peninsula University of Technology.
- To determine the extent of the frustration caused as a result of ineffective registration processes.
- To determine whether the registration process currently employed within the ambit of the Cape Peninsula University of Technology can be improved upon, through the creation of a conceptual model.

1.11. SIGNIFICANCE OF THE PROPOSED RESEARCH

The significance of this research stems from the fact that:

- This research is the first research executed on registration processes within the Cape Peninsula University of Technology.
- Should the recommendations made in this dissertation be acceptable, it would promote process efficiency pertaining to registration within the Cape Peninsula University of Technology.

1.12. ETHICAL CONSIDERATIONS

In the context of research, according to Saunders, Lewis and Thornhill, (2000:130), "...*ethics* refers to the appropriateness of your behaviour in relation to the rights of those who become the subject of your work, or are affected by it". Most ethical issues in research fall into one of four categories namely, protection from harm, informed consent, right to privacy, and honesty with professional colleagues (Leedy & Ormrod, 2001:107-108):

- **Protection from harm:** In cases where the nature of a study involves creating a small amount of psychological discomfort, participants should know about it ahead of time, and any necessary debriefing or counselling should follow immediately after their participation.
- **Informed consent:** Participants should in advance be told about the nature of the study to be conducted, and be given the choice of either participating or not participating. Furthermore, they should be given the right to withdraw from the study at any time, as participation in a study should be strictly voluntary. An informed consent form that describes the nature of research as well as the nature of the required participation will be presented to participants of this research study. Such a form should according to Leedy and Ormrod (2001:108) contain the following information:
  - A brief description of the nature of the study.
  - A description of what participation will involve in terms of activities and duration.
  - A statement indicating that participation is voluntary and can be terminated at any time without penalty.

- A list of potential risk and/or discomfort that participants may encounter.
- The guarantee that all responses will remain confidential and anonymous.
- The researcher's name, plus information about how the researcher can be contacted.
- An individual or office that participants can contact, should they have questions or concerns about the study.
- An offer to provide detailed information about the study (e.g., a summary of findings) upon its completion.
- A place for participants to sign and date the consent form, indicating agreement to participate.

- **Right to privacy:** Any research study should respect participants' right to privacy. In general, a researcher must keep the nature and quality of participants' performance strictly confidential.
- **Honesty with professional colleagues:** Researchers must report their findings in a complete and honest fashion, without misrepresenting what they have done or intentionally misleading others as to the nature of their findings. Under no circumstances should a researcher fabricate data to support a particular conclusion, no matter how seemingly 'noble' that conclusion may be.

1.13. CONCLUSION

In this chapter a holistic perspective has been provided of the issues pertaining to the proposed research. The research process was explained, the research problem and associated research question was formulated. Furthermore, the research design and methodology was elaborated upon and the chapter concluded with a chapter and content analysis and key research objectives listed.

In Chapter 2, a holistic perspective will be provided on the research environment.

CHAPTER 2: A HOLISTIC PERSPECTIVE OF THE RESEARCH ENVIRONMENT

2.1. INTRODUCTION

The current application and registration process at CPUT has initially been designed to cater for a small intake of students. One of the primary issues when registering a large number of students, are the queues that form as a result of bottlenecks. This creates frustration for the staff at the institution, the students registering, parents that come with new students and the security personnel employed to assist with crowd control.

The reason these unacceptably long queues form is because all the processes are performed manually by personnel who are assigned prescribed tasks. The question must be asked, "if the employment of more personnel to assist with registration, would not mitigate the problem?" During the peak student intake periods, the institution has employed more personnel in the form of student assistants, however while this has alleviated the problem to some extent, the issues remain. When following the registration process that takes place, one can immediately identify a number of possible solutions, however the obvious solutions highlight a furthermore complex problem vested in the Integrated Tertiary Software (ITS) database deployed at the university.

Almost every facet of registration is linked to the ITS database. When investigating the possibilities of improving the registration process, thereby shorting the queues, the researcher evaluated the use of the Internet in the Computer Centre for the registration process. If students could register on the Internet, it would result in fewer students having to stand in queues for registration purposes. Furthermore, it would allow students with uncommon problems and queries to be assisted by the personnel in less time.

The following issues impact adversely on the ITS database, namely:

- Co requisites and prerequisites are not updated on a regular basis.
- Incorrect data exist on the database.

- Academic departments have secondary databases, as they do not have permission to use the main ITS database.
- The merge of the two databases of the Technikons have not been finalised.
- Software has not been bought or written to allow for registration to take place on the Internet.
- Personnel have not been taught to use this software.
- A cultural change needs to take place so that personnel would know that the institution would benefit by trying to improve the service, which is being provided to the students during registration.

The reader's attention is drawn to the fact that the detail registration process which will be elaborated upon below is specifically included in this chapter, as it not only focuses the research, but also forms the core of the research problem in this dissertation.

2.2. TWO PROCESSES

The entire process for entrance to the institution encompasses two main events. The first event pertains to the application process, while the second event deals with the registration process should the application process be successful. For ease of reference, these events are graphically depicted in Figure 2.1, starting from when a student applies for entrance to the institution until that student has been successfully registered for a particular programme.

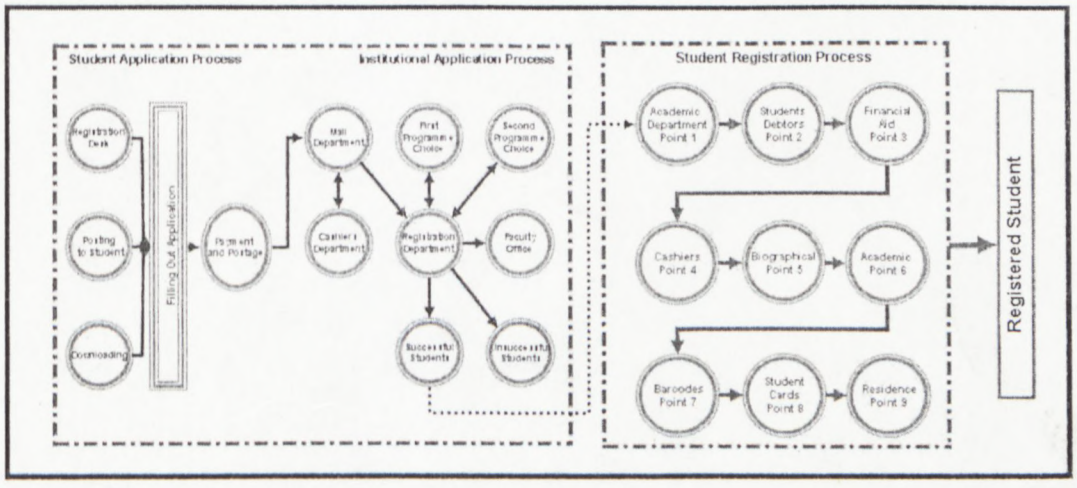

Figure 2.1: Holistic perspective of the application and registration process at CPUT

In the rest of the chapter the researcher will attempt to explain in detail the complete process, first focusing on the application process, all the events that occurs in that process, and then explain the registration process, in particular on the days that were set aside for student enrolment.

2.3. THE APPLICATION PROCESS

The application process is set in motion when a student wishes to register for a course at the university for the first time or wish to reapply for a study programme and have not studied at the university the preceding year. This process is graphically depicted in Figure 2.2, reflecting the process of student registration.

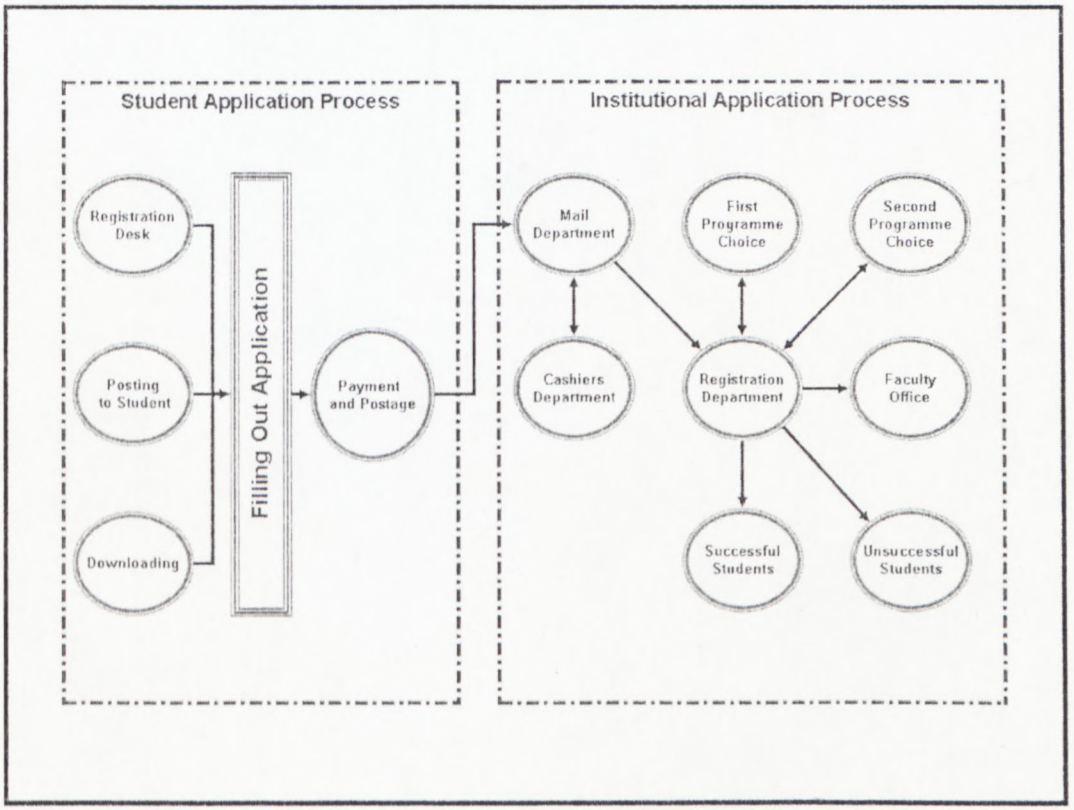

Figure 2.2: Holistic perspective of the application process at CPUT

The first phase of the process focuses on the student activities in obtaining and completing the form and then sending it to the institution. The next phase explains the process used by the institution, from receiving the application in the post until the registration department advises the student if he/she was successful or not.

2.3.1. Obtaining the application form

The first step for a student, who wishes to study at the institution, is to complete an application form. This application form amongst others, indicates the programme or course the student wishes to follow. This dispensation also applies to students who have completed a programme and wish to further their studies or wish to change from one programme to another. There are basically three methods of obtaining a blank application form, namely:

- The registration department post the application form after the prospective student has requested it via telephone.
- Going to the registration desk and requesting an application form.
- Downloading the application form from the institutional website.

The above is graphically depicted under the student application process in Figure 2.3, the shaded areas indicating the relative positioning of the step in the process.

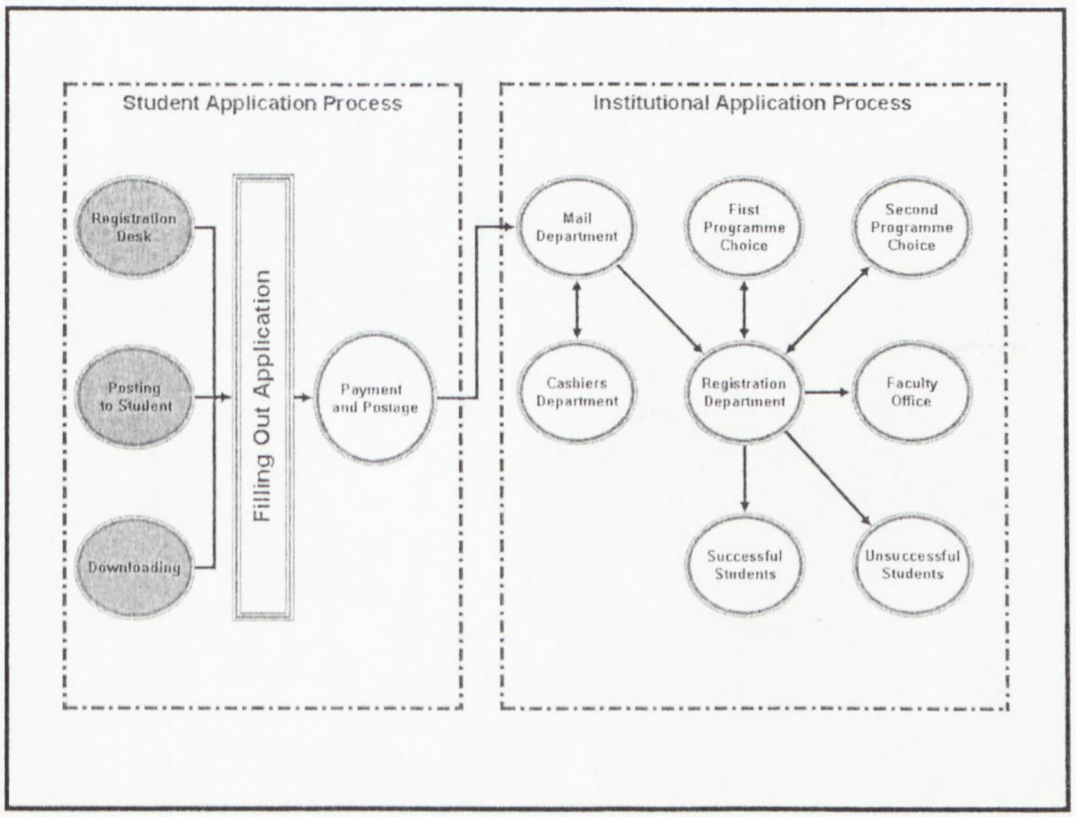

Figure 2.3: Obtaining application forms

Once the student is in possession of the application form, it has to be filed out.

2.3.2. Filling out the application form

When the prospective student is in the possession of the application form, the applicant would need to make certain decisions while completing the form. The relative positioning of this step is depicted in Figure 2.4 by the shaded area.

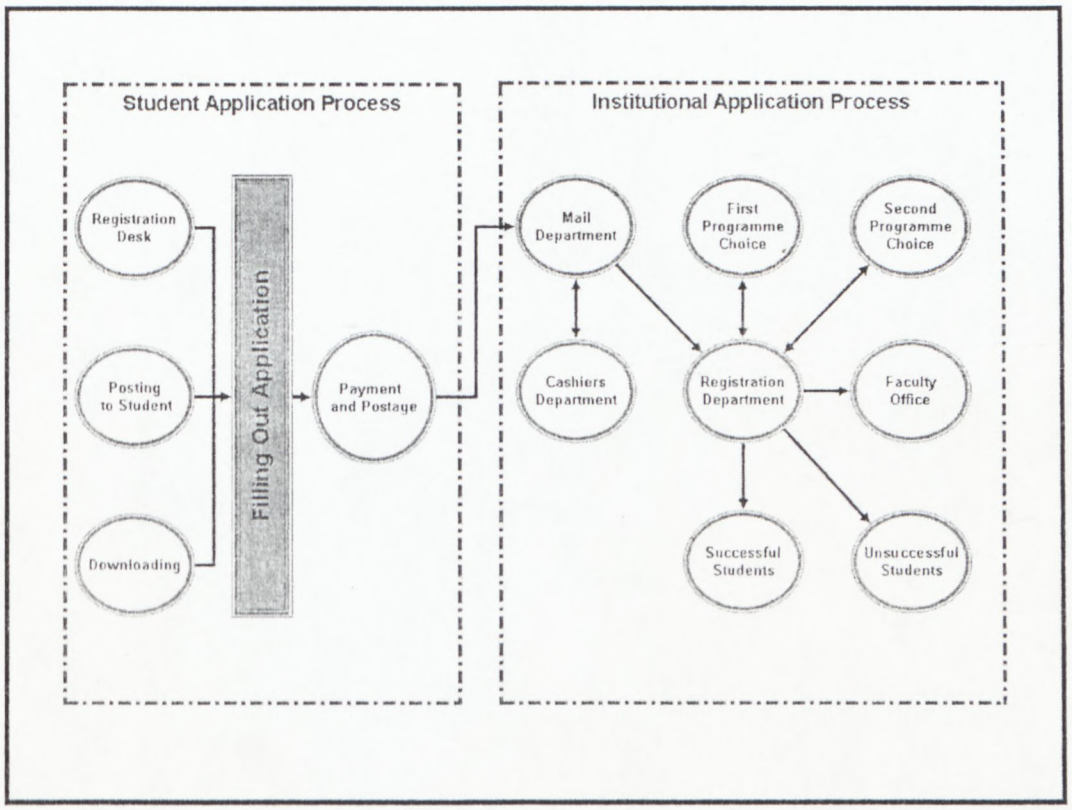

Figure 2.4: Filling out of the application forms

One of the decisions the applicant must make, is on which campus he or she would like to attend classes, Bellville or Cape Town. This is important, because some programmes are offered on both campuses and some are not. This will impact on the applicant's next decision, which will be what programme they wish to pursue. The applicant must then choose if they wish to register for full-time study, or part- time study.

Included on the application form is a section for hostel accommodation, which the applicant may fill out should he or she require hostel accommodation. This application with all the supporting documents must then be posted to the institution. The documentation would include a certified copy of their Identification Document, certified copy of their Grade 12 certificate if they are in

possession of the document already or a copy of their Grade 11 results and the latest Grade 12 results. Should the applicant have studied at another higher educational institution, a certified copy of their highest completed qualification attained and certificate of good conduct is required.

A checklist is sent with the application form so that for the applicant could ensure that everything which should accompany the application form is attached. A checklist is not available on the Internet for downloading, which creates a problem in particular if the checklist was not included with the application.

2.3.3. Payment process for application

After completing the application form, the applicant needs to ensure that the form gets to the institution and payment is made for the application process. This process is graphically depicted in Figure 2.5 and the relative positioning of the step indicated by the shaded area.

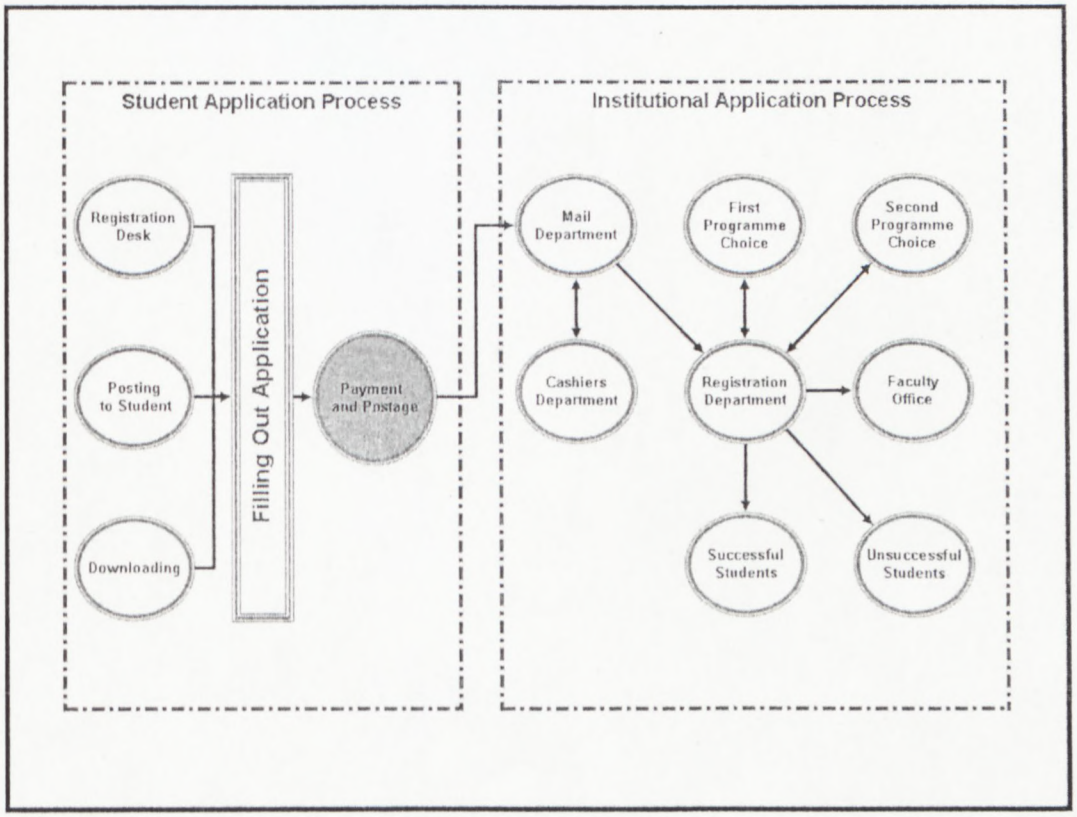

Figure 2.5: Payment and postage of application forms

Applicants have the choice to return their application forms to the institution via post, however they should ensure that their payment is included. This payment

may be done by either postal cheque, cheque or a proof of monies that have been transferred to the institutions bank account. For security reasons, the institution do not want to receive cash in the post, however some students still send cash with the application form.

This dispensation calls for an extensive monitoring process to be in place in the Post, Finance and the Cashiers Department, which is very time consuming. The other method of paying for the application fee is for the student to go to the institution and pay the monies directly to the Cashiers Department in the Administration building, where more often than not result in long queues being formed.

2.3.4. Receiving of applications at CPUT Mail Department

Once the Mail Department has received the application forms, two of its personnel are required to be present when opening applications sent by post. This is done because cash monies are invariably included calling for them to check that the correct amount of money is in the envelope. A designated person ticks off against a list of student names that will indicate the application form and the type of payment received in the post. If cash is received, they will pay it into the Cashiers Office who will then sign against the list to verify that the cash has been paid to the institutions. All the application forms will then be sent to the Registration Department. This step in the application process is reflected in Figure 2.6 by the shaded area. If applicants have paid for the application process directly at the Cashiers department, the application form is taken by the student directly with proof of payment, to the Registration Department.

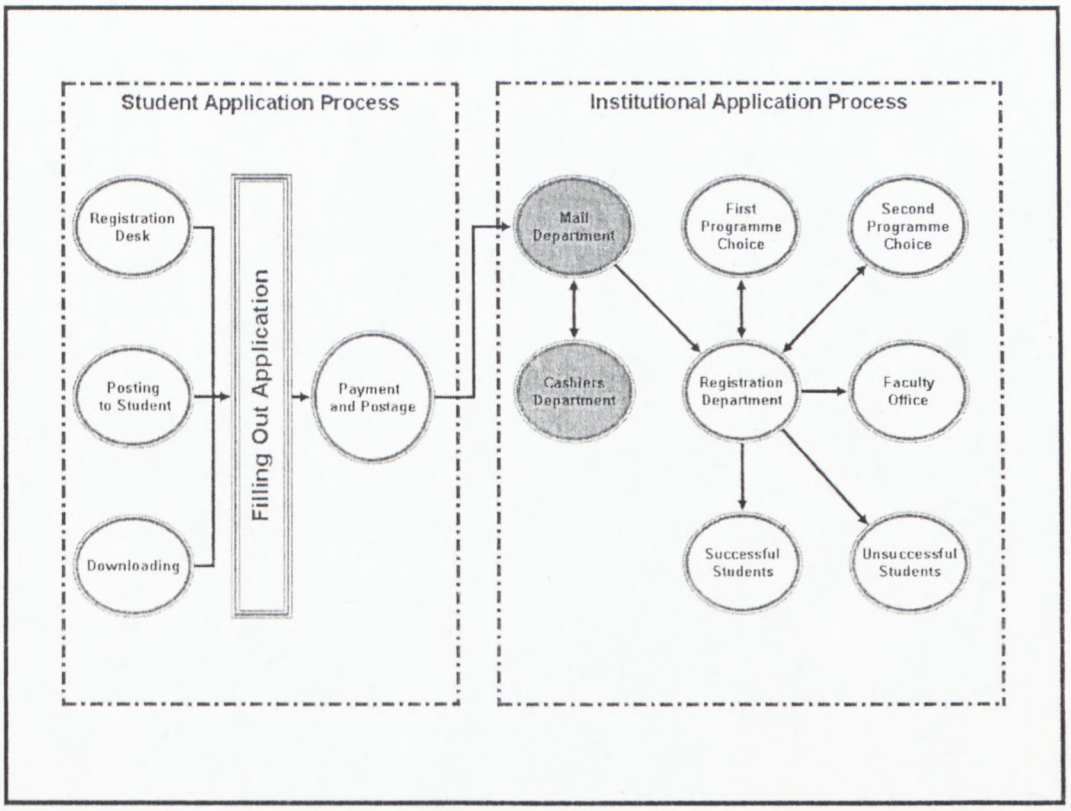

Figure 2.6: The Mail and Cashiers Department

2.3.5. Registration Department

The Registration Department receives application forms from the Mail Department, and from students whom have paid their money in at the Cashiers Department. In spite of the fact that a cut-off date applies for applications, more often than not, it arrives late.

After the receiving the application forms, the Registration Department follows the process as depicted in Figure 2.7. The first step is to manually sort the application forms into the first choice of programme that the applicant wishes to study for. At this stage, an applicant will be issued a student number if it is the first time they apply to the institution. Returning students, will use their old or existing student number. Staff then compiles an electronic list of the applicants, which is then printed and sent with the application forms to the relevant academic departments for scrutiny. At this point, the second choice of programme is not considered.

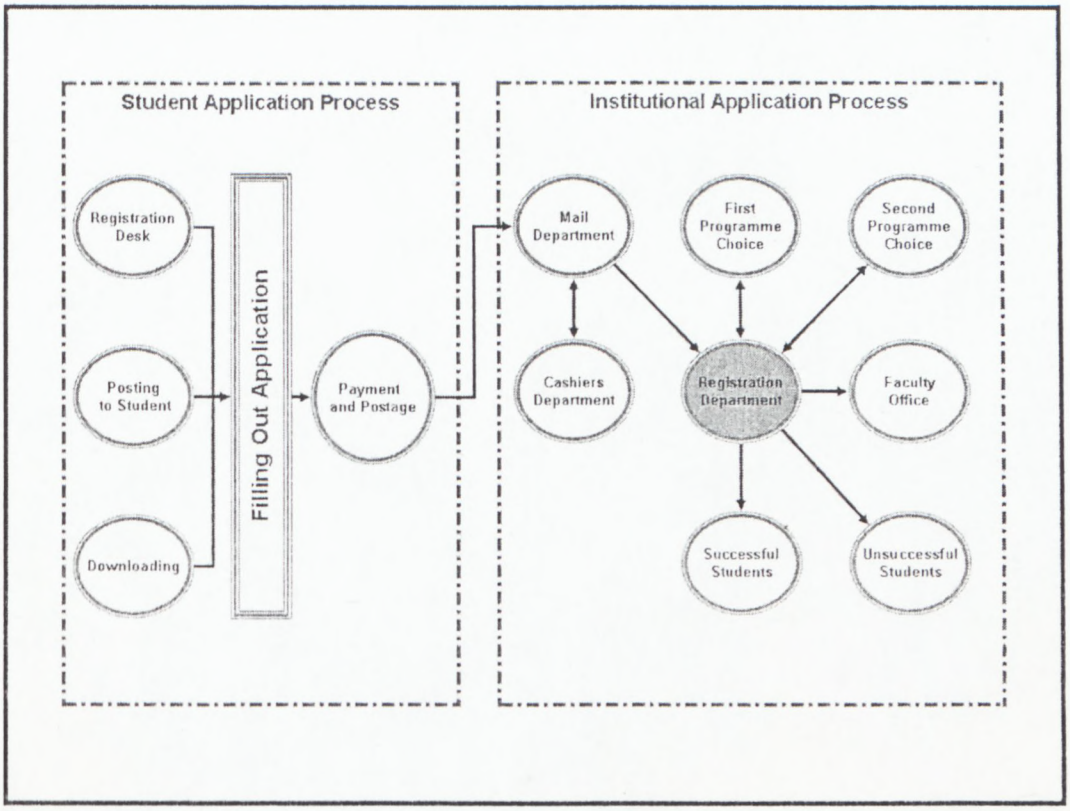

Figure 2.7: The Registration Department in the application process

As a result of students not adhering to the deadline, this process could continue for a considerable time after the cut off date. The consequence of this is that all departments involved with the application process, will on a continued basis be busy with the application process.

2.3.6. Academic Departments

Once the Academic Department receives the application form from the Registration Department, the Head of Department (HOD) or a designated Senior Lecturer will go through each application to determine if the applicant has the required pre-requisites to attend the programme. It will then be decided if the application is approved, rejected or provisionally approved depending on information still required by the applicant such as a Grade 12 Certificate. In this respect, refer to the selection process graphically depicted in Figure 2.8, the shaded areas reflecting the process. The HOD will then sign these applications off and return it to the Registration Department.

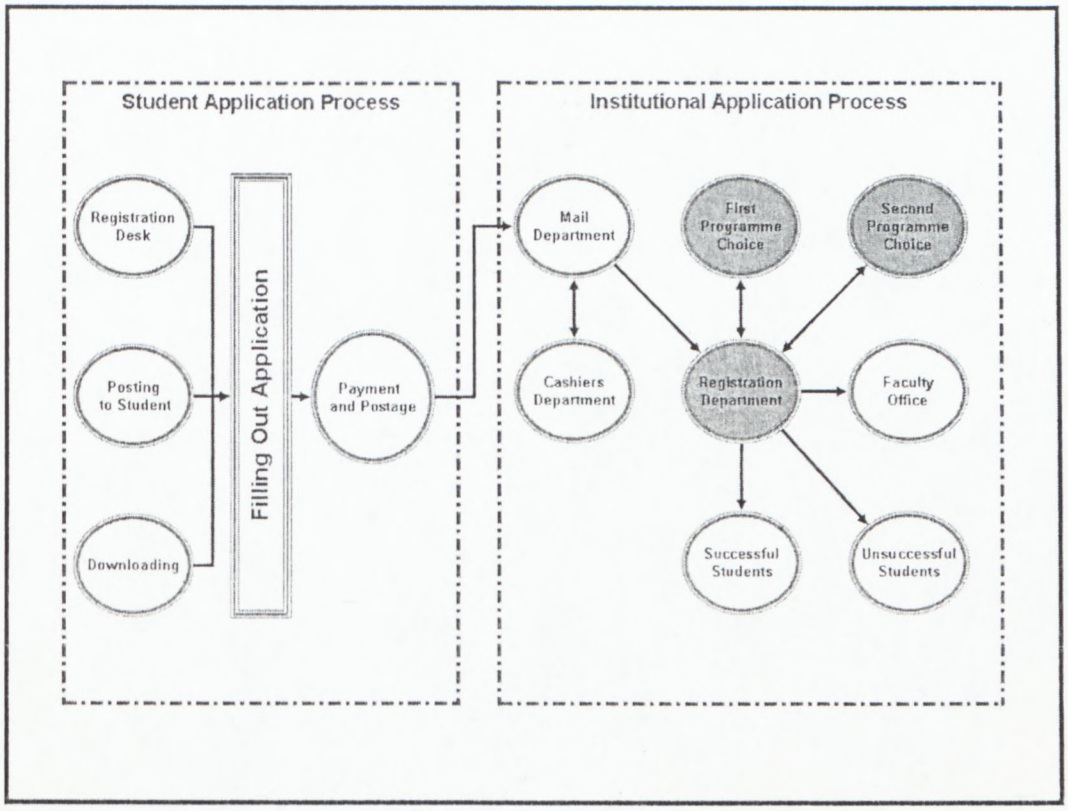

Figure 2.8: Academic Departments selecting students

Certain Academic Departments invariably at this stage record students details in terms of acceptance or rejection on their own database while going through the application forms. The Academic Departments do this so that they could forecast the student numbers for the following year, and thereby structure the resources needed for the students like the size of the classroom and material to be bought in preparation for classes. This database is not part of the main database of the institution, and as a result they have to exercise care that the two databases will conflict with student totals.

2.3.7. Return to Registration Department

At this stage, the applications that where rejected by the 'first choice' Academic Department, will then be forwarded to the 'second choice' Academic Department. This 'second choice' Academic Department will go through the process of accepting and rejecting again, before returning the application form to the Registration Department.

The applicants that have been approved or provisionally approved would then be informed via post that they have been successful, and when to register at the particular department.

The Registration Department then compiles a list of prospective students that have been successful in their applications to the institution, and sends registration forms of the students to the respective Academic Departments in preparation for registration.

2.4 THE REGISTRATION PROCESS

The registration process is embarked upon when a student who has successfully completed the application process, received a student number and has been accepted on a programme. Such students then have to register for that particular programme. The registration process is graphically depicted in Figure 2.9. It is of importance to note that in line with the established methodology followed at CPUT, the figures depicting the registration process are annotated in terms of the 'steps' followed in the process with the legend, 'Points'.

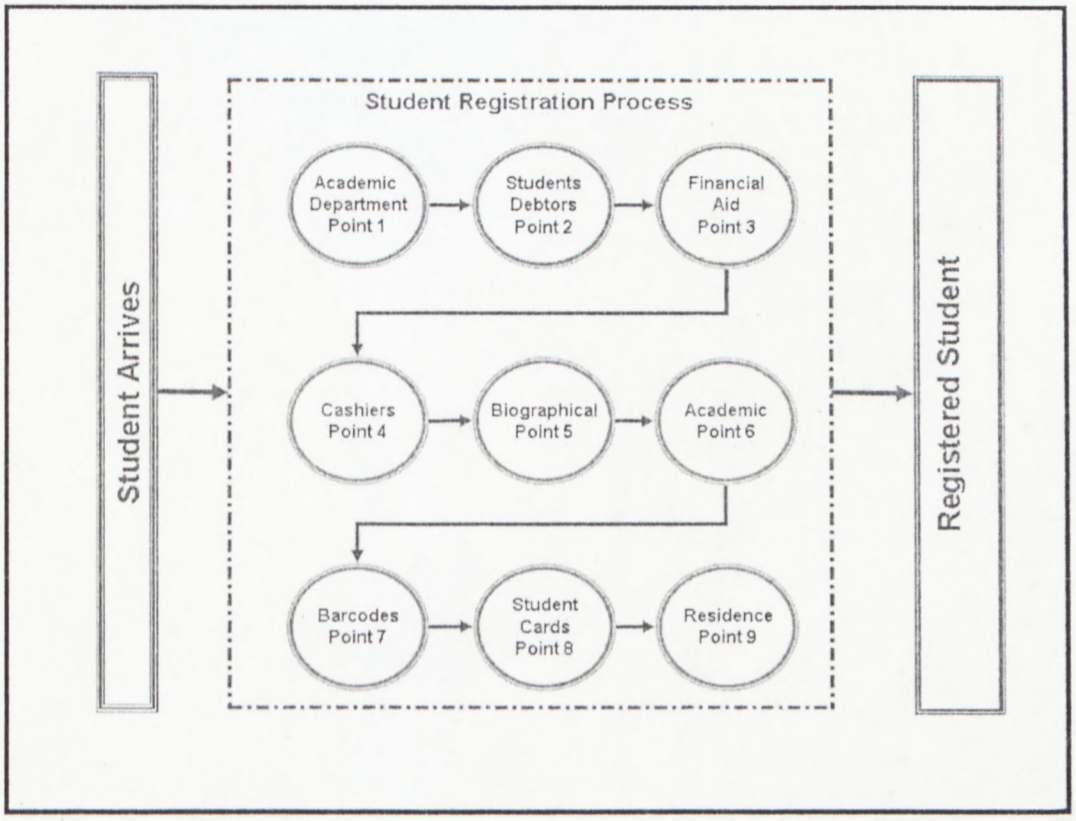

Figure 2.9: Holistic perspective of the registration process at CPUT

The reader's attention is drawn to the fact that the graphical process depicted in Figure 2.9, represents the process from when a student arrives at the institution to register, until the student has completed the registration process and is ready to attend lectures.

