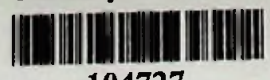# EMPLOYABILITY SKILLS OF THE GRADUATES IN FACULTY OF APPLIED SCIENCES IN SRI LANKAN UNIVERSITIES

P.A.A.U. Jothirathne

(08/10305)

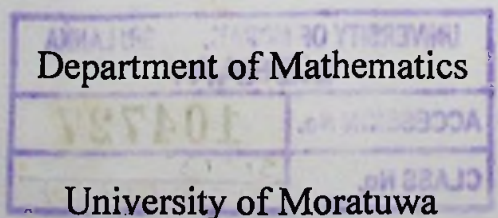Dissertation submitted in partial fulfillment of the requirements for the degree
Master of Science in Operational Research

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DECLARATION OF THE CANDIDATE

"I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any University or other institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text"

....
Signature

(P.A.A.U. Jothirathne)

....27./02./2013.
Date

DECLARATION OF THE SUPERVISOR

"I have supervised and accepted this thesis for the submission of the degree"

UOM Verified Signature

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DEDICATION

This thesis is especially dedicated to my family.

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ABSTRACT

The Research study was carried out with the aim of identify the employability skills development in graduates in Faculty of Applied Sciences. To achieve the objectives a model of employability was introduced that can be used as a framework for working with undergraduates to develop their employability, identify the perception of employers concerning the employability skills of graduates, and graduates' perception of the employability skills that they possessed. The model was developed based on existing research on employability skills and experience of the author. Inclusion of the various factors to the model was also discussed and justified using existing research work. The developed employability model consists of three principal variables namely; personal skills, core skills and process skills. For each principal variable, sub variables were identified and there were 16 sub variables in the model.

Due to the time limitation instead of longitudinal research, the study employed a comparative study of two cross sectional samples of first year and final year undergraduates from four universities. Size of the sample was 670 undergraduates and 110 employers. The study adopted a survey method and data were collected through two sets of questionnaires with the aim of gauging undergraduates' and employers' perceptions on employability skills possession of applied science graduates.

The Results of this study revealed by being at the university, graduates developed employability skills that are required to gain the employment. Furthermore, personal skills are developed most at the university and process skills were the least developed skills. The study disclosed the difference between employers and undergraduates' perception for all 16 employability skills, where employer rated graduates much lower than that of undergraduates. The results of the study also suggested that with different age groups of employers the perception relating to the possession of employability skills of graduates tend to differ. It is recommended the developed model of employability to be applied for other graduates. Some recommendations and suggestions for future research were highlighted.

Key words: Employability Skills, Employers, Graduates, Perception, Undergraduates

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LIST OF ABBREVIATIONS

Abbreviation	Description
HE	Higher Education
HEI	Higher Education Institutions
ILO	International Labour Organization
CIA	Central Intelligence Agency
YEN	Youth Employment Network
NAP	National Action Plan
GEI	Graduate Employability Indicators
ALTC	Australian Learning and Teaching Council
SPSS	Statistical Package for Social Sciences
K-S	Kolmogorov-Smirnov Test
S-W	Shapiro-Wilk Test
MWW	Mann–Whitney–Wilcoxon
UN	United Nation

CHAPTER 1
INTRODUCTION

1.1. Background of Research

This chapter presents the background of the research, the research problem, objectives of the research, significance of the study and outlines of the report.

1.1.1. Introduction

Graduate unemployment in Sri Lanka is a major problem since the country fails to get the contribution of the highly qualified labor force for its economic development. Due to the graduates' unemployment, the government investments' on higher education ends up with no or less return. It has become common to see graduates from state universities staging protests in order to obtain jobs; however, the jobs that ultimately provided by the government may neither sufficient for jobholder nor utilize the skills and knowledge of the jobholder. At the same time, government claims that the universities must be responsible for ensuring that their graduates are capable of getting jobs anywhere in the world. Hence the employability and enterprise strategies within universities will appease students as the focus is now enhancing employability of graduates and hence increasing their propensity to find employment after completion the degree.

There are certain strengths one should own apart from academic achievements. A degree alone would not do in getting the perfect job or rather their dream job. Many graduates have to go through tremendous difficulties in the tough competition to fill vacancies both in the public and private sectors in the modern commercial world. At present there are 15 universities and 79 faculties in Sri Lanka. Out of these 15 universities there are only five universities consist Applied Sciences faculty. Those universities are university of Sri Jayewardenepura, South Eastern University of Sri Lanka, Rajarata University of Sri Lanka, Sabaragamuwa University of Sri Lanka, and Wayamba University of Sri Lanka. Other than the faculty of Applied Sciences in

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university of Sri Jayewardenepura, all the other faculties aged less than 20 years. (Sri Lanka University Statistics 2011)

1.1.2   Employability

In simple terms, employability is about being capable of getting and keeping fulfilling work. More comprehensively, employability is the capability to move self-sufficiently within the labour market to realize potential through sustainable employment. Employability refers to a person's capability of gaining initial employment, maintaining employment, and obtaining new employment if required (Hillage and Pollard 1998). Today particularly the private sector complains that the graduates are lacking the employability skills although they are thorough in subject knowledge. Also they claim that even though there are many vacancies, there are no suitably qualified applicants to fill those vacancies. At the same time, graduates are looking for public sector jobs rather than joining the private sector. However employment and employability are different and can not measure one's employability on the basis of recent employment occupation and secondly, employability should not be totally regarded as an institutional achievement and instead address the graduate's individual ability to find employment. (Harvey 2001)

1.1.3.   Employability in Higher Education (HE)

The role of higher education is to equip students with skills and attributes (knowledge, attitudes and behaviors) that individual need in the workplace and that employer require, and to ensure that people have the opportunities to maintain or renew those skills and attributes throughout their working lives. (The Bologna Process 2007) At the end of any course, students will thus have an in-depth knowledge of their subject as well as generic employability skills. In some countries, Higher Education Institutions (HEI) must measure their graduates' employability, six month after the graduation and requires providing information about the employment status of these graduates. Hence the HEI's has to maintain good relationship with graduates and through that, it will open a new path for existing undergraduates to finding suitable careers.

1.1.4   Undergraduates

According to the dictionary, undergraduate is a student in a university or college who has not received a first, especially a bachelor's degree. In simply students enter universities to earn their first degree. However they follow the study programmes with the expectation of acquiring the knowledge, skills and the abilities which will help them to enter the job market as well as advance their careers. Although most undergraduates perform well in their academic activities, they are unsuccessful at practical situation where they have to do something and show the positive outcome. The problem is what extent the graduate could impart their abilities to perform the specified duties at the workplace. This is one major criticism arisen from the industry people too.

1.1.5   Importance of Developing Employability Skills among
Undergraduates

Multiple duties of universities are "conduct pure and applied research", "protect the knowledge", "exchange the knowledge", "protect the culture", "solve the social problems as a public service", "help for the modernization", "train the students for the academic and professional sectors", "improve students' thinking skills, physical strength, control emotional feelings, obey the requirements, and enhance the brain power", "improve students' requirements such as food, accommodation, medical facilities, guidance and finally the job opportunities". (Hommadi 1990 cited in Ariyawansa 2008). Hence it is clear that the employability of graduates is a major function of a university.

Graduates find it difficult to seek employment upon graduation since they lack employability skills. Thus the need to establish employability skills among university undergraduates is crucial. The benefits of the education system can only be reaped if education services are aimed at fulfilling the requirements of the labour market. Thus, it is essential to realign the education system to move away from an examination-centric, content based curriculum towards a competency based curriculum, helping to gain life skills and to encourage independent thinking. Reforms in the university system will support for alleviate the mismatch between the skills of graduates and the

requirements of the labour market, which can help reduce graduate unemployment. In generally graduates are considered as a most important human capital in a country. Hence make engage them towards the world of work is very important.

1.2   Problem Definition

Developing employability skills among undergraduates become one of the major objectives of any degree programme. There are traditional or conventional subject areas as well as the competitive subject areas in degree programme conducted by Sri Lankan universities. No matter of being conventional or competitive subject, all the degree programmes should focus on developing employability skills of undergraduates. Since it is a burden to any government to have unemployed graduates and all of them finding opportunities in public sector jobs, universities must produce graduates who can perform duties in any working environment. If the graduates have certain qualities; there are several graduate level job opportunities in private sector organizations.

Hence it is required to identify what type of employability skills are most valued by the private sector organizations and try to develop those skills through degree programmes. Then the research problem can be narrowed as the development of employability skills among the undergraduates through the degree programme and the perceptions of employers relating to graduates' employability skills. Hence this research attempts to find the development of employability skills among Applied Science undergraduates of Sri Lankan universities and how those skills reflected at industry.

1.3   Significance of the Study

For the individual, employability depends upon: the assets in terms of knowledge, skills and attitudes, the way these assets are used and deployed, presentation of assets to potential employers, and the context within which the individual works, e.g. labour market, personal circumstances. (Lees, D. n.d.). Particularly, through the education, one's knowledge should upgrade and attitudes change. At the same time it should develop the skills and it is requires to identify what skills should pay more attention

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on developing the one's employability. The employability debate is not a new one for HE. However the most critical thing is, identifying the skills suitable to play the role in the general division of labour.

The measuring and evaluation of employability and employability skills of graduates has become very important because of that there is concern that the degree programmes are not producing graduates with the kind of lifelong learning skills and professional skills which they need in order to be successful in their careers. Hence at the research study raises several questions;

1. Are the graduates develop skills that are requires to gain the employability? (types of skills develop and the level of skills develop)
2. What are the employability skills developed most in undergraduates?
3. Do industry people think that the graduates possess employability skills? (Perception of the industry people regarding the graduate employability skills)

Evaluation of employability skills of the graduates of Faculty of Applied Sciences in universities is very much essential to identify the deficiency of the skills and determine the proper channels to develop the skills. Therefore this research not only provides how to do that evaluation, but also achievement of making qualified graduate who is well suited to enter to the world of work.

1.4 Research Objectives

The objectives of the research are,

- To identify whether the graduates have employability skills and level of development of employability skills among them
- To identify whether there are any differences in perceptions of employers and graduates with regard to the employability skills inherent in graduates
- To make recommendations to the university authorities on integrating employability skills to the curricula and impart them to the undergraduates
- To make recommendations to the Applied Sciences undergraduates for acquiring employability skills from the degree programme

1.5 Chapterization

Chapter 1: Chapter 1 discusses the basic information to carry out the research.

Chapter 2: This chapter reviews the literature of the research and discussion about theories concerning employability skills of graduates. Further the chapter includes unemployment problem in Sri Lanka, youth unemployment and graduate unemployment. Based on the empirical research studies, research framework developed and the brief introduction about each employability skills also included.

Chapter 3: This includes all the hypotheses concern at the study, methodologies applied in the research, who is there in the selected sample, how data is gathered and in which way those data analyzed.

Chapter 4: This chapter presents the data and the analysis methods for the collected data. How the data was validated and what the used techniques to analysis and validation are discussed here.

Chapter 5: Findings from the research and summary out put of the research is presented in this chapter. It also discusses conclusion and recommendations related to the study.

CHAPTER 2
REVIEW OF LITERATURE

2.1   Introduction

The content of this chapter is based on a review of literature pertaining to employability, and employability skills. The review begins with brief definition of employability, followed by unemployment problem in Sri Lanka. Addressing the employability problem among the graduates, it is required to understand why they are facing the unemployment problem. It is the deficit of the development of the skills that the industries looking for. No person can say that the graduate do not have the knowledge. Despite they lack skills required to perform a certain tasks, students thorough in the subject knowledge. In some cases graduate cannot apply their theoretical knowledge in to the practical situation. This is just because not practicing to use the skills that they possess. The literature reviewed contributes to the development of a conceptual framework and a theoretical basis to address the research questions and objectives outlined in the first chapter. Based on the developed framework various hypothesis has been developed.

The main goal of this chapter was to provide historical information about the employability skills and their relationship to academic programs of the universities. This topic has received very poor attention on the part of the researchers in the Sri Lankan context. Thus, in reviewing literature it discusses the local studies on employability issues and overseas studies conducted on employability and employability skills among the graduates. However, it has been considered very useful piece of research, since the problem of unemployment graduate is a burden problem for the government and the economy of any country. At the same time upgrading the quality of the universities, employment information of the graduates were also considered.

2.2 Employability

The term employability has many definitions and the core definition of employability is the acquisition of attributes (knowledge, skills, and abilities) that make graduates more likely to be successful in their chosen occupations (whether paid employment or not). In the explanatory context employability usually refers to the employment of graduates but this includes self-employment. A broader definition includes any lifestyle choice, or refers to employability as the development of abilities to ensure graduates are critical life-long learners.

There is a narrow alternative approach to define employability popular among the policy makers. However this is less used. According to that employability is defined as the proportion of graduates, from an institution that were employed within a specified period after graduation.

Employment and employability is not similar. Being employed means having a job, being employable means having the qualities needed to maintain employment and progress in the workplace. Employability from the perspective of HEIs is therefore about producing graduates who are capable and able, and this impact upon all areas of university life, in terms of the delivery of academic programmes and extra curricula activities.

Therefore employability is not just about getting a job. Conversely, just because a student is in a vocational course does not mean that somehow employability is automatic. Employability is more than about developing attributes, techniques or experience just to enable a student to get a job, or to progress within a current career. It is about learning and the emphasis is less on 'employ' and more on 'ability'. In essence, the emphasis is on developing critical, reflective abilities, with a view to empowering and enhancing the learner (Harvey 2003 cited in Glossary of quality research international 2012).

2.3   Unemployment problem in Sri Lanka

Unemployment in Sri Lanka is not a new phenomenon. In 1971 the British Economist Dudley Seers produced a report for The International Labour Organization (ILO) stating that the reason for the large unemployment numbers in the country was that the type of skills produced by the Sri Lankan education system was not conducive to the job market. During last 40 years, this argument still remains unchanged (Fonseka 2010). In Sri Lanka employability is not only about earning a living, but is intrinsically linked to the aspirations of young people, which is in turn linked to social status and social mobility (Report of the Presidential Commission on Youth, 1990 cited in YEN-NAP Sri Lanka 2006). Employers prefer employees with not only relevant education and training, but also those who are motivated. Moreover, more educated and skilled labour force contributes to higher productivity and economic growth. According to the definition of labour force, the total labor force comprises people ages 15 and older who meet the ILO definition of the economically active population: all people who supply labor for the production of goods and services during a specified period. It includes both the employed and the unemployed. Unemployment refers to the share of the labor force without work but available for and seeking employment.

The unemployment rate in Sri Lanka is not exceptional when compared with other countries in the world. In fact, it might seem relatively low. On a list of countries ranked in order of their rate of unemployment in the World Fact book (2012) produced by the United State Central Intelligence Agency (CIA), Sri Lanka ranks 38th with a comparatively low unemployment rate of 4.2%. The Central Bank also confirms the same figure of 4.2% (Central Bank of Sri Lanka Annual Report 2011).

There are some arguments put forth as a reason for unemployment in Sri Lanka is that it is the fault of the unemployed themselves. This argument has been supported by the World Bank which appears to believe that most cases of unemployment in the country are voluntary, as a result of the unemployed waiting for "good" job openings and being unwilling to take on readily available "bad" jobs (Fonseka 2010). Accordingly, the problem is not the shortage of jobs but rather the unemployed being unwilling to

take on "bad" jobs and opting instead to remain unemployed until "good" jobs is found. While this argument may seem logical to certain extent, it may be unfair and absurd to expect degree holders, who have spent nearly two decades in school and university, to take up jobs that are well below their academic qualifications.

2.4 Youth Unemployment

Youth employment is a global challenge. The ILO estimates that there are about 74 million young people unemployed as of 2011, a number which constitutes 41 percent of the unemployed globally. Unemployment, however, is only part of the problem. A large number of young people are in the informal sector working long hours for low pay, struggling to eke out a living amidst poor working conditions. This is not only a gross waste of human resources but also one of the principle factors contributing to social problems.

Youth unemployment is concentrated among the educated youth, and the rate escalates with higher levels of education. At low levels of education, youth unemployment is low. It can be seen many educated youth have a significant preference for civil service jobs over job opportunities in the private sector. Thousands of vacancies go unfilled in the export processing zones and hundreds of others in the private sector, whereas an announcement of 300 vacancies in the telecommunications sector yielded 10,000 applications. Similarly, a very few young people were prepared to take "any job they can get". The preference for the public sector is influenced by many factors; most importantly stable income and job security makes the public sector very attractive to people from low income families. Therefore, this preference is not just an issue of wrong attitudes' and it is important to analyze the situation from a broader perspective. The reluctance of youth to enter the private sector job market may be due to real and experienced disadvantages in and barriers of finding private sector employment, such as prevailing working conditions and exclusionary attitudes towards non-English speaking employees among other factors. Social networks are seen to play a crucial role in gaining employment in the private sector, especially the corporate sector. English proficiency is paramount as well as other factors attributed to status, such as family background and type of school attended.

However, with unemployment issues Sri Lanka appears to have taken the necessary strides to combating the problem. In September 2000, under the impetus of the Millennium Declaration, the Youth Employment Network (YEN) was created in partnership with the UN, World Bank and the ILO, for which Sri Lanka volunteered to be one of ten lead countries. In 2004, with assistance from the ILO, YEN-SL was set up in Sri Lanka and the organization has been entrusted with the task of formulating a National Action Plan aimed at analyzing and strategizing a response to youth unemployment in the country (Fonseka 2010). The objective of the National Action Plan (NAP) for Youth Employment was to ensure that talents and aspirations of youth in relation to the labour market are fulfilled, thereby not only addressing existing inequalities but, by providing opportunities for young people to realize their full potential, also contribute to economic growth. The plan was based on an in-depth analysis of Sri Lanka's labour market; the analysis adheres to the "4Es" conceptual framework developed by the UN-sponsored YEN initiative, that is, to the analysis of the following four key labour market areas: equal opportunity, employment creation, employability, and entrepreneurship (YEN-NAP 2006). Still the unemployment is remaining as a serious economic and social problem.

2.5   Graduate Unemployment

The graduate unemployment problem has many dimensions. It has had its roots in some aspects of the educational reforms introduced to the country under various governments. Although all most all governments stressed the need for educational reforms no meaningful measures were taken to bring about any changes. A great milestone in the field of university education was the establishment of several new universities in the past two decades which turned out conventional course of studies.

The objective of a university is not to train students for a job. Universities generally impart theories and concepts which broaden the outlook of students enabling them to use their imagination and foresight in the problem solving process. An overwhelming majority of students who competitively obtained the available limited university places were not in a position to meet that objective. Some argues that it is the delivery of the university curriculum that fails students. The lectures are chalk and talk methodologies with little participative and self-learning being promoted, there is no

emphasis on presentation and other communication skills and no confidence building takes place due to the continued spoon feeding and closed book exams going on (Fonseka 2010). The graduate unemployment problem is therefore not only a responsibility of a government but also a responsibility of the university academic community. Though commendable progress has been achieved, present education and training systems still have significant limitations pertaining to access the quality.

However there is a moral obligation of the government to provide employment to the unemployed graduates who had been victims of the circumstances. Besides any government has a socio-political responsibility to ensure that unemployment is restricted to a bare minimum. This is because the government has overall command of the macro-economic variables in a country and is expected to take prudent measures to achieve economic growth by efficient management of the economic parameters. This is why democratically elected governments the world over make it a social responsibility to provide economic support for the unemployed until they find employment.

The unemployment total (% of total labor force) in Sri Lanka declined to 4.2 in 2011 from 4.9 in 2010, the lowest level recorded thus far. Its highest value over the past 25 years was 14.70 in 1991 (The world Fact book 2012). While the unemployment rate has continued to decline, graduate unemployment remains high. The youth unemployment among the age group 20-29 years was 12.4 percent in 2011. Although this is a lower value comparing to the year 2010 (13.8%) (Central Bank of Sri lanka Annual Report 2011), still it reflects that there are a larger number of youth are unemployed and the large proportion of this consist the graduates.

Many graduates may leave universities without the skills, attitudes and understanding that are requires entering to the job market. All most all the graduates possess the 'technical skills' or appropriate academic qualifications for a job. However they appear as to lack the soft skills to convert knowledge into a profession. It is a popular argument that there is a skills mismatch owing to the education system not producing the skills the labour market needs. Especially with respect to the educated unemployed, there is a mismatch between the desired employment and the available employment opportunities and a mismatch between the capacities and skills of

available job opportunities. Most graduate resist accepting jobs they feel are below their dignity. They may even prefer to stay unemployed till they get what they consider is a good job. This mismatch between expectations from their education and jobs available and skills needed is an important factor in creating unemployment among the graduate. The need for soft skills in private sector employment compounds this problem.

2.6   Employability Skills

Employability skills are skills that apply across a variety of jobs and life contexts. They are sometimes referred to as key skills, core skills, life skills, essential skills, key competencies, necessary skills, and transferable skills. However industry's preferred term is 'Employability Skills'. Employability skills are defined as "transferable core skill groups that represent essential functional and enabling knowledge, skills and attitudes required by the 21st century workplace... necessary for career success at all levels of employment and for all levels of education" (Overtoom 2000 cited in Ogbeide 2006). Alternatively employability skills are defined as "skills required not only to gain employment, but also to progress within an enterprise so as to achieve one's potential and contribute successfully to enterprise strategic directions". (Employability Skills Summaries 2011)

Vize (2011) describes that the employability skills or generic skills are those which can be applied to most workplace situations. They are general in nature, and cover a range of 'whole of job' experiences. They are sometimes referred to as the 'soft' skills, for many students, mastering employability skills can be a challenging and confronting process, requiring intensive teacher and school input and explicit teaching, role modeling and task planning. According to Vize (2011) employability skills are usually seen as covering eight core skill areas: 1) Initiative, 2) Teamwork, 3) Communication,4) Using technology,5) Solving problems and using initiative,6) Being able to self manage7) Learning for life and 8) Planning and organizing.

The Employability Skills Framework, developed by the Australian Chamber of Commerce and Industry and the Business Council of Australia in 2007 has discussed eight employability skills. The eight identified skills are; 1)communication skills,

2)teamwork skills, 3)problem solving skills, 4)self-management skills, 5)planning and organizing skills, 6)technology skills, 7)life-long learning skills and 8)initiative and enterprise skills.

Coopers and Lybrand (1998) define 'employability skills' in terms of four key areas: 1). traditional intellectual skills – e.g. critical evaluation, logical argument; 2). Key skills – communication, IT, etc., 3). Personal attributes – motivation, self-reliance; and 4). Knowledge of organizations and how they work. There are several synonyms - core, key, generic, personal transferable skills, common, work or employment related skills. This is another reason why it is difficult to conceptualize what is meant by employability skills. Added to that, 'skills' are often referred to as capabilities, competencies or attributes, levels or learning outcomes, thus compounding the sense of confusion.