2.4.1. Point one (Academic Department Registration)

This is the first port of call for the student who wishes to register. The student would normally arrive at the Administration building where he or she would be directed to the Academic Department designated by the selection process for enrolment. It is customary for academics from the designated Academic Department to register the students for the different programmes. Some of these buildings are far from the IT centre and students, more often than not accompanied by their parents must walk to these building to start the registration process. These students and parents more often than not would be subjected to the adverse conditions of the Cape weather, could easily end up standing in extreme conditions waiting in long queues to be assisted. Some Academic Departments have opted to use the IT centre to do this part of the registration for the very reason due to the number of students being processed, and the long queues outside of the building. This section of the registration process is graphically depicted in Figure 2.10, with 'point one' in the process shaded for ease of reference.

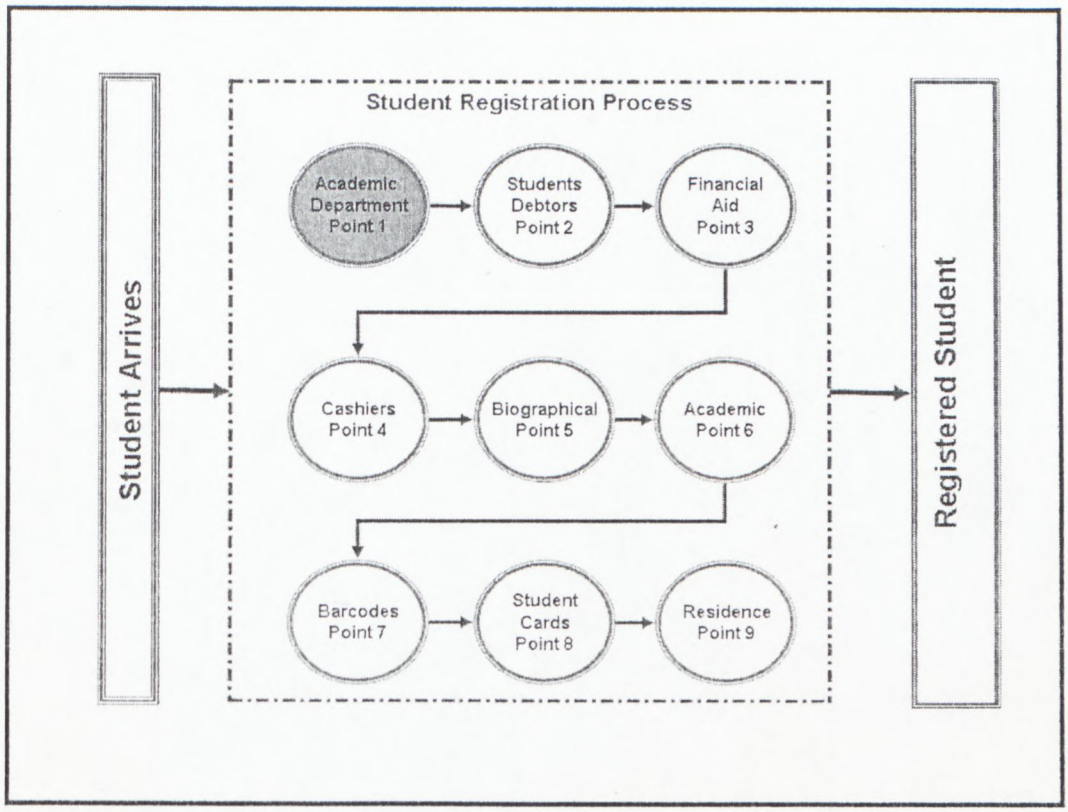

Figure 2.10: Point 1 Academic Department registration

At this point students that have been accepted or provisionally accepted will receive their registration form from a staff member in the Academic Department. This would have been printed and sent onward by the Registration Department via the Faculty Office. Here, each student registering would need to be interviewed by a lecturer assigned to a computer to assist the student in the choice of subjects. Once this has been executed, the student would be place into a class group and be presented with a timetable for his/her classes. It should also be possible to present the student with an exam timetables at this point. The fact that lecturers do this part of the registration process on a computer transposes into the fact that they have created their own database to assist with timetabling and resource management. Again, the reader's attention is drawn to the fact that this database is not the same as the main database used by the institution.

Returning students, namely those that are doing second year, second semester, completing their diploma or BTech students, would also need to be interviewed by the lecturers as some of these students would have invariably failed a subject and they would need to check time tables for classes with other subjects being

presented. Checks will have to be done to ascertain if they have all the pre-requisites and co-requisites to enable them to execute their choice of subjects.

Returning students who have not studied at the university the previous year, would not have a registration form printed for them. They would need to get a letter from the Academic Department requesting that the Registration Department print a form for them. They then would have to re-enter the IT Centre or Registration Department, stand in a queue to have it printed, return to the Academic Department, and once again stand in the queue so that the lecturer assisting the students can choose their subjects and sign the registration form.

In addition to the creation of 'own databases', more often than not Academic Departments will also create their own database to keep control or track of the number of students entering into a programme or maintain a file of students results. This is as a result of not being allowed to use the ITS to do checks, and the ITS not being setup to facilitate this kind of entry or queries. When this occurs, the University ends up having a number of smaller databases that do not map to each other. This would be alleviated if the University would use one database that everyone authorised, can use. Unfortunately, the ITS still contain erroneous and outdated data caused by the merger of the Peninsula Technikon and Cape Technikon into the Cape Peninsula University of Technology.

A further requirement is that students will have to correct the biographical details that had been entered into the system previously, and which over time could have changed e.g. change of address, change of marital status etc. This type of data is required to annotate on the registration form so that the Registration Department's staff could change it on the database.

Students who have not applied for admission before the due date, or whom have not received notification of acceptance, would be directed to the appropriate faculty where an academic staff member will have to determine whether the student satisfies the admission requirements and be accommodated. If the student qualifies for admission and accommodation is available, he/she will have to complete an application form and hand it to the academic staff member for

approval. The applicant then is required to pay an application fee at the cashiers and provide all relevant information in at enquiries desk in the IT Centre, where a registration form will be printed for the student. The students will then have to return to the Academic Department with a registration form, and queue with the other students for registration.

Once the subject choices have been completed, academic personnel are required sign and date the form. The academic staff member will hand the registration form back to the student. Cellophane tape is then pasted over subject choices, to prevent the tampering with the form. The student may then proceed to point two in the IT Centre.

2.4.2. Point two (Student Debtors)

Point two as graphically depicted in Figure 2.11 and shaded for ease of reference, has been designated for Student Debtors, where student account balances are verified. This is situated in the Student Centre for ease of access for the students during the year. During the registration periods the Student Debtors Department however move to the IT Centre to assist with registration and aimed at alleviating the need for students to have to return to the Student Centre to get to the Student Debtors Department. Unfortunately the moving of these departments to the IT Centre is temporary and therefore does not in reality work efficiently because after the two week registration period they return to their original building and late registering students are subject to a process of walking to these buildings all over the campus.

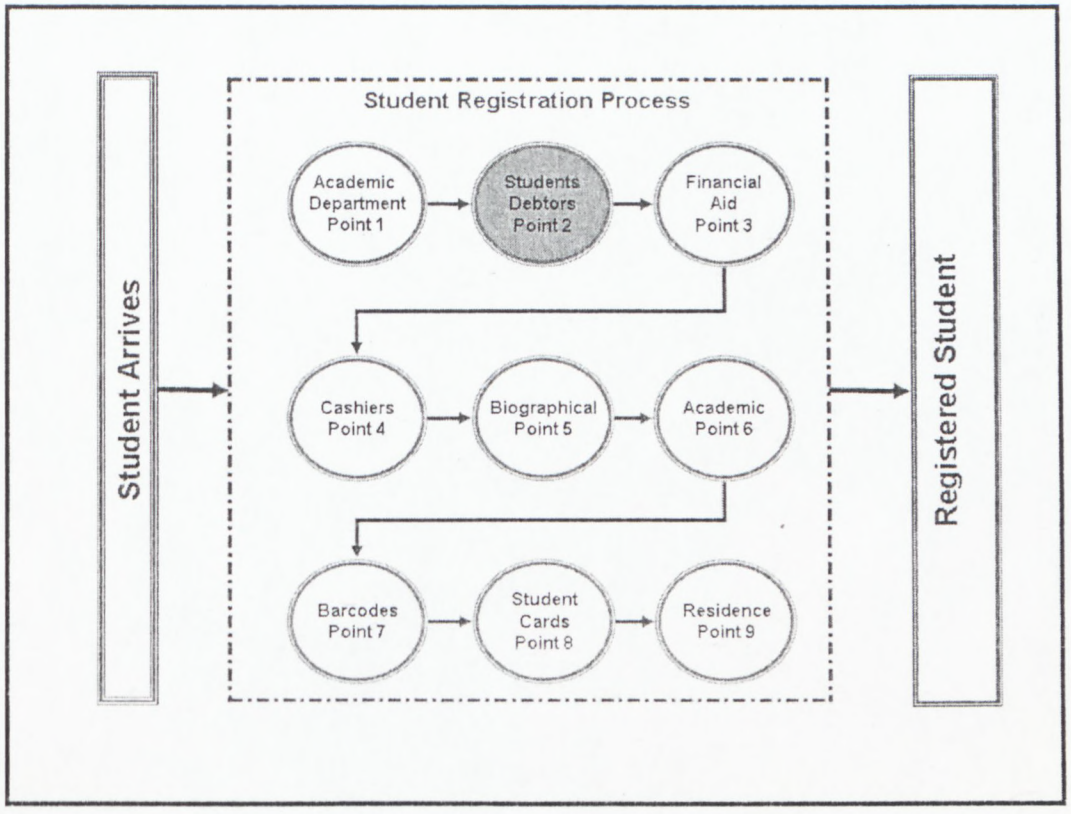

Figure 2.11: Point 2 Student Debtors

After point one, students are required to continue to point two. As a rule, point two has a long queue of students during the registration period. At point two the personnel would check for outstanding balances, culminating as a result of not settling outstanding fees from the previous year/years, outstanding monies for library books etc.

Students that do not owe money, would have their registration forms signed and will be permitted to continue to point four. At point four, students are required to pay the minimum registration fee to enabling them to continue with the registration process.

If the student was awarded a bursary, he or she would have to produce an authorisation letter from the bursar upon which, the registration form would then be signed and the student would be advised to continue to point five.

Some students who owe monies and cannot afford the registration fees or who need financial assistance, would need to apply for financial aid and would be referred to point three, which is the Financial Aid Department.

Students who paid the registration fee using the Electronic Funds Transfer (EFT) before the registration date would produce a copy of the receipt. The receipt would have to be verified against the student number, and if in order, the registration form would be signed and the student directed to point 5.

2.4.3. Point three (Financial Aid)

Students, referred to point three as elaborated upon in Paragraph 2.4.2 and graphically depicted in Figure 2.12 would now be required to apply for financial aid. They would apply either for a loan from one of the banking institutions or endeavour and get a bursary that is on offer at the university.

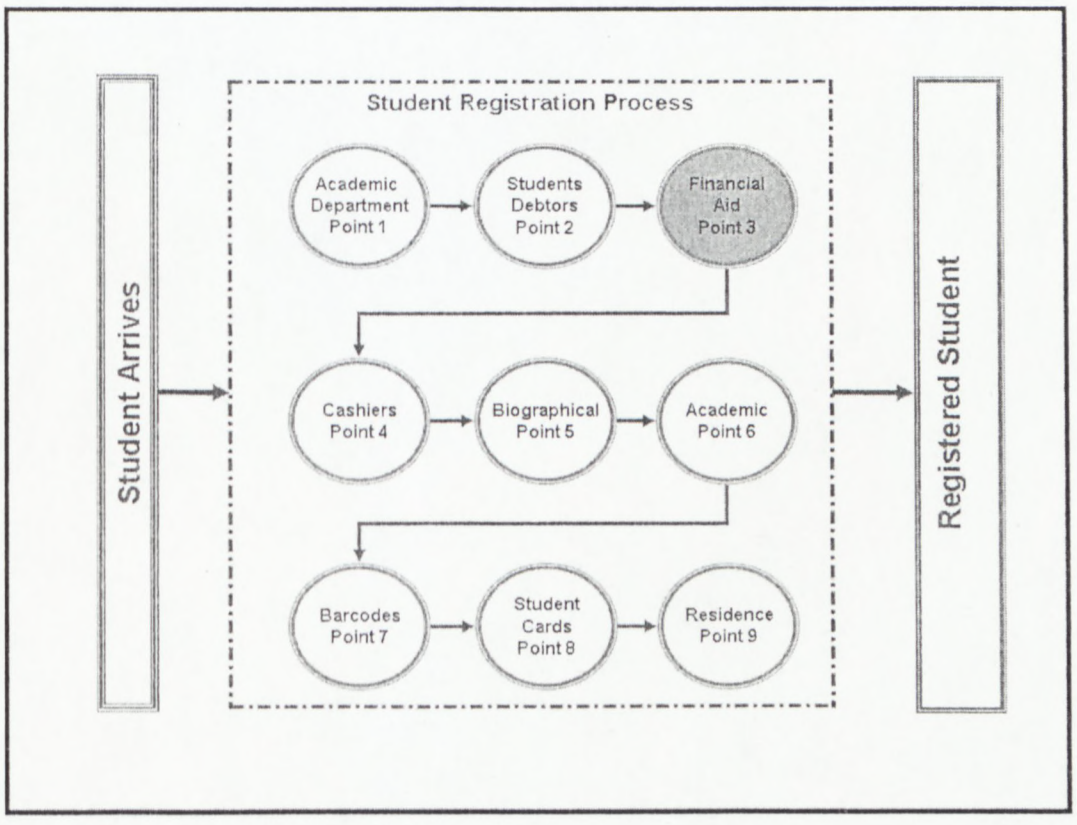

Figure 2.12: Point 3 Financial Aid

Returning students whom have not settled all outstanding fees at the university are required to obtain special permission to register. To do this, they will need to

explain and motivate their circumstances and come to an agreement on how they will pay the outstanding fees.

Students who have a letter from their companies or sponsor indicating that they will pay on behalf of the student, will need to present the letter to the Financial Aid Department. This would include a bursary external to the university.

Financial Aid staff will now issue a financial aid application form (where required). They will also check whether loans or bursaries were allocated to senior students, after which they must sign and date the registration form. If a bursary or loan was allocated to the student, staff will sign the form and the student may proceed directly to point five in the IT Centre.

2.4.4. Point four (Cashiers)

Once completed with Student Debtors, students who have not paid their registration fees, would then need to do so. They would then go to the Cashiers at the Administration building to facilitate payment. Normally during registration there are long queues at the this point, not only to pay registration fees, but also to pay outstanding fees, library fees, books etc. This process is graphically depicted in Figure 2.13, and the relevant process shaded for ease of reference.

During this process, students face a real risk of being robbed because of the large amounts of cash carried on their person. The university now employs an external security company to handle the influx of students into the administration building and to mitigate the risk of robbery. Certain areas are cordoned off for further protection, and the security around the Cashiers vicinity is also increased during the registration period. The personnel at Cashiers are overworked, and more often than not have to work through their lunch and tea breaks to cope with the demand of students who wish to pay in their money. To help with the workload the university has employed student assistants. This has increased the capacity at the Cashiers desk from two to seven staff members.

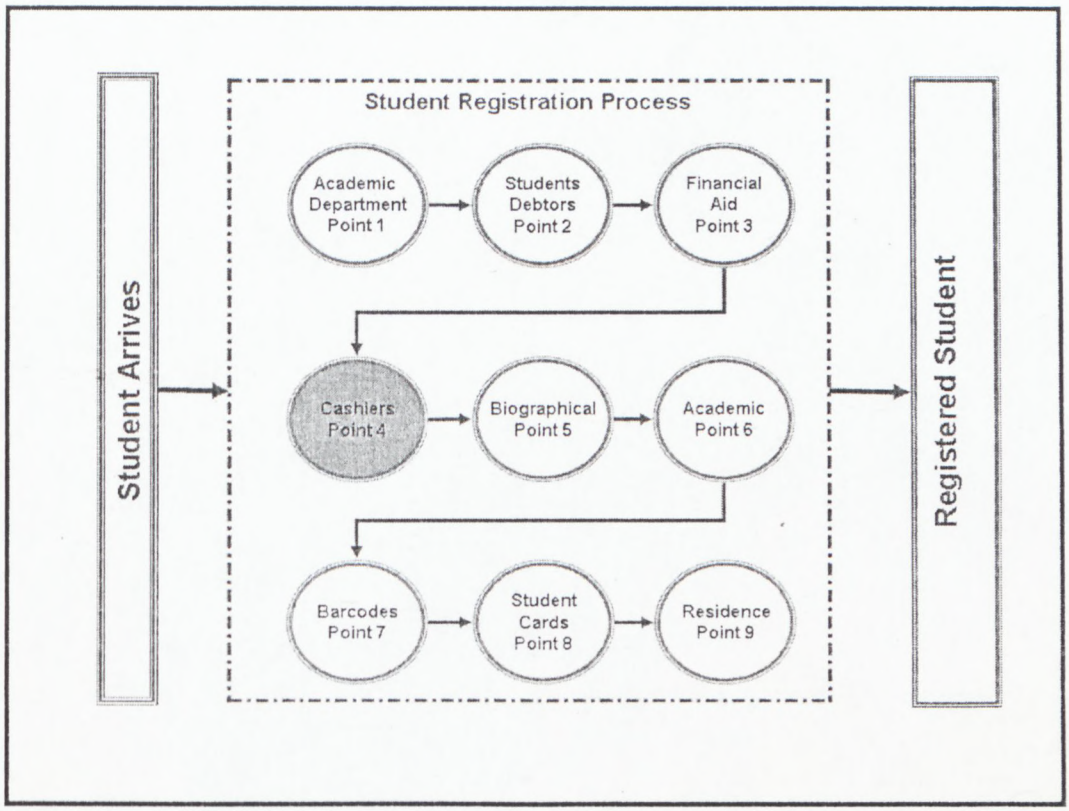

Figure 2.13: Point 4 Cashiers

The payments at the Cashiers could take place in the form of cash, credit card, debit card or cheque. This diverse payment methods calls for reconciliation of monies paid, placing more pressure on an already overburdened head cashier. When students have completed paying the registration fee, the cashier endorses signs the registration form and hand it together with a receipt back to the student, who then may proceed to point five in the IT Centre.

2.4.5. Point five (Biographical)

At this point, indicated in Figure 2.14 and shaded for ease of reference, students will have an opportunity to update their biographical details. This the student would have done manually on the registration form at the Academic Departments while waiting in the queue. They would have change details like change of address, change of marital status etc. The Registration Department employs student assistants to help enter this data onto the ITS.

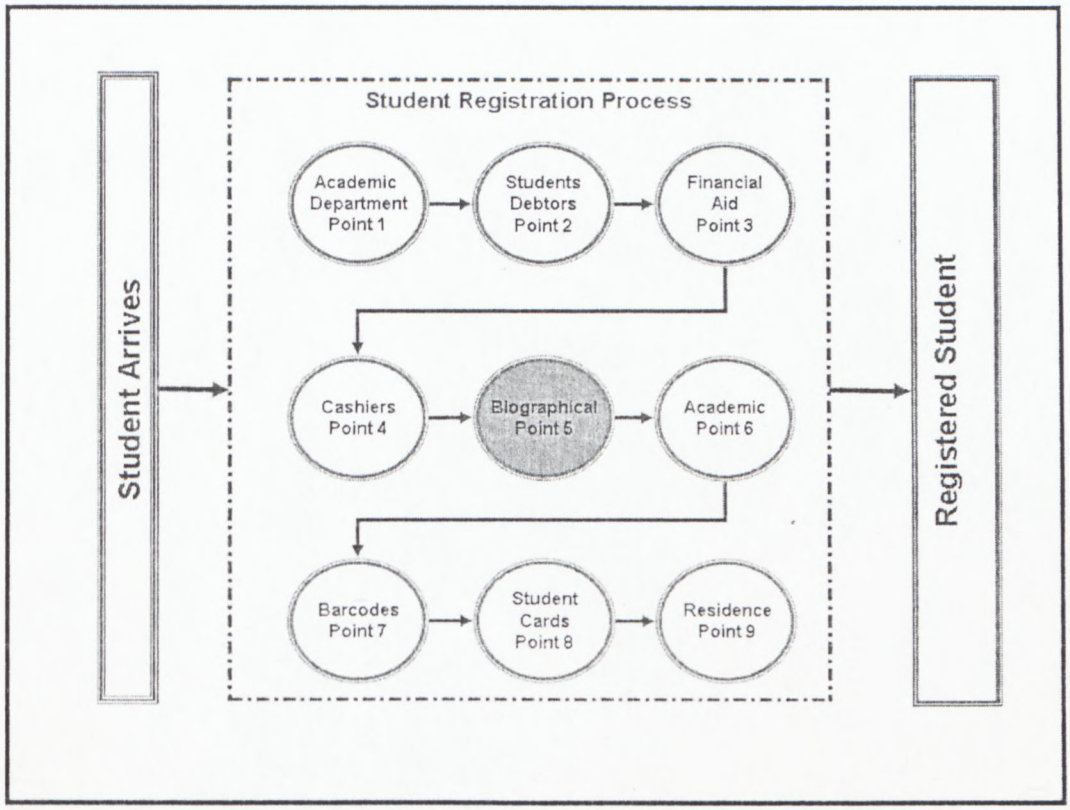

Figure 2.14: Point 5 Biographical

Invariably students have found that information that were changed previously, still does not reflect on their new registration forms. This could be attributed to a problem with the database or that the new data was not updated. This in particular, is of concern. The data capturers after capturing the changes will date and sign the registration form. The student is then sent to point six.

2.4.6. Point six (Academic Registration)

Academic Registration is the point at which the subject choices that was decided upon by the lecturer and the student at point one will be entered onto the database. This process is graphically depicted in Figure 2.15, with the action shaded for ease of reference. Data will be checked for irregularities that may have occurred by having the co and pre-requisites entered onto the database beforehand by a staff member from the Examination Department. Detail (confirmation of registration and account) is then printed and handed to the student to verify the subjects and course registered for. The student will then proceed to point seven.

Here a faculty officer must be available at all times to deal with any questions regarding the academic structure.

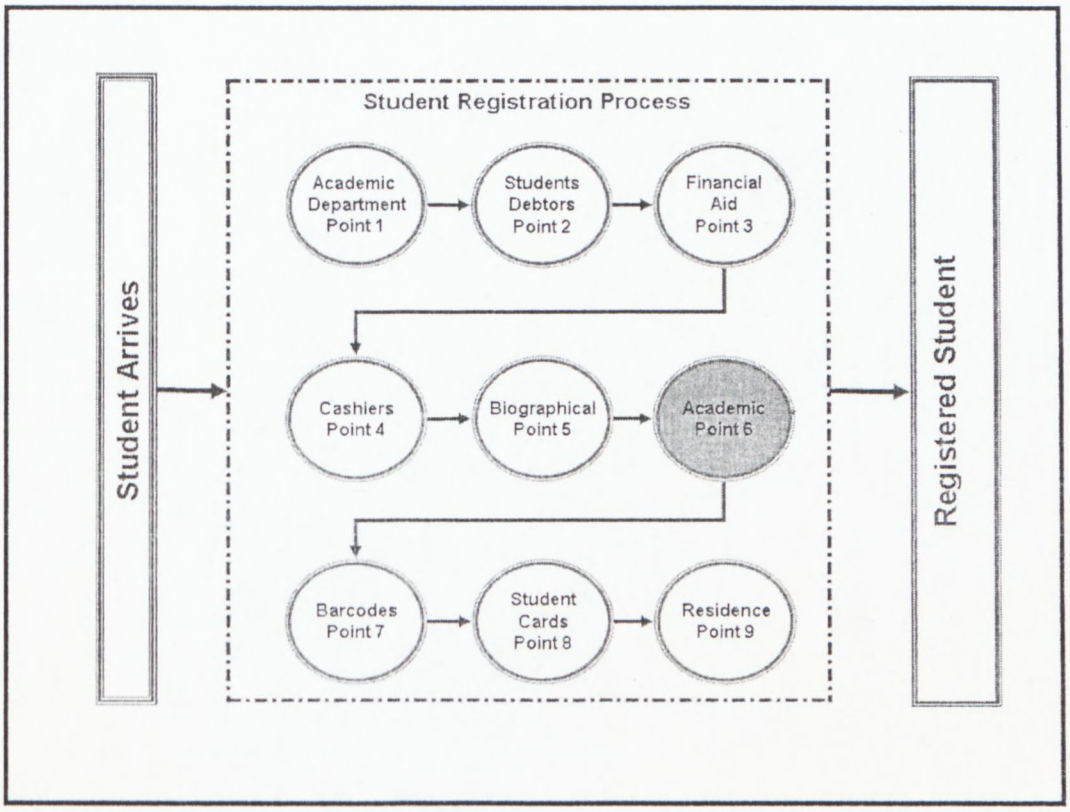

Figure 2.15: Point 6 Academic registration

2.4.7. Point seven (Barcodes)

At this stage, new students will receive a barcode and a student file will be opened for the student. This process is graphically depicted in Figure 2.16 with the action shaded for ease of reference. All registration documents are collected, including certified copies of matric results, identity documents, study permit (if applicable), registration forms etc, from the student. The barcode is assigned to the student number and is printed on his/her student number. The student will then proceed to point eight.

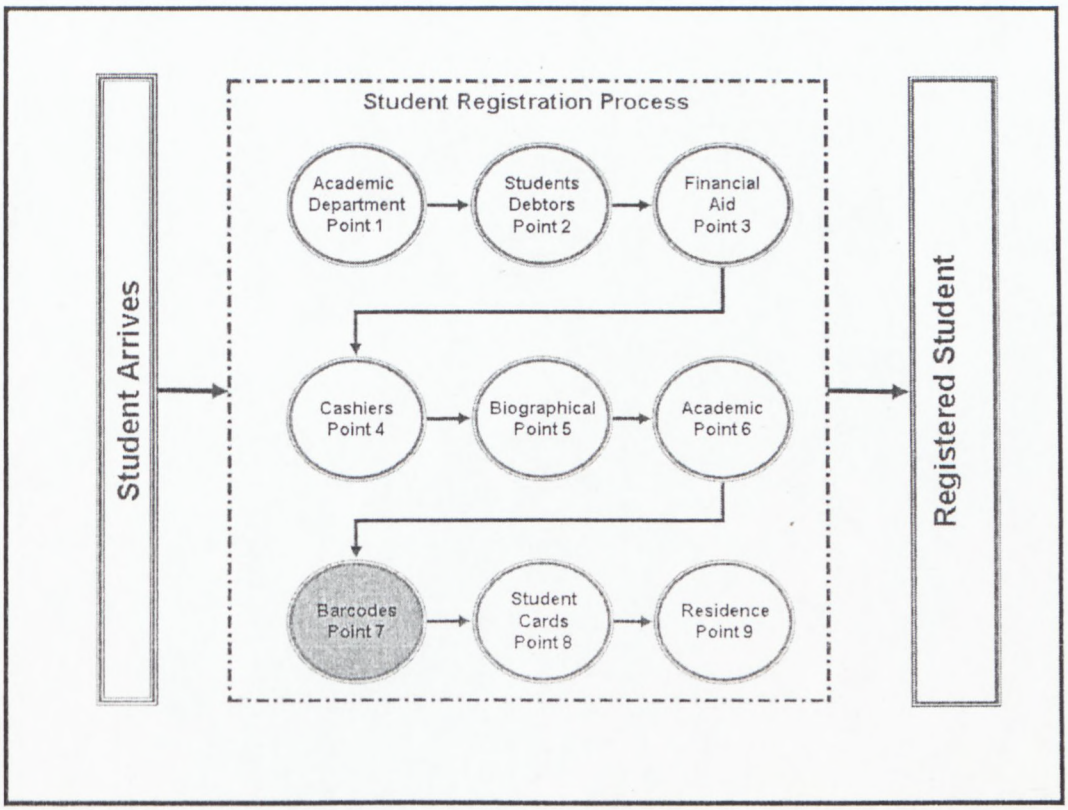

Figure 2.16: Point 7 Barcodes

2.4.8. Point eight (Student Cards)

At this point, the new student's photograph is taken and a student card is printed and issued to the student. In the case of returning students, the students must produce their old card and the student's card will be annotated with the current year reflected thereon. In the case of a lost/damaged card, the student will have to pay a replacement fee at the cashiers in the Administration Building before a new card will be printed and issued to the student. This process is graphically depicted in Figure 2.17, and the action shaded for ease of reference.

Only after the student has completed all of the above processes, will they have completed the academic registration process.

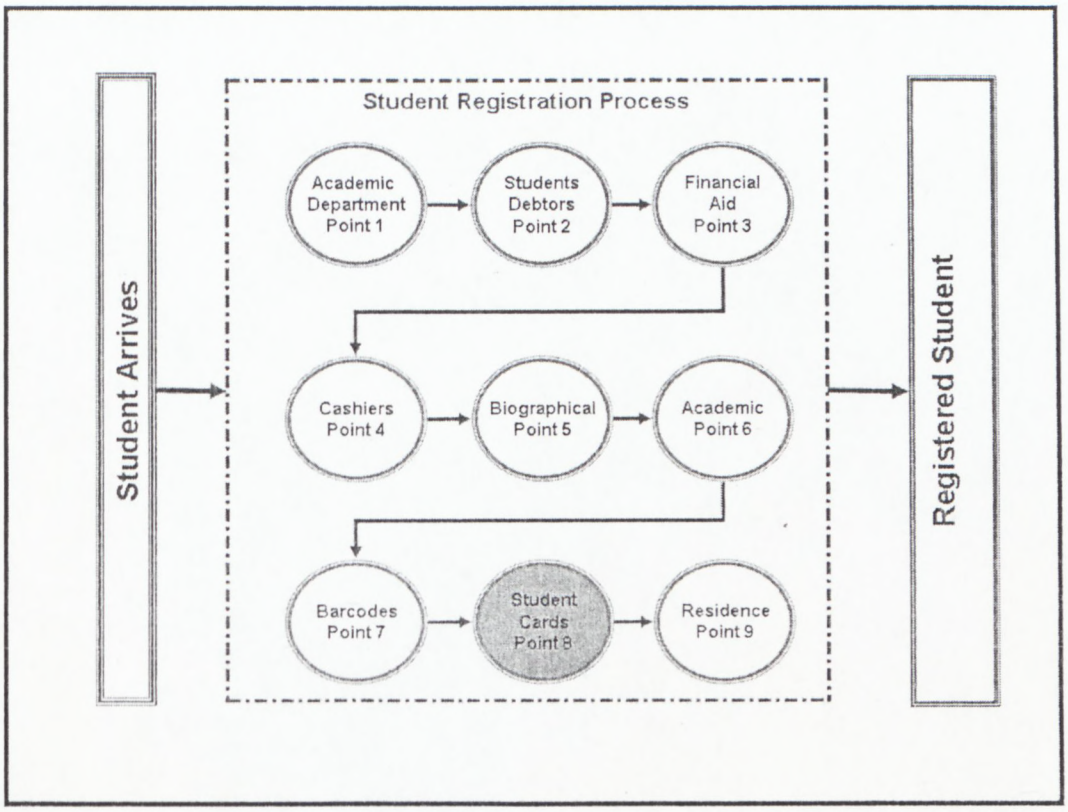

Figure 2.17: Point 8 Student Cards

2.4.9. Point nine (Residence Registration)

The Student Affairs Department will process details of a student whose application for accommodation in residence was successful (Point 9). This process is graphically depicted in Figure 2.18 and the process shaded for ease of reference. A room will be allocated and an account will be opened for the student. Students may only be registered on to the residence system after they have been registered.

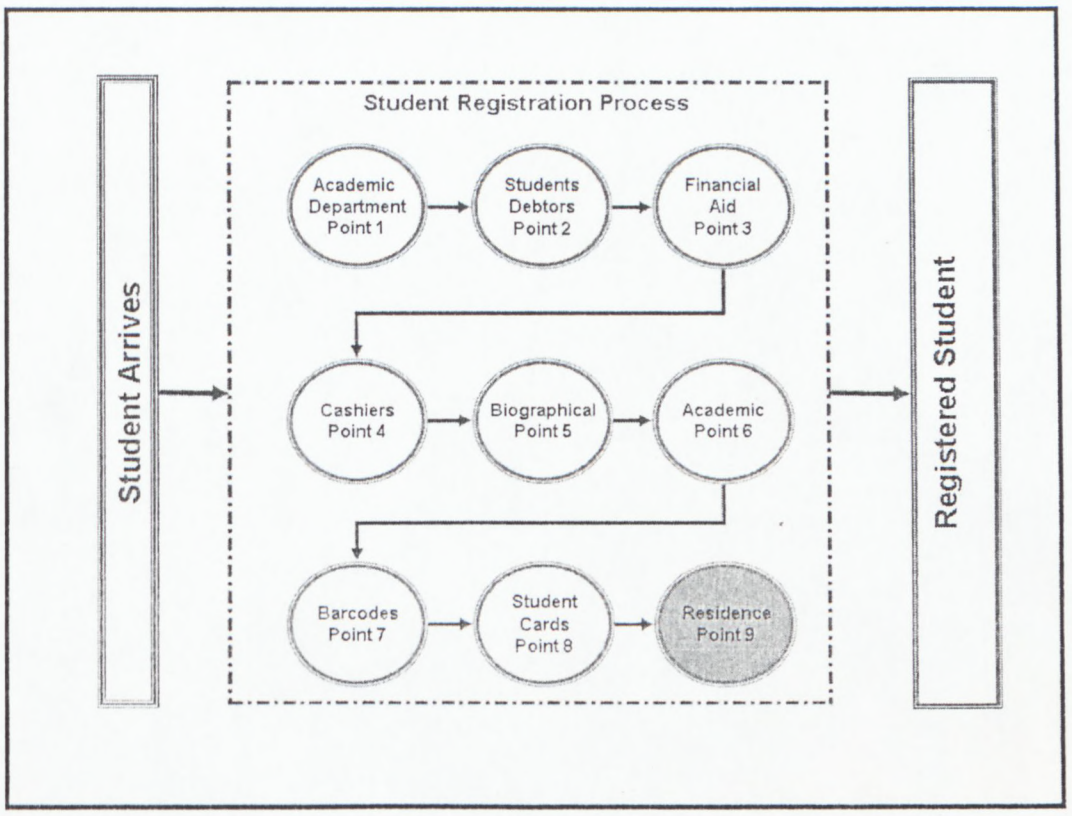

Figure 2.18: Point 9 Residence

2.5. ISSUES

There are a number of problems/issues in this process that could easily be mitigated. This could be solved in an appropriate manner by implementing new or modified solutions to make the registration process easier and faster for the students. The list below consists of processes that could be implemented without incurring huge cost to the institution or implementing an Internet registration process.

2.5.1. Schedule

The registration personnel works out a schedule, allocating a specific date for the academic departments to enrol students. The suggested solution in itself is problematic, because students do not adhere to the registration schedule, which can be attributed to the following:

- Students do not have enough money on a certain date to register.

- Due to their working hours and other obligations, students are unable to register on a specific date.
- Due to the fact that they are elsewhere in the country at the time of registration.

It is therefore recommended that provision should be made for students who were unable to register on a specific date, by implementing a later final date for registering all late students on one day and one day only. This date should be reflected on the registration schedule. If students are unable to register on the date specified, they should be required to pay a penalty with the registration fee.

The final date decided upon, must be advertised so that students and staff will know about it and therefore prepare accordingly. In this way, staff will be available to help students on the stipulated date and students will not come to campus and get frustrated when they cannot be assisted to register.

2.5.2 Shortcuts

Most of the students' frustration is caused as a result of standing in long queues. When a student that has stood in a queue for a considerable length of time, and then advised to first go to another queue and then return to the previous queue, outbursts of anger or dissatisfaction are expressed. This causes frustration with all concerned and an appropriate method must be created so that students can take a 'shortcut' and not have to stand in the same queue again.

2.5.3 Information helpdesk / kiosks

To serve as a possible 'shortcut', helpdesks or kiosks should be setup at strategic points on the campus so that students could get the correct information without first having to queue. These helpdesks or kiosks should be manned by staff and student assistants that have been trained in the whole registration process, so as to not add to the adverse situation.