The Pedagogy for Employability Group (2004, p. 5) provides a list derived from research carried out over the last 25 years and suggests that employers expect to graduates to develop following generic skills. Imagination/creativity, adaptability/flexibility, willingness to learn, independent working/autonomy, working in a team, ability to manage others, ability to work under pressure, good oral communication, communication in writing for varied purposes/audiences, numeracy, attention to detail, time management, assumption of responsibility and for making decisions, planning, coordinating and organizing ability, and ability to use new technologies.

Peter Knight from the Institute for Educational Technology at the Open University, UK is quoted in the Hobson's Directory for graduate-level vacancies, discussing skills looked on favorably amongst employers: "When hiring, employers generally value good evidence of: ability to cope with uncertainty; ability to work under pressure; action-planning skills; communication skills; IT skills; proficiency in networking and team working; readiness to explore and create opportunities; self-confidence; self-management skills; and willingness to learn".

Knight and Yorke, (2004) cited in Hingley (2005) has discussed 39 employability skills in three major groups namely, personal qualities, core skills, and process skills. 1)Malleable self-theory, 2)self-awareness, 3)self-confidence, 4)independence,

5)emotional intelligence, 6)adaptability, 7)stress tolerance, 8)initiative, 9)willingness to learn, and10) reflectiveness are discussed under the personal qualities. There are 12 skills introduces under the core skills namely; 11)reading effectiveness, 12)numeracy, 13)information retrieval, 14)language skills, 15)self-management, 16)critical analysis, 17)creativity, 18)listening, 19)written communication, 20)oral presentations, 21)explaining, and 22)global awareness skills. The process skill consist 23)computer literacy, 24)commercial awareness, 25)political sensitivity, 26)ability to work cross-culturally, 27)ethical sensitivity, 28)prioritizing, 29)planning, 30)applying subject understanding, 31)acting morally, 32)coping with ambiguity and complexity, 33)problem-solving, 34)influencing, 35)arguing for and/or justifying a point of view or a course of action, 36)resolving conflict, 37)decision making, 38)negotiating, and 39)teamwork skills.

The Graduate Employability Indicators (GEI) is an outcome of the Australian Learning and Teaching Council (ALTC) project "Building course team capacity to enhance graduate employability". The GEI are designed to supplement data from the Australian Graduate Survey and provide more comprehensive graduate employability data from a broader range of stakeholders at course level: graduates, employers and course team. There are fourteen skills in the GEI map; 1) Acquiring work-related knowledge and skills 2) Writing clearly and effectively 3) Speaking clearly and effectively 4) Thinking critically and analytically 5) Analyzing quantitative problems 6) Using computing and information technology 7) Working effectively with others 8) Learning effectively on your own 9) Understanding people of other racial and ethnic backgrounds 10) Solving complex, real-world problems 11) Developing a personal code of values and ethics 12) Contributing to the welfare of your community 13) Developing general industry awareness 14) Understanding different social contexts.

Graduates to be attractive to employers it is important that they are able to show evidence of having employability skills. Then only employers can be relieved from the problem of difficulty in recruiting 'work-ready' individuals. Therefore it is relevant to consider whether graduates do have the opportunity to develop work related skills.

2.7 Research Framework Development

From the above described literature, a comprehensive employability skills framework has been developed. It includes the skills which have been listed in many of the previous research findings. According to Kinght and Yorke (2004), there are three main types of skills that a person should have to develop in order to secure an employment. Those skills are personal qualities, core skills and process skills. All these main skills consists 39 sub activities and those are considered as a heuristic. Hence the researcher selected some of them and developed the research framework based on the selected 16 employability skills as shown in the figure 2.1.

Self Awareness
Adaptability
Initiative
Willingness to learn

Personal Skills

Self Management
Critical Analysis
Creativity
Language skills
Numeracy

Core Skills

Communication
Team Work
Technology
Planning and Organizing
Applying subject knowledge
Problem Solving/Decision making
Negotiating

Process Skills

Employability Skills
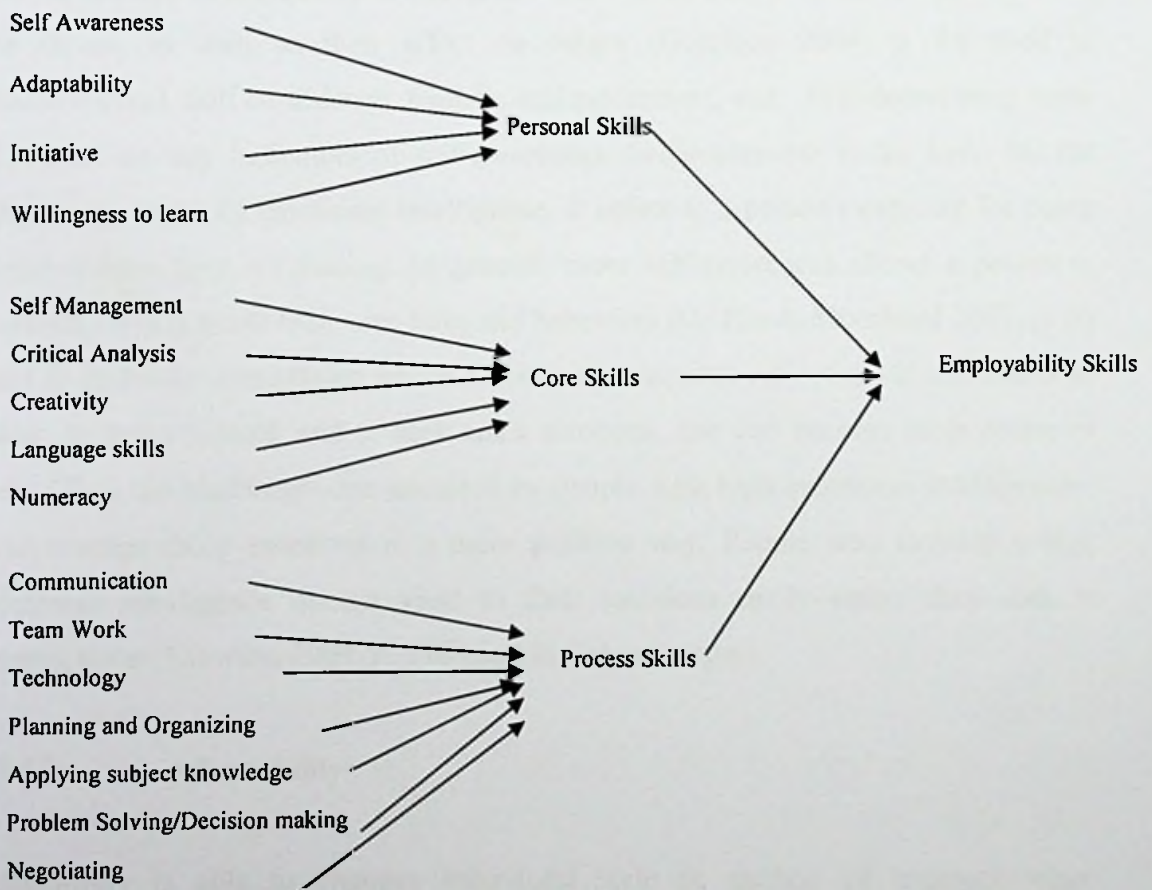
Figure 2.1: Research Framework

2.7.1 Personal Skills

Personal qualities are personal characteristics of an individual. They are what make up one's personality. They help a person get along in a new situation. For example, dependability, patience, honesty, assertiveness, flexibility (adaptability), friendliness,

intelligence, leadership, lifelong learning, initiation, and a good sense of humor are some of them. Though all the skills are important, an employer will select new employees based on their personal qualities as well. Personal skill is composed of qualities and attributes of a person and the result of possessing such skills is personal effectiveness. Self awareness, adaptability, initiative, and willingness to learn are included to the model under the personal qualities.

2.7.1.1   Self Awareness

Self Awareness is the ability to recognize and understand of self moods, emotions, and drives, as well as their effect on others (Goleman 2004, p. 88 cited in Bolender.com). Self confidence, realistic self assessment, and Self-deprecating sense of humor are key indicators of self-awareness. Self-awareness is the basis for the other components of emotional intelligence. It refers to a person's capacity for being aware of how they are feeling. In general, more self-awareness allows a person to more effectively guide their own lives and behaviors (Griffin & Moorhead 2007, p. 65 cited in Bolender.com).Being aware of emotions requires reflection. If one learns to pause, to focus inward, and to seek one's emotions, one can become more aware of them. Then the challenge--one accepted by people with high emotional intelligence-- is to manage those emotions in a more positive way. People who develop a high emotional intelligence do not yield to their emotions easily--rather they seek to manage them (Clawson 2009, p. 176 cited in Bolender.com).

2.7.1.2   Adaptability

Adaptability is able to changes behavioral style or method of approach when necessary to achieve a goal; adjusts style as appropriate to the needs of the situation; ability to responds to change with a positive attitude and a willingness to learn new ways to accomplish work activities and objectives. Looks for ways to make changes work rather than only identifying why change will not work, adapts to change quickly and easily, makes suggestions for increasing the effectiveness of changes, shows willingness to learn new methods, procedures, or techniques, resulting from departmental or University-wide change, and shifts strategy or approach in response

to the demands of a situation are some behavioral indicators if one's possess the adaptability skill.

2.7.1.3 Initiative

If a person is initiative, he does more than is required or expected in the job; does things that no one has requested that will improve or enhance products and services, avoid problems, or develop entrepreneurial opportunities and plans ahead for upcoming problems or opportunities and takes appropriate action. Goes beyond expectations in the assignment, task, or job description without being asked, demonstrates a sincere positive attitude towards getting things done, digs beneath the obvious to get at the facts, even when not asked to do so, creates opportunities or minimizes potential problems by anticipating and preparing for these in advance, seeks out and/or accepts additional responsibilities in the context of the job are some behavioral indicators of initiative (humanresources.syr.edu 2012).

2.7.1.4 Willingness to Learn

Learning is an ongoing process in the workplace and does not only occur when taking up a new role. Employees are increasingly expected to improve and alter working practices based on what they have learnt from everyday experiences, as well as more formal and structured training and education.

Pursuit of knowledge for either personal or professional reasons and shows the eagerness of learning is the willingness to learn. Be willing to learn new ways of working, seek information to improve performance from people and workplace documents like policies, procedures etc., understand equipment characteristics, technical capabilities, limitations and procedures are indicators of willingness to learn skill.

2.7.2 Core Skills

Core skills are prerequisite to improve the quality of life, become successful in one's endeavors, and find happiness and fulfillment. Core skills are fundamental skills that a

person cannot do without if he/she wants to become effective individual. (Exforsys Inc. 2012) another definition of core skills is the basic essential skills that are required to perform a task or a job. In the developed research model it has identified self management skill, critical analysis skill, creativity skill, language skill and the numeracy skill under the core skills which positively affected to the employability skills.

2.7.2.1   Self Management

Self management is a form of workplace decision-making in which the employees themselves agree on choices (for issues like customer care, general production methods, scheduling, division of labor etc.) instead of the traditional supervisor telling workers what to do, how to do it and where to do it. Take responsibility for planning and organizing own work priorities and completing assigned tasks, monitor own performance to ensure work will be completed well and on time, planning activities; organizing one's own time; thinking ahead; detecting, diagnosing, analyzing and resolving problems; noticing and checking for errors are behavioral indicators of self management skill.

2.7.2.2   Critical Analysis

Critical analysis is a central process in all academic work. It involves thinking critically, which is applying rational and logical thinking while deconstructing the texts read and write at university. When a person thinks critically the person is being active; and not passively accepting everything what he read and hears, but questioning, evaluating, making judgements, finding connections and categorising. It means being open to other points of view and not being blinded by own biases. When the person analyse critically, he can specify goals, constraints, generate alternatives, analyze risk and select the best alternative, recognize problems and devise and implement a plan of action, and organize available information and process them.

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2.7.2.3 Creativity

Creativity is the act of turning new and imaginative ideas into reality. Creativity involves two processes: thinking, then producing. It is the process of bringing something new. Novel symbols and myths, methods are born as results of one's creativity. It brings to our awareness what was previously hidden and points to new life. It applies original thinking in approach to job responsibilities and to improve processes, methods, systems, or services. Also it tries new approaches when problem solving, seeking ideas, or suggestions from others as appropriate, identifies novel approaches for completing work assignments more effectively or efficiently and works within the "established" system to push for "a better way."

2.7.2.4 Language Skills

Generally language skill means ability to use relevant languages effectively. In the business environment this includes competency in English. The competency in a language is assessed by speaking skill, hearing skill, listening skill and writing skill of a person.

2.7.2.5 Numeracy

Numeracy skill is an ability to work with numbers and understand mathematical concepts. This will underpin an individual's ability to think and express effectively in quantitative terms or else communicate with numbers.

2.7.3 Process Skills

Process skills are a means for learning and are essential to the conduct of science. Perhaps the best way to teach process skills is to let students carry out scientific investigations and then point out the process skills they used in the course of the investigations. Research model includes the communication skill, team work skill, technology skill, planning and organizing skill, applying subject knowledge, problem solving skill, and negotiation skill under the process skills.

2.7.3.1 Communication Skill

According to Woods and King (2002), "effective communication is the lubricant that allows organizations to smoothly and productively operate". Communication skills include oral communication skills, written communication skills, listening skills, face-to-face communication skills and the ability to resolve conflicts positively (Woods & King 2002). Face-to-face communication skills involve the use of non-verbal communication skills such as eye contact, facial expression, yes no nodding, head movement, hand signals, physical stance, hand gesture, etc (Evers et al n.d.; Rampersad 2001). All the above non-verbal communication skills help to clarify the transfer of information from the communicator to the audience. Communication is possibly the most prevalent of all the employability skills. Speaking, listening, reading and/or writing are central to all work practices and there are very few examples of units of competency which do not contain at least some aspects of communication. Communication takes many forms to contribute to successful work outcomes, and may include: Creating documents – everything from maintenance documentation to in-depth research on the competition. Reading and interpreting documentation – this can include staying up to date with the latest policies and procedure manuals, or interpreting complex tender documentation. Oral communication – such as how to convey your message, or more complex skills like empathizing or persuading that may be required for interactions with staff or customers.

2.7.3.2 Team Work

Team work is the process of working collaboratively with a group of people in order to achieve a goal. Teamwork is often a crucial part of a business, as it is often necessary for colleagues to work well together, trying their best in any circumstance. Teamwork means that people will try to cooperate, using their individual skills and providing constructive feedback, despite any personal conflict between individuals (Business dictionary.com 2012). It recognizes the importance of relationships with others in the workplace. There are very few tasks and roles which occur in isolation, but even these require at least some degree of relationship with customers and/or supervisors or an understanding of how the work being done contributes to an overall goal or target. Structural change, the growing complexity and diversity of services and

products being provided, the use of outsourced providers, workplace flexibility and multi skilling are just some of the factors influencing the increased requirements for teamwork. All of these changes require workers to be able to function well as part of a team. Some of the team work skills learners may need to develop include: supporting team members – this typically needs to be done by supervisors as well as team members, supervisors may need to monitor worker progress and provide assistance where necessary, and team members may need to see where there are bottlenecks in the work and help each other out, contributing to positive team dynamics – this is a responsibility for all team members, and includes dealing appropriately with conflict, understanding one's relationship and accountability to other team members, working with people who vary in their age, gender, race, religion or political persuasion, working autonomously in the interest of shared team goals and objectives.

2.7.3.3   Technology

The inclusion of technology as an employability skill recognizes the importance that technology plays not just as a task skill, but in a range of functions performed in the workplace. This employability skill includes the more traditional forms of information technology and the skills needed to work with other equipment and machinery. In the workplace this skill applied when people are: using information technology to assist in communication and support management and planning functions, operating machinery and technologies which assist in the completion of routine, heavy or complex tasks, troubleshooting machinery and technology. Applying occupational health and safety knowledge to appropriately use technology, be it information technology or machinery.

Technology skill is the ability to select and apply contemporary forms of technology to solve problems or compile information. Identifying the appropriate equipments, their potential hazards, and ready for responses for hazards, and obtaining permission where necessary, follow procedures and techniques relevant to the equipment and work being done, use technology to monitor and report on work progress, operate equipment safely, and finally use communications technology appropriate to the workplace (email, mobile, radio, etc) are major components of technology skill.

It is hard to think of jobs that do not rely on the use of technology in some way. Despite the prevalence of information technology specialists, in big business or operating small companies, everyone needs to continue to develop proficiencies in new and emerging technologies.

2.7.3.4 Planning and Organizing

Planning and organizing reflects an individual's ability to manage the tasks and timelines which define their work roles. This has also been identified as one of the employability skill areas which benefit the most from on-the-job experience. Planning and organizing can apply to: time management – an individual's ability to meet time based requirements and deadlines, project management skills – an ability to manage multiple tasks and resources simultaneously, planning, strategy and resource allocation – participating in and leading processes which contribute to the establishment of key directions for the organization, achieving goals and targets – an ability to complete the tasks assigned, research – collecting, analyzing and organizing information to inform subsequent work processes, Scheduling – tasks, rosters or delivery, for example even school learners need to demonstrate planning and organizing skills to manage their study and to submit homework and assessment tasks.

Planning and organizing are part of jobs such as stacking supermarket shelves, scheduling deliveries by couriers and prioritizing clients. Managers need to plan and organize others as well as themselves. It is almost impossible to think of a job role where planning and organizing is not a critical function.

Planning and organizing establishes a systematic course of action for self or others to ensure accomplishment of a specific objective. It sets priorities, goals, and timetables to achieve maximum productivity. Behavioral Indicators are develops or uses systems to organize and keep track of information (e.g., "to-do" lists, appointment calendars, follow-up file systems), sets priorities with an appropriate sense of what is most important and plans with an appropriate and realistic sense of the time demand involved, keeps track of activities completed and yet to do, to accomplish stated

objectives, keeps clear, detailed records of activities related to accomplishing stated objectives, knows status of one's own work at all times.

2.7.3.5 Applying Subject Knowledge

Employers want graduates with relevant subject specific skills, knowledge and understanding, but in addition to that they should be able to apply the knowledge where necessary. See the theoretical background at real world problems and be able to solve the problem using the theory into practice and knowledge on current research /technology relating to the subject and effectively use them where the related areas of work are some indicators of having this skill in a person.

2.7.3.6 Problem Solving/ Decision Making

At its simplest, problem solving can be described as seeing that something is wrong and fixing it. At a more complex level, problem solving can include processes to identify problems; for example, risk management and quality assurance. Initiative was identified in the initial report as an important facet of problem solving as it allows individuals to take steps to solve problems, with or without input from supervisors, before they impact on production or service delivery. Some of the ways in which problem solving is used in the workplace are: in contingency situations – when staff are required to identify and resolve non-standard situations which may arise, using troubleshooting equipment – including standard checks and maintenance as well as addressing breakdowns that may occur in the course of use, providing customer service – working with customers to resolve problems and provide options for complaints resolution, for planning, strategy and resource allocation, which contribute to the avoidance or resolution of contingency situations, for continuous improvement processes – an important means to ensure that key lessons are earned and integrated following workplace problems.

Research, which is a problem solving process, can also contribute to effective resolution of problems. Problem solving is an important part of any job role. It builds a logical approach to address problems or opportunities or manage the situation at hand by drawing on one's knowledge and experience base, and calling on other

references and resources as necessary. Behavioral Indicators are, undertakes a complex task by breaking it down into manageable parts in a systematic, detailed way, thinks of several possible explanations or alternatives for a situation and anticipates potential obstacles and develops contingency plans to overcome them, identifies the information needed to solve a problem effectively, presents problem analysis and recommended solution to others rather than just identifying or describing the problem itself, acknowledges when one doesn't know something and takes steps to find out.

2.7.3.7   Negotiating

Negotiation is a process of discussions that takes place after a process of persuasion. According to numerous management luminaries such as Chester Karass "In business as in life, you don't get what you deserve, you get what you negotiate" (Patrick 2012). Negotiating can therefore be summed as a process of give and take and it is the process of gaining agreement or middle ground.

With negotiation it explores positions and alternatives to reach outcomes that gain acceptance of all parties. Behavioral Indicators are determines minimal or ideal conditions of the other party during negotiations, develops a strategy for giving on some points and standing firm on others to achieve desired outcomes, responds to opposing views in a non-defensive manner, keeps arguments issue-oriented, offers compromises and trade-offs to others, as necessary, in exchange for cooperation.

Negotiation skills are a joy to watch, whether its politicians negotiating out a piece of legislation, trade unionists negotiating for their members rights or other professionals negotiating concessions with both sides gaining something. Good negotiating skills are an asset in a person.

CHAPTER 3
METHODOLOGY

3.1   Introduction

In the previous chapter, a literature review was done to explore the skills which will enhance the employability of the graduates. Hence self awareness, adaptability, initiative, willingness to learn, self management, critical analysis, creativity, language skills, numeracy, communication, team work, technology, planning and organizing, applying subject knowledge, problem solving/decision making and negotiating skills have been identified for investigation.

Research involves formulating the problem to be investigated, choosing and applying research approaches, designing the research study, procedures for data collection and analyzing and communicating the findings through the written report.

This Chapter deals with research methodology that was used for this study. The research methodology refers to the research decisions taken within the framework of specific determinants unique to the research study (De Beer 1999 cited in Phoofolo 2006). Chapter includes the research hypothesis, research approach, research design, details of the population and sample, then the methods of data collection and data analysis.

3.2   Hypothesis Development

A hypothesis is a proposition – a tentative assumption which a researcher wants to test for its logical or empirical consequences. Hypotheses are more useful when stated in precise and clearly defined terms. It may be mentioned that though a hypothesis is useful it is always not necessary, especially in case of exploratory researches. However, in a problem-oriented research, it is necessary to formulate a hypothesis or hypotheses. In such researches, hypotheses are generally concerned with the causes of a certain phenomenon or a relationship between two or more variables under investigation (Bhattacharyya 2009). With a view of fulfilling the objectives, following hypotheses were formulated for this study:

H_1: There is no difference in employability skills development between entry level students and exit level students.

H_2: Personal skills have been developed in exit level students compare to the Core skills and Process skills

H_3: Core skills have been developed in exit level students compare to the Personal skills and Process skills

H_4: Process skills have been developed in exit level students compare to the Core skills and Personal skills

H_5: There is no difference between the perception of graduates regarding employability skills possession and the perception of industry people regarding employability skills of graduates.