Student assistants should be able to answer student queries and make sure that students' have the appropriate documentation before they go to the next point. This will alleviate the problem of students standing in long queues and then going to get documentation that is required elsewhere.

Helpdesks or kiosks should be equipped with a computer connected to the network for staff to do queries, to enable the staff to assist students. The helpdesks or kiosks should also have telephone connectivity to the rest of the campus for queries. The helpdesks or kiosks should operate during the entire registration period and should be move strategically, and be situated near to the department buildings that are busy with registration.

2.5.4 Database

The ITS database that the university uses, cannot be used by the academics and therefore some academic departments have created there own databases. This in itself causes problems, because the data on one database could and would differ from the other. If a program could be installed so that academics could do their scheduling and register students directly onto the database, students would be able to complete the registration process much faster, as some of the queues would be eliminated.

The Department of Education supplies each Higher Educational Institution with the database of students that have completed the schooling year. This database should be incorporated into the ITS database at the institution and thereby eradicating the need for students to produce photocopies of their results.

When the two previously Technikons merged, the two databases from the respective campuses were merged into one database, namely the ITS database. Current issues with the database have to be rectified as soon as possible. One of the problems that exist on the database is the subject codes that are different, creating confusion for the student and academics alike.

2.5.5. Banking

One of the longest queues on campus is when students pay their student accounts. The institution hires a security company to guard this process and the Cashiers Office. It is recommended that the institution should not accept monies (cash) at the cashiers for registration and make it compulsory for students to pay using the electronic banking system only. Only credit cards and debit cards should be allowed to be used during the registration period, therefore resulting in shorter queues and students not losing there money due to robbery.

2.5.6. Barcodes for subjects

Academics and the registration department enter subjects manually onto the registration form, however mistakes invariably occur. It also has the added result that the method is slow and therefore slows down the process of registration. If subject codes and other choices on the registration form were printed in barcode format, the process could be much faster with less mistakes.

2.6. CONCLUSION

In this chapter a holistic perspective has been provided of the issues pertaining to the research environment. The research environment was explained, some areas that could be immediately corrected was highlighted. Furthermore, the application and registration process was elaborated upon in detail.

In Chapter 3, a literature review will be undertaken on the research objectives as well as the research problems

CHAPTER 3: STREAMLINING THE REGISTRATION PROCESS AND INFLUENCING FACTORS: A LITERATURE REVIEW

3.1 INTRODUCTION AND BACKGROUND

The obvious analogy can be drawn that in a developing country, certain tertiary institutions have slow registration processes as a result of primarily manual processes, and prospective students view this as an institution that does not provide cutting edge advanced education. These students against this background, would then prefer going to another more progressive institution. Thus, the retention of students through academic and administrative provision is often associated with services that link the registrar and admission by the academics (Abouchedid & Nasser, 2002:198 citing Gunn & Backes, 1992).

The traditional registration process is adversely impacted upon by the sheer numbers of new and old students wishing to register for a new academic year, and the fact that students would want to add, drop or change subjects. This often places more strain on an already overworked registration department, who then as a result are rude, intolerant and austere to the students. Furthermore, adding and dropping of courses by students can work against the university's productivity and generally hampers the process of registration. The manual intensive registration process overburden employees, an aspect which can be alleviated if electronic technological systems are deployed for registration. The research will focus on factors relating to attitudes of students towards on-campus registration quality provision as it pertains to instructions given prior to registration, course offering, dropping of subjects, adding of subjects, advice provisioning and renewal of identification cards. It is typical of universities in developing countries to be driven by the concept of technological transfer, with service quality not featuring high on list of priorities. In this study, service satisfaction levels will be determined, in particular during the registration process and possible mitigation thereof.

In this chapter the author will investigate what other tertiary institutions have done to streamline their registration process and what technology can be used to improve manual processes. The main focus of the chapter would be to investigate the concept of enrolment management and all the services pertaining to it. Furthermore, how enrolment management can be facilitated by Information Communication Technology (ICT), in particular as it pertains to the touch tone telephone system and the Internet. The last part of the chapter deals with quality related issues concerned with not implementing an electronic registration system.

3.2 ENROLMENT MANAGEMENT

According to Anthony (2006:**O**nline) citing Hossler and Bean (1990), "Enrolment management is an organizational concept and a systematic set of activities designed to enable educational institutions to exert more influence over their student enrolments". One of the core concepts of strategic enrolment management strategies is the institutional mission (Anthony, 2006:**O**nline citing Bontrager, 2004).

Hossler (2008:**O**nline), emphasizes that enrolment management is an open-systems and synergistic organizational approach. This approach encourages an organizational atmosphere that makes reporting relationships among student-service units more transparent. Furthermore, it encourages an environment where offices and divisions collaborate to enhance the quality of the student experience, which in turn facilitates the strategic management of enrolments.

Anthony (2006:**O**nline) citing Hossler and Bean (1990), is further of the opinion that enrolment management is organized by strategic planning and supported by institutional research, concerning student college choice, transition to college, student attrition and retention, and student outcomes. Furthermore according to Hossler and Bean (1990) cited by Anthony (2006:**O**nline), institutional practices are guided by these processes in the areas of new student recruitment and financial aid, student support services, curriculum development, and other academic areas that affect enrolments, student persistence, and student outcomes from college.

3.2.1. ICT assisting financial aid in Higher Education

With a total enrolment of 6 400 students, Wake Forest University in the United States is a private, coeducational, liberal arts institution. A study conducted at the University (College Board, 2005:**O**nline), determined that approximately two-thirds of its undergraduate students are awarded financial aid, and every applicant is verified. The institution faced an annual challenge to complete this labour-intensive verification process in a timely fashion with a small staff contingent. "The Financial Aid staff had to work overtime throughout the spring awarding period to obtain and manually process tax documents from about 5,000 financial aid applicants. By choosing Institutional Documentation Service (IDOC) for document collection and imaging, data entry and Web posting, Wake Forest has expedited its aid packaging and given the Financial Aid Office more time to spend with students and families" (College Board, 2005:**O**nline).

3.2.2. ICT easing the workload in Higher Education

According to College Board (2005:**O**nline), Wake Forest's Financial Aid Office faced a huge administrative task each year with staff compliment of nine people consisting of seven professional and two support staff members. "During the brief three-month awarding season, the staff had to request and obtain financial documents from approximately 5,000 undergraduate and graduate students, review all of them, and manually key data to update student and parent application information in the system. Because reading documentation for need analysis is a specialized skill, the director, Bill Wells, could not hire temporary workers to augment his staff" (College Board, 2005:**O**nline). To mitigate this adverse situation, the university then deployed the Institutional Documentation Service. This service collects financial documents from applicants and processes the data. This process involves scanning the data, keying in data from W-2 forms and tax returns. This data is then provided to the institution electronically. As a result, Wake Forest Staff can conveniently and securely view the actual images of the documents on the College Board website (College Board, 2005:**O**nline).

3.2.3. ICT and the scarcity of resources

"No theoretical concept furnishes a better understanding of the emergence of the field of enrolment management, or provides a better focal point for enrolment managers, than Resource Dependency Theory. Resources Dependency Theory looks at how the external environment affects internal resources" Anthony (2006:**O**nline) citing Hossler and Hoezee (2001). Enrolment managers are helped by resource dependency theory by continually asking the following question. What are the scarce resources associated with student enrolments? (Anthony, 2006:**O**nline citing Hossler & Hoezee 2001):

Anthony (2006:**O**nline), citing Hossler and Hoezee (2001), is of the opinion that enrolment managers need to pose the following questions to themselves:

- What are the areas of scarcity on campus?
- Are student enrolments associated with any of these?
- Can my organizational unit help to provide these scarce resources?

3.2.4. Enrolment goals

Kurz and Scannell (2006:**O**nline), list the following as 'goals' of enrolment:

- **The Organization for Enrolment Management**: To organize departments that relate to the management of enrolments in such a way that the coordination of staff, flow of information, and the integration of decisions can most easily be facilitated.
- **Student Information Systems and Research**: To create an integrated student database and the capacity to use systems, including the web, for coordinated research, planning, recruitment, and communication.
- **Admissions Marketing:** To develop an admissions marketing program in order to attract appropriate students in sufficient numbers
- **Pricing and Financial Aid Strategies**: To implement pricing and financial aid strategies that will optimize the institution's ability to generate net tuition revenue and attract and retain the desired academic, racial/ethnic, and social/economic mix of students.

- **Demand Analysis and Institutional Response:** To develop a capability to anticipate immediate and long-term student demand and methods of improving the institution's ability to respond to these interests.
- **Retention and Transfer Students:** to formalize an institutional retention program in order to identify reasons for attrition, to minimize it to whatever extent desirable, and to enroll qualified transfer students as replacements.

3.2.5. Understanding the needs of the Institution

Before a tertiary institution can begin the process of organizing to meet its enrolment goals, there must be a thorough, realistic, and honest understanding of itself before. In this respect, Kuntz and Scannel (2006:**O**nline), list the following actions to be taken by organizations, based on institutional realities.

- If your college is seeing its yield, that is the percent of students enrolling among those admitted-declining significantly over a period of time, the Financial Aid office and the Admissions office need to work together to understand price sensitivity and make appropriate changes to awarding policy, with merit as well as need-based funds.
- If demand, the number of appropriate inquiries and applications at your institution-is on the decline, Admissions needs to partner with Marketing and Communication to conduct research that will confirm if the core messages are on target, are well understood and valued in the marketplace, and are being articulated clearly and compellingly.
- If attrition has been a chronic problem at your institution, it will certainly require institutional research and the Registrar's office to help identify patterns of at-risk students either by entry level qualifications, demographic/biographic information, or experiences while enrolled. In addition, academic and student life staff will need to be active participants in the interventions identified by this cohort retention analysis.
- If you are an open-enrolment institution offering two-year terminal and college-transfer degrees to both traditional age as well as adult students, many of whom are attending part-time, then 'best in class' customer service is an institutional imperative. Clearly the administrative offices of

Admissions, Financial Aid, Registrar, Student Accounts, and Advising, to name a few, have to be integrally connected, cross-trained, and dedicated to 'owning' every problem that a student presents.

- If you have been a local or in-state institution, whose new vision calls now for expanding your geographic reach and opening new markets out of region or out of state, the Admissions and Alumni Affairs offices will need to team up to develop alumni admission volunteer networks that can introduce and represent the institution in faraway locations.
- If you are an institution that wants to increase transfer enrolments as a priority for growth, then the academic leadership-deans and department chairs, as well as the Registrar's office-will need to join with Admissions to provide timely and comprehensive services (e.g., credit evaluations). Transfer students are very focused on, 'time to degree'. This makes course equivalency guides, articulation agreements, and 2+2 programs important recruitment tools.

When evaluating all of the above actions listed by Kuntz and Scannell (2006:Online), the obvious analogy can be drawn that at CPUT there is a definite need for cross functional teams to be created so that these issues relating to the registration process can be addressed and acted upon and on a regular basis.

3.3. METHODOLOGIES/APPLICATIONS UTILISED TO STREAMLINE THE STUDENT REGISTRATION PROCESS

"Student enrolment is a significant operational challenge for all educational institutions. At the same time, students can see it as an unnecessarily bureaucratic and time consuming task. But streamlining the process has traditionally meant either spending a lot of time and resources integrating different business systems or throwing away everything and starting from scratch" (Campus IT, 2008:Online).

3.3.1 Automated ITS system.

The Extended Education Department at California State University, Fullerton had a rather complex registration process and, "wanted to provide the potential student

a better registration experience, to streamline the internal handling of the process as well as to increase efficiency" (SystemArts, 2007:**O**nline). The university implemented a fully automated student registration processing system aptly termed, Complete Registration; which have the following functionality (SystemArts, 2007:**O**nline):

- Automated credit card processing ensures timely feedback to students.
- Self monitoring subsystem with immediate administrator notification improves system stability, responsiveness, and user satisfaction.
- Legacy system interfaces eliminate the need for manual intervention and processing.
- Automated student notification standardizes the outgoing correspondence and provides timely status updates.

3.3.2 Animated screens as opposed to teaching

A study conducted by Adobe Systems Incorporated (2008:**O**nline), concluded that the University of California together with the Administrative Computing and Telecommunications (ACT) group used 'RoboDemo' as a key enabler in developing a new remote registration service. This had become critical for streamlining the registration process. New students were previously assigned to computer labs across the campus, and staff walked them through course registration at the same time. This strained the university's servers to the point of overload. "ACT used RoboDemo to create a simulation of the registration process, which consists of a series of animated screens that walk students through registration step-by-step. The registration process was moved online and students can now register whenever they want, with the RoboDemo simulation providing the necessary online training of the registration system. This enables ACT to provide better service to their students, and reduce network load and support calls" (Adobe Systems Incorporated, 2008:**O**nline).

3.3.3. ICT a critical success factor

McClea and Yen (2005:88), state that information technology presently represents a critical success factor for a number of organisations. Higher educational

institutions fall into this category, and have sought the status of 'first movers' in relation to the development and implementation of information technology. The admission process places emphasis on the following four levels, namely:

- Applicants,
- Prospects,
- acceptances, and
- confirms.

According to McClea and Yen (2005:94), the admission system focuses on the flow of data utilizing the following path:

Prospects – Applicants – Acceptances – Confirms.

The Miami University admission system utilized three essential parts, namely:

- Recruitment PLUS, as a CRM/DB solution.
- SCT Banner, as the university ERP system.
- Microsoft Office Applications, as the homegrown MIS/DSS system.

"The framework sets the stage and proffers a basic structure that is capable of adapting to the specific environs of each unique admission department while continuously providing enhanced information. The ideal goal is to improve the strategies of the university, while simultaneously, improving the processes within the admission department" (McClea & Yen, 2005:94).

3.3.4. Using ICT to improve services

Southampton Solent University has deployed CampusIT's business process automation application, in an attempt to integrate their enrolment process. This enabled the university according to Campus IT (2008:**O**nline), to develop a quick and easy method of enrolling students. The university according to Campus IT (2008:**O**nline), has moved enrolment online and produced a student-centric process that:

- Meets the organisation's operational and business needs, and
- delivers a better student experience.

Furthermore, this application enables the university to:

- Unify their administration and management systems to create more efficient business processes, and

- place more services online to create a better student experience.

An online enrolment system at Southhampton Solvent University went live less than four months after the project was initiated. Students can log in via the student portal and access their profile where they confirm or amend their details and pay any fees that are required. This in turn eliminates queuing. After payment is completed, the student is automatically enrolled and their details are transferred into the student record system. Streamlining this process has not only had a positive effect on student experience, but also improved operational efficiency (Campus IT, 2008:**O**nline).

3.3.5 Online registration and the control of processes

A customer case study conducted by Oracle (2006:**O**nline), indicated that Kasetsart University in Thailand implemented a student registration system with the Oracle Database as the underlying platform, to ensure it had better control of enrolment and administration processes. The university decided to introduce an online registration option in 2005 in an attempt to ease the workload on staff and facilitating a smoother, faster registration process for students. Students were encouraged to enroll for courses via the Web. The university estimated that the new system comfortably processes around 1 million transactions a day (Oracle, 2006:**O**nline).

3.3.6. Essential tool for enrolment management

According to Zalanowski (2007:Online), as higher education enters the twenty-first century, technology has become an essential tool for enrolment management to meet student outreach and recruitment goals. Admission professionals used the Internet to expand recruitment regions, individualize contact with prospective students and personalize the admission funnel simultaneously. Online technologies were implemented to help enrolment management professionals reach out to prospective students, and help them explore colleges in unique and 'technologically-savvy' ways. These technologies included email, Web sites and Weblogs.

3.4. FACTORS IMPACTING THE REGISTRATION PROCESS.

"Information technology, in a general sense, is utilized to provide basic information regarding the four distinct pieces of data collected during the admission process, i.e. prospects, applicants, acceptances, and confirms. This data is then processed into basic reports, forms, and graphics to provide summarized information on the admission process. However, this is the extent of information technology used in relation to the admission process" (McClea & Yen 2005:91).

3.4.1. Quality of registration is inextricably linked to success

Abouchedid and Nasser (2002:198), examined how the quality of registration at a higher education institution is inextricably linked to the competitive service and success of that institution. "The extent to which students (customers) perceive the level of service performance meets their expectations reflects the quality of service provided by the higher educational institutions" (Abouchedid and Nasser, 2002:199 citing Zammuto *et al.*, 1996). The analogy was drawn that in a developing country, some institutions have slow registration processes and prospective students view this as an institution, which does not provide excellent education. These students would then prefer going to another institution. As a result, the admission and retention of students is often associated with services and processes such as registration.

3.4.2. Waiting for paper files

Arizona State University Graduate College (Cardiff, 2006:**O**nline), implemented separate scan-from-paper and Web based processes for receiving and processing graduate applications. The projects initially brought significant productivity gains. Despite these processes being implemented, "...faculty and staff in the reviewing units sometimes had to wait eight weeks to receive the paper file containing an application and supporting materials. This delay negatively impacted the university's ability to be competitive with other higher education institutions in making offers to the highest caliber candidates" (Cardiff, 2006:**O**nline). The

university decided to then integrate the 'Cardiff Teleform Information Capture Solution' in conjunction with a Binary Office process.

3.4.3. Manual time consuming processes

A study conducted by VISA (2008:**O**nline), at the University of Jyväskylä, Finland determined that the existing enrolment process require students to queue to submit a system account form to the IT department, which manually verifies the students' details before creating their user accounts. The entire process was rather time consuming, inconvenient and the process delayed the students' ability to use the University services i.e. making last-minute course changes. Since the process was manual, it required staff resources and proved to be costly for the University to administer. The University moved to having students submit their credentials over the Internet in a secure manner order to increase expediency, reduce costs, and make life easier for the students.

3.4.4 ICT and VISA

The University of Jyväskylä implemented the Visa Authentication Services (VAS) in a pilot to authenticate student identities online and providing their email credentials in real-time. This entire process takes about a minute with VAS. According to Visa (2008:**O**nline), the simplicity of VAS's technical interfaces enabled the University to implement online registration with just 6 person-days of effort. During the pilot, a total of 350 students (45%) of those eligible, retrieved their University credentials securely over the Internet and were able to utilise the University e-services before arriving on campus. Based on the results of 238 surveys completed by students, 98% reported that the VAS experience was easy and 96% were comfortable using their Visa cards in the process. Furthermore, 92% said they would recommend using VAS for secure authentication to other University services. The University was able to automate their processes and lower their costs (VISA , 2008:**O**nline).

3.5 THE CONCEPT OF ICT

TechTarget (2008:**O**nline), is of the opinion that ICT is an umbrella term that includes any communication device or application, including: Radio, television, cellular phones, computer and network hardware and software, satellite systems etcetera as well as the various services and applications associated with them, such as videoconferencing and distance learning.

3.6 THE IMPORTANCE OF ICT

TechTarget (2008:**O**nline), in considering the importance of ICT cites a European Commission who was of the opinion that, "the importance of ICTs lies less in the technology itself than in its ability to create greater access to information and communication in underserved populations". Furthermore, many countries around the world have established organizations for the promotion of ICTs, because it is feared that unless less technologically advanced areas have a chance to catch up, the increasing technological advances in developed nations will only serve to exacerbate the already-existing economic gap between technological 'have' and 'have not' areas. Internationally, the United Nations actively promotes ICTs for Development (ICT4D), as a means of bridging the digital divide (Tech Target, 2008:**O**nline).

3.7 THE IMPACT ICT HAS ON HIGHER EDUCATION ADMISSION PROCESSES.

Information technology presently represents a critical success factor for numerous organizations. Higher educational institutions fall into this category, and have sought the status of 'first movers' in relation to the development and implementation of information technology throughout the areas of academia (McClea & Yen 2005:88).

3.7.1. Valuable elements of ICT

Bulchand, Rodríguez and Chattah (2005:71), citing Connolly (1999), states that Information Systems (IS) are valuable elements for organizations since they support decision-making, organise and classify data and process transactions, among many other activities. Bulchand *et al.* (2005:75), investigated MiULPGC as a tool that facilitates the design and development of the learning experience, while also streamlining administrative and management tasks. The authors determined that this instrument makes it possible for the different 'actors' to interact through the common use of technology as a support for virtual instruments. This situation permits a series of activities to be combined and visible advantages to be obtained, namely:

- It perfects teaching and research work.
- It promotes interaction by means of communication spaces and instant response.
- It motivates participation and collaboration in works by providing notes and files for students and researchers.
- It improves feedback by making it faster, more fluid and more appropriate.
- It contributes to distance learning and to administration processes.
- It streamlines management and administration.

3.7.2. ICT Evolution

In this new age, ICT and its associated instruments are evolving rapidly, and yet most of its applications are still in the experimental stage. The scenarios and actors are more and more demanding, which means designing and developing easy-to-use tools like MiULPGC, that are capable of dynamic management and administration of contents and the integration of information without overwhelming the users, while offering a space that enables them to act and be players (Bulchand *et al.*, 2005:76).

3.7.3. Impact of ICT in Education

Anonymous 1 (2007:**O**nline), citing Nasralla (2007), emphasized the impact ICT has on education in the latters' presentation entitled "Early Measures to Foster Multilevel Impact of ICT in Education: EEI Impact generating Framework". Nasralla (2007) cited by Anonymous 1 (2007:**O**nline), focused on the following key aspects:

- The impact of ICT does not come as a natural end, unless strategic and action planning are taking rigorously to yield the expected impact.
- Designating the level of impact is instrumental in the assessment of impact.
- Monitoring and evaluation of personal factors such as the level of knowledge, skills and dispositions, on the job performance and the sustainability of ICT related practices, along with the contextual factors such as work place management, appraisal system, peers pressure, supervision and mentorship scheme, are significant in yielding the expected impact.
- Identification of expected changes in performance and the expression of the KSD matrix needed to reach these performance changes, are key issues in the Impact generating model presented.
- Formative evaluation of interventions is needed among the identified early measures in the presented framework to foster impact.
- Monitoring and evaluating changes in individual and institutional performance as the 'outcomes' of the planned interventions, are key results in yielding the expected impact.

3.8 ICT INTERGRATION ENHANCES THE REGISTRATION PROCESS.

Wake Forest University implemented the IDOC system to improve the financial aid section of their enrolment process. After successful implementation a study (College Board, 2005:**O**nline), returned the following benefits:

- Significantly reduced staff workload and overtime has been the most dramatic benefit of the IDOC service. "First, IDOC saves us the effort of requesting and collecting thousands of verification documents. Then, IDOC images them and

key-enters data so that it can be imported into our system to update student information. This service takes a lot of the really tedious routine out of the financial aid process, including sending out so many missing information letters. With IDOC, we're able to get the work done with the staff we have, during normal business hours, and on time" (College Board, 2005:**O**nline citing Wells, 2005).

- High level of data accuracy and IDOC has helped Wake Forest achieve the required results. Students can verify their submission status on the College Board Web site. Fair and effective awarding depends on complete, timely and accurate data, with IDOC provided the university with this service.
- Cost and time savings.
- Easy-to-use Web access to images.
- One of the major advantages of IDOC is its integration with the College Board's Power*FAIDS* software, which Wake Forest uses to automate its financial aid function. IDOC's interface with Power*FAIDS* makes it seem like the two are one system. Correct and complete data captured through IDOC is loaded into Power*FAIDS*, ensuring the accuracy of Wake Forest's ISIR and PROFILE.

3.9 IMPLEMENTING A REGISTRATION PROCESS.

According Digital Architecture Group (2003:**O**nline), the integration of technology into education does not mean that all administrators need be expertly trained technology people, but it does mean that recognizing a new media exists and is being used as a key touch point in the enrolment process. Since the web is most probably on of the first points of contact with potential students and perhaps the most influential as such, it makes sense to have a clear understanding of the factors that are most important to them and the implications and consequences that information has for the enrolment strategy.

By examining the problem and the information available, enrolment managers can make more effective technology decisions. Recent findings (Digital Architecture Group 2003:**O**nline), indicate that the Web is second only in importance to guidance counselors in terms of sources of information in the first stage of the

college search process, when identifying where to apply. These findings indicates that 48% of college bound students mentioned a high school guidance counselor as being highly important, followed by 37% who cited web sites with information about colleges as being important. The next sources of information most frequently cited were friends (25%), guidebooks/books (23%), and college catalogs (21%) (Digital Architecture Group, 2003:**O**nline).

3.9.1. Enrolment management professionals

At any tertiary institution, it should be mandatory that the office of institutional research should play a major role in successful enrolment management efforts. The more enrolment management professionals know about the characteristics, attitudes, and values of prospective students, the better able they are to design effective recruitment and orientation programs. Persistence studies conducted by institutional researchers can formulate strategies to enhance the success of first-year students, and institutional research professionals can examine the impact of various forms of student financial assistance upon matriculation decisions and the academic success. A strong institutional function is a critical element of a sound enrolment management effort (Hossler, 2008:**O**nline).

3.9.2. Personal experience of students during the enrolment process

A study conducted by Campus Management (2008:**O**nline), returned that Westwood College's goal was to improve each student's personal experience during the enrolment process. This depended on choosing the right technological solution. Westwood's technology team worked with admissions, marketing, and other departments to define the ideal requirements with the student's experience as the cornerstone of the initiative, however legacy systems and call center services presented significant obstacles. To achieve a truly 'customer-friendly' model, Westwood had to pursue a centralized concierge model to orchestrate its enrolment services.

3.9.3. Using ICT to improve work flow

Westwood College decided to use a Customer Relationship Management (CRM) solution and elected to use the Campus Management CRM solution. "Campus Management impressed us with their focus on higher education, their embedded knowledge of automated student recruiting, and the openness of their application to interface with our student system and call center. They offered a superior product" (Campus Management, 2008:**O**nline citing Annamalai, 2008). Campus Management introduced a Web-based interface and deployed its application to more than 400 desktops. Admissions representatives quickly grew proficient in the use of the system and integration across legacy systems narrowed or eliminated tedious manual data entry and batch processing. With the new work flow in place, admissions were capable of setting administrative wheels in motion within minutes or seconds of an inquiry. Students experience seamless care from admissions to financial aid and other departments (Campus Management, 2008:**O**nline).

3.9.4. Office of admissions

According to Hossler (2008: **O**nline), the office of admissions plays a key role in enrolment management innovations. The enrolment manager has a key role to ensure that the university has broad marketing efforts in place to make the institution visible and sufficiently attractive, so that desirable prospective students are motivated to seriously consider them.

Noel-Levits (2008:**O**nline), developed a check list that can be used in strategic enrolment planning. The check list includes the following elements:

Internal Research

- Student satisfaction/engagement.
- Faculty/staff satisfaction/ priorities.
- Alumni satisfaction/outcomes.
- Student attrition research.
- 5-year projections of enrolment and related fiscal implications.
- Characteristics of incoming students who succeed or do not succeed.

- Cost of serving different student populations.
- Analysis of student flows into academic majors and courses.
- Academic program capacity and demand analysis.

External Market Research

- Demographic trends: High school and adults.
- Number of students by test score, race/ethnicity and major.
- Projected demand for academic programs.
- Brand, image and perception research:
  - College-bound.
  - High school students.
  - Parents.
  - Adult students.
  - Guidance counselors.
  - Employers.
  - Community opinion leaders.
  - Employer satisfaction.

Competition Research.

- Competition communications study.
- Academic program overlap study.
- Price sensitivity study External.
- Lost inquiries and applicants External study.

General Trend Research.

- Potential disruptive innovations national and local publications.

3.9.5. Organizing enrolment management efforts

The administrative approaches for organizing enrolment management efforts according to Hossler (2008:**O**nline) are described as follows: "The enrolment management coordinator is charged with organizing recruitment and retention activities. Usually, a midlevel administrator, such as the dean of admissions or financial aid, is asked to coordinate offices such as admissions, financial aid, and registration and records. An important disadvantage is that the coordinator model

provides no formal mechanism for linking enrolment concerns into the decision-making agenda of senior level administrators".

The enrolment management matrix is a more centralized approach. In the matrix model, an existing senior level administrator, such as the vice president for student affairs, an academic affair, or institutional advancement, directs the activities of the enrolment management matrix. In this model, administrative units such as financial aid or student retention are not formally reassigned to a new vice president. Instead, the administrative heads of these units continue their existing reporting relationships, but they also become part of the enrolment management matrix.

The most centralized organizational model is the enrolment management division. In the division model, a vice president or associate vice president is assigned the responsibilities for most or all of the administrative areas that influence student enrolments, housed within one large functional unit. This model requires a high levels of administrative support; the president or a senior vice president generally has to become a strong advocate of this model. One important advantage of this model is that an enrolment management vice president can carry enrolment-related concerns directly to the president and the board of trustees.

3.10. ICT REGISTRATION SECRETS

According to Safari (2004:**O**nline), "...successful online registration attracts more registrants, makes events more valuable, results in more satisfied attendees". (Safari, 2004:**O**nline) is furthermore is of the opinion that in order for the implementation of an online system to be successful, the following aspects should be considered:

- Take the time up front.
- Maximize registration time.
- Make signing up easy.
- Help registrants feel at home.
- Welcome registrants.
- Give access to detail.

- Ask deeper questions.
- Fulfill the desire to buy.
- Thank your registrants.
- Add value before the event.

Safari (2004 Online), furthermore provides advice on the implementation of tactics on the online system in order to bring back registrants who have abandoned the online registration page.

3.11. MEASURING PROCESS IMPROVEMENT.

Benchmarking is widely considered to be an optimal measure for improvement initiatives. Weller (1996:24) citing George (1992), is of the belief that benchmarking was originally perceived to be a type of competitive intelligence gathering. In an attempt to narrow the performance gap between two companies, one company is able to use 'benchmarking' to understand how another company's' best practices worked.

In this instance, internal benchmarking is the suitable measure to be used as the registration process is considered to be an internal process that will eventually be measured against external entities. Weller (1996:25), describes the internal 'benchmarking method' as, "...examines the internal processes of an organization to determine its own best-practices first, and then uses this information as baseline data for benchmarking external organizations".

3.12. ONLINE REGISTRATION AS OPPOSED TO TOUCH TONE TELEPHONE SYSTEMS

3.12.1 Advantages and disadvantages of the Touch Tone Telephone registration mechanism

Touch Tone Telephone Systems (TTTS) as a registration mechanism has its advantages and disadvantages (Weiger,1999:Online). Green River Community College's telecommunications officer Shirley Benson cited by Weiger (1999:Online), is of the opinion that in the early stages of inception of TTTS,

there was a lot of negative feedback because the telephone system was just beginning to take hold. They then tried to ease users into using the system by explaining that they could still press '0' and get help from the operator.

After continual changes and tweaking the TTTS based on feedback from the users, the college now has 1800 calls answered by the TTTS per day. Only when the system goes down, does a live operator answers the calls, often to the surprise and shock of the users, leaving them not really knowing what to do. Of the callers, 75 percent navigate the system themselves as opposed to selecting to go to the live operator.

Benson cited by Weiger (1999:**O**nline), is furthermore of the opinion that when there is a complaint about the TTTS, it is often symptomatic of a deeper issue. Usually the users would be angry about something else i.e. financial aid or results and then take it out on the TTTS. Furthermore, the advantage of automation is obvious, namely in that control is in the callers' hands, hours of operation is extended, the school has the flexibility to manage a larger volume of users without adding extra staff, and operators can give better service to those who really need it.

3.12.2. TTTS tangible value

Not everyone believes that the TTTS is a great idea. Dr Alan I Marcus, a professor of history at Iowa State University and an expert on the history of American technology calls the TTTS at colleges, "...the worst marketing strategy you could possibly make. One thing in the competition of students is to show a personal, hands-on approach, is better than this [automation] reduces it to not caring enough to even put a person on live to take my call" (Weiger, 1999:**O**nline).

Marcus cited by Weiger (1999:**O**nline), also believes that when a university replaces human operators by machines, the university loses the opportunity to give the potential students the impression that they will be treated like human beings. Marcus adds that it is more important to have extra staff, "If you really in

a competitive school market, this is an incidental expense, to have someone there is encouraging and gives a dawn is worth its weight in gold" (Weiger, 1999:**O**nline).

3.12.3. TTTS causes frustration

At Bishops State Community College in Mobile, Ala., frustration is mounting over an automated TTTS. School officials thought that they would be simplifying the system and making things easier for the students, instead, automation only complicated issues. Wanda Daniels cited by (Weiger 1999:**O**nline), dean of students at Bishop State is of the opinion that, "...while it is better in some sense, in other ways it is not better at all". (Weiger 1999:**O**nline), states that the schools' problems increased during registration when its normal 200 calls per day increased to 2000 calls per day. Daniels believes that the institution would probably keep the system, but that they will have to find a better way to design it.

Officials at Foothill College in Los Altos Hill California, had a similar experience with automation, and are of the opinion that inefficiency caused their system to fail. They got rid of the system because of to many complaints about it. Users of the system at Foothill College encountered high levels of frustration as a result (Weiger, 1999:**O**nline).

At Pikes Peak Community College in Colorado Springs, officials believe that they may be better served by having someone live and in person to answer the telephones. The dean of student services Beth Lebsock is of the opinion that it would be better to turn off the automated system. They wish to focus on customer service and sometimes finding better ways is to meet student needs, one would think is to automate the process, but often this does not help (Weiger, 1999:**O**nline).

3.12.4. The computer/Internet solution

According to Weiger (1999:**O**nline) who cites James R. Mingle, executive director of the State Higher Education Executive Officers and an expert on

technology applications in higher education, the latter who believes that, 'there are pluses and minuses to the automated system'. According to Weiger (1999:**O**nline), "If you can get the user to do the data entry, you're eliminate the middle man, but the [automated] telephone thing irritates me. On the positive side, automation can provide a caller to move straight to the specialist when he needs one. On the negative side, callers can get caught up in a loop". Weiger (1999:**O**nline) believes that the answer lies in the computer and the Internet, and that, "...people are happier with the Web".

While registration in Western universities has rapidly adapted the banking touch-tone telephone systems for registration (Abouchedid and Nasser, 2002:199 citing Spencer 1991), Western universities housed in developing countries attempt to struggle with bureaucracies and inefficient infrastructure, hence registration remains a traditional and manual process.

According to Peskin and Hart (1996:68), it often is the elusive ingredients of a quality solution that are not identified at the start of a computer systems development project. The project quality management has not been adequately defined, the computer system that is subject to quality management has not been adequately defined and no methodology for measuring quality within the specific systems environment has been defined. Peskin and Hart (1996:68), is of the opinion that to measure quality accurately, the quality characteristics must first be defined. In a service industry, these characteristics can be grouped into five key dimensions, namely tangibles, reliability, responsiveness, assurance and empathy.

3.13. FOUR-STAGE FRAMEWORK

Ancarani (2005:8), believes that the use of an online environment in the Local Public Services (LPS) sphere is quite unexplored territory, although the potential for heightening customer-supplier relationships are rich. Consequently, it has become increasingly important to realise how e-service is provided, measured, and how the web sites that have been produced, can be equated. Furthermore Ancarni (2005:8), proposes methodologies to identify the availability of e-services by patterning the evolutionary course of the digital interface between public

agencies and users. Ancarani (2005:10), refers to a model which was developed and proposed by the European Commission in a report on the provision of public e-services. This model is used to measure the level of online sophistication of the services. Ancarani (2005:10) describes the model in terms of the following:

- **Information**: Online information about services.
- **Interaction:** Downloading of forms.
- **Two-way interaction:** Processing of forms.
- **Transaction:** Case handling; decision and delivery.

3.14. A MODEL FOR EVALUATING E-SERVICE APPLICATION AND EVOLUTION

Four levels of interaction between a firm and its customers can be identified for e-services (Ancarani 2005:13). Such a model assumes that an increasing level of effectiveness in firm-customer relationships will be attained as the number of available e-services increases. The levels of e-service move from the provision of information, to interaction, to transaction. The four levels of interaction (Level 0-Level 3) in terms of Information, Interactions, and Transactions (IIT), are graphically depicted in Figure 3.1 as a 'Maslow-type' pyramid of 'needs'.

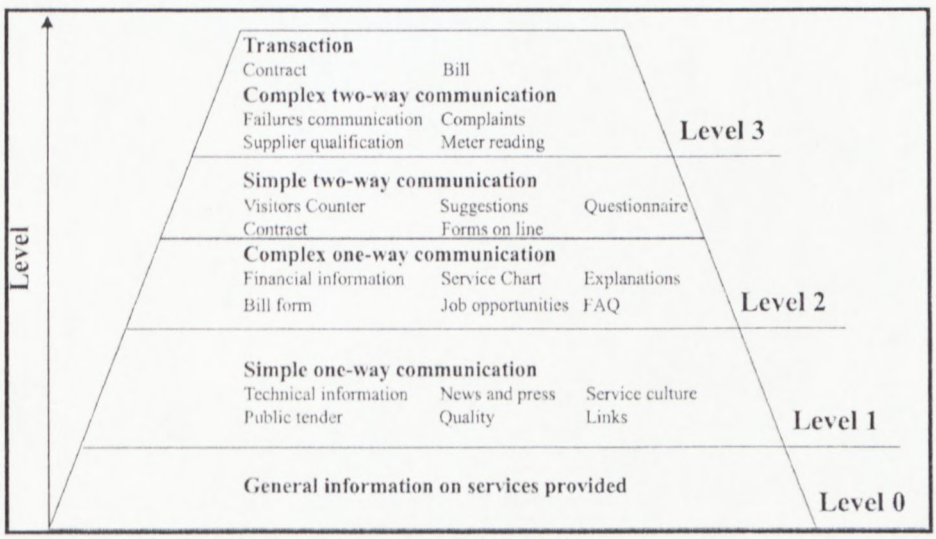

Figure 3.1: Pyramid of needs. **Source:** Ancarani (2005:13)

Maslow's theory of hierarchy of needs (Smit and de Cronje, 1992:311), debates that lower-level needs (base of the pyramid) must be satisfied before higher-level

needs (top of the pyramid) can be fulfilled. In a similar fashion, the pyramid for communication assumes that e-service content will be added more and more for it to be effective.

According to Ancarani (2005:13), "...higher levels of e-service are effective only if proper content has been provided at the lower levels. Level 0 refers to the basic presentation of a logo and the type of service provided. Level 1 includes six categories of information. Level 2 includes five categories of information and three forms of interaction. Level 3 includes four forms of interaction and two forms of transaction".

Furthermore Ancarani (2005:13-15), is of the opinion that if this has to be duplicated by relevant organisational change, the pace of e-service provision can be conceived to be decreasing. As a result, the first section of the curve depicted in Figure 3.2 reflects huge exponential increment in gains, while technological complexity stays at a lower level. The following part of the curve reflects a logarithmic increment in benefits while technological complexity is higher. The depicted model shown in Figure 3.2, describes the evolutionary course through the following four phases:

- **Phase 0**: The web site has only a formal institutional function.
- **Phase 1**: The web site provides simple information.
- **Phase 2:** The web site provides simple and complex information and explores two-way communication online.
- **Phase 3:** The web site provides simple and complex information, and allows for two-way communication and transaction online.

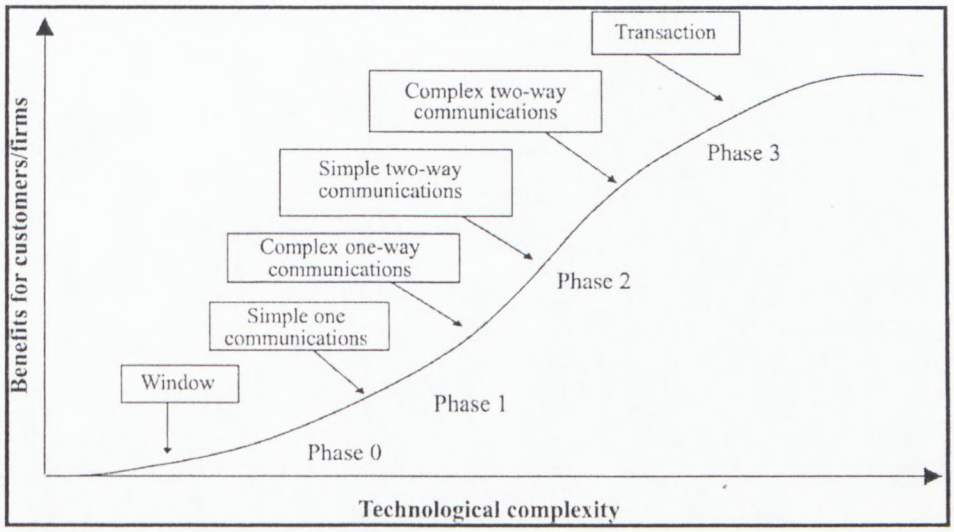

Figure 3.2: Evolutionary path of a web site in local public services. **Source:** Ancarani (2005:13)

In reflecting on Figure 3.2, only those web sites that increasingly add IIT would be considered representative of companies that support Internet service provision with adequate organisational changes. The e-service provided has been considered as belonging to a particular phase, only when a bulk of the corresponding IIT are available. It has been assumed that every web site will have at least general information (phase 0). From this point on, considering the ITT reflected in Figure 3.1, the e-services that are provided were classified as being in phase 1 when at least three IIT of level 1 are available. Phase 2 required at least three IIT of level 1 and four IIT of level 2. Phase 3 required the conditions for phase 2, plus at least three IIT of level 3.

3.15. CUSTOMER EMPLOYEES AND TRAINING

In some situations, according to Bitner et al. (2007:195), the consumer inputs are called for to assist the service organisation in producing the service, this is termed 'moderate levels of participation'. Inputs can include data, effort or physical ownerships. Similar types of data, effort or physical ownerships are required when the customer is an organisation seeking to outsource services such as payroll, customer database management, or tax accounting. In some situations, customers can actually be involved in co-creating the service termed, 'high level of participation'. For such services, customers have crucial production functions that,

if not accomplished, will affect the nature of the service outcome. All types of education, training and health care fit this profile.

Similarly, an organisation requiring training services for its employees will need to help specify the quality of the training, identify the correct employees for the training, establish incentives for them to learn and facilitate the use of the training on the job. If the organisation does not do this, the organisation and the employees affected will not benefit fully of the service.

When mapping the above to the registration process at CPUT, the academic and administrative staff needs to be trained in line with what the students (customers) requirements are. This could be further superimposed onto training on the ITS database.

3.16. MANAGING CHANGE AND INNOVATION

According to Bartoli and Hermel (2004:416), as far as the contribution of Information Technology (IT) on firms are concerned, one is faced with warning signals on the unavoidable need for change management, and the perverse side effects of technology improvements when they are not incorporated within a strategic and managerial model. The analysis of practices pertaining the introduction of IT in organisations demonstrates that often, the context and the process are disregarded. As for the content, it is focused on tools rather than on the demands to be satisfied. Information is not synonymous with communication (Senn, 1990:802). Merely giving someone more or better information may not improve either communication or the person's performance.

Furthermore according to Bartoli and Hermel (2004:422), the decision by IT to promote and implement new software in a firm often encounters cultural barriers. Often certain countries do not have an adequate level of development of technologies, or the functioning modes of the organisation remain based on other forms of exchanges of information (the spoken mode, for example), and these new tools are a true cultural shock. The organisational training often being neither easy nor spontaneous follows periods of destabilisation. Resistance to change which

Senn (1990:807), defines as 'dysfunctional behaviour', can manifest as aggression, projection or avoidance.

3.17. DATABASE INTEGRITY AND ACCESS TO ALL STAFF

The employment of advanced database technology (McClea and Yen, 2005:98), within the university departments will provide them with the ability to share data with the rest of the campus through a common application, while keeping a location which contains historical and current data, appropriate to the department. This data should be derived directly from the database solution through a communication flow determined by the needs of the departments. Furthermore, according to McClea and Yen (2005:98), the system should only require updates and should not receive inputs or deletions, but instead act as a single repository for admission data.

McClea and Yen (2005:98), are of the opinion that the software must be capability to generate information from the collection of data gathered in the applications. The software should serve as the foundation of data for all of the proposed reporting systems, so as to allow for an equilibrium of redundancy and the capability to authenticate information and bring out mistakes. The automated reports should reflect standardized reports needed on a consistent basis. These reports should reflect summarized data and can be distributed as a high-level information report. The Internet-based solution should be utilized by the staff within the department to generate standardized reports and queries on the data, so as to offer the capability to monitor departmental goals and strategy.

3.18. QUALITY ACTION TEAMS

A team is a group of employees (Okes and Westcott, Online:2001), who perform interdependent projects to work toward a mutual mission. Some teams have a lifespan, for instance a design team developing a product, or a process, improvement team organized to solve a special problem.

Others teams are ongoing, such as a department team that meets regularly to review goals, processes and performance. Understanding the many interrelationships that exist between organisational units and processes, and the impact of these relationships on quality, productivity and cost, makes the value of teams apparent, in particular as it pertains to the development of an online system to manage registration processes for a tertiary institution.

3.19. CONCLUSION

From the literature cited in this literature review, it is clear that IT can be deployed to alleviate the issues pertaining to the registration process at universities. This trend maps to the concept of a 'web revolution' as proposed by Turban, Mcleon and Wetherbe (2002:120), in which organisations for a plethora of valid business reasons are 'forced' to transform to the 'digital economy'.

In the next chapter, the student and employee registration survey design and methodology will be expanded upon.

CHAPTER 4:
STUDENT AND EMPLOYEE REGISTRATION SURVEY DESIGN AND METHODOLOGY

4.1. THE SURVEY ENVIRONMENT

The Cape Peninsula University of Technology (CPUT) provides higher education, mainly to the greater community of Cape Town as well the rest of South Africa, including to some international students. In this research study, students that have registered at the university, the Registration, Academic, ICT, Finance, Faculty Office and the Examinations departments as well as randomly chosen employees and students will form the survey sample. The Academic Departments involved include the Mechanical Engineering, Civil Engineering and the Industrial Engineering Departments.

4.2. AIM OF THIS CHAPTER

The aim of this chapter and the survey contained therein is to determine what the key factors are for streamlining a registration process, and implementing such processes within CPUT. The ultimate objective being to solve the research problem as defined in Chapter 1, Paragraph 1.4, and which reads as follows:

"The poor quality of the registration process for students at the Cape Peninsula University of Technology, adversely impact on the organisations' efficiency".

4.3. THE TARGET POPULATION / CHOICE OF SAMPLING METHOD

It is required with any survey, that the target population be clearly defined, which Collis & Hussey (2003:56), define as follows: "A population is any precisely defined set of people or collection of items which is under consideration".

According to Collis and Hussey (2003:155-160), a sample is made up of some of the members of a 'population' (the target population), the latter referring to a body

of people or to any other collection of items under consideration for the purpose of research. The 'sampling frame' according to Vogt (1993) and cited by Collis and Hussey (2003:155), represents a list or record of the population from which all the sampling units are drawn.

The 'student' target population forming the sampling frame is made up of 28720 CPUT students on the Bellville campus. The sample consists of 50 CPUT students. The method of probability sampling used is random sampling. The customer satisfaction survey was e-mailed to the 200 potential student respondents.

The 'employee' target population forming the sampling frame is made up of 3045 CPUT employees. The sample frame consists of 30 CPUT employees. Purposive sampling is used for the employee registration survey, as the researcher has chosen people who typically deal with the registration of students and who also represent diverse perspectives on the issue registration. The majority of the employees, who comprise the sample, were departmental managers from the academics sphere and the administration sector who supplies the registration service to the students at CPUT.

According to Babbie (2005:196-197), there are two reasons for using random selection methods. First, this procedure serves as a check on conscious or unconscious bias on the part of the researcher. Random selection erases the danger of the researcher who selects cases on an intuitive basis to support his or her research expectations or hypotheses. Second, random selection offers access to the body of probability theory, which provides the basis for estimating the characteristics of the population as well as estimates of the accuracy of the samples.

The sampling frames were specifically chosen in order to validate the practicality of the concepts as presented here. However, the risk of bias, which cannot be statistically eliminated, is recognised by the author due to the small number of respondents to the registration survey and the fact that certain departments within CPUT were intuitively chosen by the researcher to form part of the research.

- The target population for the unstructured interviews (refer Paragraph 1.6.1) was drawn from the University of Johannesburg, the University of South Africa, Rhodes University and Integrated Tertiary Software (Pty) Ltd

4.4. DATA COLLECTION

Emory and Cooper (1995:278), distinguish between three primary types of data collection (survey) methods namely:

- Personal interviewing.
- Telephone interviewing.
- Self-administered questionnaires/surveys.

The primary data collection method used in this survey is the self-administered questionnaires/surveys.

LaPorte (1997), is of the opinion that another source of information that can be invaluable to qualitative researchers, is analysis of documents. Such documents include official records, letters, newspaper accounts, diaries, and reports, as well as the published data used in a review of literature. These have in addition to the survey been used by the researcher in the collection of data. The data collection method used in the survey, falls within the context of a survey, defined by Collis & Hussey (2003:60), as: "A sample of subjects being drawn from a population and studied to make inferences about the population".

The survey conducted in this dissertation falls within the ambit of the 'descriptive survey' which is determined by the purpose of the study (Ghauri, Grønhaug & Kristianslund, 1995:58-64). The data collection methods used fall within the ambit of both the definitions attributed to the concepts 'survey' and 'field study'. Remenyi *et al.* (2002:290), cited by Watkins (2008:54), define the concept of 'survey' as: "...the collection of a large quantity of evidence usually numeric, or evidence that will be converted to numbers, normally by means of a questionnaire", while according to Gay and Diebl (1992:238), 'survey', is an attempt to collect data from members of a population in order to determine the current status of that population with respect to one or more variables. Kerlinger

(1986:372), defines 'field study' as non-experimental scientific inquiries aimed at discovering the relations and interactions among ... variables in real ... structures. As with the case of most academic research, the collection of data forms an important part of the overall dissertation content.

Leedy and Ormrod (2005:185), point out that a questionnaire allows the participants to respond to questions with assurance that their responses will be anonymous. This means the respondents can be more truthful than they would be in a personal interview.

4.5 MEASUREMENT SCALES

The survey is based on the Lickert scale, where respondents are asked to respond to questions or statements (Parasuraman 1991:410). The Lickert scale is chosen as the scale can be used in both respondent-centred (how responses differ between people) and stimulus-centred (how responses differ between various stimuli) studies, and it is most appropriate to glean data in support of the research problem in question (Emory and Cooper 1995:180-181). According to Emory and Cooper (1995:180-181), the following are the advantages of the Lickert scale:

- Easy and quick to construct.
- Each item meets an empirical test for discriminating ability.
- The Lickert scale is probably more reliable than the Thurston scale, and it provides a greater volume of data than the Thurston differential scale.
- The Lickert scale is also treated as an interval scale.

Remenyi, Williams, Money, Swartz (2002:153-154), are of the opinion that interval scales facilitate meaningful statistics when calculating means, standard deviation and Pearson correlation coefficients.

4.6 THE DEMAND FOR A QUALITATIVE RESEARCH STRATEGY

The author acknowledges that numerous strategies can be applied to similar research projects. In this research, the well-known concepts of objectivity, reliability etcetera, inherited from the empirical analytical paradigm, is suggested

for business research in the traditional way. Emory & Cooper (1995:156) defines these concepts as follows:

- **Practicality:** Practicality is concerned with a wide range of factors of economy, convenience, and interpretability.
- **Validity:** Validity refers to the extent to which a test measures what we actually wish to measure. Yin (2003:34), identifies 3 subsets to the concept validity namely, construct validity, internal validity and external validity.
- **Reliability:** Reliability has to do with the accuracy and precision of a measurement procedure.

4.7 SURVEY DESIGN

Collis & Hussey (2003:60-66), expresses the opinion that research should be organised in order to make the best of opportunities and resources available. Furthermore, to provide a coherent and logical route to a reliable outcome, research must be conducted systematically, using appropriate methods to collect and analyse the data. The survey should be designed according to the following stages:

- **Stage one:** Identify the topic and set some objectives.
- **Stage two:** Pilot a questionnaire to find out what people know and what they see as the important issues.
- **Stage three:** List the areas of information needed and refine the objectives.
- **Stage four:** Review the responses to the pilot.
- **Stage five:** Finalise the objectives.
- **Stage six:** Write the questionnaire.
- **Stage seven:** Re-pilot the questionnaire.
- **Stage eight:** Finalise the questionnaire.
- **Stage nine:** Code the questionnaire.

The survey design to be used in this instance is that of the descriptive survey as opposed to the analytical survey. The descriptive survey is according to Collis & Hussey (2003:60-66), frequently used in business research in the form of attitude surveys. The descriptive survey as defined by Ghauri, Grønhaug and Kristianslund (1995:60), has furthermore the characteristics to indicate how many members of a

particular population have a certain characteristic. Particular care was taken to avoid bias in the formulation of the questions. According to Patel, Tong & Elliot (2005:28) (citing Leedy & Ormrod 2005), questionnaire construction is a very demanding task, which requires not only methodological competence but also extensive experience with research in general and questioning techniques in particular.

The statements within the survey have been designed with the following principles in mind:

- Avoidance of double-barrelled statements.
- Avoidance of double-negative statements.
- Avoidance of prestige bias.
- Avoidance of leading statements.
- Avoidance of the assumption of prior knowledge.

4.8 VALIDITY AND RELIABILITY ISSUES

According to Janesick (1998:44) citing Yin (2003), a fatal flaw in doing case studies is to conceive of statistical generalization as a method of generalizing the results of the case. This flaw exists because cases are not 'sampling units', and should not be chosen for this reason. The researcher thus acknowledges that results obtained from the research should not be generalized. According to Babbie (2005:285), survey research is generally weak on validity and strong on reliability. According to Denzin (1998:328), qualitative research is biased, because interpretation produces understandings which are shaped by class, gender, race, and ethnicity. Malterud (1998:329-330), expresses the view that qualitative research presents a perspective that is always partial, and findings that represent only a temporary and limited view. The researcher also acknowledges that descriptions and explanations involve selective viewing and interpretation, and that they cannot be neutral, objective or total (Mason, 1996: 6).

4.9 THE RESEARCH QUESTIONAIRE

A questionnaire is a quantitative data collection method, which has several advantages, namely:

- It is relatively economical.
- It can ensure anonymity.
- It contains questions for specific purposes.
- Existing questionnaires can be used, or modified.

The purpose of the questionnaire is to determine presence of diversity, the vision and commitment to diversity, the educational benefit of diversity, responsible interactions and the supportive climate for diversity. There are two questionnaires sets for this survey, namely:

- Section 1: CPUT Registration process survey for staff.
- Section 2: CPUT Registration process survey for students.

A list of the questions in the research questionnaire, are listed below for ease of reference.

4.9.1 Registration process survey for staff

The objective of this survey is to determine how staff feel about various issues relating to the registration process at CPUT.

Staff were informed that:

- There will be complete anonymity regarding the survey.
- There are no right or wrong answers to any items in this questionnaire, it is your opinion regarding each of the statements that matters.
- This survey contains a number of statements about their experiences with registration at CPUT. They were requested to respond to each of the statements by marking the appropriate block with an X or a tick.
- The number in the answer block should be ticked that most accurately fits the extent to which they agree with the statement description.

An example (See Table 4.1) of the process to be followed was provided.

Table 4.1: Example of staff registration survey. (**Source:** Own source)

	Questions	Strongly Agree	Agree	Do not Know	Disagree	Strongly Disagree
1	All co-requisites must be on the database			√		

The questions for the staff are listed in Table 4.2 below for ease of reference.

Table 4.2: Staff registration survey questions. (**Source:** Own source)

Q 1:	Do you think that CPUT could improve the quality of the registration process?
Q 2:	Can the process be refined or improved on?
Q 3:	Do you think that an Internet registration process would be more effective?
Q 4:	The introduction of Internet registration and using online banking will reduce the long queues during registration?
Q 5:	Could Internet registration work in CPUT current setup?
Q 6:	Would Internet registration help students register faster and easier?
Q 7:	Should registration be centralized?
Q 8:	Should students go to other buildings in the registration process?
Q 9:	Should CPUT have a standard timetable?
Q 10:	Should CPUT have a standard venue timetable?
Q 11:	Should all pre-requisites be on the database?
Q 12:	Should all co-requisites be on the database?
Q 13:	Should CPUT have a separate administration registration period?
Q 14:	Should CPUT have a separate academic registration period?
Q 15:	Should CPUT have a combined registration period?
Q 16:	Should CPUT increase the registration period?
Q 17:	Should CPUT have more staff to man the different points, especially at the cashiers during the registration period?
Q 18:	Administrative staff, assisting with registration, should have a proper schedule for breaks during registration period.
Q 19:	Should CPUT have a procedure in place to allow for payment for registration to take place before students register?
Q 20:	Should CPUT have kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration?
Q 21:	Should CPUT use the DOE database
Q 22:	Students must be able to register online from any computer that is connected to the internet.
Q 23:	Web interface must be designed to allow for online registration and applications.

Q 24:	Students must be able to pay for registration and application using the same web interface.
Q 25:	Students must be able to do course applications from any computer that is connected to the internet.
Q 26:	Students must be able to check their outstanding balance from any computer that is connected to the internet.
Q 27:	Students must be able to check prerequisites and co requisites for the subjects that they wish to do from any computer that is connected to the internet.
Q 28:	Students must be able to check their examination and progressive marks on any computer that is connected to the internet.
Q 29:	Students should not have to spend more time than what is absolutely necessary to register at CPUT.
Q 30:	Queues for registration must be shortened, (only students with special cases should have to stand in queues).
Q 31:	Students should not need to walk from one building to another too register.
Q 32:	A single, updated and clean database must be created.
Q 33:	Academic, ICTS, registration, finance and examination departments must work together too continuously to improve the registration process.

4.9.2 Registration process survey for students

The objective of this survey is to determine how students feel about various issues relating to the registration process at CPUT.

Students were informed that:

- There will be complete anonymity regarding the survey.
- There are no right or wrong answers to any items in this questionnaire, it is your opinion regarding each of the statements that matters.
- This survey contains a number of statements about their experiences with registration at CPUT. They were requested to respond to each of the statements by marking the appropriate block with an X or a tick.
- The number in the answer block should be ticked that most accurately fits the extent to which they agree with the statement description.

An example (See Table 4.3) of the process to be followed were provided.

Table 4.3: Example of student registration survey. (**Source:** Own source)

	Questions	Strongly Agree	Agree	Do not Know	Disagree	Strongly Disagree
1	All co-requisites must be on the database			√		

The questions for the students are listed in Table 4.4 below for ease of reference.

Table 4.4: Students registration survey questions. (**Source:** Own source)

Q 1:	CPUT could improve the quality of the registration process
Q 2:	The process can be improved on?
Q 3:	Do you think that an Internet registration process would be more effective?
Q 4:	The introduction of Internet registration will reduce the long queues during registration
Q 5:	Could Internet registration work in the universities current setup?
Q 6:	Internet registration would help students register faster and easier
Q 7:	Registration should be centralized
Q 8:	Students could go to other buildings in the registration process?
Q 9:	CPUT should have a standard timetable?
Q 10:	CPUT should have a standard venue timetable.
Q 11:	All pre-requisites must be on the database
Q 12:	All co-requisites must be on the database
Q 13:	CPUT must have a separate administration registration period?
Q 14:	CPUT must have a separate academic registration period
Q 15:	CPUT must have a combined registration period
Q 16:	CPUT must increase the registration period
Q 17:	CPUT must have more staff to man the different points, especially at the cashiers during the registration period
Q 18:	CPUT must allow for the payment of registration to take place, before students register
Q 19:	CPUT should have kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration
Q 20:	CPUT must use the Department of Education's database
Q 21:	Students must be able to register online from any computer that is connected to the internet.
Q 22:	A web interface must be designed to allow for online registration and applications.
Q 23:	Students must be able to pay for registration and application using the same web interface.

Q 24:	Students must be able to do course applications from any computer that is connected to the internet.
Q 25:	Students must be able to check their outstanding balance from any computer that is connected to the internet.
Q 26:	Students must be able to check prerequisites and co requisites for the subjects that they wish to do from any computer that is connected to the internet.
Q 27:	Students must be able to check their examination and progressive marks on any computer that is connected to the internet.
Q 28:	Students should not have to spend more time than what is absolutely necessary to register at CPUT.
Q 29:	Queues for registration must be shortened, (only students with special cases should have to stand in queues).
Q 30:	Students should not need to walk from one building to another too register.

4.10 CONCLUSION

In this chapter, the 'customer satisfaction' and 'employee satisfaction' survey design and methodology were addressed under the following functional headings:

- Survey environment.
- Aim of the chapter.
- Target population / Choice of sampling method.
- Data collection.
- Measurement scales.
- Demand for a qualitative research strategy.
- Survey design.
- Validity and reliability issues
- Survey questions.

In Chapter 5, results from the survey will be analysed in detail and subsequent conclusions drawn.

CHAPTER 5: INTERPRETATION OF DATA ANALYSIS OF RESULTS

5.1 INTRODUCTION

This chapter represents a statistical analysis of the questionnaires compiled by the researcher. The aim of this study is to formulate an approach to the improvement of registration processes at the CPUT. In this chapter the data obtained from the completed questionnaires will be presented and analysed.

To serve the purpose of this research, descriptive and inferential statistics were used to analyse the data. The data was analysed by using SAS procedures developed for analysing information. As descriptive statistics, frequency tables displayed in Paragraph 5.8.2 shows the distribution of statement responses. Comparative statistics to determine equal proportions and for determining whether there is an association between staff and students in connection with the responses on the statements, are shown in Paragraph 5.8.4.

The Chi-square (two-sample) tests are probably the most widely used nonparametric test of significance that is useful for tests involving nominal data, but it can be used for higher scales as well like cases where persons, events or objects are grouped in two or more nominal categories such as 'yes-no' or cases A, B, C or D. The technique is used to test for significant differences between the observed distribution of data among categories and the expected distribution based on the null hypothesis. It must be calculated with actual counts rather than percentages (Cooper & Schindler, 2006:499).

SAS computes a P-value (Probability value), that measure statistical significance which automatically incorporate the chi-square values. Results will be regarded as significant if the p-values are smaller than 0.05, because this value presents an acceptable level on a 95% confidence interval ($p \leq 0.05$). The p-value is the probability of observing a sample value as extreme as, or more extreme than, the value actually observed, given that the null hypothesis is true. This area represents

the probability of a Type 1 error that must be assumed if the null hypothesis is rejected.

The p-value is compared to the significance level (α) and on this basis the null hypothesis is either rejected or not rejected. If the p value is less than the significance level, the null hypothesis is rejected (if p value $<\alpha$, reject null). If the p value is greater than or equal to the significance level, the null hypothesis is not rejected (if p value $\geq\alpha$, don't reject null). Thus with α=0.05, if the p value is less than 0.05, the null hypothesis will be rejected. The p value is determined by using the standard normal distribution. The small p value represents the risk of rejecting the null hypothesis.

A difference has statistical significance if there is good reason to believe the difference does not represent random sampling fluctuations only. Results will be regarded as significant if the p-values are smaller than 0.05, because this value is used as a cut-off point in most behavioural science research.

5.2 DATA FORMAT

The data was provided in paper form and then converted into an electronic format in Microsoft Excel. The questionnaires were captured by the researcher in an Excel worksheet, which were then transposed and adapted to the correct format for analysis purposes. It was then imported into SAS through the SAS ACCESS module. This information was then analysed and interpreted.

5.3 DATA VALIDATION

Descriptive statistics for each variable to determine whether all answers fall in boundaries of the question were printed. A cross analysis was performed on linked and test variables to determine whether they compare.

5.4 PRELIMINARY ANALYSIS

A Uni-variate analysis was executed on all variables, displaying frequencies, percentages, cumulative frequencies and cumulative percentages for both the staff members and students.

5.5 TECHNICAL REPORT WITH GRAPHICAL DISPLAYS

A written report with explanations of all variables and their outcome were compiled. Cross analysis of variables where necessary with statistical probability attach to indicate the magnitude of these probabilities were also performed.

5.6 ASSISTANCE TO RESEARCHER

The conclusions made by the researcher, is validated by the statistical report. Help was provided to interpret the outcome of the data. The final report written by the researcher was validated and checked by a qualified statistician, to exclude any misleading interpretations.

5.7 SAMPLE

The target population was represented by staff members and students of CPUT.

5.8 ANALYSIS

In total 50 students and 30 staff members answered the questionnaires. Some of the variables had missing values (no responses), and are indicated as unknown in the descriptive tables.

5.8.1 Reliability testing

A reliability test (Cronbach's Alpha Coefficient) was executed on all the statements made. Cronbach's Alpha is an index of reliability associated with the

variation accounted for by the true score of the "underlying construct". Construct is the hypothetical variables (statements) that are being measured.

According to the Cronbach's Alpha Coefficients (Refer Table 5.1), underlying constructs for the staff members were not as consistent and reliable as for the students. An acceptable level is more than 0.70 and for statements 22, 23 and 24 of the staff members the Cronbach Alpha Coefficients were just less than 0.70. It means that the variability of the error is more than 30% for these statements.

Table 5.1: Cronbach's Alpha Coefficient

Statements (Test all statements without current one's input)	**Variable nr.**	**Cronbach's Alpha Coefficient**
Staff members		
1. CPUT could improve the quality of the registration process.	Q01	0.7296
2. The registration process can be improved on?	Q02	0.7307
3. Do you think that an Internet registration process would be more effective?	Q03	0.7031
4. The introduction of Internet registration will reduce the long queues during registration.	Q04	0.7289
5. Could Internet registration work in the universities current setup?	Q05	0.7417
6. Internet registration would help students register faster and easier.	Q06	0.7313
7. Registration should be centralized.	Q07	0.7491
8. Students could go to other buildings in the registration process?	Q08	0.7851
9. CPUT should have a standard timetable?	Q09	0.7308
10. CPUT should have a standard venue timetable.	Q10	0.7240
11. All pre-requisites must be on the database.	Q11	0.7212
12. All co-requisites must be on the database.	Q12	0.7212
13. CPUT must have a separate administration registration period.	Q13	0.7170
14. CPUT must have a separate academic registration period.	Q14	0.7170
15. CPUT must have a combined registration period.	Q15	0.7999
16. CPUT must increase the registration period.	Q16	0.7761

Statements (Test all statements without current one's input)	Variable nr.	Cronbach's Alpha Coefficient
17 CPUT must have more staff to man the different points, especially at the cashiers during the registration period.	Q17	0.7287
18. Administrative staff, assisting with registration, should have a proper schedule for breaks during registration period.	Q18	0.7446
19. CPUT must allow for the payment of registration to take place, before students register.	Q19	0.7233
20. CPUT should have kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration.	Q20	0.7209
21. CPUT must use the Department of Education's database.	Q21	0.6915
22. Students must be able to register online from any computer that is connected to the internet.	Q22	0.6969
23. A web interface must be designed to allow for online registration and applications.	Q23	0.6990
24. Students must be able to pay for registration and application using the same web interface.	Q24	0.6937
25. Students must be able to do course applications from any computer that is connected to the internet.	Q25	0.7160
26. Students must be able to check their outstanding balance from any computer that is connected to the internet.	Q26	0.7163
27. Students must be able to check prerequisites and co requisites for the subjects that they wish to do from any computer that is connected to the internet.	Q27	0.7060
28. Students must be able to check their examination and progressive marks on any computer that is connected to the internet.	Q28	0.7143
29. Students should not have to spend more time than what is absolutely necessary to register at CPUT.	Q29	0.7156
30. Queues for registration must be shortened, (only students with special cases should have to stand in queues).	Q30	0.7158
31. Students should not need to walk from one building to another to register.	Q31	0.7076
32. A single, updated and clean database must be created.	Q32	0.7191
33. Academic, ICTS, registration, finance and examination departments must work together to continuously improve	Q33	0.7242

Statements (Test all statements without current one's input)	Variable nr.	Cronbach's Alpha Coefficient
the registration process.		
Cronbach's Coefficient Alpha for standardized variables		0.8354
Cronbach's Coefficient Alpha for raw variables		0.7332
Students		
1. CPUT could improve the quality of the registration process.	Q01	0.8229
2. The process can be improved on?	Q02	0.8196
3. Do you think that an Internet registration process would be more effective?	Q03	0.8282
4. The introduction of Internet registration will reduce the long queues during registration.	Q04	0.8304
5. Could Internet registration work in the universities current setup?	Q05	0.8334
6. Internet registration would help students register faster and easier.	Q06	0.8243
7. Registration should be centralized.	Q07	0.8258
8. Students could go to other buildings in the registration process?	Q08	0.8370
9. CPUT should have a standard timetable?	Q09	0.8292
10. CPUT should have a standard venue timetable.	Q10	0.8286
11. All pre-requisites must be on the database.	Q11	0.8277
12. All co-requisites must be on the database.	Q12	0.8291
13. CPUT must have a separate administration registration period.	Q13	0.8183
14. CPUT must have a separate academic registration period.	Q14	0.8200
15. CPUT must have a combined registration period.	Q15	0.8322
16. CPUT must increase the registration period.	Q16	0.8319
17 CPUT must have more staff to man the different points, especially at the cashiers during the registration period.	Q17	0.8288
18. CPUT must allow for the payment of registration to take place, before students register.	Q18	0.8415
19. CPUT should have kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration.	Q19	0.8319
20. CPUT must use the Department of Education's database.	Q20	0.8220

Statements (Test all statements without current one's input)	Variable nr.	Cronbach's Alpha Coefficient
21. Students must be able to register online from any computer that is connected to the internet.	Q21	0.8290
22. A web interface must be designed to allow for online registration and applications.	Q22	0.8304
23. Students must be able to pay for registration and application using the same web interface.	Q23	0.8210
24. Students must be able to do course applications from any computer that is connected to the internet.	Q24	0.8182
25. Students must be able to check their outstanding balance from any computer that is connected to the internet.	Q25	0.8278
26. Students must be able to check prerequisites and co requisites for the subjects that they wish to do from any computer that is connected to the internet.	Q26	0.8256
27. Students must be able to check their examination and progressive marks on any computer that is connected to the internet.	Q27	0.8290
28. Students should not have to spend more time than what is absolutely necessary to register at CPUT.	Q28	0.8314
29. Queues for registration must be shortened, (only students with special cases should have to stand in queues).	Q29	0.8347
30. Students should not need to walk from one building to another to register.	Q30	0.8363
Cronbach's Coefficient Alpha for standardized variables		0.8513
Cronbach's Coefficient Alpha for raw variables		0.8331

5.8.2 Descriptive statistics

It is of importance for the reader to note that the number of respondents (N) may differ from variable to variable due to the fact that some of the variables were not answered. Table 5.2 and Table 5.3 show all the categorical variables in the questionnaire with the frequencies in each category and the percentage out of total questionnaires for staff members and students respectively. In some cases there were no answers given (left blank) in the questionnaire. These are shown as 'unknown'.