H_6: There is no difference in perception of industry people in different age group regarding employability skills of graduates.

H_7: There is no difference in perception of industry people with their job position regarding employability skills of graduates.

H_8: There is no difference in perception of industry people with their years of experience regarding employability skills of graduates.

3.3   Research Approach

In order to support the process of methodology description, it is essential to follow the research paradigm with appropriate research approach. There are mainly two kinds of research approaches deductive and inductive. Deductive research approach is associated with the positivism paradigm, whereas inductive research approach is associated with interpretive. (Dissertation Writing 2012)

Deductive research approach allows the research to establish a hypothesis by using theory. Variety of data and information is collected by the researcher to confirm or reject the hypothesis to resolve issue (Gill and Johnson 2010). Figure 3.1 illustrates the various steps of deductive research approach. Those steps are development of theory, hypothesis, observation through data and information and confirmation.

| Theory | Hypothesis | Observation | Confirmation |
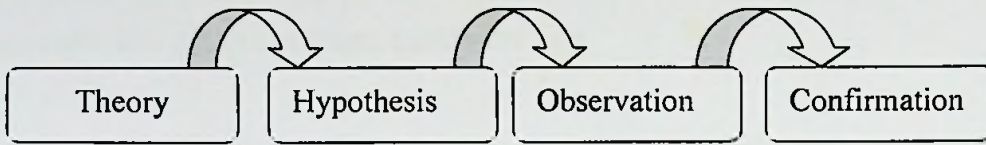
Figure 3.1: Steps of Deductive Research Approach

Inductive approach is totally reverse form deductive approach. Observation, pattern, tentative hypothesis and theory are important steps of the inductive approach. Inductive research is a flexible approach because there is no requirement of pre-determined theory to collect data and information. Figure 3.2 illustrates the steps of inductive research approach.

| | | Confirmation |
| Theory | Hypothesis | Observation |
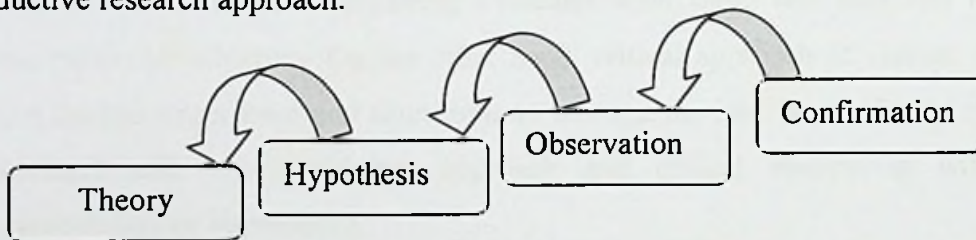
Figure 3.2: Steps of Inductive Research Approach

There are mainly three research paradigms; positivism approach, interpretive approach and realism approach. In the Positivism approach, outcomes can be measured with the help of defined facts and observations. For example, numeric data sets and surveys, experimentations, etc. are associated with the positivist approach. This research paradigm is mainly based on the quantitative research approach. According to this paradigm, researchers own beliefs, values and thoughts will not have any influence on the research study.

Interpretive approach is based on the identification of the problems in the research. This approach helps in assessing the variables related with the research solution. In the management researchers, this term is also known as social constructivism. When the researchers found that business world has become too complex and 45 multifaceted, this research paradigm is used by them. With the help of this terminology, it becomes easy for the researchers to evaluate the perception of reality, which is determined by people not the external factors (Easterby, Smith et al 2006). Due to the differences in perceptions, personality, living standards, culture, values,

nature, etc. understanding of individuals is different. With the help of interpretive approach, it is easy to evaluate qualitative data.

As the name of realism, this research paradigm is a kind of approach, which is based on critical evaluation of reality. Under this approach, social issues are highlighted in terms of identifying the social realities by historical structure. According to Cooper and Schindler (2006), in this approach the researcher response that which sense experiences and which have an existence on human mind. Two important categories of realism are direct and critical realism.

In direct realism process, researcher evaluates what sense see, hear and felt about some particular situation. On the other hand, critical approach of realism discusses about human experience and sensations to manage the real world. Direct realism is associated with the positivism approach and critical realism is with social constructivism or interpretive.

3.4   Research Design

Primary data collection method was a questionnaire method (Appendix A, Appendix B) and it was administrated on a random sample of first year and final year undergraduates of four universities. The Longitudinal Approach is the best approach for this type of research since it deals with the change of a phenomenon. Longitudinal research is a type of research method used to discover relationships between variables that are not related to various background variables. This observational research technique involves studying the same group of individuals over an extended period of time and involves taking multiple measures over an extended period of time. However, due to the time constrain, cannot carry out a longitudinal study. As a precaution for this issue, decided to have two cross-sectional samples from the beginning and end. Cross-sectional research is a research method often used in developmental psychology, but also utilized in many other areas including social science and education. This type of study utilizes different groups of people who differ in the variable of interest, but share other characteristics such as socioeconomic status, educational background, and ethnicity. Cross-sectional research is focused on looking at variables at a specific point in time. Thus, decided to investigate level one

student and final students as samples the study was tried to analyze how graduate attributes developed through curriculum, curricula related activities and extracurricular activities within the university life.

This was done using a comparative study of two cross sectional samples. Then compare entry level skills of undergraduates vs. exit level skills of them. Through this, it was planned to identify which employability skills has been developed and in which extent those skills has been developed among the undergraduates. It was planned to send a survey questionnaire (Appendix B) to selected reputed business organizations to assess whether the recruited graduates have employability skills which is in the developed model.

3.5   Population

Population is the complete set of elements (persons or objects) that possess some common characteristic defined by the sampling criteria established by the researcher. Population composed of two groups; target population and accessible population. The target population consist the entire group of people or objects to which the researcher wishes to generalize the study findings, and those meet the criteria of interest to researcher.   The accessible population is the portion of the population to which the researcher has reasonable access; may be a subset of the target population and limited to a region, state, city, country or institution.

In this study the population was graduates and employers. Graduates can be categorized based on their study programme as illustrated in figure 3.3. Some study programmes are directly related to their profession. After the graduation, those are guaranteed a job in the specific field of study. For an example, undergraduates of a medical faculty are guaranteed to become a physician after graduation. In this study researcher consider only the Applied Sciences graduates under science stream. This is because Applied Sciences graduates are new to the job market and also they learn more applied sciences subject than the pure sciences. For this reason they are open to have many jobs in a competitive labor market. The possession of different skills together with the theoretical and practical knowledge may guarantee a job for applied

science graduates. Hence it is required to analyze whether these graduates have acquired and developed the employability skills as an undergraduate.

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                          ┌─────────────────┐
                          │    Graduates    │
                          └─────────────────┘
                                   │
              ┌────────────────────┴────────────────────┐
    ┌──────────────────────┐              ┌──────────────────────┐
    │ Directly related to a│              │ Directly not related to│
    │      profession      │              │     a profession      │
    └──────────────────────┘              └──────────────────────┘
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| Medicine (Medicine, Dental Surgery, Veterinary Science) | Law | Engineering | ARTS | Science (Physical Science, Biological Science, Applied Sciences) | Management |
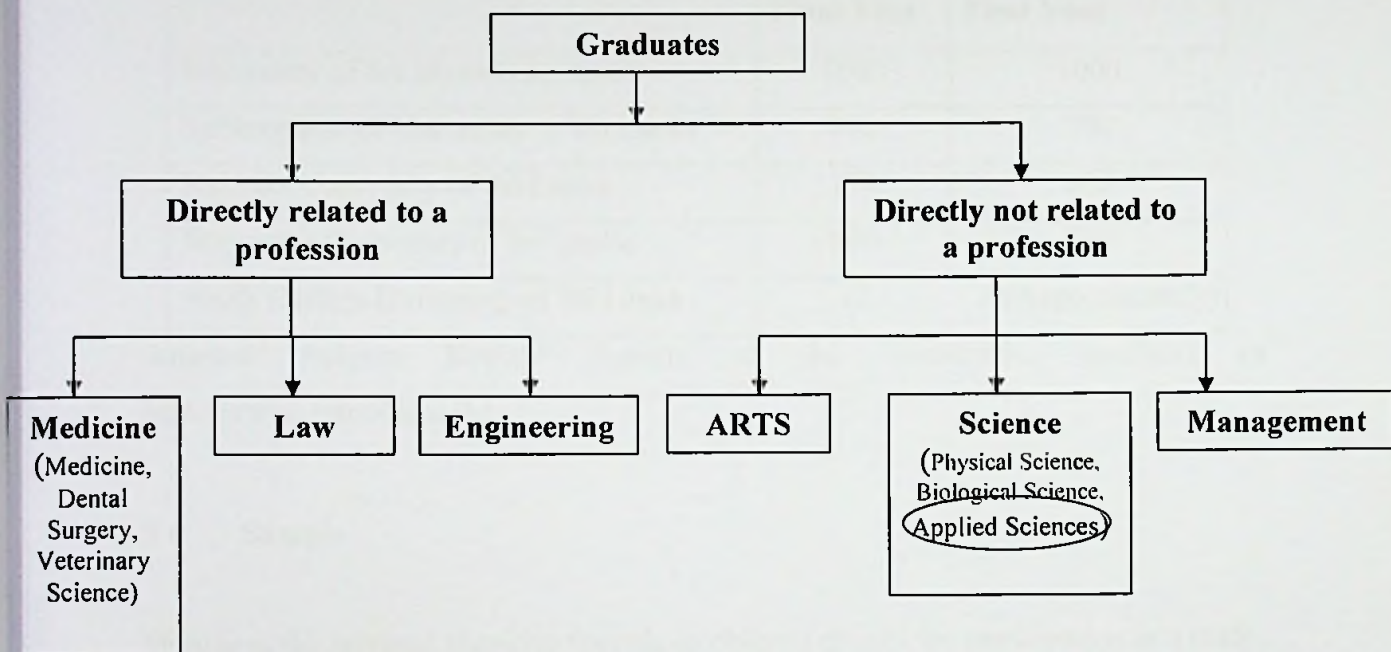
Figure 3.3 Classification of Graduates based on the Study Programme

Also there are several levels of staff members in the business organization. Among them special attention had to be given to the middle level management because most of the time they interact with fresh graduates at the working places. However top level people's estimations on employability skills of graduates also have to consider since they are the persons who make decision on employee recruitments. Therefore, the questionnaire was administrated to the different level of management in selected organizations.

Therefore the target population was defined as first year and final year Applied Science undergraduates and employers of selected business organizations. Only in university of Sri Jayewardenepura, South Eastern University of Sri Lanka, Rajarata University of Sri Lanka, Sabaragamuwa University of Sri Lanka, and Wayamba University of Sri Lanka consist Applied Sciences faculties. Hence the size of the target population was presented in table 3.1.

Table 3.1: Size of the Population

University	Size of the Population	
	Final Year	First Year
University of Sri Jayawardenepura	1000	1000
Sabaragamuwa University of Sri Lanka	190	200
Rajarata University of Sri Lanka	150	150
Wayamba University of Sri Lanka	100	150
South Eastern University of Sri Lanka	72	72(Approximately)

Sources: Subject Review Reports of the Universities available in http://www.qaacouncil.lk/

3.6   Sample

Sample is the selected elements (people or objects) chosen for participation in a study; people are referred to as subjects or participants. Collecting the data for the study was done using a sample because the population of the study is very large and data collection from the population was practically impossible. When selecting the sample it was required to consider all five universities which consists applied sciences faculties. However due to the practical difficulties of collecting data from the South-Eastern university of Sri Lanka, it was excluded from the survey.