Table 5.2: Descriptive statistics of staff members on all statements

Variables	Categories	Frequency	Percentage out of total
1. CPUT could improve the quality of the registration process.	Strongly agree	22	73.3%
	Agree	8	26.7%
	Do not know	0	0.0%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
	Unknown	0	0.0%
2. The registration process can be improved on?	Strongly agree	18	60.0%
	Agree	10	33.3%
	Do not know	1	3.3%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
	Unknown	1	3.3%
3. Do you think that an Internet registration process would be more effective?	Strongly agree	18	60.0%
	Agree	8	26.7%
	Do not know	1	3.3%
	Disagree	2	6.7%
	Strongly disagree	1	3.3%
	Unknown	0	0.0%
4. The introduction of Internet registration will reduce the long queues during registration.	Strongly agree	19	63.3%
	Agree	9	30.0%
	Do not know	1	3.3%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
	Unknown	1	3.3%
5. Could Internet registration work in the universities current setup?	Strongly agree	11	36.7%
	Agree	6	20.0%
	Do not know	11	36.7%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
	Unknown	2	6.7%
6. Internet registration would help students	Strongly agree	15	50.0%

Variables	Categories	Frequency	Percentage out of total
register faster and easier.	Agree	12	40.0%
	Do not know	2	6.7%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
	Unknown	1	3.3%
7. Registration should be centralized.	Strongly agree	11	36.7%
	Agree	10	33.3%
	Do not know	2	6.7%
	Disagree	4	13.3%
	Strongly disagree	2	6.7%
	Unknown	1	3.3%
8. Students could go to other buildings in the registration process?	Strongly agree	5	16.7%
	Agree	6	20.0%
	Do not know	1	3.3%
	Disagree	9	30.0%
	Strongly disagree	9	30.0%
	Unknown	0	0.0%
9. CPUT should have a standard timetable?	Strongly agree	15	50.0%
	Agree	7	23.3%
	Do not know	2	6.7%
	Disagree	4	13.3%
	Strongly disagree	0	0.0%
	Unknown	2	6.7%
10. CPUT should have a standard venue timetable.	Strongly agree	16	53.3%
	Agree	10	33.3%
	Do not know	1	3.3%
	Disagree	3	10.0%
	Strongly disagree	0	0.0%
	Unknown	0	0.0%
11. All pre-requisites must be on the database.	Strongly agree	22	73.3%
	Agree	8	26.7%
	Do not know	0	0.0%
	Disagree	0	0.0%

Variables	Categories	Frequency	Percentage out of total
	Strongly disagree	0	0.0%
	Unknown	0	0.0%
12. All co-requisites must be on the database.	Strongly agree	21	70.0%
	Agree	8	26.7%
	Do not know	0	0.0%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
	Unknown	1	3.3%
13. CPUT must have a separate administration registration period.	Strongly agree	13	43.3%
	Agree	5	16.7%
	Do not know	8	26.7%
	Disagree	2	6.7%
	Strongly disagree	1	3.3%
	Unknown	1	3.3%
14. CPUT must have a separate academic registration period.	Strongly agree	13	43.3%
	Agree	5	16.7%
	Do not know	8	26.7%
	Disagree	2	6.7%
	Strongly disagree	1	3.3%
	Unknown	1	3.3%
15. CPUT must have a combined registration period.	Strongly agree	4	13.3%
	Agree	5	16.7%
	Do not know	3	10.0%
	Disagree	6	20.0%
	Strongly disagree	11	36.7%
	Unknown	1	3.3%
16. CPUT must increase the registration period.	Strongly agree	4	13.3%
	Agree	3	10%
	Do not know	2	6.7%
	Disagree	8	26.7%
	Strongly disagree	13	43.3%
	Unknown	0	0.0%
17 CPUT must have more staff to man the	Strongly agree	22	73.3%

Variables	Categories	Frequency	Percentage out of total
different points, especially at the cashiers during the registration period.	Agree	6	20.0%
	Do not know	0	0.0%
	Disagree	2	6.7%
	Strongly disagree	0	0.0%
	Unknown	0	0.0%
18. CPUT must allow for the payment of registration to take place, before students register.	Strongly agree	16	53.3%
	Agree	10	33.3%
	Do not know	2	6.7%
	Disagree	2	6.7%
	Strongly disagree	0	0.0%
	Unknown	0	0.0%
19. CPUT should have kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration.	Strongly agree	22	73.3%
	Agree	5	16.7%
	Do not know	1	3.3%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
	Unknown	2	6.7%
20. CPUT must use the Department of Education's database.	Strongly agree	16	53.3%
	Agree	6	20.0%
	Do not know	6	20.0%
	Disagree	0	0.0%
	Strongly disagree	1	3.3%
	Unknown	1	3.3%
21. Students must be able to register online from any computer that is connected to the internet.	Strongly agree	19	63.3%
	Agree	6	20.0%
	Do not know	2	6.7%
	Disagree	1	3.3%
	Strongly disagree	1	3.3%
	Unknown	1	3.3%
22. A web interface must be designed to allow for online registration and applications.	Strongly agree	18	60.0%
	Agree	8	26.7%
	Do not know	1	3.3%
	Disagree	1	3.3%

Variables	Categories	Frequency	Percentage out of total
	Strongly disagree	1	3.3%
	Unknown	1	3.3%
23. Students must be able to pay for registration and application using the same web interface.	Strongly agree	18	60.0%
	Agree	6	20.0%
	Do not know	3	10.0%
	Disagree	0	0.0%
	Strongly disagree	1	3.3%
	Unknown	2	6.7%
24. Students must be able to do course applications from any computer that is connected to the internet.	Strongly agree	'19	63.3%
	Agree	5	16.7%
	Do not know	4	13.3%
	Disagree	0	0.0%
	Strongly disagree	1	3.3%
	Unknown	1	3.3%
25. Students must be able to check their outstanding balance from any computer that is connected to the internet.	Strongly agree	23	76.7%
	Agree	5	16.7%
	Do not know	1	3.3%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
	Unknown	1	3.3%
26. Students must be able to check prerequisites and co requisites for the subjects that they wish to do from any computer that is connected to the internet.	Strongly agree	24	80.0%
	Agree	3	10.0%
	Do not know	2	6.7%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
	Unknown	1	3.3%
27. Students must be able to check their examination and progressive marks on any computer that is connected to the internet.	Strongly agree	21	70.0%
	Agree	4	13.3%
	Do not know	3	10.0%
	Disagree	0	0.0%
	Strongly disagree	1	3.3%
	Unknown	1	3.3%
28. Students should not have to spend more	Strongly agree	21	70.0%

Variables	Categories	Frequency	Percentage out of total
time than what is absolutely necessary to register at CPUT.	Agree	5	16.7%
	Do not know	2	6.7%
	Disagree	1	3.3%
	Strongly disagree	0	0.0%
	Unknown	1	3.3%
29. Queues for registration must be shortened, (only students with special cases should have to stand in queues).	Strongly agree	23	76.7%
	Agree	5	16.7%
	Do not know	1	3.3%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
	Unknown	1	3.3%
30. Students should not need to walk from one building to another to register.	Strongly agree	21	70.0%
	Agree	7	23.3%
	Do not know	0	0.0%
	Disagree	0	0.0%
	Strongly disagree	2	6.7%
	Unknown	0	0.0%
31. A single, updated and clean database must be created.	Strongly agree	20	66.7%
	Agree	7	23.3%
	Do not know	1	3.3%
	Disagree	1	3.3%
	Strongly disagree	0	0.0%
	Unknown	1	3.3%
32. Administrative staff, assisting with registration, should have a proper schedule for breaks during registration period.	Strongly agree	18	60.0%
	Agree	10	33.3%
	Do not know	1	3.3%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
	Unknown	1	3.3%
33. Academic, ICTS, registration, finance and examination departments must work together to continuously improve the registration process.	Strongly agree	24	80.0%
	Agree	4	13.3%
	Do not know	1	3.3%
	Disagree	0	0.0%

Variables	Categories	Frequency	Percentage out of total
	Strongly disagree	0	0.0%
	Unknown	1	3.3%

Table 5.3: Descriptive statistics of students on all statements

Variables	Categories	Frequency	Percentage out of total
1. CPUT could improve the quality of the registration process.	Strongly agree	36	72.0%
	Agree	13	26.0%
	Do not know	0	0.0%
	Disagree	0	0.0%
	Strongly disagree	1	2.0%
	Unknown	0	0.0%
2. The registration process can be improved on?	Strongly agree	23	46.0%
	Agree	15	30.0%
	Do not know	7	14.0%
	Disagree	0	0.0%
	Strongly disagree	1	2.0%
	Unknown	4	8.0%
3. Do you think that an Internet registration process would be more effective?	Strongly agree	31	62.0%
	Agree	13	26.0%
	Do not know	3	6.0%
	Disagree	1	2.0%
	Strongly disagree	2	4.0%
	Unknown	0	0.0%
4. The introduction of Internet registration will reduce the long queues during registration.	Strongly agree	32	64.0%
	Agree	14	28.0%
	Do not know	3	6.0%
	Disagree	1	2.0%
	Strongly disagree	0	0.0%
	Unknown	0	0.0%
5. Could Internet registration work in the universities current setup?	Strongly agree	15	30.0%
	Agree	17	34.0%

Variables	Categories	Frequency	Percentage out of total
	Do not know	13	26.0%
	Disagree	2	4.0%
	Strongly disagree	2	4.0%
	Unknown	1	2.0%
6. Internet registration would help students register faster and easier.	Strongly agree	28	56.0%
	Agree	16	32.0%
	Do not know	3	6.0%
	Disagree	1	2.0%
	Strongly disagree	1	2.0%
	Unknown	1	2.0%
7. Registration should be centralized.	Strongly agree	15	30.0%
	Agree	14	28.0%
	Do not know	11	22.0%
	Disagree	2	4.0%
	Strongly disagree	7	14.0%
	Unknown	1	2.0%
8. Students could go to other buildings in the registration process?	Strongly agree	9	18.0%
	Agree	15	30.0%
	Do not know	6	12.0%
	Disagree	9	18.0%
	Strongly disagree	10	20.0%
	Unknown	1	2.0%
9. CPUT should have a standard timetable?	Strongly agree	22	44.0%
	Agree	15	30.0%
	Do not know	11	22.0%
	Disagree	1	2.0%
	Strongly disagree	1	2.0%
	Unknown	0	0.0%
10. CPUT should have a standard venue timetable.	Strongly agree	21	42.0%
	Agree	16	32.0%
	Do not know	10	20.0%
	Disagree	2	4.0%
	Strongly disagree	1	2.0%

Variables	Categories	Frequency	Percentage out of total
	Unknown	0	0.0%
11. All pre-requisites must be on the database.	Strongly agree	15	30.0%
	Agree	24	48.0%
	Do not know	5	10.0%
	Disagree	0	0.0%
	Strongly disagree	2	4.0%
	Unknown	4	8.0%
12. All co-requisites must be on the database.	Strongly agree	15	30.0%
	Agree	16	32.0%
	Do not know	10	20.0%
	Disagree	1	2.0%
	Strongly disagree	2	4.0%
	Unknown	6	12.0%
13. CPUT must have a separate administration registration period.	Strongly agree	22	44.0%
	Agree	15	30.0%
	Do not know	4	8.0%
	Disagree	6	12.0%
	Strongly disagree	2	4.0%
	Unknown	1	2.0%
14. CPUT must have a separate academic registration period.	Strongly agree	25	50.0%
	Agree	15	30.0%
	Do not know	4	8.0%
	Disagree	4	8.0%
	Strongly disagree	1	2.0%
	Unknown	1	2.0%
15. CPUT must have a combined registration period.	Strongly agree	5	10.0%
	Agree	10	20.0%
	Do not know	9	18.0%
	Disagree	15	30.0%
	Strongly disagree	10	20.0%
	Unknown	1	2.0%
16. CPUT must increase the registration period.	Strongly agree	22	44.0%
	Agree	10	20.0%

Variables	Categories	Frequency	Percentage out of total
	Do not know	2	4.0%
	Disagree	7	14.0%
	Strongly disagree	5	10.0%
	Unknown	4	8.0%
17 CPUT must have more staff to man the different points, especially at the cashiers during the registration period.	Strongly agree	37	74.0%
	Agree	9	18.0%
	Do not know	2	4.0%
	Disagree	1	2.0%
	Strongly disagree	0	0.0%
	Unknown	1	2.0%
18. CPUT must allow for the payment of registration to take place, before students register.	Strongly agree	20	40.0%
	Agree	9	18.0%
	Do not know	4	8.0%
	Disagree	8	16.0%
	Strongly disagree	8	16.0%
	Unknown	1	2.0%
19. CPUT should have kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration.	Strongly agree	36	72.0%
	Agree	11	22.0%
	Do not know	2	4.0%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
	Unknown	1	2.0%
20. CPUT must use the Department of Education's database.	Strongly agree	11	22.0%
	Agree	10	20.0%
	Do not know	19	38.0%
	Disagree	8	16.0%
	Strongly disagree	2	4.0%
	Unknown	0	0.0%
21. Students must be able to register online from any computer that is connected to the internet.	Strongly agree	33	66.0%
	Agree	10	20.0%
	Do not know	2	4.0%
	Disagree	4	8.0%
	Strongly disagree	1	2.0%

Variables	Categories	Frequency	Percentage out of total
	Unknown	0	0.0%
22. A web interface must be designed to allow for online registration and applications.	Strongly agree	27	54.0%
	Agree	20	40.0%
	Do not know	2	4.0%
	Disagree	1	2.0%
	Strongly disagree	0	0.0%
	Unknown	0	0.0%
23. Students must be able to pay for registration and application using the same web interface.	Strongly agree	21	42.0%
	Agree	18	36.0%
	Do not know	2	4.0%
	Disagree	5	10.0%
	Strongly disagree	4	8.0%
	Unknown	0	0.0%
24. Students must be able to do course applications from any computer that is connected to the internet.	Strongly agree	29	58.0%
	Agree	14	28.0%
	Do not know	1	2.0%
	Disagree	2	4.0%
	Strongly disagree	3	6.0%
	Unknown	1	2.0%
25. Students must be able to check their outstanding balance from any computer that is connected to the internet.	Strongly agree	37	74.0%
	Agree	10	20.0%
	Do not know	1	2.0%
	Disagree	0	0.0%
	Strongly disagree	1	2.0%
	Unknown	1	2.0%
26. Students must be able to check prerequisites and co requisites for the subjects that they wish to do from any computer that is connected to the internet.	Strongly agree	33	66.0%
	Agree	11	22.0%
	Do not know	5	10.0%
	Disagree	0	0.0%
	Strongly disagree	1	2.0%
	Unknown	0	0.0%
27. Students must be able to check their examination and progressive marks on	Strongly agree	43	86.0%
	Agree	6	12.0%

Variables	Categories	Frequency	Percentage out of total
any computer that is connected to the internet.	Do not know	0	0.0%
	Disagree	1	2.0%
	Strongly disagree	0	0.0%
	Unknown	0	0.0%
28. Students should not have to spend more time than what is absolutely necessary to register at CPUT.	Strongly agree	31	62.0%
	Agree	16	32.0%
	Do not know	2	4.0%
	Disagree	1	2.0%
	Strongly disagree	0	0.0%
	Unknown	0	0.0%
29. Queues for registration must be shortened, (only students with special cases should have to stand in queues).	Strongly agree	34	68.0%
	Agree	6	12.0%
	Do not know	3	6.0%
	Disagree	3	6.0%
	Strongly disagree	4	8.0%
	Unknown	0	0.0%
30. Students should not need to walk from one building to another to register.	Strongly agree	40	80.0%
	Agree	7	14.0%
	Do not know	0	0.0%
	Disagree	0	0.0%
	Strongly disagree	3	6.0%
	Unknown	0	0.0%

5.8.3 Uni-variate graphs

The statements are grouped into groups which present more or less the same measurement for illustrative purposes.

5.8.3.1 Staff members

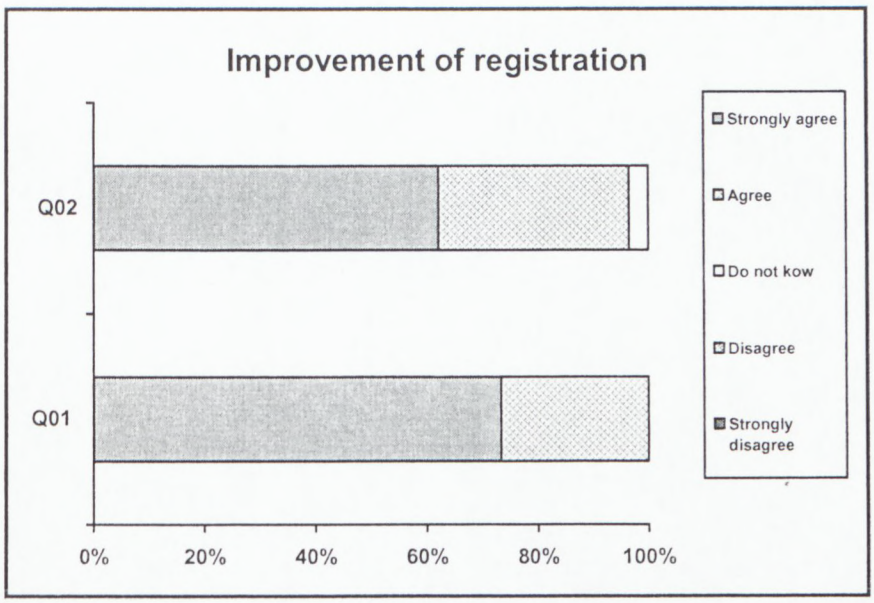

Figure 5.1: Improvement of registration

All the staff respondents indicated that CPUT could improve the quality of the registration process, while 93.3% believed that the process can be improved or refined.

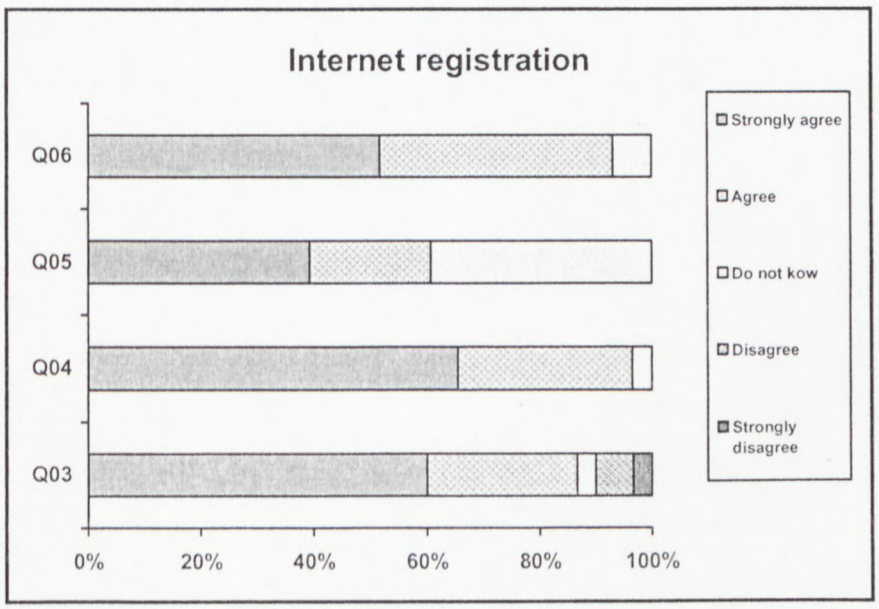

Figure 5.2: Internet registration

According to the staff respondents:

- "The internet registration process would be more effective" (86.7%).

- "The introduction of Internet registration and using online banking will reduce the long queues during registration" (93.3%).
- "Internet registration will help students register faster and easier (90.0%)".

They also felt that "Internet registration could work in CPUT's current setup" (56.7%), although a large percentage "did not know" (36.7%).

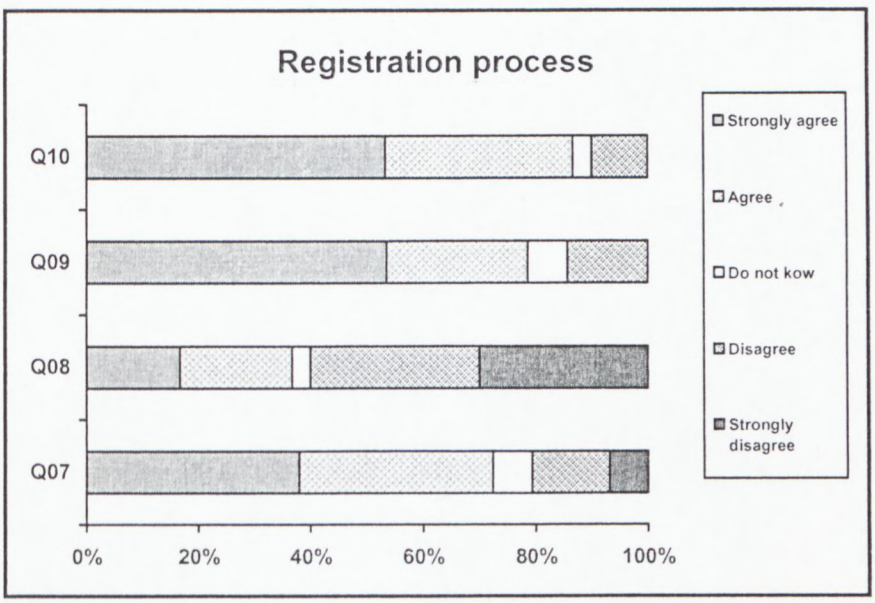

Figure 5.3: Registration process

According to the staff respondents:

- "Registration should be centralized" (70.0%).
- "CPUT should have a standard timetable" (75.9%).
- "CPUT should have a standard venue timetable" (86.7%).

They also felt that, "Students should not go to other buildings in the registration process" (60.0%).

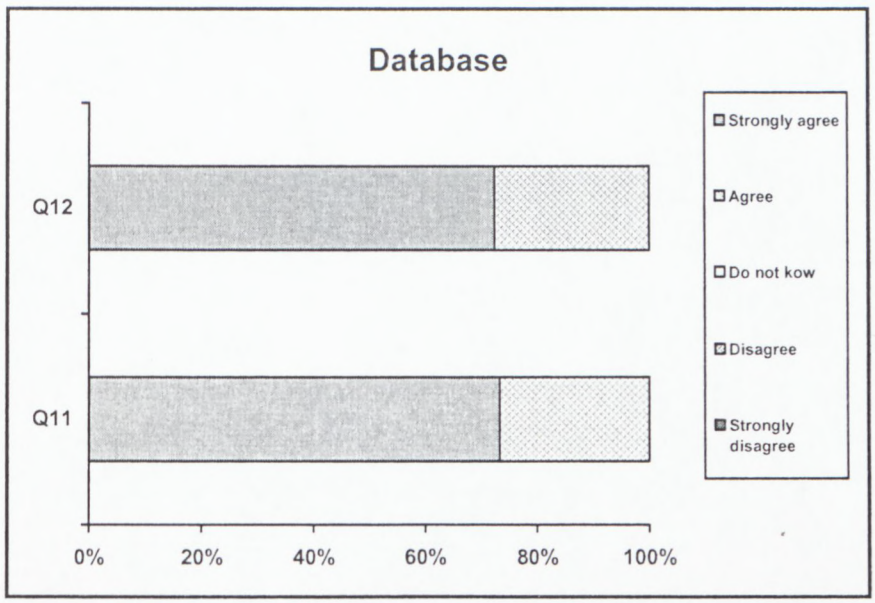

Figure 5.4: Database

All the staff respondents indicated that all pre-requisites and co-requisites should be on the database.

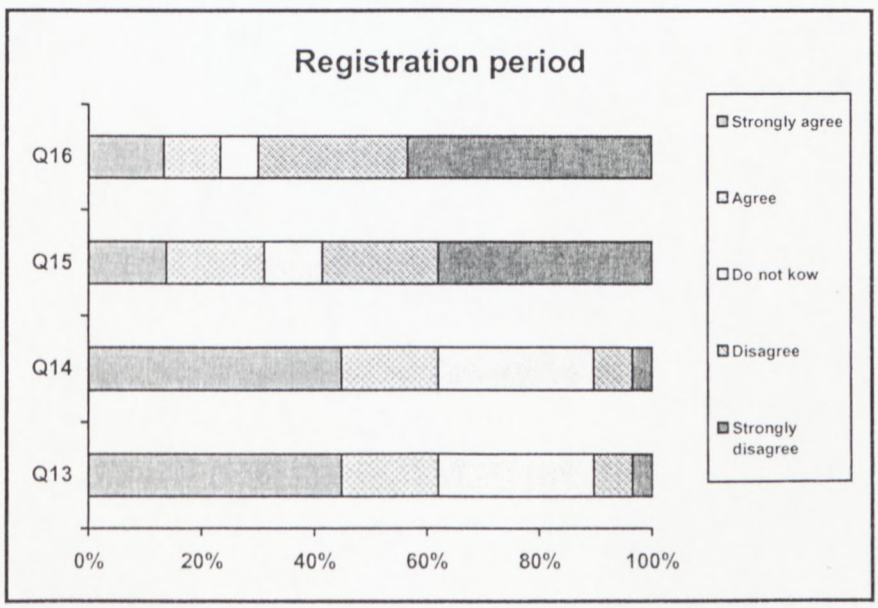

Figure 5.5: Registration process

According to the staff respondents:

- "CPUT should have a separate administration registration period" (60.0%).
- "CPUT should have a separate academic registration period" (60.0%).
- "CPUT should not have a combined registration period" (56.7%).
- "CPUT should not increase the registration period" (70.0%).

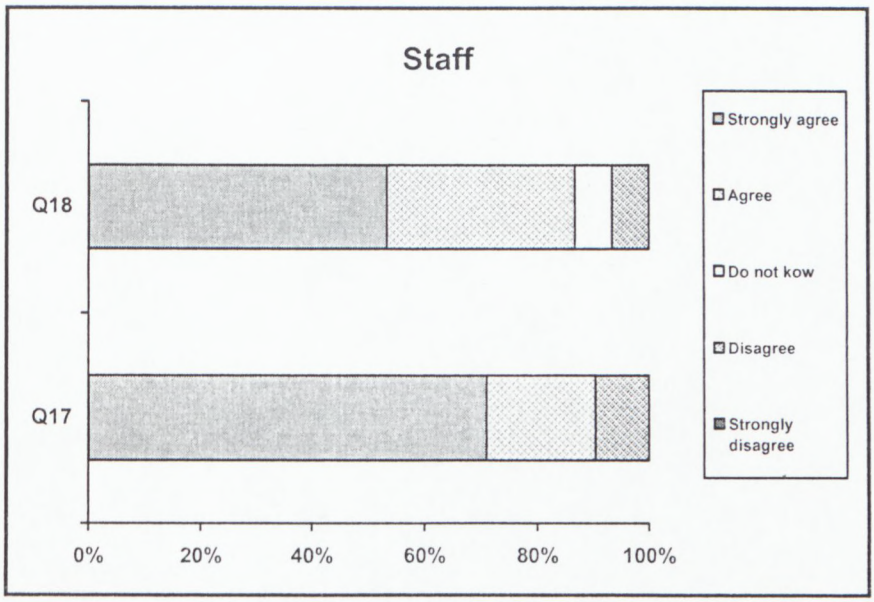

Figure 5.6: Staff

According to the staff respondents:

- "CPUT should have more staff to man the different points, especially at the cashiers during the registration period" (93.3%).
- "Administration staff, assisting with registration, should have a proper schedule for breaks during registration period" (86.7%).

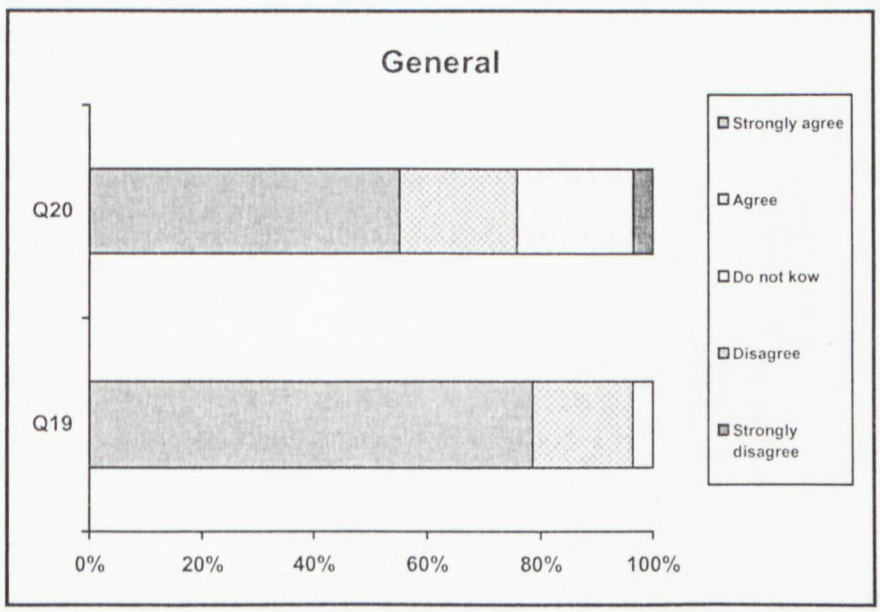

Figure 5.7: General

According to the staff respondents:

- "CPUT should have a kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration" (73.3%).
- "CPUT should use the DOE database" (83.3%).

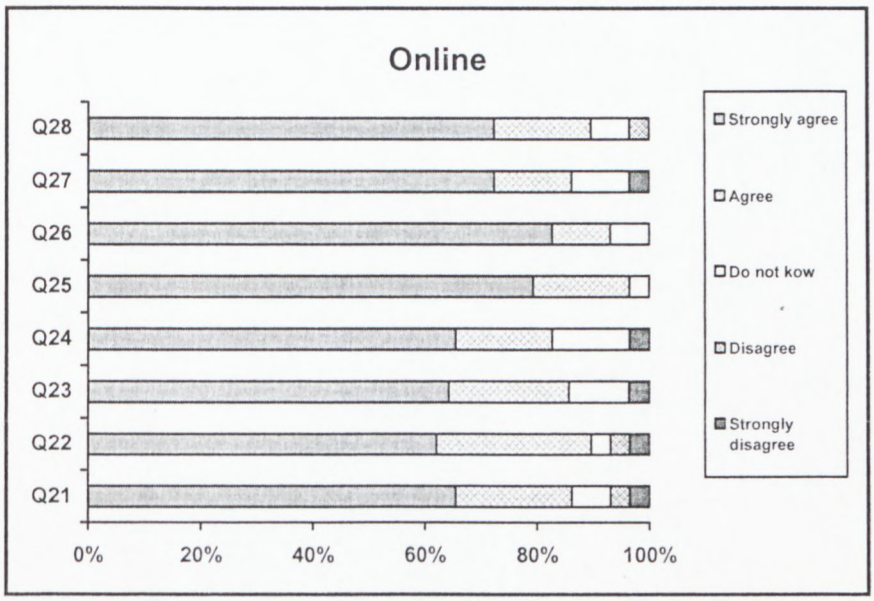

Figure 5.8: Online

According to the staff respondents:

- "Students must be able to register online from any computer that is connected to the Internet" (83.3%).
- "A web interface must be designed to allow for online registration and applications" (86.7%).
- "Students must be able to pay for registration and application using the same web interface" (80.0%).
- "Students must be able to do course applications from any computer that is connected to the Internet" (80.0%).
- "Students must be able to check their outstanding balance from any computer that is connected to the Internet" (93.3%).
- "Students must be able to check prerequisites and co requisites for the subjects that they wish to do from any computer that is connected to the Internet" (90.0%).
- "Students must be able to check their examination and progressive marks on any computer that is connected to the Internet" (83.3%).

- "Students should not have to spend more time than what is absolutely necessary to register at CPUT" (86.7%).

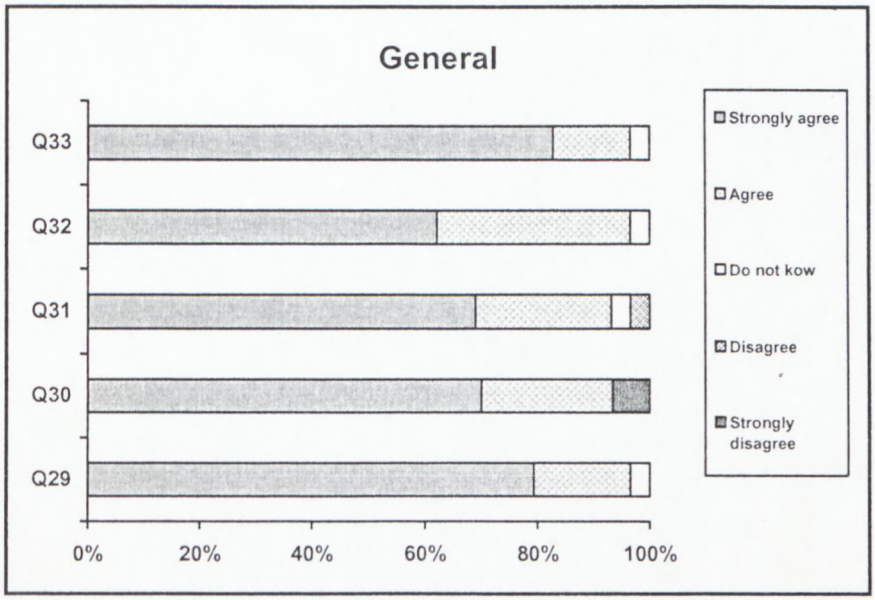

Figure 5.9: General

According to the staff respondents:

- "Queues for registration must be shortened, (only students with special cases should have to stand in queues)" (93.3%).
- "Students should not need to walk from one building to another to register" (93.3%).
- "A single, updated and clean database must be created" (90.0%).
- "Administrative staff, assisting with registration, should have a proper schedule for breaks during registration period" (93.3%).
- "Academic, ICTS, registration, finance and examination departments must work together to continuously improve the registration process" (93.3%).

5.8.3.2 Students

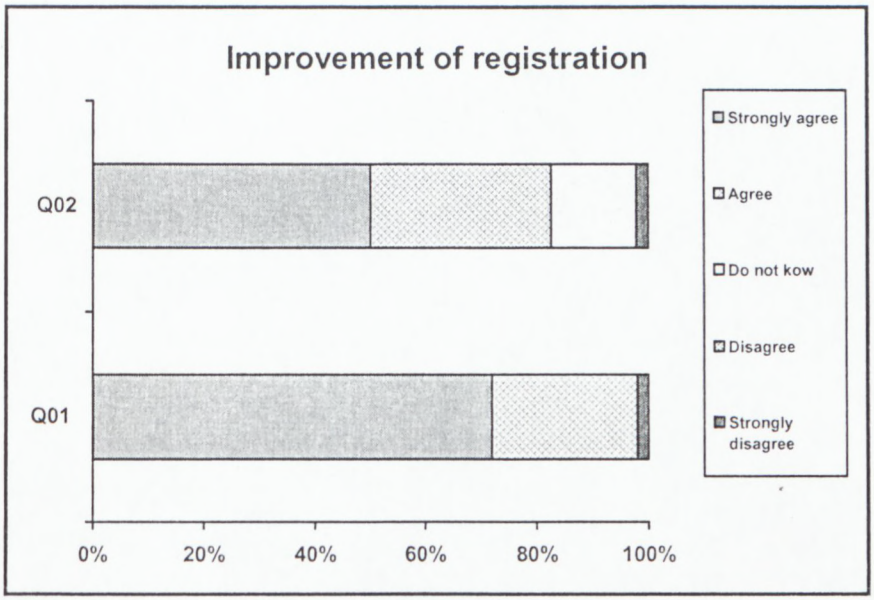

Figure 5.10: Improvement of registration

Nearly all the student respondents (98.0%) indicated that CPUT could improve the quality of the registration process, while 76.0% believed that the process can be improved or refined.

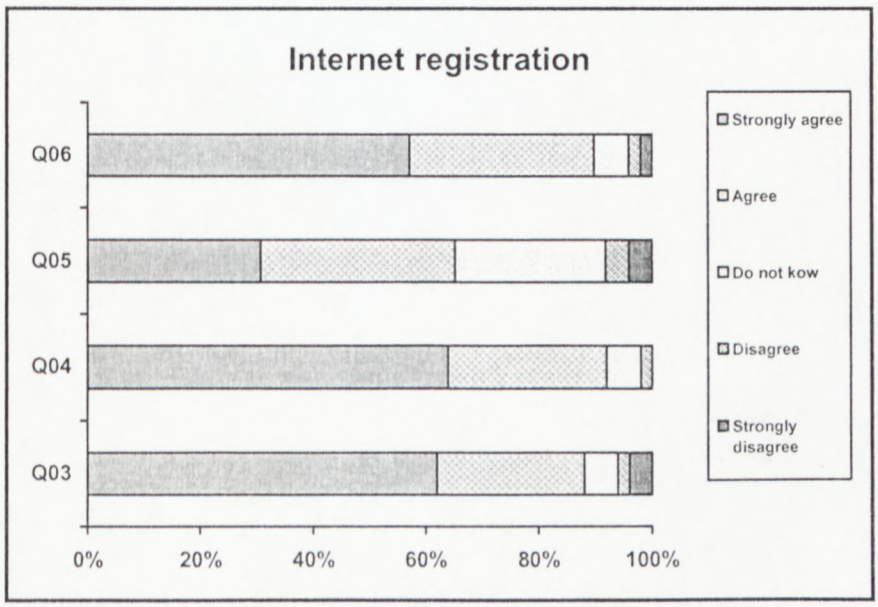

Figure 5.11: Internet registration

According to the student respondents:

- "The Internet registration process would be more effective" (88.0%).