Table 3.2 shows the size of the sample which the researcher selected based on the standard sampling formula.

Table 3.2: Sample Size

University	Size of the sample	
	Final Year	First Year
University of Sri Jayawardenepura	120	120
Sabaragamuwa University of Sri Lanka	80	81
Rajarata University of Sri Lanka	70	70
Wayamba University of Sri Lanka	60	70

3.7 Data Collection and Questionnaire Development

A questionnaire has been defined by De Vos (1998:89) as an instrument with open or closed questions or statements to which a responded must react. This has been confirmed by Vogt (1993) as cited by Terre Blanche et al (2006:484) who state that a questionnaire is a group of written questions used to gather information from respondents, and it is regarded as one of the most common tools for gathering data in the social sciences. (Kopolo 2009)

Initial questionnaire was developed and with the suggestions of the supervisor it had evolved further (Appendix A, Appendix B). In initial questionnaire some questions were open ended while some were close ended. But in analyzing it was difficult and also has no consistent, second questionnaire was developed with the likert type scaled questions to collect the employability skills while including some questions to collect demographic and academic data of the undergraduates and demographic and professional data of the industry people. The skill indicators were assessed by assigning ranks from 1 to 5 in the following way;

1 – Strongly disagree to 5 – Strongly agree

The first seven questions of the questionnaire given to the undergraduates (Appendix A) include some general information about the participants. Through that, it was identified, which universities they are from, the level of study (to get to know whether he or she has developed the employability skills by being at the university), and the gender. Also it is assessed their expectation after the graduation as to get an idea of their future career propensity. There, the major concern was given to the level of study, i.e. whether they were in the first year of the study programme or in the final year of the study programme. For the first year undergraduate group it was worthless to asking whether they are doing general or special degree, since all the universities adopted the selection criteria for the special or joint major degree after their level II studies. At the same time it was give no meaning of inquiring from the level I students, whether they are willing to set-up for self employments or their job preference, since they just enter to the university and at least there are two more years to decide their destination. Hence researcher did not collect such information from the level I undergraduates.

The first six questions of the questionnaire given to the industry (Appendix B) include some demographic information and job related information about the participants. From that questionnaire, researcher could identify their measurements on possessing the employability skills in the recruited graduates. Through that questionnaire, level of the job position, age group they belongs to, the experience, academic qualifications and the nature and background of the industry also collected.

The number of all student groups consists around 2900 while the 670 questionnaires were distributed among the four universities. The number of questionnaires to send was decided based on the standard sampling formula. The number of questionnaires distributed to the first year student group was 340 while the number of questionnaires distributed to the final year student group was 330. Since the stratified random sampling technique was used, there was an equal chance of being selected for the survey within the group. Survey was conducted through the questionnaire and it was filled by the undergraduates by being at their specified universities.

3.8   Operationalization of Variables

To build the research model existing set of employability skills were used and as of considering the behaviors of skills, those are grouped into the three principal variables: personal skills, core skills and process skills. Since the employability skills of graduates can be measured through various indicators researcher used both qualitative and quantitative approach. Hence data was collected by administering a questionnaire. Qualitative responses were quantified by five point likert scale.

The questionnaire includes two parts. First part includes the demographic variables whereas the second part includes the questions related to variables of the research model. Table 3.3 shows the operationalization of variables of the research framework.

Table 3.3: Operationalization of variables

Dependent Variable	Principal independent Variables	Sub Variables	Indicators	Question No
Employability Skills	Personal Skills	Self Awareness	Realistic self-assessment	Q1
			Self-confidence	Q2, Q12
			Self-deprecating sense of humor	Q3
		Adaptability	Adapts to change quickly and easily	Q4
			Makes suggestions for increasing the effectiveness of changes.	Q5
			Shows willingness to learn new methods, procedures, or techniques, resulting from departmental or University-wide change	Q6
		Initiative	Demonstrates a sincere positive attitude towards getting things done.	Q7
			Goes beyond expectations in the assignment, task, or job description without being asked.	Q8
			Digs beneath the obvious to get at the facts, even when not asked to do so.	Q9
		Willingness to learn	Be willing to learn new ways of working	Q6
			Seek information to improve performance from people and workplace documents like policies, procedures etc.	Q10
			Understand equipment characteristics, technical capabilities, limitations and procedures	Q11
	Core Skills	Self Management	Take responsibility for planning and organizing own work priorities and completing assigned tasks	Q13
			Monitor own performance to ensure work will be completed well and on time	Q14
			Planning activities; Organizing one's own time; Thinking ahead; Detecting, diagnosing, analyzing and resolving problems; Noticing and checking for errors.	Q15

		Critical Analysis	Specify goals, constraints, generate alternatives, analyze risk and select the best alternative	Q16
			Recognize problems and devise and implement a plan of action	Q17
				Q18
		Creativity (Innovation)	Tries new approaches when problem solving, seeking ideas, or suggestions from others as appropriate.	Q19, Q21
			Identifies novel approaches for completing work assignments more effectively or efficiently and works within the "established" system to push for "a better way."	Q20
		Language skills	Listening	Q22
			Speaking	Q23
			Reading	Q24
			Writing	Q25
		Numeracy	Multiply and divide accurately, Calculate percentages.	Q26
			Use simple statistics.	Q27
			Read and interpret graphs and tables.	Q28
	Process Skills	Communication	Speak clearly and directly	Q29
			Read and interpret work instructions and safety signs	Q30
			Complete incident and maintenance reports	Q31, Q33
			Listen carefully to instructions and information and make responses accordingly	Q32, Q34
		Team Work	Apply teamwork in a range of situations, particularly in a safety context	Q35
			Work cooperatively with people of different ages, gender, race, religion or political persuasion	Q36
			Contribute to group efforts confidently	Q37, Q38
		Technology	Identify and obtain appropriate equipment and permits	Q39
			Identify potential hazards and prepare appropriate responses, Follow procedures and techniques relevant to the equipment and work being done	Q40

				Use technology to monitor and report on work progress, Operate equipment safely	Q41
				Use communications technology appropriate to the workplace (email, mobile, radio, etc)	Q42
			Planning	Develops or uses systems to organize and keep track of information (e.g., "to-do" lists, appointment calendars, follow-up file systems).	Q43
				Sets priorities with an appropriate sense of what is most important and plans with an appropriate and realistic sense of the time demand involved.	Q44
				Manage time and priorities to complete work	Q45
			Applying subject knowledge	see the theoretical background at real world problems	Q46
				Knowledge on current research /technology relating to the subject.	Q47
			Problem Solving/Decision making	Undertakes a complex task by breaking it down into manageable parts in a systematic, detailed way	Q49, Q50
				Thinks of several possible explanations or alternatives for a situation and anticipates potential obstacles and develops contingency plans to overcome them.	Q48
				Identifies the information needed to solve a problem effectively.	Q49
				Presents problem analysis and recommended solution to others rather than just identifying or describing the problem itself.	Q51
			Negotiating	Responds to opposing views in a non-defensive manner, Keeps arguments issue-oriented.	Q52
				Offers compromises and trade-offs to others, as necessary, in exchange for cooperation, Develops a strategy for giving on some points and standing firm on others to achieve desired	Q53

| | | | | outcomes. | |
| | | | | Determines minimal or ideal conditions of the other party during negotiations. | Q54 |

3.9 Data Analysis

This research embarked on a mixed research design which is a combination of quantitative and qualitative research methods. It is a mixed model research where within a single stage of the research process, there is a mixture of both quantitative and qualitative approaches. Qualitative data collected from these questionnaires were analyzed through qualitative content analysis. Quantitative data collected were analyzed using the Statistical Package for Social Sciences (SPSS) version 16 where data were analyzed through descriptive and inferential statistics.

This study yields data identified in ordinal scale, because of the inability to further quantify the measurements. Thus the researcher was forced to measure improvement on an ordinal scale in to strongly disagree to strongly agree. As it is difficult to measure such responses rank such responses from 1 to 5.

3.9.1 Testing for Normality

An assessment of the normality of data is a prerequisite for many statistical tests as normally distributed data are an underlying assumption in parametric testing. There are two main methods of assessing normality - graphically and numerically.

Plotting a histogram with the normal curve superimposed will provides useful graphical representation of the data. Looking at the values of Skewness and Kurtosis is another method. Skewness involves the symmetry of the distribution. Skewness that is normal involves a perfectly symmetric distribution. Kurtosis involves the peakedness of the distribution. Kurtosis that is normal involves a distribution that is bell-shaped and not too peaked or flat. Both Skewness and Kurtosis are 0 in a normal distribution, so the farther away from 0, the more non-normal the distribution. The question is "how much" skew or kurtosis render the data non-normal? This is an arbitrary determination, and sometimes difficult to interpret using the values of

Skewness and Kurtosis. There are established tests for normality that take into account both Skewness and Kurtosis simultaneously. (A collaborative Psychology Wiki, 2012)

The Kolmogorov-Smirnov test (K-S) and Shapiro-Wilk (S-W) test are designed to test normality by comparing the data to a normal distribution with the same mean and standard deviation of the sample. If the test is not significant, then the data are normal, thus any value above .05 indicates normality. If the test is significant (less than .05), then the data will not normal. Shapiro-Wilk Test is more appropriate for small sample sizes (< 50 participants) but can also handle sample sizes as large as 2000. In terms of hypothesis testing, the Kolmogorov-Smirnov test is used for samples which have more than 50 subjects. (A collaborative Psychology Wiki, 2012)

One limitation of the normality tests is that the larger the sample size, the more likely to get significant results. Thus, one may get significant results with only slight deviations from normality when sample sizes are large. In analysis phase, the researcher used the Kolmogorov-Smirnov test (K-S) and Shapiro-Wilk (S-W) test to test the normality.

3.9.2 Validity and Reliability

Reliability indicates the extent to which data are free from errors but capitulate consistent results (Ary et al. 2002; Harris and Ogbonna 2001 cited in Ogbeide 2006). In general, the concept of reliability refers to how accurate, on the average; the estimate of the true score is in a population of objects to be measured. For an example of reliability, to make sure the questionnaire measure employability skills of the graduate in a useful way? Using reliability analysis, it can determine the extent to which the items in the questionnaire are related to each other, it can get an overall index of the repeatability or internal consistency of the scale as a whole, and can identify problem items that should be excluded from the scale.

Some models of reliability measure are available in SPSS. While there is a lot of information gleaned from looking at correlations, there may really want a single statistic to tell how reliable the survey was. Among those the most common method

is Cronbach's alpha. Here it was used to check the reliability of the data. It is a model of internal consistency, based on the average inter-item correlation. Values range from 0 to 1, with higher values indicating higher reliability. The usual criterion is a Cronbach's alpha coefficient of .70 (Harris & Ogbonna 2001 cited in Ogbeide 2006). A Cronbach's alpha coefficient of .70 and above indicates a high degree of internal consistency among the data collected (Harris & Ogbonna; Hsu et al. 2003 cited in Ogbeide 2006).

Validity is the extent of accuracy of an instrument to measure the construct it is supposed to measure in the context of the concepts or variables being studied. A structured questionnaire was developed after a review of relevant literature to incorporate and measure important variables in the study. The researcher and supervisor closely examined the questions in the questionnaire to ensure that they measured the desired variables. The face validity, content validity and construct validity were also examined.