- "The introduction of Internet registration and using online banking will reduce the long queues during registration" (92.0%).
- "Internet registration will help students register faster and easier" (88.0%).

They also felt that "Internet registration could work in CPUT's current setup" (64.0%), although a large percentage "did not know" (26.0%).

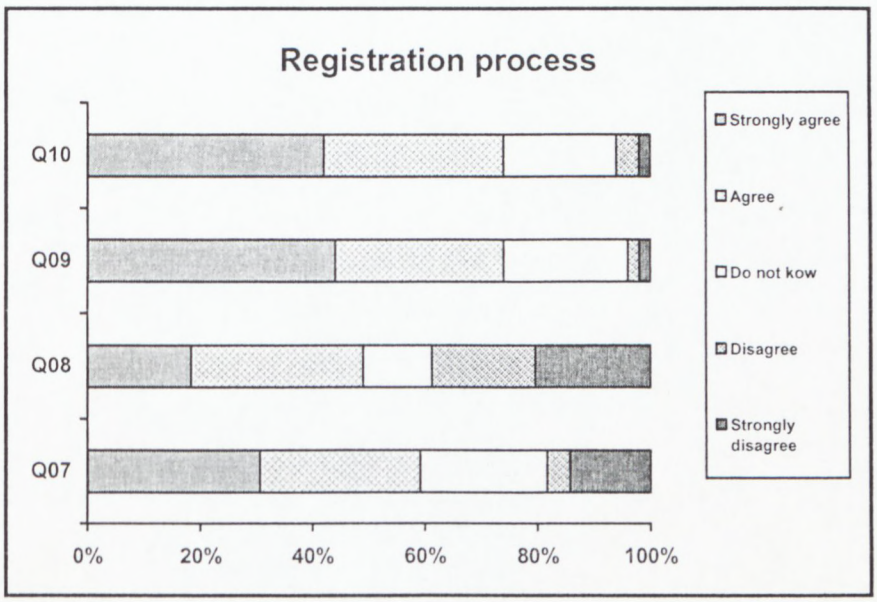

Figure 5.12: Registration process

According to the student respondents:

- "Registration should be centralized" (58.0%),
- "CPUT should have a standard timetable" (74.0%).
- "CPUT should have a standard venue timetable" (74.0%).

They were split between whether "Students should go to other buildings in the registration process" (48.0%) or not (38%).

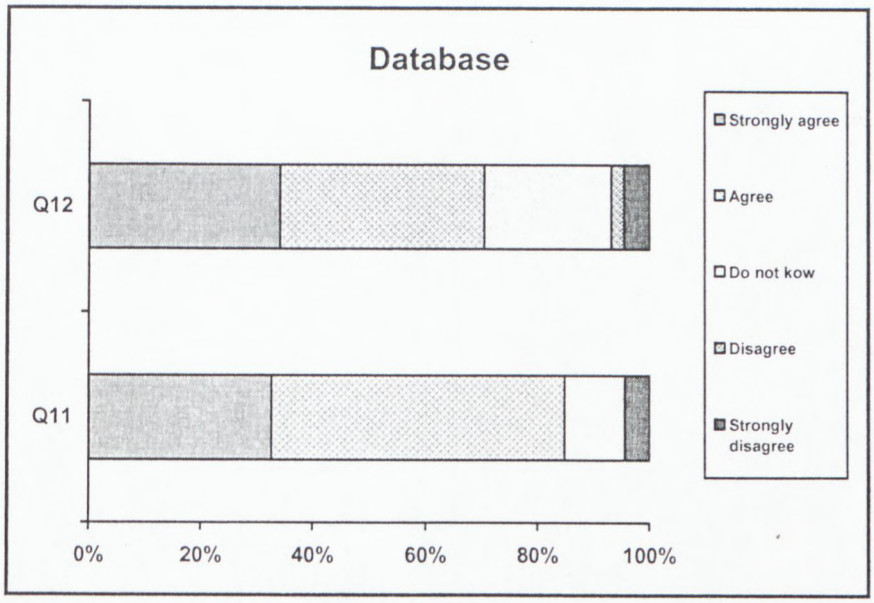

Figure 5.13: Database

The student respondents indicated that in 78% of the cases, that pre-requisites and in 63.3% that co-requisites should be on the database.

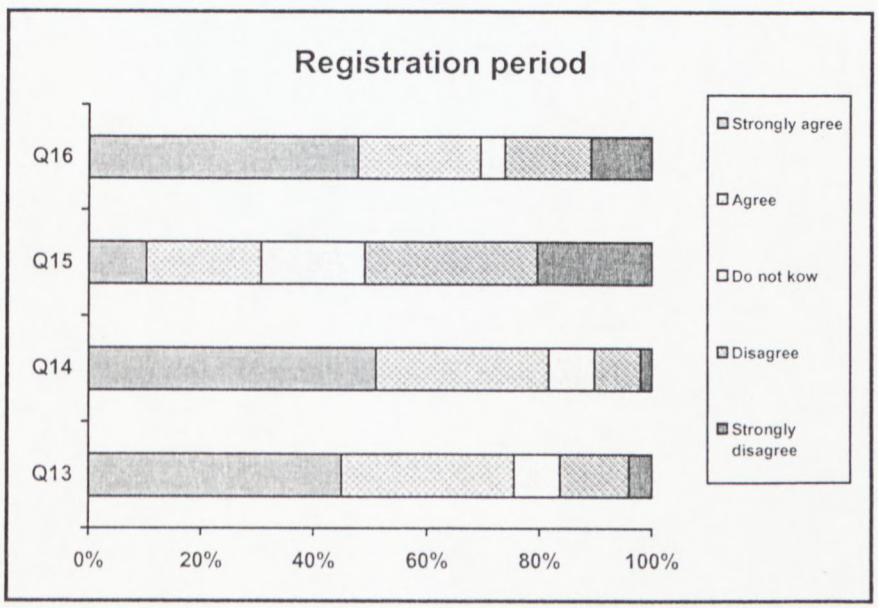

Figure 5.14: Registration process

According to the staff respondents:

- "CPUT should have a separate administration registration period" (75.5%).
- "CPUT should have a separate academic registration period" (80.0%).
- "CPUT should not have a combined registration period" (50.0%).
- "CPUT should increase the registration period" (64.0%).

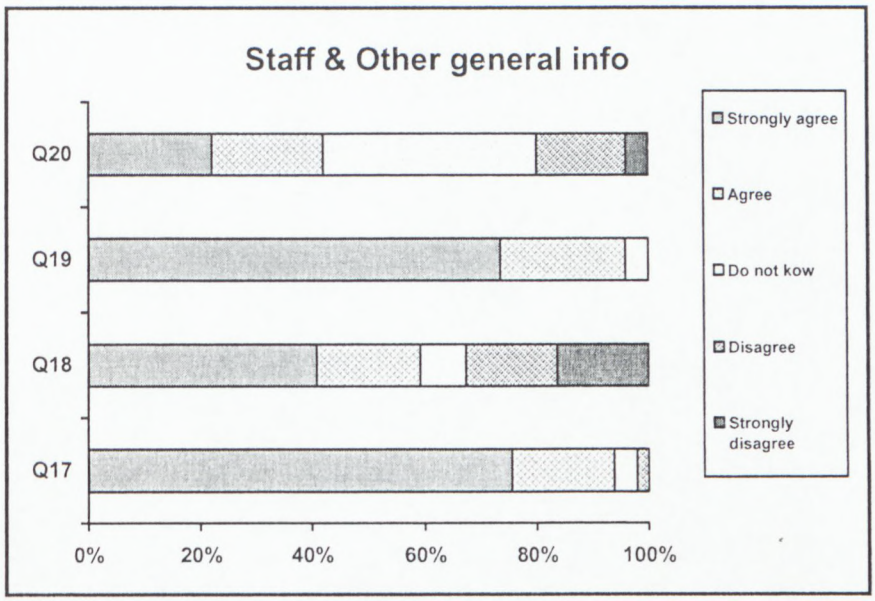

Figure 5.15: Staff & Other general information

According to the student respondents:

- "CPUT must have more staff to man the different points, especially at the cashiers during the registration period" (92.0%).
- "CPUT must allow for the payment of registration to take place, before students register" (58.0%).
- "CPUT should have a kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration" (94.0%).

They also felt that, "CPUT should use the DOE database" (42.0%), although a large percentage "did not know" (38.0%).

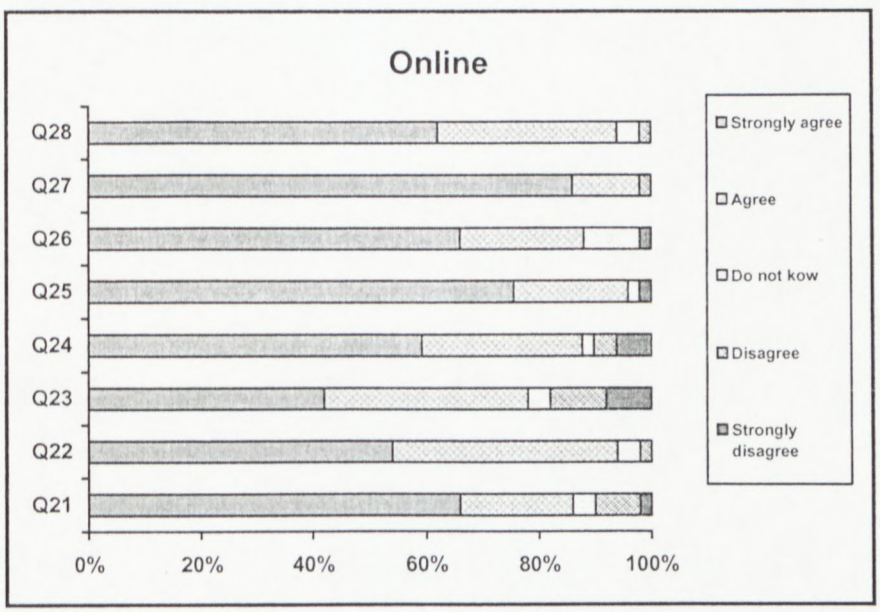

Figure 5.16: Online

According to the staff respondents:

- "Students must be able to register online from any computer that is connected to the Internet" (86.0%).
- "A web interface must be designed to allow for online registration and applications" (94.0%).
- "Students must be able to pay for registration and application using the same web interface" (78.0%).
- "Students must be able to do course applications from any computer that is connected to the Internet" (86.0%).
- "Students must be able to check their outstanding balance from any computer that is connected to the Internet" (94.0%).
- "Students must be able to check prerequisites and co requisites for the subjects that they wish to do from any computer that is connected to the Internet" (88.0%).
- "Students must be able to check their examination and progressive marks on any computer that is connected to the Internet" (98.0%).
- "Students should not have to spend more time than what is absolutely necessary to register at CPUT" (94.0%).

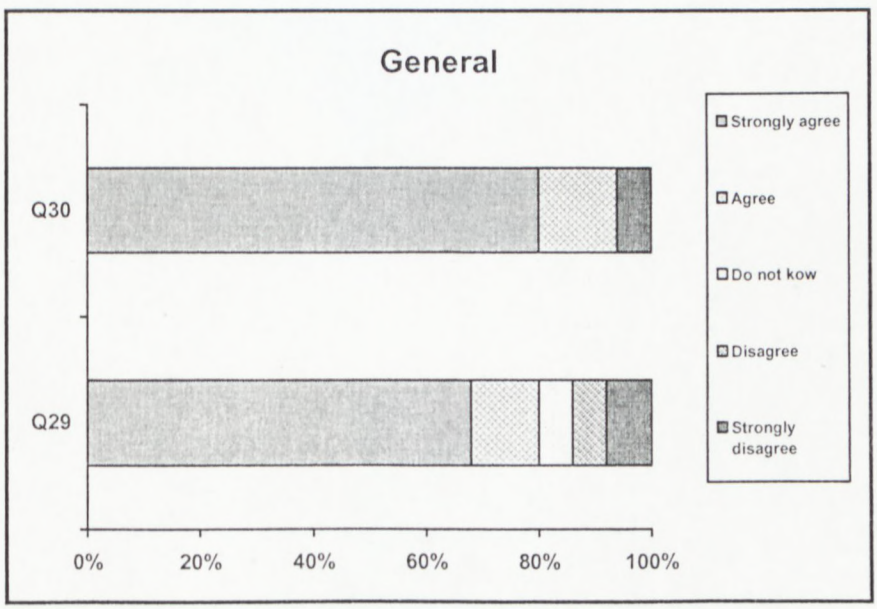

Figure 5.17: General

According to the student respondents:

- "Queues for registration must be shortened, (only students with special cases should have to stand in queues)" (80.0%).
- "Students should not need to walk from one building to another to register" (94.0%).

5.8.4 Comparative statistics

The chi-square tests for equal proportions were performed on the statements to indicate whether one choice was preferred above another.. Table 5.4 shows the statistical results.

Table 5.4: Chi-Square tests for equal proportions

Question / Statement	Sample Size	Chi-Square	DF	P-Value
Staff members				
1. CPUT could improve the quality of the registration process.	30	6.5333	1	0.0106*
2. The registration process can be improved on?	29	14.9655	2	0.0006***
3. Do you think that an Internet registration process would be more effective?	30	35.6667	4	<0.0001***
4. The introduction of Internet registration will reduce the long queues during registration.	29	16.8276	2	0.0002***
5. Could Internet registration work in the universities current setup?	28	1.7857	2	0.4095
6. Internet registration would help students register faster and easier.	29	9.5862	2	0.0083**
7. Registration should be centralized.	29	13.2414	4	0.0102*
8. Students could go to other buildings in the registration process?	30	7.3333	4	0.1193
9. CPUT should have a standard timetable?	28	14.0000	3	0.0029**
10. CPUT should have a standard venue timetable.	30	18.8000	3	0.0003***
11. All pre-requisites must be on the database.	30	6.5333	1	0.0106*
12. All co-requisites must be on the database.	30	5.8276	1	0.0158*

Question / Statement	Sample Size	Chi-Square	DF	P-Value
13. CPUT must have a separate administration registration period.	29	16.3448	4	0.0026**
14. CPUT must have a separate academic registration period.	29	16.3448	4	0.0026**
15. CPUT must have a combined registration period.	29	6.6897	4	0.1532
16. CPUT must increase the registration period.	30	13.6667	4	0.0084**
17 CPUT must have more staff to man the different points, especially at the cashiers during the registration period.	30	22.4000	2	<0.0001***
18. CPUT must allow for the payment of registration to take place, before students register.	30	18.5333	3	0.0003***
19. CPUT should have kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration.	28	26.6429	2	<0.0001***
20. CPUT must use the Department of Education's database.	29	16.3793	3	0.0009***
21. Students must be able to register online from any computer that is connected to the internet.	29	40.4828	4	<0.0001***
22. A web interface must be designed to allow for online registration and applications.	29	38.4138	4	<0.0001***
23. Students must be able to pay for registration and application using the same web interface.	28	24.8571	3	<0.0001***
24. Students must be able to do course applications from any computer that is connected to the internet.	29	26.5862	3	<0.0001***
25. Students must be able to check their outstanding balance from any computer that is connected to the internet.	29	28.4138	2	<0.0001***
26. Students must be able to check prerequisites and co requisites for the subjects that they wish to do from any computer that is	29	31.9310	2	<0.0001***

Question / Statement	Sample Size	Chi-Square	DF	P-Value
connected to the internet.				
27. Students must be able to check their examination and progressive marks on any computer that is connected to the internet.	29	35.4138	3	<0.0001***
28. Students should not have to spend more time than what is absolutely necessary to register at CPUT.	29	35.9655	3	<0.0001***
29. Queues for registration must be shortened, (only students with special cases should have to stand in queues).	29	28.4138	2	<0.0001***
30. Students should not need to walk from one building to another to register.	30	19.4000	2	<0.0001***
31. A single, updated and clean database must be created.	29	33.2069	3	<0.0001***
32. Administrative staff, assisting with registration, should have a proper schedule for breaks during registration period.	29	14.9655	2	0.0006***
33. Academic, ICTS, registration, finance and examination departments must work together to continuously improve the registration process.	29	32.3448	2	<0.0001***
Students				
1. CPUT could improve the quality of the registration process.	50	37.9600	2	<0.0001***
2. The process can be improved on?	46	23.9130	3	<0.0001***
3. Do you think that an Internet registration process would be more effective?	50	64.4000	4	<0.0001***
4. The introduction of Internet registration will reduce the long queues during registration.	50	48.4000	3	<0.0001***
5. Could Internet registration work in the universities current setup?	49	21.5102	4	0.0003***
6. Internet registration would help students register faster and easier.	49	58.2449	4	<0.0001***
7. Registration should be centralized.	49	11.7143	4	0.0196*
8. Students could go to other buildings in the registration process?	49	4.3673	4	0.3586

Question / Statement	Sample Size	Chi-Square	DF	P-Value
9. CPUT should have a standard timetable?	50	33.2000	4	<0.0001***
10. CPUT should have a standard venue timetable.	50	30.2000	4	<0.0001***
11. All pre-requisites must be on the database.	46	26.1739	3	<0.0001***
12. All co-requisites must be on the database.	44	22.5909	4	0.0002***
13. CPUT must have a separate administration registration period.	49	29.0612	4	<0.0001***
14. CPUT must have a separate academic registration period.	49	41.1020	4	<0.0001***
15. CPUT must have a combined registration period.	49	5.1837	4	0.2690
16. CPUT must increase the registration period.	46	25.9565	4	<0.0001***
17 CPUT must have more staff to man the different points, especially at the cashiers during the registration period.	49	69.7755	3	<0.0001***
18. CPUT must allow for the payment of registration to take place, before students register.	49	14.7755	4	0.0052**
19. CPUT should have kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration.	49	38.0000	2	<0.0001***
20. CPUT must use the Department of Education's database.	50	15.0000	4	0.0047**
21. Students must be able to register online from any computer that is connected to the internet.	50	71.0000	4	<0.0001***
22. A web interface must be designed to allow for online registration and applications.	50	40.7200	3	<0.0001***
23. Students must be able to pay for registration and application using the same web interface.	50	31.000	4	<0.0001***
24. Students must be able to do course applications from any computer that is connected to the internet.	49	58.2449	4	<0.0001***

Question / Statement	Sample Size	Chi-Square	DF	P-Value
25. Students must be able to check their outstanding balance from any computer that is connected to the internet.	49	71.0816	3	<0.0001***
26. Students must be able to check prerequisites and co requisites for the subjects that they wish to do from any computer that is connected to the internet.	50	48.8800	3	<0.0001***
27. Students must be able to check their examination and progressive marks on any computer that is connected to the internet.	50	63.1600	2	<0.0001***
28. Students should not have to spend more time than what is absolutely necessary to register at CPUT.	50	47.7600	3	<0.0001***
29. Queues for registration must be shortened, (only students with special cases should have to stand in queues).	50	72.6000	4	<0.0001***
30. Students should not need to walk from one building to another to register.	50	49.4800	2	<0.0001***

Except for statements "Could Internet registration work in current university's setup", "Students could go to other buildings in the registration process" and "CPUT must have a combined registration period", there is evidence that the proportions of different response categories for all the different statements were not equal for the staff member group. For the student group, except for statements "Students could go to other buildings in the registration process" and "CPUT must have a combined registration period", there is evidence that the proportions of different response categories for all the different statements were not equal. The chi-square tests for equal proportions for all the statements are shown in Annexure A.

The chi-square test for equal proportions show that the H_o: $P_1=P_2$ are to be rejected, thus $P_1 \neq P_2$. This means that a significant higher / lower proportion of respondents indicated one category rather than one of the other categories. For

instance, statistically significant more staff members 'Strongly agree' (73.3%) than 'Agree' (26.7%) for the statement: "Do you think that CPUT could improve the quality of the registration process".

Cross tables using the Chi-square tests were also compiled to determine whether the staff members and the students; differed in there responses on the statements that they both answered. Due to the different numbering of statements for the staff member group and student group, a table is compiled with new statement numbers to indicate the same statements in both cases and the table is attach as Annexure B.

In most of the comparisons the cells had an expected frequency of less than 5, in which case the chi-square test may become invalid. To overcome this problem some of the categories which mean approximately the same are aggregated. That is for instance to combine all the agree categories and all the disagree categories, leaving out the degree with which they disagree or agree.

Table 5.5 (cross tables) and Table 5.6 (chi-square test results), consisting out of all the statements where statistical significantly differences were found, are compiled. In other words the H_0 hypothesis assumes that staff members and students and the answers given on the statements are independent, are to be rejected. The cross tables and statistics for all the statements are shown in Annexure C.

Table 5.5: Cross tables between staff members / students and Answers on Statements.

Statement	Answer	Staff member	Student	Total
12. All co-requisites must be on the database.	Agree to strongly agree	29 100.0%	31 70.4%	60 82.2%
	Do not know	0 0.0%	10 22.7%	10 13.7
	Disagree to Strongly disagree	0 0.0%	3 6.8%	3 4.1%
	Total	29 39.7%	44 60.3%	73 100.0%
16. CPUT must increase	Agree to	7	32	39

Statement	Answer	Staff member	Student	Total
the registration period.	strongly agree	23.3%	69.6%	51.3%
	Do not know	2 6.7%	2 4.4%	4 5.3
	Disagree to Strongly disagree	21 70.0%	12 26.1%	33 43.4%
	Total	30 39.5%	46 60.5%	76 100.0%
19. CPUT must allow for the payment of registration to take place, before students register.	Agree to Strongly Agree	27 96.4%	29 59.2%	56 72.7%
	Do not know	1 3.6%	4 8.2%	5 6.5
	Strongly disagree	0 0.0%	16 32.6%	16 20.8%
	Total	28 36.4%	49 63.6%	77 100.0%
20. CPUT should have kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration.	Agree to strongly agree	22 75.9%	47 95.9%	69 88.4%
	Do not know	6 20.7%	2 4.1%	8 20.7%
	Disagree to Strongly disagree	1 3.4%	0 0.0%	1 3.4%
	Total	29 37.2%	49 62.8%	78 100.0%
21. CPUT must use the Department of Education's database.	Agree to strongly agree	25 86.2%	21 42.0%	46 58.2%
	Do not know	2 6.9%	19 38.0%	21 26.6%
	Disagree to Strongly disagree	2 6.9%	10 20.0%	12 15.2%
	Total	29 36.7%	50 63.3%	79 100.0%

Table 5.6: Statistical Significant Chi-Square statistics for Independency between staff members / students and Answers on Statements

Statement	N	DF	Chi-Square value	P-value
12. All co-requisites must be on the database.	73	2	10.4246	0.0054**
16. CPUT must increase the registration period.	76	2	15.8126	0.0004***
19. CPUT must allow for the payment of registration to take place, before students register.	77	2	13.1200	0.0014**
20. CPUT should have kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration.	78	2	7.4174	0.0245*
21. CPUT must use the Department of Education's database.	79	2	14.9147	0.0006***

Staff members and students responded statistically significant different from each other for the statements in Table 5.6. For instance statistically significant more students than staff members indicated that CPUT must increase the registration period.

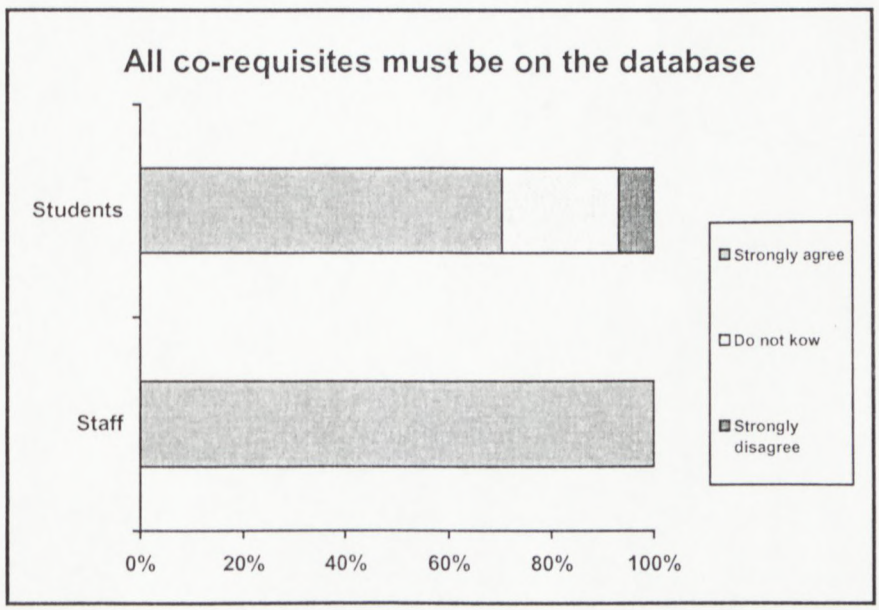

Figure: 5.18: Question 12

All the staff members indicated that all co-requisites must be on the database, while although a high percentage of students agreed to this statement, there was also a percentage that did not know.

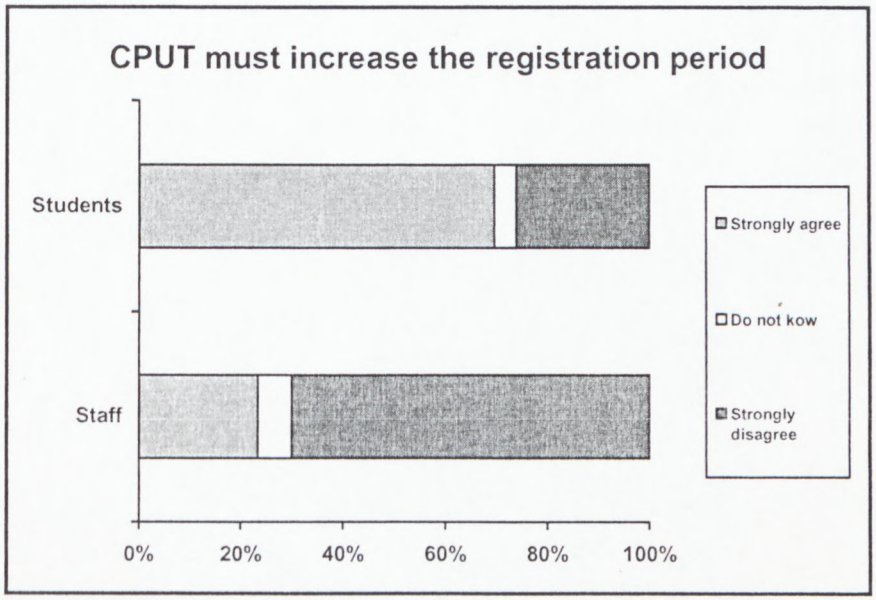

Figure 5.19: Question 16

The staff members felt that CPUT should not increase the registration period, while the student felt that CPUT should increase the registration period.

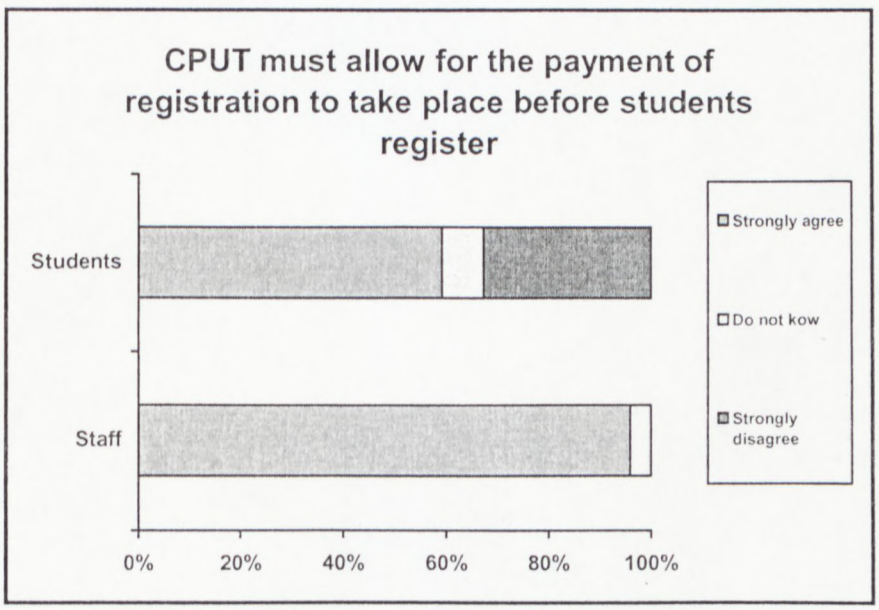

Figure 5.20: Question 19

Although most of the staff members felt that CPUT must allow for the payment of registration to take place before students registers, a percentage of students did not feel the same.

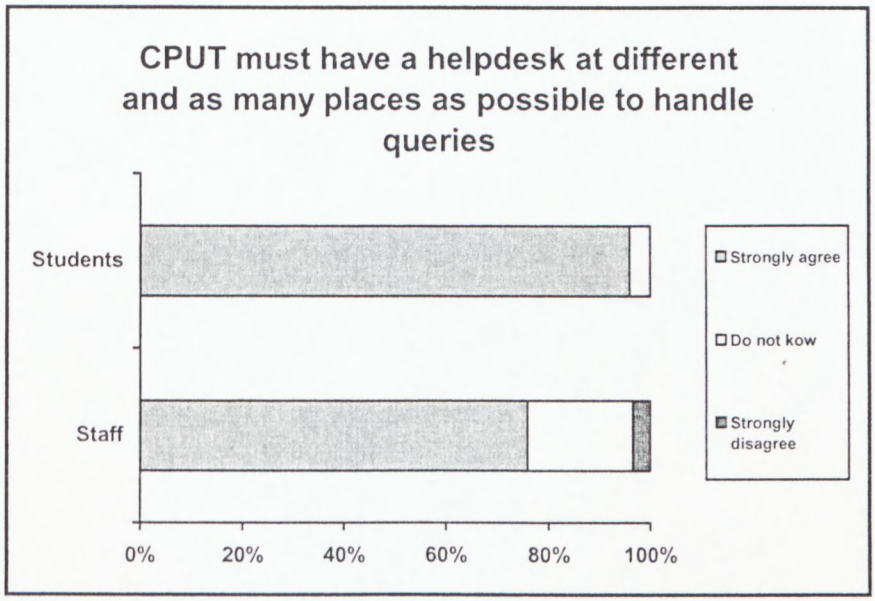

Figure 5.21: Question 20

The difference in this

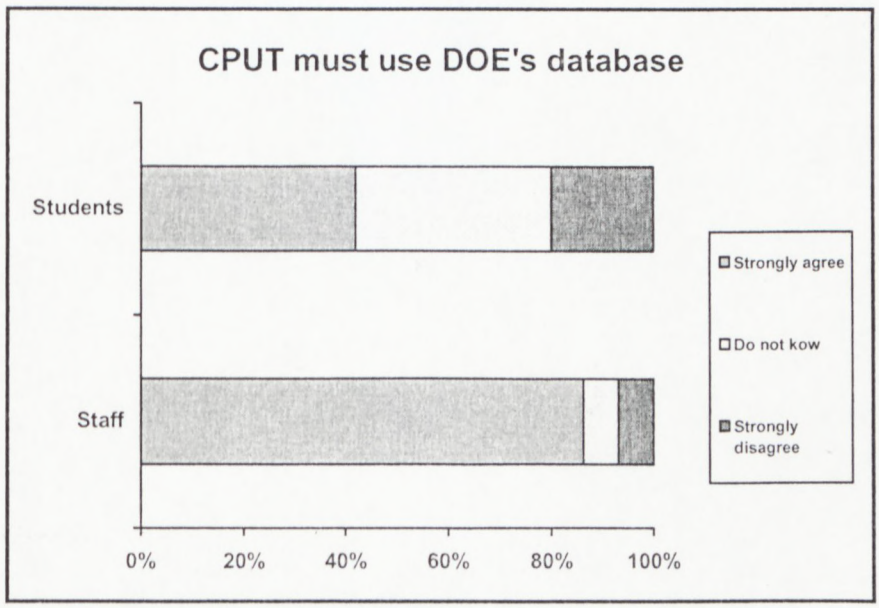

Figure 5.22: Question 12

5.9 DISCUSSIONS AND CONCLUSIONS

The following analogies can be drawn from the above mentioned data analysis:

- Significant more students agreed than disagreed on almost all the statements made.
- Significant more staff members agreed than disagreed on almost all the statements made.
- Except for a few statements the staff members and the students responded the same way.

This suggests that most of the statements made, in order to improve registration at CPUT are accepted by both the student and staff member groups.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1. THE RESEARCH THUS FAR

In chapter one, the scope of the research contained within the ambit of this dissertation was elaborated upon. In chapter two, a holistic perspective of the research environment was provided. In chapter three, a literature review was conducted on the issue of streamlining the registration process and associated influencing factors. In chapter four, the student and employee registration survey design and methodology provided detail of the process of data collection. In Chapter five, data gleaned from the survey conducted in chapter four was analysed and interpreted. In this chapter, final analogies will be drawn and recommendation made to mitigate the research problem.

6.2 RESEARCH SURVEY AND INTERVIEW FINDINGS

For ease of reference, the analysis contained in chapter five pertaining to the survey, can be summarised as follows:

- The staff member group and the student group differed statistically significantly for the following statements:
  - All co-requisites must be on the database.
  - CPUT must increase the registration period.
  - CPUT must allow for the payment of registration to take place, before students registered.
  - CPUT should have kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration.
  - CPUT must use the Department of Education's database.
- There are statistically significant evidence that the proportions were not equal for staff members on almost all the statements except for statements:
  - Could Internet registration work in the current university's setup?
  - Students could go to other buildings in the registration process.
  - CPUT must have a combined registration period.

- There are statistically significant evidence that the proportions were not equal for students on almost all the statements except for statements:
  - Students could go to other buildings in the registration process; and
  - CPUT must have a combined registration period.

In addition to the data analysis conducted in chapter five, unstructured interviews (Cooper and Schindler, 2006:204, 208, 210-211), were conducted. The findings from the interviews from eight respondents drawn from the University of Johannesburg (UJ), University of South Africa (UNISA), Rhodes University (RU) and Integrated Tertiary Software (Pty) Ltd (ITS) are summarized in point format for ease of reference:

- Splitting registration processes namely postal, personal and Internet registration: UNISA.
- Smaller registration offices situated in different parts of the country. UNISA.
- Mobile information counters to assist students: UNISA, UJ.
- Student registration advisors to assist students: UNISA, UJ, RU.
- Student advisors to be trained in customer relations and in-house: UNISA.
- Meet with student advisors everyday to continuously improve process: UNISA, RU.
- Student advisors must be visible, blue or red bibs: UNISA.
- Communication with student advisors (2 way radios): UNISA.
- Self-help area for returning students: UNISA.
- Integrated computer system for all to use: UNISA, UJ
- All requisites must be done by Student Admissions and Registration in conjunction with representative from the academics departments: UNISA, UJ, RU.
- Committee must continually meet concerning the requisites every year: UJ.
- Standardize on timetable and keep it consistent: UNISA, UJ, RU.
- Timetables must be strictly regulated: UNISA, UJ, RU.
- Students must deposit money beforehand, no cash on registration day: UJ.
- Have implemented Internet registration with huge success. UJ
- Have implemented Internet registration on a small scale: UNISA
- Definitely Internet registration is way to go: UNISA, UJ, RU.