Face validity refers to subjective judgment on whether the research instrument appears to measure what it is supposed to measure. Face validity was maintained by constructing questions relevant to the study.

Construct validity ensures that abstract concepts are measured adequately and logically, and relationships between variables are identified with the instrument based on theory and clear operational definitions. The variables were defined in understandable terms to create a common understanding between the researcher and reader.

Content validity is the evaluation of the tool to ensure that all the components of the variables to be measured in a study are included in the questionnaire without neglecting important components. To meet this criterion, the researcher reviewed relevant literature before developing the instrument and ensure that all the necessary variables were included.

3.9.3   Non-Parametric Test Statistical Analysis

When the variables of interest are measure on an ordinal scale, test procedure must resort to nonparametric statistical tests to provide the technique for analyzing these data. Also if the data not distributed normally again the non parametric tests should be undertaken. The word nonparametric evolves the type of hypothesis usually tested when dealing with ordinal level data (Pallant 2010). Therefore researcher used nonparametric test statistics to analyzing the data.

SPSS offers nonparametric versions of some commonly used tests such as t test, analysis of variance, one-sample test and other tests. Among them the Friedman test is a non-parametric test for testing the difference between several related samples. This is a distribution free test; hence there are no strong assumptions. However following Assumptions are considered when performing Friedman test.

1.)   Each set of K observations must represent a random sample from a population and must be independent of every other set of K observations. If the data are from a repeated-measures design, the scores for each participant must be independent of the scores from any other participant. If the data are from a matched subjects design, the sets of scores from any matched set of participants must be independent of the scores of any other matched set of participants. If the independence assumption is violated, the test is likely to yield inaccurate results. It should be noted that the analysis permits dependency among scores within a set.

2.)   The Chi-Square values for the Friedman test yield relatively accurate results to the extent that the sample size is large. The results for the tests should be fairly accurate if the sample size is 30 or greater.

3.)   The Distribution of the differences scores between any pair of levels is continuous and symmetrical in the population. This assumption is required to avoid ties and to ensure that the test evaluates difference in medians rather than other characteristics of the distribution (Green and Salkind 2008).

The null hypothesis for the Friedman test is that there are no differences between the variables. If the calculated probability is low (P<0.05) the null-hypothesis is rejected and it can be concluded that at least 2 of the variables are significantly different from each other. The SPSS computes both Chi square value, and Kendall's coefficient of concordance (Kendall's W). Kendall's W is measured a strength-of-relationship index and is a normalization of the statistic of the Friedman test. This can be used for assessing agreement among raters. It ranges from 0 to 1, with higher values indicating a stronger relationship (Green and Salkind 2008). The Friedman test for the undergraduates' data set and employers' data set was performed to evaluate the differences in the perceptions medians among the 16 employability skills. In the given questionnaires, it is allowed to rank identified variables independently and there is no influence one rank to the other variable. However sample was ranked their perceptions independently. Hence the underlying assumptions were met to perform the test.

If the results show significant differences among the variables, follow-up tests need to be conducted to evaluate comparisons between pairs of medians. For this purpose Wilcoxon test or Mann Whitney test can be performed.

Wilcoxon matched-pairs signed-rank tests are nonparametric statistic that can be used with ordinally scaled dependent variable when the independent variable has two levels and the participants have been matched or the samples are correlated. Thus, the test is useful when a t-test cannot be employed because its assumptions have been violated. The Wilcoxon test uses both direction and magnitude information and is more powerful statistical tool. However, the Wilcoxon test assumes that the difference between pairs of scores is ordinally scaled, and this assumption is difficult to test. (Using SPSS for Ordinally Scaled Data: Mann-Whitney U, Sign Test, and Wilcoxon Tests 2012)

The null hypothesis for the Wilcoxon test is there are no differences between the two variables. If the calculated probability is low (P<0.05) the null-hypothesis is rejected. The test statistic provides the direction of the difference with the magnitude. Hence

could identify the variable with higher scores. To check which principal variable had the largest value in the exit level undergraduates, this test was performed.

Next test used to test for two or more independent sample is Mann-Whitney test. The Mann Whitney U test is a non-parametric test that is useful for determining if the mean of two groups are different from each other (Pallant 2010). By considering each variable as a different sample it could be used Mann-Whitney test. It requires that four conditions be met:

1. The dependent variable must be at least ordinally scaled.
2. The independent variable has only two levels.
3. A between-subjects design is used.
4. The subjects are not matched across conditions.

(Using SPSS for Ordinally Scaled Data: Mann-Whitney U, Sign Test, and Wilcoxon Tests 2012)

One objective of the study was to find whether the undergraduates developed employability skills. To find that it was required to compare the two independent groups of undergraduates' perceptions on skills possession. To test this, the Mann Whitney U test was carried out.

The Kruskal-Wallis Test is the nonparametric test equivalent to the one-way ANOVA and an extension of the Mann-Whitney Test to allow the comparison of more than two independent groups. It is used when compare three or more sets of scores that come from different groups. Underlying assumptions are dependent variable should be ordinal, interval or ratio and one independent variable that consist of three or more independent groups (Wikipedia, s.v. "Kruskal-Wallis one-way Analysis of Variance"). Null hypothesis for the Kruskal Wallis test is the median of the k populations considered are equal. The test statistic calculated the Chi square value and need to determine whether the groups' responses are significantly different or not. If the calculated probability is a small value (less than the specified α value) for any of the variable, then the null hypothesis will be rejected and concludes that for the stated variable, median is significantly different among the groups. If the test

shows that the differences are significant further Kruskal wallis test can be carried out with identified variables.

Perception changes with the age, with the position and with the year of experience of the employers were also tested and the Kruskal Wallis test was used for all three occasions. Since there were four groups in each grouping variable and there were 16 independent variables, particular test could be carried out.

CHAPTER 4

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1   Introduction

The methodology described in the previous chapter provided the baseline for data gathering. In this chapter, the presentation of data is systematically linked to the format of the survey questionnaire. This chapter will focus on the analysis and interpretation of data that was collected through the survey. Data analysis entails that the analyst break down data into constituent parts to obtain answers to research questions and to test hypothesis. (De Vos 1998). The analysis of survey data does not provide the answer to the research problem. The purpose of interpreting the data is to reduce it to an intelligible and interpretable form so that the relations of research problem can be studied and tested, and conclusions drawn. On the other hand, when the researchers interpret the research results, he/she studies them for their meaning and implications (De Vos 1998).

The chapter consists three parts. In the first part it presents the data gathered from the questionnaires. At the part two it includes the analysis of the gathered data through various statistical tools including data validation. Latter part of the chapter discusses the findings of the study.

A total of 670 questionnaires were distributed among the universities as shown in the table 3.2 and total of 110 questionnaires were distributed among the selected business organization. Out of these 670 questionnaires, only 520 were completed and returned back while the 62 responses received out of 110 questionnaires from the industry people. All the respondents' confidentiality was maintained and results of the study were reported with aggregate data. No respondent identifiers were gathered at any time.

4.2   Reliability Testing (Undergraduates)

The Reliability Analysis procedure calculates a number of commonly used measures of scale reliability and also provides information about the relationships between

individual items in the scale. For the testing reliability of the data this test has been done and following out put could be extracted in relation to the data previously analyzed.

Following is the calculated alpha value for the data gathered from the undergraduates and standardized alpha value of such data.

Table 4.1: Cronbach's Alpha for Undergraduates' Data

Reliability Coefficients 55 items	
Cronbach's Alpha	.944
Cronbach's Alpha Based on Standardized Items	.944

The cronbach's Alpha value is .944, suggesting very good internal consistency reliability for the scale with this sample.

The alpha value is higher than the acceptable level of Cronbach's alpha, 0.7. So it can be concluded that the data in the sample are reliable and there were no any biased responses in the selected samples.

4.3 Undergraduates General Profile
4.3.1 Response Rate (Undergraduates)

Within the allowed time period only 520 filled questionnaires were received and used for the analysis part of the research. Table 4.2 shows the number of participants for the survey from the final year undergraduates and first year undergraduates.

Table 4.2: Summary of the undergraduates participants to the survey, based on their academic level

	Size of the Sample	Survey Participants	Percentage of the participants from the Sample
Exit Level	330	281	85.15
Entry Level	340	239	70.29

According to the table 4.2, it was clear that the out of 520 responses, 281 were from the Exit level undergraduates, while the 239 responses from the Entry level students. There were a higher number of Exit level undergraduates participated for the survey and it is about 85% of selected sample (figure 4.1). According to the figure 4.2, only about 70% has responded to the questionnaire from the entry level undergraduates.

Exit Level
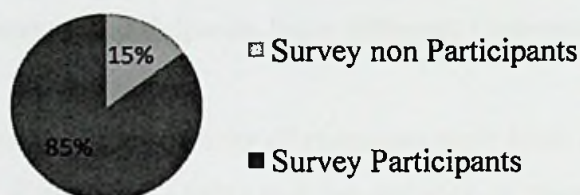
Figure 4.1: Survey Responses from Exit level Undergraduates

Entry Level
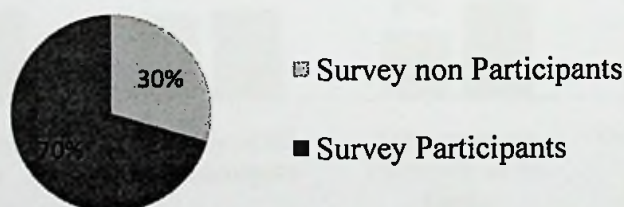
Figure 4.2: Survey Responses from Entry level Undergraduates

Table 4.3 shows the number of participants for the survey from the different universities. According to that the highest number of responses was received from the University of Sri Jayewardenepura (205) out of 240, following Rajarata University of Sri Lanka (109) out of 161. The least responses (99) out of 130, received from the Sabaragamuwa University of Sri Lanka. This is further illustrated by the figure 4.3.