- Merge database: UNISA, UJ
- Must have a one stop shop (central not dispersed): UNISA
- Start the Internet registration rollout with a target group: UJ, ITS.
- I-enabler developed by ITS (Pty) Ltd does what is needed: UJ, ITS.
- Student card must be valid for 3 years: UJ
- Solve the easy cases with Internet registration and queues will get shorter. UNISA, UJ, RU.
- Must be a user-friendly Internet interface: UJ, UNISA.
- Students must be able to query accounts at anytime: UNISA, UJ, RU.
- Institutions should use the DOE results for registration: UNISA, UJ
- Only one week must be allowed for late registration: UJ.
- Cross functional training of staff: UJ.
- Small database must be approved by ITS: RU
- Two registration processes Academic and Admin: RU
- Application should be online: UNISA, UJ, RU.

6.3. THE RESEARCH PROBLEM RE-VISITED

The research problem that was formulated and researched within the ambit of this dissertation reads as follows: *"The poor quality of the registration process for students at the Cape Peninsula University of Technology, adversely impact on the organisations' efficiency."*

In chapter two, the issues pertaining to poor quality of the registration process at the CPUT was elaborated on in detail, clearly showing elements of poor quality in the registration process. The literature review contained in chapter three, highlighted are the issues of poor quality, further confirmed by the surveys within the context of chapter five and interviews analysed in this chapter. In the opinion of this author, should the recommendations be implemented as set out in this chapter, the research problem can be mitigated.

6.4. RESEARCH QUESTION RE-VISITED.

The research question which formed the crux of the dissertation reads as follows: *"How the registration process at the CPUT be automated to the extent that online facilities would be available to students, which would improve the adverse current inefficient processes?"*

A number of examples from the literature review process that online facilities could improve inefficient registration process at CPUT. "An online enrolment system went live less than four months after the project was initiated. Students can log in via the student portal and access their profile where they confirm or amend their details and pay any fees that are required, this in turn eliminated queuing. After payment is completed, the student is automatically enrolled" (CampusIT, 2008:**O**nline).

A customer case study conducted by Oracle (2006:**O**nline), indicated that Kasetsart University in Thailand implemented a student registration system with Oracle Database as the underlying platform to ensure it had better control of enrolment and administration processes. The university decided to introduce an online registration option in 2005 in an attempt to ease the workload on staff and facilitate a smoother, faster registration process for students. Students were encouraged to enroll for courses via the Web. The university estimated that the new system comfortably processes around 1 million transactions a day.

According to Zalanowski (2007:Online), online technologies were implemented to help enrolment management professionals reach out to prospective students and help them explore colleges in unique and 'technologically-savvy' ways. These technologies included email, Web sites and Weblogs.

The findings from the survey, and interviews concluded (See Paragraph 6.2) returned amongst others that:

- All co-requisites must be on the database.
- CPUT must increase the registration period.

- CPUT must allow for the payment of registration to take place, before students registered, Merge database: UNISA, UJ
- Have implemented Internet registration with huge success. UJ
- CPUT should have kiosk / helpdesk at different and as many places as possible, to handle queries from students during registration; and
- CPUT must use the Department of Education's database.

6.5. INVESTIGATIVE QUESTIONS RE-VISITED.

The investigative questions researched in support of the research question reads as follows:

- How can online registration mitigate the quality issues associated with the registration process of students?

An online registration process has with huge success been implemented at the University of Johannesburg and on a smaller scale to the University of South Africa: Refer to Paragraph 6.2 of this chapter and Paragraphs 3.3.1, 3.3.4, 3.3.5, 3.4.1, 3.4.3, 3.8, 3.9.2, 3.9.3 and 3.12.4 in Chapter three, where universities elsewhere have all mitigated the quality issues concerning their registration processes.

- Should the current database be setup for staff and students to capture data and do queries?

The university of Johannesburg and the University of South Africa both believe that CPUT should have an Integrated Computer System for all to use, This will then allow for requests to be executed by Student Admissions and Registration in conjunction with representative from the Academics Departments as in the instances at the University of South Africa, University of Johannesburg and Rhodes University. The interviews at the University of Johannesburg and University of South Africa also suggest, that the interface to this database must be user-friendly, so that as an example, students could check their outstanding balances. In Chapter three, Paragraphs 3.24, 3.36, 3.4.3 and 3.8 it was intimated that staff and students should be able to capture data and do queries online.

- How can a single, clean and updated database be created as opposed to merging current databases.

In Chapter 3 Paragraph 3.14, a model describes how to create the database and the use of software surrounding it. In Paragraph 6.2 in this chapter, it was confirmed that the University of Johannesburg and the University of South Africa have implemented Internet registration and have merged their databases.

- How can the Academic, Information and Communication Technology (ICTS), Registration, Finance and Examination departments work together to continuously improve the registration process?

Departments in industry and educational institutions should work together to break down barriers and improve the quality of processes (Refer to Chapter 3 Paragraph 3.18). As a result, the CPUT should implement quality circles to endeavour to improve the registration process on a continual basis as implemented by the University of Johannesburg.

6.6. KEY RESEARCH OBJECTIVES RE-VISITED.

Key research objectives for this dissertation are as follows:

- To identify key inhibitors to the current registration process within Cape Peninsula University of Technology.

The key inhibitors of the current registration process are:

- The database that is not clean and completely merged.
- The fact that there are no quality circle meetings to drive the improvement process.
- That the database is not connected to applications that would allow students to register electronically.
- To determine the extent of the frustration caused as a result of ineffective registration processes.

This aspect was elaborated upon in detail within the ambit of Chapter 2 and the results of the student registration survey in Chapter 5.

- To determine whether the registration process currently employed within the ambit of the Cape Peninsula University of Technology can be improved upon through the creation of a conceptual model.

In this respect, see recommendation in this chapter in Paragraph 6.7.

6.7. RECOMMENDATIONS

Recommendations to mitigate the research problem and to provide an answer to the research question and the associated investigative questions, the following:

- Improve on the database and its integrity. The ICT Department should create one database and all data must be verified against the available documents. The institution should create a portal as well, whereby students could check their details on the Internet, and then submit the necessary changes to the institution.
- Have ITS install the i-enabler module for electronic registration, thereby allowing students to register electronically on the Internet from anywhere in the country.
- Start the electronic registration using a focus group for ease of management. This would allow the institution to manage smaller groups of students during the registration period, and focus on the students that would be easy to register.
- Start a 'quality circle' consisting of representative from all Academic Departments, the Registration Department, Examination Department, ICT Department and all role players that are involved with registration. This 'quality circle' would meet before and after registration periods to study problems that arose during registration period and investigate ways of improving these processes.
- Standardise on timetabling and venues. The reason timetables and venues should be standardised are so that when accessing the database, the students will be able to choose subjects that will not result in a clash with another subject.
- Ensure that all requisites are programmed into the database. This would guarantee that students will not be able to register for a subject that he/she are not allowed to register for.

- Train student assistance and staff in conflict management and in the registration process, thereby enabling staff and student assistance to understand the registration system and to avoid getting into a dispute with a student.

6.8. FINAL CONCLUSION

This research was conducted over a three-year period. In this time the researcher has engaged in discussion with numerous universities, the academic staff and the administrative staff from these institutions. When reviewing the research problem that was formulated and researched within the ambit of this dissertation the researcher is of the opinion that if the institution implements the recommendation made concerning the improving of the registration process, they will find that it will streamline the process to the benefit of the institution and students alike.

BIBLIOGRAPHY

ABOUCHEDID, K. & NASSER, R. 2002. Assuring quality service in higher education: registration and advising attitudes in a private university in Lebanon. *Quality Assurance in Education,* 10(4):198-206.

ADOBE SYSTEMS INCORPORATED. 2008. *Adobe Success Story: University of California, San Diego*. [Online].Available from: https://www.adobe.com/cfusion/showcase/index.cfm?event=casestudyprint&casestudyid=29244&loc=en_us [Accessed 09/09/2008]

ANCARANI, A. 2005. Towards quality e-service in the public sector: The evolution of web sites in the local public service sector. *Managing Service Quality,* 15(1):6-23.

ANONYMOUS 1. 2007. *Assessing the Impact of ICT in Education Workshop*. [Online] Available from:http://www.mcit.gov.eg/events/Finalreport200763123256.pdf [Accessed 09/09/2008]

ANTHONY, S.B. 2006. *Enrollment Management Case Study*. [Online]. Available from: http://ericstoller.com/blog/2006/05/05/enrollment-management-case-study/ [Accessed 09/09/2008].

ARDERNE, R. 2004. Improving the quality of the registration processes at the Peninsula Technikon. *B Tech Project Report.*

BABBIE, E. 2005. *The basics of social research*. Belmont: Thomson Wadsworth.

BARTOLI, A. & HERMEL, P. 2004. Managing change and innovation in IT implementation process. *Journal of Manufacturing Technology Management,* 15(5):416–425.

BITNER, M. J., FARANDA, W. T., HUBBERT, A. R. & ZEITHAML, V. A. 1997. Customer contributions and roles in service delivery. *International Journal of Service Industry Management*, 8(3):193-205.

BULCHAND, J., RODRÍGUEZ, J. & CHATTAH, A. C. 2005. A tool for the administration and management of university profile information. *Campus-Wide Information Systems,* 22(2):71-76.

CAMPUS IT. 2008. *Making Enrolment the Start of a Better Student Experience: Streamlining the Re-enrolment Process*. [Online]. Available from: http://www.campusit.net/customers/ssu_enrolment_casestudy.pdf [Accessed 09/09/2008]

CAMPUS MANAGEMENT. 2008. *Taking Enrollment Management to the Next Level.* [Online]. Available from: http://www.campusmanagement.com /clients/customers_westwood.asp [Accessed 09/09/2008]

CARDIFF. 2006. *Case Study: Arizona State University*. [Online]. Available from: http://publications.autonomy.com/pdfs/Cardiff/Case%20Studies/arizona-su.pdf [Accessed 09/09/2008]

COLLEGE BOARD. 2005. *College Board's IDOC Service Expedites Aid Verification Processing for Wake Forest University, Saving Time and Optimizing* Resources. [Online]. Available from: http://www.collegeboard.com/prod_ downloads/highered/fa/wake_forest_case_study.pdf [Accessed 09/09/2008]

COLLIS, J. & HUSSEY, R. 2003. *Business Research: A practical guide for undergraduate and post graduate students*. Houndmills: Macmillan Palgrave.

COOPER, P.S &. SCHINDLER, D.R. 2006. *Business Research Methods*. Seventh/Eight Edition. New York, NY. McGraw-Hill.

DENZIN, N. K. 1998. *The art and politics of interpretation.* USA: Sage Publications Inc.

DIGITAL ARCHITECTURE GROUP. 2003. *Identifying Effective Web-Strategies for Enrollment Management.* [Online] Available from: http://www.acalog.com /media/white_paper_03_05_15.pdf [Accessed 09/09/2008]

EMORY, C. W. & COOPER, D. R. 1995. *Business Research Methods.* Fifth Edition. Homewood: Irwin.

GAY, L. R. & DIEBL, P. L. 1992. *Research methods for business and management.* MacMillan Publishing Company. New York.

GHAURI, P. GRØNHAUG, K. KRISTIANSLUND, I. 1995. *Research methods in business studies.* New York: Prentice Hall

HOSSLER, D. 2008. *Enrollment Management in Higher Education.* [Online]. Available from: http://www.answers.com/topic/enrollment-management-in-higher-education [Accessed 09/09/2008]

JANESICK, V. J. 1998. *The dance of research design; metaphor, methodology, and meaning.* USA: Sage Publications Inc.

KERLINGER, F. N. 1986. *Foundations of behavioural research.* New York: CBS College Publishing.

KURZ, K. & SCANNELL J. 2006. *Enrollment Management Grows Up. Enrollment managers share their current approaches.* [Online]. Available from: http://www2.universitybusiness.com/viewarticle.aspx?articleid=23 [Accessed 09/09/2008]

LAPORTE, J. 1997. Choosing Qualitative Research: A Primer for Technology Education Researchers. *Journal of Technology Education.* 9(1), Fall.

LEEDY, P. D. & ORMROD, J. E. 2005. *Practical research: planning and design.* 8th ed. New Jersey: Pearson Education.

LEEDY, P.D. & ORMROD, J.E. 2001. *Practical research.* New Jersey: Merrill Prentice Hall.

MALTERUD, K 1998. *Making changes with key questions in medical practices; studying what makes a difference. Doing qualitative research.* USA: SAGE Publications Inc.

MASON, J. 1996. *Qualitative Research.* Thousand Oaks: Sage Publications.

MCCLEA, M. & YEN, D. C. 2005. A framework for the utilization of information technology in higher education admission department. *International Journal of Educational Management,* 19(2):87-101

NOEL-LEVITZ, 2008. *Strategic Enrollment Planning Research Checklist.* Available from: http://www.okhighered.org/admin-fac/enrollment-mgmt-conf/06-NoelLevitz-checklist.pdf [Accessed 09/09/2008]

OKES, D. & WESTCOTT, R. T. 2001. *People Create Quality.* [Online]. Available from: http://www.asq.org/learn-about-quality/teams /overview/ overview.html [Accessed 09/09/2008]

ORACLE, 2006. *Kasetsart University Streamlines Student Registration Processes with Web-Enabled System.* [Online] Available from:http://www.oracle.com /customers/snapshots/kasetsart-university-case-study.pdf [Accessed 09/09/2008]

PARASURAMAN, A. 1991. *Market Research.* 2nd Edition, Eddision-Wesley.

PATEL, P., PATEL, D., TANG, H. & ELLIOTT, G. 2005. *Research methods for organisational studies.* Paper read at the First Annual Conference and Workshop on Sustainable ICT Capacity in Developing Countries, held in Kampala, Uganda,

on the 9-12 August 2005. London, UK. (Unpublished).

PESKIN, M. I. & HART, J. J. 1996. Measuring the quality of computer systems development. *Benchmarking for Quality Management & Technology*, 3(2):68-84.
REMENYI, D. WILLIAMS, B. MONEY, A. & SWARTZ, E. 2002. *Doing research in business and management.* London: Sage.

SAFARI, A. 2004. *Online Registration Secrets.* [Online]. Available from: http://www.mpiweb.org/CMS/mpiweb/mpicontent.aspx?id=3515 [Accessed 09/09/2008]

SAUNDERS, M.N.K. LEWIS, P. & THORNHILL, A. 2000. *Research methods for business students.* Edinburgh Gate: Pearson Education.

SENN, J. A. 1990. *Information Systems Management* Belmont:Wadsworth.

SMIT, P. J. & DE CRONJÉ, G. J. 1992. *Management Principals*. Kerwyn: Juta.

SYSTEMARTS. 2008. *Case Study: California State* University, Fullerton. [Online]. Available from: http://www.systemarts.net/education.html [Accessed 09/09/2008]

TECH TARGET. 2008. *ICT.* [Online] Available from:http://searchcio-midmarket.techtarget.com/sDefinition/0,,sid183_gci928405,00.html [Accessed 09/09/2008]

TURBAN, E., MCLEAN, E. AND WETHERBY, J. 2002. *Information Technology for Management.* USA: Wiley.

VISA. 2008. *University IT streamlines student registration in Visa Authentication Services Pilot* [Online]. Available from: http://virtuaaliyliopisto.jyu.fi /etusivu/hankkeet/finland_pilot_case_study_v1.pdf [Accessed 09/09/2008]

WATKINS, J.A. 2008. *Thesis/Dissertations/Research Reports: A practical guide for students to the preparation of written preparations of academic research.* CAPE TOWN: Content Solutions.

WEIGER, P. R. 1999. *Touch tone telephone trials and tribulations*, [Online]. Available from: http://web.ebscohost.com/ehost/detail?vid=4&hid=8&sid=50f1aa7e35014801aa9b9a2a98b69e35%40sessionmgr108&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=aph&AN=2595621 [Accessed 10/09/2008]

WELLER, L. D. 1996. Benchmarking: a paradigm for change to quality education. *The TQM Magazine*, 8(6):24–29

YIN, R. K. 2003. *Case Study Research: Design and Methods*. Sage: Thousand Oakes.

ZALANOWSKI, K. 2007. *Instant Messenger in Enrollment Management: Evaluating Use and Effectiveness*. [Online]. Available from: http://findarticles.com/p/articles/mi_qa3955/is_200707/ai_n19433291 [Accessed 09/09/2008]

Annexure A

Staff member respondents

q1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	22	73.33	22	73.33
Agree	8	26.67	30	100.00

Chi-Square Test for Equal Proportions

Chi-Square	6.5333
DF	1
Pr > ChiSq	0.0106

Sample Size = 30

q2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	18	62.07	18	62.07
Agree	10	34.48	28	96.55
Do not know	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	14.9655
DF	2
Pr > ChiSq	0.0006

Sample Size = 29

q3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	18	60.00	18	60.00
Agree	8	26.67	26	86.67
Do not know	1	3.33	27	90.00
Disagree	2	6.67	29	96.67
Strongly disagree	1	3.33	30	100.00

Chi-Square Test for Equal Proportions

Chi-Square	35.6667
DF	4
Pr > ChiSq	<.0001

Sample Size = 30

q4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	19	65.52	19	65.52
Agree	9	31.03	28	96.55
Do not know	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	16.8276
DF	2
Pr > ChiSq	0.0002

Sample Size = 29

q5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	11	39.29	11	39.29
Agree	6	21.43	17	60.71
Do not know	11	39.29	28	100.00

Chi-Square Test for Equal Proportions

Chi-Square	1.7857
DF	2
Pr > ChiSq	0.4095

Sample Size = 28

q6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	15	51.72	15	51.72
Agree	12	41.38	27	93.10
Do not know	2	6.90	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	9.5862
DF	2
Pr > ChiSq	0.0083

Sample Size = 29

q7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	11	37.93	11	37.93
Agree	10	34.48	21	72.41
Do not know	2	6.90	23	79.31
Disagree	4	13.79	27	93.10
Strongly disagree	2	6.90	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	13.2414
DF	4
Pr > ChiSq	0.0102

Sample Size = 29

q8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	5	16.67	5	16.67
Agree	6	20.00	11	36.67
Do not know	1	3.33	12	40.00
Disagree	9	30.00	21	70.00
Strongly disagree	9	30.00	30	100.00

Chi-Square Test for Equal Proportions

Chi-Square	7.3333
DF	4
Pr > ChiSq	0.1193

Sample Size = 30

q9	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	15	53.57	15	53.57
Agree	7	25.00	22	78.57
Do not know	2	7.14	24	85.71
Disagree	4	14.29	28	100.00

Frequency Missing = 1

Chi-Square Test
for Equal Proportions

Chi-Square	14.0000
DF	3
Pr > ChiSq	0.0029

Effective Sample Size = 28
Frequency Missing = 1

q10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	16	53.33	16	53.33
Agree	10	33.33	26	86.67
Do not know	1	3.33	27	90.00
Disagree	3	10.00	30	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	18.8000
DF	3
Pr > ChiSq	0.0003

Sample Size = 30

q11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	22	73.33	22	73.33
Agree	8	26.67	30	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	6.5333
DF	1
Pr > ChiSq	0.0106

Sample Size = 30

q12	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	21	72.41	21	72.41
Agree	8	27.59	29	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	5.8276
DF	1
Pr > ChiSq	0.0158

Sample Size = 29

q13	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	13	44.83	13	44.83
Agree	5	17.24	18	62.07
Do not know	8	27.59	26	89.66
Disagree	2	6.90	28	96.55
Strongly disagree	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	16.3448
DF	4
Pr > ChiSq	0.0026

Sample Size = 29

q14	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	13	44.83	13	44.83
Agree	5	17.24	18	62.07
Do not know	8	27.59	26	89.66
Disagree	2	6.90	28	96.55
Strongly disagree	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	16.3448
DF	4
Pr > ChiSq	0.0026

Sample Size = 29

q15	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	4	13.79	4	13.79
Agree	5	17.24	9	31.03
Do not know	3	10.34	12	41.38
Disagree	6	20.69	18	62.07
Strongly disagree	11	37.93	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	6.6897
DF	4
Pr > ChiSq	0.1532

Sample Size = 29

q16	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	4	13.33	4	13.33
Agree	3	10.00	7	23.33
Do not know	2	6.67	9	30.00
Disagree	8	26.67	17	56.67
Strongly disagree	13	43.33	30	100.00

Chi-Square Test for Equal Proportions

Chi-Square	13.6667
DF	4
Pr > ChiSq	0.0084

Sample Size = 30

q17	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	22	73.33	22	73.33
Agree	6	20.00	28	93.33
Disagree	2	6.67	30	100.00

Chi-Square Test for Equal Proportions

Chi-Square	22.4000
DF	2
Pr > ChiSq	<.0001

Sample Size = 30

q18	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	16	53.33	16	53.33
Agree	10	33.33	26	86.67
Do not know	2	6.67	28	93.33
Disagree	2	6.67	30	100.00

Chi-Square Test for Equal Proportions

Chi-Square	18.5333
DF	3
Pr > ChiSq	0.0003

Sample Size = 30

q19	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	22	78.57	22	78.57
Agree	5	17.86	27	96.43
Do not know	1	3.57	28	100.00

Chi-Square Test for Equal Proportions

Chi-Square	26.6429
DF	2
Pr > ChiSq	<.0001

Sample Size = 28

q20	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	16	55.17	16	55.17
Agree	6	20.69	22	75.86
Do not know	6	20.69	28	96.55
Strongly disagree	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	16.3793
DF	3
Pr > ChiSq	0.0009

Sample Size = 29

q21	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	19	65.52	19	65.52
Agree	6	20.69	25	86.21
Do not know	2	6.90	27	93.10
Disagree	1	3.45	28	96.55
Strongly disagree	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	40.4828
DF	4
Pr > ChiSq	<.0001

Sample Size = 29

q22	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	18	62.07	18	62.07
Agree	8	27.59	26	89.66
Do not know	1	3.45	27	93.10
Disagree	1	3.45	28	96.55
Strongly disagree	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	38.4138
DF	4
Pr > ChiSq	<.0001

Sample Size = 29

q23	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	18	64.29	18	64.29
Agree	6	21.43	24	85.71
Do not know	3	10.71	27	96.43
Strongly disagree	1	3.57	28	100.00

Chi-Square Test for Equal Proportions

Chi-Square	24.8571
DF	3
Pr > ChiSq	<.0001

Sample Size = 28

q24	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	19	65.52	19	65.52
Agree	5	17.24	24	82.76
Do not know	4	13.79	28	96.55
Strongly disagree	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	26.5862
DF	3
Pr > ChiSq	<.0001

Sample Size = 29

q25	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	23	79.31	23	79.31
Agree	5	17.24	28	96.55
Do not know	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	28.4138
DF	2
Pr > ChiSq	<.0001

Sample Size = 29

q26	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	24	82.76	24	82.76
Agree	3	10.34	27	93.10
Do not know	2	6.90	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	31.9310
DF	2
Pr > ChiSq	<.0001

Sample Size = 29

q27	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	21	72.41	21	72.41
Agree	4	13.79	25	86.21
Do not know	3	10.34	28	96.55
Strongly disagree	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	35.4138
DF	3
Pr > ChiSq	<.0001

Sample Size = 29

q28	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	21	72.41	21	72.41
Agree	5	17.24	26	89.66
Do not know	2	6.90	28	96.55
Disagree	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	35.9655
DF	3
Pr > ChiSq	<.0001

Sample Size = 29

q29	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	23	79.31	23	79.31
Agree	5	17.24	28	96.55
Do not know	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	28.4138
DF	2
Pr > ChiSq	<.0001

Sample Size = 29

q30	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	21	70.00	21	70.00
Agree	7	23.33	28	93.33
Strongly disagree	2	6.67	30	100.00

Chi-Square Test for Equal Proportions

Chi-Square	19.4000
DF	2
Pr > ChiSq	<.0001

Sample Size = 30

q31	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	20	68.97	20	68.97
Agree	7	24.14	27	93.10
Do not know	1	3.45	28	96.55
Disagree	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	33.2069
DF	3
Pr > ChiSq	<.0001

Sample Size = 29

q32	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	18	62.07	18	62.07
Agree	10	34.48	28	96.55
Do not know	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	14.9655
DF	2
Pr > ChiSq	0.0006

Sample Size = 29

q33	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	24	82.76	24	82.76
Agree	4	13.79	28	96.55
Do not know	1	3.45	29	100.00

Chi-Square Test for Equal Proportions

Chi-Square	32.3448
DF	2
Pr > ChiSq	<.0001

Sample Size = 29

Annexure B:

Student respondents

q1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	36	72.00	36	72.00
Agree	13	26.00	49	98.00
Strongly disagree	1	2.00	50	100.00

Chi-Square Test for Equal Proportions

Chi-Square	37.9600
DF	2
Pr > ChiSq	<.0001

Sample Size = 50

q2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	23	50.00	23	50.00
Agree	15	32.61	38	82.61
Do not know	7	15.22	45	97.83
Strongly disagree	1	2.17	46	100.00

Chi-Square Test for Equal Proportions

Chi-Square	23.9130
DF	3
Pr > ChiSq	<.0001

Sample Size = 46

q3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	31	62.00	31	62.00
Agree	13	26.00	44	88.00
Do not know	3	6.00	47	94.00
Disagree	1	2.00	48	96.00
Strongly disagree	2	4.00	50	100.00

Chi-Square Test for Equal Proportions

Chi-Square	64.4000
DF	4
Pr > ChiSq	<.0001

Sample Size = 50

q4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	32	64.00	32	64.00
Agree	14	28.00	46	92.00
Do not know	3	6.00	49	98.00
Disagree	1	2.00	50	100.00

Chi-Square Test for Equal Proportions

Chi-Square	48.4000
DF	3
Pr > ChiSq	<.0001

Sample Size = 50

q5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	15	30.61	15	30.61
Agree	17	34.69	32	65.31
Do not know	13	26.53	45	91.84
Disagree	2	4.08	47	95.92
Strongly disagree	2	4.08	49	100.00

Chi-Square Test for Equal Proportions

Chi-Square	21.5102
DF	4
Pr > ChiSq	0.0003

Sample Size = 49

q6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	28	57.14	28	57.14
Agree	16	32.65	44	89.80
Do not know	3	6.12	47	95.92
Disagree	1	2.04	48	97.96
Strongly disagree	1	2.04	49	100.00

Chi-Square Test for Equal Proportions

Chi-Square	58.2449
DF	4
Pr > ChiSq	<.0001

Sample Size = 49

q7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	15	30.61	15	30.61
Agree	14	28.57	29	59.18
Do not know	11	22.45	40	81.63
Disagree	2	4.08	42	85.71
Strongly disagree	7	14.29	49	100.00

Chi-Square Test for Equal Proportions

Chi-Square	11.7143
DF	4
Pr > ChiSq	0.0196

Sample Size = 49

q8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	9	18.37	9	18.37
Agree	15	30.61	24	48.98
Do not know	6	12.24	30	61.22
Disagree	9	18.37	39	79.59
Strongly disagree	10	20.41	49	100.00

Chi-Square Test for Equal Proportions

Chi-Square	4.3673
DF	4
Pr > ChiSq	0.3586

Sample Size = 49

q9	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	22	44.00	22	44.00
Agree	15	30.00	37	74.00
Do not know	11	22.00	48	96.00
Disagree	1	2.00	49	98.00
Strongly disagree	1	2.00	50	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	33.2000
DF	4
Pr > ChiSq	<.0001

Sample Size = 50

q10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	21	42.00	21	42.00
Agree	16	32.00	37	74.00
Do not know	10	20.00	47	94.00
Disagree	2	4.00	49	98.00
Strongly disagree	1	2.00	50	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	30.2000
DF	4
Pr > ChiSq	<.0001

Sample Size = 50

q11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	15	32.61	15	32.61
Agree	24	52.17	39	84.78
Do not know	5	10.87	44	95.65
Strongly disagree	2	4.35	46	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	26.1739
DF	3
Pr > ChiSq	<.0001

Sample Size = 46

q12	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	15	34.09	15	34.09
Agree	16	36.36	31	70.45
Do not know	10	22.73	41	93.18
Disagree	1	2.27	42	95.45
Strongly disagree	2	4.55	44	100.00

Frequency Missing = 1

Chi-Square Test
for Equal Proportions

Chi-Square	22.5909
DF	4
Pr > ChiSq	0.0002

Effective Sample Size = 44
Frequency Missing = 1

q13	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	22	44.90	22	44.90
Agree	15	30.61	37	75.51
Do not know	4	8.16	41	83.67
Disagree	6	12.24	47	95.92
Strongly disagree	2	4.08	49	100.00

Frequency Missing = 1

Chi-Square Test for Equal Proportions

Chi-Square	29.0612
DF	4
Pr > ChiSq	<.0001

Effective Sample Size = 49
Frequency Missing = 1

q14	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	25	51.02	25	51.02
Agree	15	30.61	40	81.63
Do not know	4	8.16	44	89.80
Disagree	4	8.16	48	97.96
Strongly disagree	1	2.04	49	100.00

Chi-Square Test for Equal Proportions

Chi-Square	41.1020
DF	4
Pr > ChiSq	<.0001

Sample Size = 49

q15	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	5	10.20	5	10.20
Agree	10	20.41	15	30.61
Do not know	9	18.37	24	48.98
Disagree	15	30.61	39	79.59
Strongly disagree	10	20.41	49	100.00

Chi-Square Test for Equal Proportions

Chi-Square	5.1837
DF	4
Pr > ChiSq	0.2690

Sample Size = 49

q16	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	22	47.83	22	47.83
Agree	10	21.74	32	69.57
Do not know	2	4.35	34	73.91
Disagree	7	15.22	41	89.13
Strongly disagree	5	10.87	46	100.00

Chi-Square Test for Equal Proportions

Chi-Square	25.9565
DF	4
Pr > ChiSq	<.0001

Sample Size = 46

q17	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	37	75.51	37	75.51
Agree	9	18.37	46	93.88
Do not know	2	4.08	48	97.96
Disagree	1	2.04	49	100.00

Chi-Square Test for Equal Proportions

Chi-Square	69.7755
DF	3

Pr > ChiSq <.0001

Sample Size = 49

q18	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	20	40.82	20	40.82
Agree	9	18.37	29	59.18
Do not know	4	8.16	33	67.35
Disagree	8	16.33	41	83.67
Strongly disagree	8	16.33	49	100.00

Chi-Square Test for Equal Proportions

Chi-Square	14.7755
DF	4
Pr > ChiSq	0.0052

Sample Size = 49

q19	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	36	73.47	36	73.47
Agree	11	22.45	47	95.92
Do not know	2	4.08	49	100.00

Chi-Square Test for Equal Proportions

Chi-Square	38.0000
DF	2
Pr > ChiSq	<.0001

Sample Size = 49

q20	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	11	22.00	11	22.00
Agree	10	20.00	21	42.00
Do not know	19	38.00	40	80.00
Disagree	8	16.00	48	96.00
Strongly disagree	2	4.00	50	100.00

Chi-Square Test for Equal Proportions

Chi-Square	15.0000
DF	4
Pr > ChiSq	0.0047

Sample Size = 50

q21	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	33	66.00	33	66.00
Agree	10	20.00	43	86.00
Do not know	2	4.00	45	90.00
Disagree	4	8.00	49	98.00
Strongly disagree	1	2.00	50	100.00

Chi-Square Test for Equal Proportions

Chi-Square	71.0000
DF	4
Pr > ChiSq	<.0001

Sample Size = 50

q22	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	27	54.00	27	54.00
Agree	20	40.00	47	94.00
Do not know	2	4.00	49	98.00
Disagree	1	2.00	50	100.00

Chi-Square Test for Equal Proportions

Chi-Square	40.7200
DF	3
Pr > ChiSq	<.0001

Sample Size = 50

q23	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	21	42.00	21	42.00
Agree	18	36.00	39	78.00
Do not know	2	4.00	41	82.00
Disagree	5	10.00	46	92.00
Strongly disagree	4	8.00	50	100.00

Chi-Square Test for Equal Proportions

Chi-Square	31.0000
DF	4
Pr > ChiSq	<.0001

Sample Size = 50

q24	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	29	59.18	29	59.18
Agree	14	28.57	43	87.76
Do not know	1	2.04	44	89.80
Disagree	2	4.08	46	93.88
Strongly disagree	3	6.12	49	100.00

Chi-Square Test for Equal Proportions

Chi-Square	58.2449
DF	4
Pr > ChiSq	<.0001

Sample Size = 49

q25	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	37	75.51	37	75.51
Agree	10	20.41	47	95.92
Do not know	1	2.04	48	97.96
Strongly disagree	1	2.04	49	100.00

Chi-Square Test for Equal Proportions

Chi-Square	71.0816
DF	3
Pr > ChiSq	<.0001

Sample Size = 49

q26	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	33	66.00	33	66.00
Agree	11	22.00	44	88.00
Do not know	5	10.00	49	98.00
Strongly disagree	1	2.00	50	100.00

Chi-Square Test for Equal Proportions

Chi-Square	48.8800
DF	3
Pr > ChiSq	<.0001

Sample Size = 50

q27	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	43	86.00	43	86.00
Agree	6	12.00	49	98.00
Disagree	1	2.00	50	100.00

Chi-Square Test for Equal Proportions

Chi-Square	63.1600
DF	2
Pr > ChiSq	<.0001

Sample Size = 50

q28	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	31	62.00	31	62.00
Agree	16	32.00	47	94.00
Do not know	2	4.00	49	98.00
Disagree	1	2.00	50	100.00

Chi-Square Test for Equal Proportions

Chi-Square	47.7600
DF	3
Pr > ChiSq	<.0001

Sample Size = 50

Q29	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	34	68.00	34	68.00
Agree	6	12.00	40	80.00
Do not know	3	6.00	43	86.00
Disagree	3	6.00	46	92.00
Strongly disagree	4	8.00	50	100.00

Chi-Square Test for Equal Proportions

Chi-Square	72.6000
DF	4
Pr > ChiSq	<.0001

Sample Size = 50

q30	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	40	80.00	40	80.00
Agree	7	14.00	47	94.00
Strongly disagree	3	6.00	50	100.00

Chi-Square Test for Equal Proportions

Chi-Square	49.4800
DF	2
Pr > ChiSq	<.0001

Sample Size = 50

Annexure C:

Staff members and student respondents where the same statements were stated

nq1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	58	72.50	58	72.50
Agree	21	26.25	79	98.75
Strongly disagree	1	1.25	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	62.7250
DF	2
Pr > ChiSq	<.0001

Sample Size = 80

nq2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	5	6.25	5	6.25
Strongly Agree	41	51.25	46	57.50
Agree	25	31.25	71	88.75
Do not know	8	10.00	79	98.75
Strongly disagree	1	1.25	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	69.7500
DF	4
Pr > ChiSq	<.0001

Sample Size = 80

nq3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	49	61.25	49	61.25
Agree	21	26.25	70	87.50
Do not know	4	5.00	74	92.50
Disagree	3	3.75	77	96.25
Strongly disagree	3	3.75	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	99.7500
DF	4
Pr > ChiSq	<.0001

Sample Size = 80

nq4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	1.25	1	1.25
Strongly Agree	51	63.75	52	65.00
Agree	23	28.75	75	93.75
Do not know	4	5.00	79	98.75
Disagree	1	1.25	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	116.7500
DF	4
Pr > ChiSq	<.0001

Sample Size = 80

nq5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	3.75	3	3.75
Strongly Agree	26	32.50	29	36.25
Agree	23	28.75	52	65.00
Do not know	24	30.00	76	95.00
Disagree	2	2.50	78	97.50
Strongly disagree	2	2.50	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	54.8500
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	2.50	2	2.50
Strongly Agree	43	53.75	45	56.25
Agree	28	35.00	73	91.25
Do not know	5	6.25	78	97.50
Disagree	1	1.25	79	98.75
Strongly disagree	1	1.25	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	119.8000
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	2.50	2	2.50
Strongly Agree	26	32.50	28	35.00
Agree	24	30.00	52	65.00
Do not know	13	16.25	65	81.25
Disagree	6	7.50	71	88.75
Strongly disagree	9	11.25	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	35.6500
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	1.25	1	1.25
Strongly Agree	14	17.50	15	18.75
Agree	21	26.25	36	45.00
Do not know	7	8.75	43	53.75
Disagree	18	22.50	61	76.25
Strongly disagree	19	23.75	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	22.9000
DF	5
Pr > ChiSq	0.0004

Sample Size = 80

nq9	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	2.50	2	2.50
Strongly Agree	37	46.25	39	48.75
Agree	22	27.50	61	76.25
Do not know	13	16.25	74	92.50
Disagree	5	6.25	79	98.75
Strongly disagree	1	1.25	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	73.9000
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	37	46.25	37	46.25
Agree	26	32.50	63	78.75
Do not know	11	13.75	74	92.50
Disagree	5	6.25	79	98.75
Strongly disagree	1	1.25	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	57.0000
DF	4
Pr > ChiSq	<.0001

Sample Size = 80

nq11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4	5.00	4	5.00
Strongly Agree	37	46.25	41	51.25
Agree	32	40.00	73	91.25
Do not know	5	6.25	78	97.50
Strongly disagree	2	2.50	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	72.3750
DF	4
Pr > ChiSq	<.0001

Sample Size = 80

nq12	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	7	8.75	7	8.75
Strongly Agree	36	45.00	43	53.75
Agree	24	30.00	67	83.75
Do not know	10	12.50	77	96.25
Disagree	1	1.25	78	97.50
Strongly disagree	2	2.50	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	71.9500
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq13	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	2.50	2	2.50
Strongly Agree	35	43.75	37	46.25
Agree	20	25.00	57	71.25
Do not know	12	15.00	69	86.25
Disagree	8	10.00	77	96.25
Strongly disagree	3	3.75	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	58.4500
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq14	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	2.50	2	2.50
Strongly Agree	38	47.50	40	50.00
Agree	20	25.00	60	75.00
Do not know	12	15.00	72	90.00
Disagree	6	7.50	78	97.50
Strongly disagree	2	2.50	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	72.4000
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq15	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	2.50	2	2.50
Strongly Agree	9	11.25	11	13.75
Agree	15	18.75	26	32.50
Do not know	12	15.00	38	47.50
Disagree	21	26.25	59	73.75
Strongly disagree	21	26.25	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	20.2000
DF	5
Pr > ChiSq	0.0011

Sample Size = 80

nq16	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4	5.00	4	5.00
Strongly Agree	26	32.50	30	37.50
Agree	13	16.25	43	53.75
Do not know	4	5.00	47	58.75
Disagree	15	18.75	62	77.50
Strongly disagree	18	22.50	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	26.9500
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq17	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	1.25	1	1.25
Strongly Agree	59	73.75	60	75.00
Agree	15	18.75	75	93.75
Do not know	2	2.50	77	96.25
Disagree	3	3.75	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	152.5000
DF	4
Pr > ChiSq	<.0001

Sample Size = 80

nq19	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	3.75	3	3.75
Strongly Agree	42	52.50	45	56.25
Agree	14	17.50	59	73.75
Do not know	5	6.25	64	80.00
Disagree	8	10.00	72	90.00
Strongly disagree	8	10.00	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	79.1500
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq20	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	2.50	2	2.50
Strongly Agree	52	65.00	54	67.50
Agree	17	21.25	71	88.75
Do not know	8	10.00	79	98.75
Strongly disagree	1	1.25	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	111.3750
DF	4
Pr > ChiSq	<.0001

Sample Size = 80

nq21	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	1.25	1	1.25
Strongly Agree	30	37.50	31	38.75
Agree	16	20.00	47	58.75
Do not know	21	26.25	68	85.00
Disagree	9	11.25	77	96.25
Strongly disagree	3	3.75	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	46.6000
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq22	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	1.25	1	1.25
Strongly Agree	51	63.75	52	65.00
Agree	18	22.50	70	87.50
Do not know	3	3.75	73	91.25
Disagree	5	6.25	78	97.50
Strongly disagree	2	2.50	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	142.3000
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq23	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	2.50	2	2.50
Strongly Agree	45	56.25	47	58.75
Agree	26	32.50	73	91.25
Do not know	5	6.25	78	97.50
Disagree	1	1.25	79	98.75
Strongly disagree	1	1.25	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	124.9000
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq24	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	1.25	1	1.25
Strongly Agree	40	50.00	41	51.25
Agree	23	28.75	64	80.00
Do not know	6	7.50	70	87.50
Disagree	5	6.25	75	93.75
Strongly disagree	5	6.25	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	86.2000
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq25	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	2.50	2	2.50
Strongly Agree	52	65.00	54	67.50
Agree	19	23.75	73	91.25
Do not know	2	2.50	75	93.75
Disagree	2	2.50	77	96.25
Strongly disagree	3	3.75	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	151.4500
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

nq26	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	2.50	2	2.50
Strongly Agree	61	76.25	63	78.75
Agree	13	16.25	76	95.00
Do not know	3	3.75	79	98.75
Strongly disagree	1	1.25	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	164.0000
DF	4
Pr > ChiSq	<.0001

Sample Size = 80

nq27	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	1.25	1	1.25
Strongly Agree	54	67.50	55	68.75
Agree	15	18.75	70	87.50
Do not know	8	10.00	78	97.50
Strongly disagree	2	2.50	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	120.6250
DF	4
Pr > ChiSq	<.0001

Sample Size = 80

nq28	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	1.25	1	1.25
Strongly Agree	64	80.00	65	81.25
Agree	11	13.75	76	95.00
Do not know	2	2.50	78	97.50
Disagree	2	2.50	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	184.1250
DF	4
Pr > ChiSq	<.0001

Sample Size = 80

nq29	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	1.25	1	1.25
Strongly Agree	54	67.50	55	68.75
Agree	21	26.25	76	95.00
Do not know	3	3.75	79	98.75
Disagree	1	1.25	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	130.5000
DF	4
Pr > ChiSq	<.0001

Sample Size = 80

nq30	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Agree	55	68.75	55	68.75
Agree	13	16.25	68	85.00
Do not know	3	3.75	71	88.75
Disagree	3	3.75	74	92.50
Strongly disagree	6	7.50	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	123.0000
DF	4
Pr > ChiSq	<.0001

Sample Size = 80

nq31	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	1.25	1	1.25
Strongly Agree	60	75.00	61	76.25
Agree	14	17.50	75	93.75
Do not know	1	1.25	76	95.00
Disagree	1	1.25	77	96.25
Strongly disagree	3	3.75	80	100.00

Chi-Square Test for Equal Proportions

Chi-Square	205.6000
DF	5
Pr > ChiSq	<.0001

Sample Size = 80

Annexure D:

Variable name changes as per statement to staff or to student

New nr	Description	Staff nr	Student nr
nq1	CPUT could improve the quality of the registration process.	q1	q1
nq2	The registration process can be improved on?	q2	q2
nq3	Do you think that an Internet registration process would be more effective?	q3	q3
nq4	The introduction of Internet registration will reduce the long queues during registration.	q4	q4
nq5	Could Internet registration work in the universities current setup?	q5	q5
nq6	Internet registration would help students register faster and easier.	q6	q6
nq7	Registration should be centralized.	q7	q7
nq8	Students could go to other buildings in the registration process?	q8	q8
nq9	CPUT should have a standard timetable?	q9	q9
nq10	CPUT should have a standard venue timetable.	q10	q10
nq11	All pre-requisites must be on the database.	q11	q11
nq12	All co-requisites must be on the database.	q12	q12
nq13	CPUT must have a separate administration registration period.	q13	q13
nq14	CPUT must have a separate academic registration period.	q14	q14
nq15	CPUT must have a combined registration period.	q15	q15
nq16	CPUT must increase the registration period..	q16	q16
nq17	CPUT must have more staff to man the different points, especially at the cashiers during the registration period.	q17	q17
nq18	Administrative staff, assisting with registration, should have a proper schedule for breaks during registration period	q18	
nq19	CPUT must allow for the payment of registration to take place, before students register.	q19	q18
nq20	CPUT should have kiosk / helpdesk at different and as many places as possible, to handle queries from students	q20	q19

New nr	Description	Staff nr	Student nr
	during registration.		
nq21	CPUT must use the Department of Education's database.	q21	q20
nq22	Students must be able to register online from any computer that is connected to the internet.	q22	q21
nq23	A web interface must be designed to allow for online registration and applications.	q23	q22
nq24	Students must be able to pay for registration and application using the same web interface.	q24	q23
nq25	Students must be able to do course applications from any computer that is connected to the internet.	q25	q24
nq26	Students must be able to check their outstanding balance from any computer that is connected to the internet.	q26	q25
nq27	Students must be able to check prerequisites and co requisites for the subjects that they wish to do from any computer that is connected to the internet.	q27	q26
nq28	Students must be able to check their examination and progressive marks on any computer that is connected to the internet.	q28	q27
nq29	Students should not have to spend more time than what is absolutely necessary to register at CPUT.	q29	q28
nq30	Queues for registration must be shortened, (only students with special cases should have to stand in queues).	q30	q29
nq31	Students should not need to walk from one building to another to register.	q31	q30
nq32	A single, updated and clean database must be created.	q32	
nq33	Academic, ICTS, registration, finance and examination departments must work together to continuously improve the registration process.	q33	

Annexure E:

Table of type by q1

Frequency, Percent, Row Pct, Col Pct	Strongly Agree	Disagree, Strongly agree	Total
Student	49	1	50
	61.25	1.25	62.50
	98.00	2.00	
	62.03	100.00	
Staff	30	0	30
	37.50	0.00	37.50
	100.00	0.00	
	37.97	0.00	
Total	79	1	80
	98.75	1.25	100.00

Statistics for Table of type by q1

Statistic	DF	Value	Prob
Chi-Square	1	0.6076	0.4357
Likelihood Ratio Chi-Square	1	0.9476	0.3303
Continuity Adj. Chi-Square	1	0.0000	1.0000
Mantel-Haenszel Chi-Square	1	0.6000	0.4386
Phi Coefficient		-0.0871	
Contingency Coefficient		0.0868	
Cramer's V		-0.0871	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Fisher's Exact Test

Cell (1,1) Frequency (F)	49
Left-sided Pr <= F	0.6250
Right-sided Pr >= F	1.0000
Table Probability (P)	0.6250
Two-sided Pr <= P	1.0000

Sample Size = 80

Table of type by q2

Frequency, Percent, Row Pct, Col Pct	Strongly Agree to agree	Do not know	Disagree, -Strongly agree	Total
Student	38	7	1	46
	50.67	9.33	1.33	61.33
	82.61	15.22	2.17	
	57.58	87.50	100.00	
Staff	28	1	0	29
	37.33	1.33	0.00	38.67
	96.55	3.45	0.00	
	42.42	12.50	0.00	
Total	66	8	1	75
	88.00	10.67	1.33	100.00

Statistics for Table of type by q2

Statistic	DF	Value	Prob
Chi-Square	2	3.3331	0.1889
Likelihood Ratio Chi-Square	2	4.0823	0.1299
Mantel-Haenszel Chi-Square	1	3.2053	0.0734
Phi Coefficient		0.2108	
Contingency Coefficient		0.2063	
Cramer's V		0.2108	

WARNING: 67% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 75

Table of type by q3

Frequency, Percent, Row Pct, Col Pct	Strongly Agree to agree	Do not know	Disagree, -Strongly agree	Total
Student	44	3	3	50
	55.00	3.75	3.75	62.50
	88.00	6.00	6.00	
	62.86	75.00	50.00	
Staff	26	1	3	30
	32.50	1.25	3.75	37.50
	86.67	3.33	10.00	
	37.14	25.00	50.00	
Total	70	4	6	80
	87.50	5.00	7.50	100.00

Statistics for Table of type by q3

Statistic	DF	Value	Prob
Chi-Square	2	0.6705	0.7152
Likelihood Ratio Chi-Square	2	0.6740	0.7139
Mantel-Haenszel Chi-Square	1	0.1070	0.7436
Phi Coefficient		0.0915	
Contingency Coefficient		0.0912	
Cramer's V		0.0915	

WARNING: 67% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 80

Table of type by q4

Frequency, Percent, Row Pct, Col Pct	Strongly Agree to agree	Do not Know	Disagree, -Strongly agree	Total
Student	46	3	1	50
	58.23	3.80	1.27	63.29
	92.00	6.00	2.00	
	62.16	75.00	100.00	
Staff	28	1	0	29
	35.44	1.27	0.00	36.71
	96.55	3.45	0.00	
	37.84	25.00	0.00	
Total	74	4	1	79
	93.67	5.06	1.27	100.00

Statistics for Table of type by q4

Statistic	DF	Value	Prob
Chi-Square	2	0.8566	0.6516
Likelihood Ratio Chi-Square	2	1.2054	0.5473
Mantel-Haenszel Chi-Square	1	0.7521	0.3858
Phi Coefficient		0.1041	
Contingency Coefficient		0.1036	
Cramer's V		0.1041	

WARNING: 67% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 79

Table of type by q5

Frequency, Percent, Row Pct, Col Pct	Strongly Agree to agree	Do not Know	Disagree, -Strongly agree	Total
Student	32	13	4	49
	41.56	16.88	5.19	63.64
	65.31	26.53	8.16	
	65.31	54.17	100.00	
Staff	17	11	0	28
	22.08	14.29	0.00	36.36
	60.71	39.29	0.00	
	34.69	45.83	0.00	
Total	49	24	4	77
	63.64	31.17	5.19	100.00

Statistics for Table of type by q5

Statistic	DF	Value	Prob
Chi-Square	2	3.2748	0.1945
Likelihood Ratio Chi-Square	2	4.5780	0.1014
Mantel-Haenszel Chi-Square	1	0.0017	0.9676
Phi Coefficient		0.2062	
Contingency Coefficient		0.2020	
Cramer's V		0.2062	

WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 77

Table of type by q6

Frequency, Percent, Row Pct, Col Pct	Strongly Agree to agree	Do not Know, now	Disagree, -Strongly agree	Total
Student	44	3	2	49
	56.41	3.85	2.56	62.82
	89.80	6.12	4.08	
	61.97	60.00	100.00	
Staff	27	2	0	29
	34.62	2.56	0.00	37.18
	93.10	6.90	0.00	
	38.03	40.00	0.00	
Total	71	5	2	78
	91.03	6.41	2.56	100.00

Statistics for Table of type by q6

Statistic	DF	Value	Prob
Chi-Square	2	1.2226	0.5426
Likelihood Ratio Chi-Square	2	1.8982	0.3871
Mantel-Haenszel Chi-Square	1	0.4623	0.4965
Phi Coefficient		0.1252	
Contingency Coefficient		0.1242	
Cramer's V		0.1252	

WARNING: 67% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 78

Table of type by nq7

Frequency, Percent, Row Pct, Col Pct	Strongly Agree to agree	Do not Know, now	Disagree, -Strongly agree	Total
Student	29	11	9	49
	37.18	14.10	11.54	62.82
	59.18	22.45	18.37	
	58.00	84.62	60.00	
Staff	21	2	6	29
	26.92	2.56	7.69	37.18
	72.41	6.90	20.69	
	42.00	15.38	40.00	
Total	50	13	15	78
	64.10	16.67	19.23	100.00

Statistics for Table of type by q7

Statistic	DF	Value	Prob
Chi-Square	2	3.1925	0.2027
Likelihood Ratio Chi-Square	2	3.5631	0.1684
Mantel-Haenszel Chi-Square	1	0.6679	0.4138
Phi Coefficient		0.2023	
Contingency Coefficient		0.1983	
Cramer's V		0.2023	

Sample Size = 78

Table of type by q8

Frequency, Percent, Row Pct, Col Pct	Strongly Agree, Agree	Do not Know, now	Disagree, -Strongly agree	Total
Student	24	6	19	49
	30.38	7.59	24.05	62.03
	48.98	12.24	38.78	
	68.57	85.71	51.35	
Staff	11	1	18	30
	13.92	1.27	22.78	37.97
	36.67	3.33	60.00	
	31.43	14.29	48.65	
Total	35	7	37	79
	44.30	8.86	46.84	100.00

Statistics for Table of type by q8

Statistic	DF	Value	Prob
Chi-Square	2	4.0942	0.1291
Likelihood Ratio Chi-Square	2	4.3210	0.1153
Mantel-Haenszel Chi-Square	1	1.8694	0.1715
Phi Coefficient		0.2277	
Contingency Coefficient		0.2220	
Cramer's V		0.2277	

WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 79

Table of type by q9

Frequency, Percent, Row Pct, Col Pct	Strongly Agree, Agree	Do not Know, now	Disagree, -Strongly agree	Total
Student	37	11	2	50
	47.44	14.10	2.56	64.10
	74.00	22.00	4.00	
	62.71	84.62	33.33	
Staff	22	2	4	28
	28.21	2.56	5.13	35.90
	78.57	7.14	14.29	
	37.29	15.38	66.67	
Total	59	13	6	78
	75.64	16.67	7.69	100.00

Frequency Missing = 1

Statistics for Table of type by q9

Statistic	DF	Value	Prob
Chi-Square	2	4.8953	0.0865
Likelihood Ratio Chi-Square	2	5.1046	0.0779
Mantel-Haenszel Chi-Square	1	0.0022	0.9624
Phi Coefficient		0.2505	
Contingency Coefficient		0.2430	
Cramer's V		0.2505	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Effective Sample Size = 78
Frequency Missing = 1

Table of type by q10

Frequency, Percent, Row Pct, Col Pct	Strongly Agree	Agree to agree	Do not Know	Disagree to agree	Disagree Strongly	Total
Student	37	10		3		50
	46.25	12.50		3.75		62.50
	74.00	20.00		6.00		
	58.73	90.91		50.00		
Staff	26	1		3		30
	32.50	1.25		3.75		37.50
	86.67	3.33		10.00		
	41.27	9.09		50.00		
Total	63	11		6		80
	78.75	13.75		7.50		100.00

Statistics for Table of type by q10

Statistic	DF	Value	Prob
Chi-Square	2	4.5699	0.1018
Likelihood Ratio Chi-Square	2	5.4243	0.0664
Mantel-Haenszel Chi-Square	1	0.8643	0.3525
Phi Coefficient		0.2390	
Contingency Coefficient		0.2325	
Cramer's V		0.2390	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 80

Table of type by q11

Frequency, Percent, Row Pct, Col Pct	Strongly Agree	Agree to agree	Do not Know	Disagree to agree	Disagree Strongly	Total
Student	39	5		2		46
	51.32	6.58		2.63		60.53
	84.78	10.87		4.35		
	56.52	100.00		100.00		
Staff	30	0		0		30
	39.47	0.00		0.00		39.47
	100.00	0.00		0.00		
	43.48	0.00		0.00		
Total	69	5		2		76
	90.79	6.58		2.63		100.00

Statistics for Table of type by q11

Statistic	DF	Value	Prob
Chi-Square	2	5.0284	0.0809
Likelihood Ratio Chi-Square	2	7.4876	0.0237
Mantel-Haenszel Chi-Square	1	4.3682	0.0366
Phi Coefficient		0.2572	
Contingency Coefficient		0.2491	
Cramer's V		0.2572	

WARNING: 67% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 76

Table of type by q12

Frequency, Percent, Row Pct, Col Pct	Strongly Agree t,o agree	Do not Know,now	Disagree, -Strongly y agree	Total
Student	31	10	3	44
	42.47	13.70	4.11	60.27
	70.45	22.73	6.82	
	51.67	100.00	100.00	
Staff	29	0	0	29
	39.73	0.00	0.00	39.73
	100.00	0.00	0.00	
	48.33	0.00	0.00	
Total	60	10	3	73
	82.19	13.70	4.11	100.00

Frequency Missing = 1

Statistics for Table of type by q12

Statistic	DF	Value	Prob
Chi-Square	2	10.4246	0.0054
Likelihood Ratio Chi-Square	2	14.9842	0.0006
Mantel-Haenszel Chi-Square	1	9.8541	0.0017
Phi Coefficient		0.3779	
Contingency Coefficient		0.3535	
Cramer's V		0.3779	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Effective Sample Size = 73
Frequency Missing = 1

Table of type by q13

Frequency, Percent, Row Pct, Col Pct	Strongly Agree t,o agree	Do not Know,now	Disagree, -Strongly y agree	Total
Student	37	4	8	49
	47.44	5.13	10.26	62.82
	75.51	8.16	16.33	
	67.27	33.33	72.73	
Staff	18	8	3	29
	23.08	10.26	3.85	37.18
	62.07	27.59	10.34	
	32.73	66.67	27.27	
Total	55	12	11	78
	70.51	15.38	14.10	100.00

Frequency Missing = 1

Statistics for Table of type by q13

Statistic	DF	Value	Prob
Chi-Square	2	5.3963	0.0673
Likelihood Ratio Chi-Square	2	5.2324	0.0731
Mantel-Haenszel Chi-Square	1	0.5817	0.4456
Phi Coefficient		0.2630	
Contingency Coefficient		0.2544	
Cramer's V		0.2630	

WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Effective Sample Size = 78
Frequency Missing = 1

Table of type by q14

Frequency, Percent, Row Pct, Col Pct	Strongly Agree t,o agree	Do not Know,now	Disagree, -Strongly y agree	Total
Student	40	4	5	49
	51.28	5.13	6.41	62.82
	81.63	8.16	10.20	
	68.97	33.33	62.50	

Staff	18	8	3	29
	23.08	10.26	3.85	37.18
	62.07	27.59	10.34	
	31.03	66.67	37.50	
Total	58	12	8	78
	74.36	15.38	10.26	100.00

Statistics for Table of type by q14

Statistic	DF	Value	Prob
Chi-Square	2	5.4053	0.0670
Likelihood Ratio Chi-Square	2	5.2360	0.0729
Mantel-Haenszel Chi-Square	1	2.3911	0.1220
Phi Coefficient		0.2632	
Contingency Coefficient		0.2546	
Cramer's V		0.2632	

WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 78

Table of type by q15

Frequency,
Percent ,
Row Pct ,
Col Pct ,Strongly, Agree t,o agree ,Do not K,now ,Disagree, -Strongl,y agree , Total

Student	15	9	25	49
	19.23	11.54	32.05	62.82
	30.61	18.37	51.02	
	62.50	75.00	59.52	
Staff	9	3	17	29
	11.54	3.85	21.79	37.18
	31.03	10.34	58.62	
	37.50	25.00	40.48	
Total	24	12	42	78
	30.77	15.38	53.85	100.00

Statistics for Table of type by q15

Statistic	DF	Value	Prob
Chi-Square	2	0.9586	0.6192
Likelihood Ratio Chi-Square	2	1.0027	0.6057
Mantel-Haenszel Chi-Square	1	0.0466	0.8292
Phi Coefficient		0.1109	
Contingency Coefficient		0.1102	
Cramer's V		0.1109	

Sample Size = 78

Table of type by q16

Frequency, Percent, Row Pct, Col Pct	Strongly Agree, agree	Do not Know	Disagree, -Strongly agree	Total
Student	32	2	12	46
	42.11	2.63	15.79	60.53
	69.57	4.35	26.09	
	82.05	50.00	36.36	
Staff	7	2	21	30
	9.21	2.63	27.63	39.47
	23.33	6.67	70.00	
	17.95	50.00	63.64	
Total	39	4	33	76
	51.32	5.26	43.42	100.00

Statistics for Table of type by q16

Statistic	DF	Value	Prob
Chi-Square	2	15.8126	0.0004
Likelihood Ratio Chi-Square	2	16.4497	0.0003
Mantel-Haenszel Chi-Square	1	15.6006	<.0001
Phi Coefficient		0.4561	
Contingency Coefficient		0.4150	
Cramer's V		0.4561	

WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 76

Table of type by q17

Frequency, Percent, Row Pct, Col Pct	Strongly Agree, agree	Do not Know	Disagree, -Strongly agree	Total
Student	46	2	1	49
	58.23	2.53	1.27	62.03
	93.88	4.08	2.04	
	62.16	100.00	33.33	
Staff	28	0	2	30
	35.44	0.00	2.53	37.97
	93.33	0.00	6.67	
	37.84	0.00	66.67	
Total	74	2	3	79
	93.67	2.53	3.80	100.00

Statistics for Table of type by q17

Statistic	DF	Value	Prob
Chi-Square	2	2.2736	0.3208
Likelihood Ratio Chi-Square	2	2.9203	0.2322
Mantel-Haenszel Chi-Square	1	0.1442	0.7041
Phi Coefficient		0.1696	
Contingency Coefficient		0.1673	
Cramer's V		0.1696	

WARNING: 67% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 79

Table of type by q18(student) q19(staff)

Frequency, Percent, Row Pct, Col Pct	Strongly Agree	Agree	Do not Know	Disagree	-Strongly agree	Total
Student	29	4		16		49
	37.66	5.19		20.78		63.64
	59.18	8.16		32.65		
	51.79	80.00		100.00		
Staff	27	1		0		28
	35.06	1.30		0.00		36.36
	96.43	3.57		0.00		
	48.21	20.00		0.00		
Total	56	5		16		77
	72.73	6.49		20.78		100.00

Statistics for Table of type by q18(student) q19(staff)

Statistic	DF	Value	Prob
Chi-Square	2	13.1200	0.0014
Likelihood Ratio Chi-Square	2	18.3791	0.0001
Mantel-Haenszel Chi-Square	1	12.9210	0.0003
Phi Coefficient		0.4128	
Contingency Coefficient		0.3816	
Cramer's V		0.4128	

WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 77

Table of type by q19(student) q20(staff)

Frequency, Percent, Row Pct, Col Pct	Strongly Agree	Agree	Do not Know	Disagree	-Strongly agree	Total
Student	47	2		0		49
	60.26	2.56		0.00		62.82
	95.92	4.08		0.00		
	68.12	25.00		0.00		
Staff	22	6		1		29
	28.21	7.69		1.28		37.18
	75.86	20.69		3.45		
	31.88	75.00		100.00		
Total	69	8		1		78
	88.46	10.26		1.28		100.00

Statistics for Table of type by q19(student) q20(staff)

Statistic	DF	Value	Prob
Chi-Square	2	7.4174	0.0245
Likelihood Ratio Chi-Square	2	7.5607	0.0228
Mantel-Haenszel Chi-Square	1	7.2307	0.0072
Phi Coefficient		0.3084	
Contingency Coefficient		0.2947	
Cramer's V		0.3084	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 78

Table of type by q20(student) q21(staff)

Frequency, Percent, Row Pct, Col Pct	Strongly Agree	Do not know	Disagree, -Strongly agree	Total
Student	21	19	10	50
	26.58	24.05	12.66	63.29
	42.00	38.00	20.00	
	45.65	90.48	83.33	
Staff	25	2	2	29
	31.65	2.53	2.53	36.71
	86.21	6.90	6.90	
	54.35	9.52	16.67	
Total	46	21	12	79
	58.23	26.58	15.19	100.00

Statistics for Table of type by q20(student) q21(staff)

Statistic	DF	Value	Prob
Chi-Square	2	14.9147	0.0006
Likelihood Ratio Chi-Square	2	16.4239	0.0003
Mantel-Haenszel Chi-Square	1	12.8311	0.0003
Phi Coefficient		0.4345	
Contingency Coefficient		0.3985	
Cramer's V		0.4345	

Sample Size = 79

Table of type by q21(student) q22(staff)

Frequency, Percent, Row Pct, Col Pct	Strongly Agree	Do not know	Disagree, -Strongly agree	Total
Student	43	2	5	50
	54.43	2.53	6.33	63.29
	86.00	4.00	10.00	
	62.32	66.67	71.43	
Staff	26	1	2	29
	32.91	1.27	2.53	36.71
	89.66	3.45	6.90	
	37.68	33.33	28.57	
Total	69	3	7	79
	87.34	3.80	8.86	100.00

Statistics for Table of type by q21(student) q22(staff)

Statistic	DF	Value	Prob
Chi-Square	2	0.2423	0.8859
Likelihood Ratio Chi-Square	2	0.2500	0.8825
Mantel-Haenszel Chi-Square	1	0.2361	0.6271
Phi Coefficient		0.0554	
Contingency Coefficient		0.0553	
Cramer's V		0.0554	

WARNING: 67% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 79

Table of type by q22(student) q23(staff)

Frequency, Percent, Row Pct, Col Pct	Strongly Agree, agree	Do not Know, now	Disagree, -Strongly agree	Total
Student	47	2	1	50
	60.26	2.56	1.28	64.10
	94.00	4.00	2.00	
	66.20	40.00	50.00	
Staff	24	3	1	28
	30.77	3.85	1.28	35.90
	85.71	10.71	3.57	
	33.80	60.00	50.00	
Total	71	5	2	78
	91.03	6.41	2.56	100.00

Statistics for Table of type by q22(student) q23(staff)

Statistic	DF	Value	Prob
Chi-Square	2	1.5705	0.4560
Likelihood Ratio Chi-Square	2	1.4980	0.4728
Mantel-Haenszel Chi-Square	1	1.3103	0.2523
Phi Coefficient		0.1419	
Contingency Coefficient		0.1405	
Cramer's V		0.1419	

WARNING: 67% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 78

Table of type by q23(student) q24(staff)

Frequency, Percent, Row Pct, Col Pct	Strongly Agree, agree	Do not Know, now	Disagree, -Strongly agree	Total
Student	39	2	9	50
	49.37	2.53	11.39	63.29
	78.00	4.00	18.00	
	61.90	33.33	90.00	
Staff	24	4	1	29
	30.38	5.06	1.27	36.71
	82.76	13.79	3.45	
	38.10	66.67	10.00	
Total	63	6	10	79
	79.75	7.59	12.66	100.00

Statistics for Table of type by q23(student) q24(staff)

Statistic	DF	Value	Prob
Chi-Square	2	5.4402	0.0659
Likelihood Ratio Chi-Square	2	5.9969	0.0499
Mantel-Haenszel Chi-Square	1	0.9047	0.3415
Phi Coefficient		0.2624	
Contingency Coefficient		0.2538	
Cramer's V		0.2624	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 79

Table of type by q24(student) q25(staff)

Frequency, Percent, Row Pct, Col Pct	Strongly Agree, Agree	Do not know, Agree nor disagree	Disagree, Strongly agree	Total
Student	43	1	5	49
	55.13	1.28	6.41	62.82
	87.76	2.04	10.20	
	60.56	50.00	100.00	
Staff	28	1	0	29
	35.90	1.28	0.00	37.18
	96.55	3.45	0.00	
	39.44	50.00	0.00	
Total	71	2	5	78
	91.03	2.56	6.41	100.00

Statistics for Table of type by q24(student) q25(staff)

Statistic	DF	Value	Prob
Chi-Square	2	3.2548	0.1964
Likelihood Ratio Chi-Square	2	4.9386	0.0846
Mantel-Haenszel Chi-Square	1	2.2408	0.1344
Phi Coefficient		0.2043	
Contingency Coefficient		0.2001	
Cramer's V		0.2043	

WARNING: 67% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 78

Table of type by q25(student) q26(staff)

Frequency, Percent, Row Pct, Col Pct	Strongly Agree, Agree	Do not know, Agree nor disagree	Disagree, Strongly agree	Total
Student	47	1	1	49
	60.26	1.28	1.28	62.82
	95.92	2.04	2.04	
	63.51	33.33	100.00	
Staff	27	2	0	29
	34.62	2.56	0.00	37.18
	93.10	6.90	0.00	
	36.49	66.67	0.00	
Total	74	3	1	78
	94.87	3.85	1.28	100.00

Statistics for Table of type by q25(student) q26(staff)

Statistic	DF	Value	Prob
Chi-Square	2	1.7239	0.4223
Likelihood Ratio Chi-Square	2	2.0134	0.3654
Mantel-Haenszel Chi-Square	1	0.0126	0.9107
Phi Coefficient		0.1487	
Contingency Coefficient		0.1470	
Cramer's V		0.1487	

WARNING: 67% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 78

Table of type by q26(student) q27(staff)

Frequency, Percent, Row Pct, Col Pct	Strongly Agree to agree	Do not Know	Disagree, Strongly agree	Total
Student	44	5	1	50
	55.70	6.33	1.27	63.29
	88.00	10.00	2.00	
	63.77	62.50	50.00	
Staff	25	3	1	29
	31.65	3.80	1.27	36.71
	86.21	10.34	3.45	
	36.23	37.50	50.00	
Total	69	8	2	79
	87.34	10.13	2.53	100.00

Statistics for Table of type by q26(student) q27(staff)

Statistic	DF	Value	Prob
Chi-Square	2	0.1610	0.9227
Likelihood Ratio Chi-Square	2	0.1555	0.9252
Mantel-Haenszel Chi-Square	1	0.1061	0.7446
Phi Coefficient		0.0451	
Contingency Coefficient		0.0451	
Cramer's V		0.0451	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 79

Table of type by q27(student) q28(staff)

Frequency, Percent, Row Pct, Col Pct	Strongly Agree to agree	Do not Know	Disagree, Strongly agree	Total
Student	49	0	1	50
	62.03	0.00	1.27	63.29
	98.00	0.00	2.00	
	65.33	0.00	50.00	
Staff	26	2	1	29
	32.91	2.53	1.27	36.71
	89.66	6.90	3.45	
	34.67	100.00	50.00	
Total	75	2	2	79
	94.94	2.53	2.53	100.00

Statistics for Table of type by q27(student) q28(staff)

Statistic	DF	Value	Prob
Chi-Square	2	3.7350	0.1545
Likelihood Ratio Chi-Square	2	4.2909	0.1170
Mantel-Haenszel Chi-Square	1	1.9042	0.1676
Phi Coefficient		0.2174	
Contingency Coefficient		0.2125	
Cramer's V		0.2174	

WARNING: 67% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 79

Table of type by q28(student) q29(staff)

Frequency, Percent, Row Pct, Col Pct	Strongly Agree, agree	Do not Know, now	Disagree, -Strongly agree	Total
Student	47	2	1	50
	59.49	2.53	1.27	63.29
	94.00	4.00	2.00	
	62.67	66.67	100.00	
Staff	28	1	0	29
	35.44	1.27	0.00	36.71
	96.55	3.45	0.00	
	37.33	33.33	0.00	
Total	75	3	1	79
	94.94	3.80	1.27	100.00

Statistics for Table of type by q28(student) q29(staff)

Statistic	DF	Value	Prob
Chi-Square	2	0.6073	0.7381
Likelihood Ratio Chi-Square	2	0.9423	0.6243
Mantel-Haenszel Chi-Square	1	0.3617	0.5476
Phi Coefficient		0.0877	
Contingency Coefficient		0.0873	
Cramer's V		0.0877	

WARNING: 67% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 79

Table of type by q29(student) q30(staff)

Frequency, Percent, Row Pct, Col Pct	Strongly Agree, agree	Do not Know, now	Disagree, -Strongly agree	Total
Student	40	3	7	50
	50.00	3.75	8.75	62.50
	80.00	6.00	14.00	
	58.82	100.00	77.78	
Staff	28	0	2	30
	35.00	0.00	2.50	37.50
	93.33	0.00	6.67	
	41.18	0.00	22.22	
Total	68	3	9	80
	85.00	3.75	11.25	100.00

Statistics for Table of type by q29(student) q30(staff)

Statistic	DF	Value	Prob
Chi-Square	2	3.0885	0.2135
Likelihood Ratio Chi-Square	2	4.1762	0.1239
Mantel-Haenszel Chi-Square	1	2.1569	0.1419
Phi Coefficient		0.1965	
Contingency Coefficient		0.1928	
Cramer's V		0.1965	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 80

Table of type by q30(student) q31(staff)

Frequency, Percent, Row Pct, Col Pct	Strongly Agree	Do not know	Disagree, Strongly agree	Total
Student	47	0	3	50
	59.49	0.00	3.80	63.29
	94.00	0.00	6.00	
	63.51	0.00	75.00	
Staff	27	1	1	29
	34.18	1.27	1.27	36.71
	93.10	3.45	3.45	
	36.49	100.00	25.00	
Total	74	1	4	79
	93.67	1.27	5.06	100.00

Statistics for Table of type by q30(student) q31(staff)

Statistic	DF	Value	Prob
Chi-Square	2	1.9617	0.3750
Likelihood Ratio Chi-Square	2	2.2561	0.3237
Mantel-Haenszel Chi-Square	1	0.0022	0.9626
Phi Coefficient		0.1576	
Contingency Coefficient		0.1557	
Cramer's V		0.1576	

WARNING: 67% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 79