Table 4.3: Summary of the Undergraduates' Participants in Different Universities

University	Number of Responses	Percentage of response from Total Response
University of Sri Jayewardenepura	205	39.4
Rajarata University of Sri Lanka	109	21.0
Wayamba University of Sri Lanka	107	20.6
Sabaragamuwa University of Sri Lanka	99	19.0
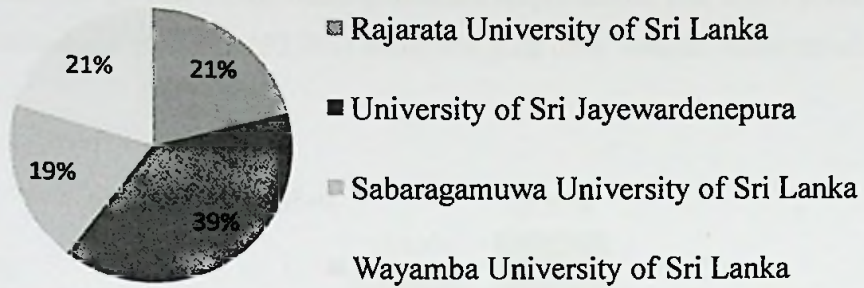
Figure 4.3: Survey Participants from different Universities

According to the figure 4.4, the majority of responses were from the University of Sri Jayewardenepura for Entry level (49%) and the majority of responses were from the Wayamba University for Exit level (60%).
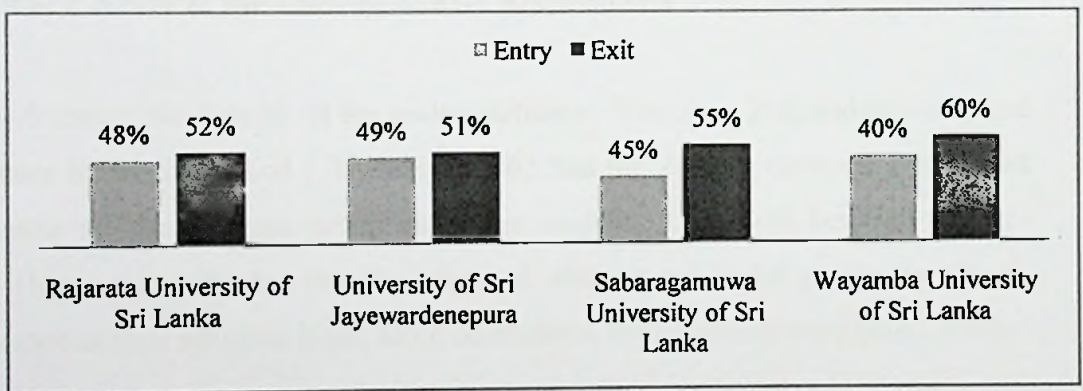
Figure 4.4: Response Rate in different Universities with the level of Study

4.3.2   Demographic and Academic Profile (Undergraduates)
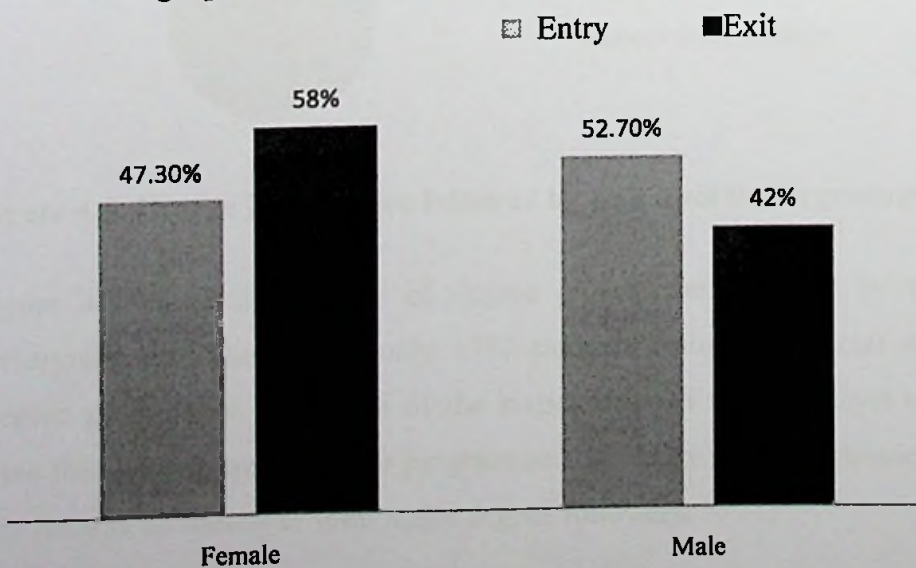
Figure 4.5: Gender of the Undergraduate Respondents

Figure 4.5 presents the gender of the undergraduates respondents. The Entry level group consist more male students (52.7%) while the Exit level consist more female students (58.0%).
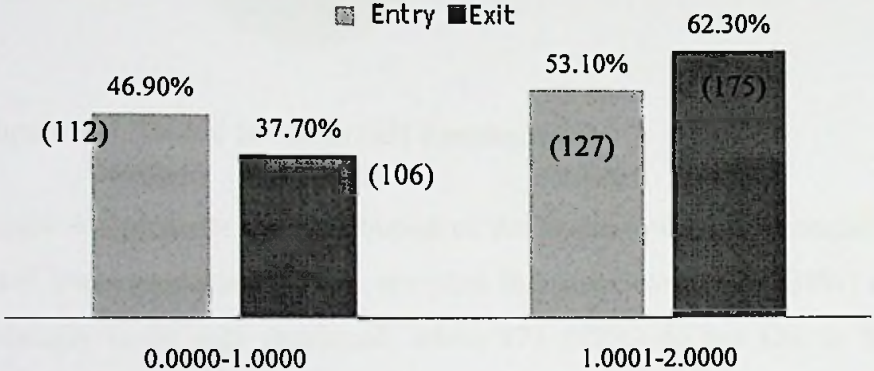
Figure 4.6: Z-Score of the Undergraduate Respondents

Figure 4.6 shows the Z-score of the undergraduates. There are 218 students who had the Z-score between 0.0 and 1.0 while the 302 had the Z-score between 1.0001 and 2.0. Almost all the students group had more students in Z-score between 1.0001-2.0000. Hence this indicated that the admitted students are in the average academic performance at their advance level, since no students have Z-score more than 2.0000.
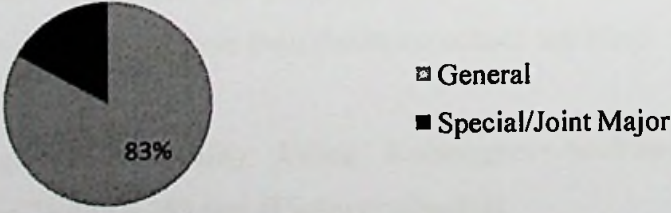
Figure 4.7: Degree Programme followed by Exit level Undergraduates

Figure 4.7 presents the type of degree programme followed by the Exit level undergraduates. There were only 17% students following special or Joint Major Degree programme. The most of the respondents of the Exit level undergraduates were following general degree programme. Generally in the population also consist less number of special or joint major degree followers.
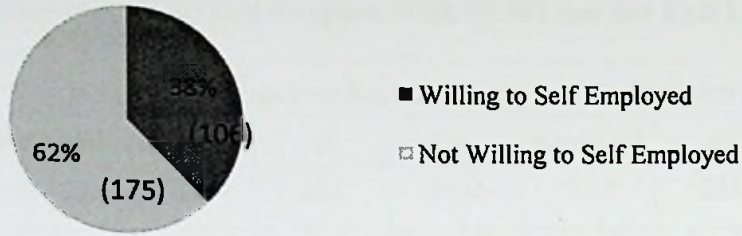
Figure 4.8: Desire towards Self Employment

Figure 4.8 presents the distribution of the desire towards self employment of the Exit level undergraduates. It was revealed that there were 106 (38%) respondents, who willingly to be self employed, while 175 (62%) do not like to be self employed. Figure 4.9 shows the job preference of the respondents.
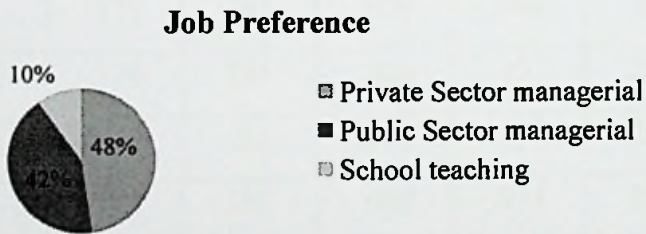
Figure 4.9: Job Preference

Considering the job preferences of the Exit year undergraduates, only 134 were fond of private sector managerial job position, 119 were preferred to join public sector managerial job and only 28 gave their desire on school teaching.

4.4 Testing for Normality Using Kolmogorov-Smirnov test (K-S) and Shapiro-Wilk (S-W) test (Undergraduates)

Before using any statistical tool it is required to analyze, whether the data following normal distribution or not. There are two main methods of assessing normality - graphically and numerically. Hence normality test has to be conducted for each variable in the model using K-S test and S-W tests. If the Significant value of the Shapiro-Wilk Test is greater the 0.05 then the data is normal. If it is below 0.05 then the data significantly deviate from a normal distribution (Laerd Statistics 2012).

H_0: The data follow a normal distribution

H_1: The data do not follow a normal distribution

Table 4.4: Tests of Normality of Employability skills using Kolmogorov-Smirnov test (K-S) and Shapiro-Wilk (S-W) test for Exit Level

Employability Skill	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Self Awareness	.225	281	.000	.914	281	.000
Adaptability	.215	281	.000	.911	281	.000
Initiative	.224	281	.000	.901	281	.000
Willingness to Learn	.177	281	.000	.928	281	.000
Self Management	.197	281	.000	.899	281	.000
Critical Analysis	.196	281	.000	.940	281	.000
Creativity	.179	281	.000	.924	281	.000
Language Skills	.139	281	.000	.966	281	.000
Numeracy	.126	281	.000	.957	281	.000
Communication	.117	281	.000	.978	281	.000
Team Work	.117	281	.000	.971	281	.000
Technology	.097	281	.000	.975	281	.000
Planning and Organizing	.136	281	.000	.967	281	.000
Applying Subject Knowledge	.147	281	.000	.947	281	.000
Problem Solving	.122	281	.000	.968	281	.000
Negotiating	.145	281	.000	.958	281	.000

The table 4.4 and Table 4.5 presented the results of the Kolmogorov-Smirnov Test and the Shapiro-Wilk Test. From the above table it can be concluded that for the Exit level and Entry level group the data in the dependent variables, i.e. employability skills was significantly deviate from a normal distribution since the Significant value of both tests was less than 0.05. Hence the data was not normally distributed.

Table 4.5: Tests of Normality of Employability skills using Kolmogorov-Smirnov test (K-S) and Shapiro-Wilk (S-W) test for Entry Level

Employability Skill	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Self Awareness	.104	239	.000	.976	239	.000
Adaptability	.105	239	.000	.972	239	.000
Initiative	.115	239	.000	.971	239	.000
Willingness to Learn	.114	239	.000	.972	239	.000
Self Management	.111	239	.000	.973	239	.000
Critical Analysis	.127	239	.000	.970	239	.000
Creativity	.122	239	.000	.969	239	.000
Language Skills	.108	239	.000	.971	239	.000
Numeracy	.133	239	.000	.964	239	.000
Communication	.075	239	.003	.987	239	.031
Team Work	.091	239	.000	.977	239	.001
Technology	.096	239	.000	.971	239	.000
Planning and Organizing	.128	239	.000	.968	239	.000
Applying Subject Knowledge	.132	239	.000	.950	239	.000
Problem Solving	.097	239	.000	.978	239	.001
Negotiating	.114	239	.000	.967	239	.000

If the distributions are not normal, there are two methods to be appropriate in analyzing data. Those are, use non-parametric statistics instead of parametric statistics, or transform the variable to make it normal. The researcher undertook the non parametric tests for further analysis.

4.5 Analyzing the Development of Employability Skills of the Graduates

The development of employability skills analysis was based on the responses provided by the undergraduates to the questionnaire. To analyze the each

employability skills, calculated the mean value of responses for indicated questions relating to the particular employability skill. The table 4.6 summarizes the mean rank of each employability skills when executed the Friedman test in non parametric test. In here scores were given to each employability skill was independent from other participants, size of the sample was large (exit level 281 and entry level 239). Hence it satisfied the requirements of performing Friedman test.

Table 4.6: Mean Ranks of the employability skills (Undergraduates)

Employability Skill	Mean Rank	
	Exit Level	Entry Level
Self Awareness	11.69	8.24
Adaptability	10.97	8.22
Initiative	12.62	7.59
Willingness to Learn	8.91	7.74
Self Management	10.93	8.14
Critical Analysis	8.33	7.98
Creativity	8.83	8.31
Language Skills	7.67	7.85
Numeracy	6.68	8.22
Communication	6.58	11.69
Team Work	6.92	11.26
Technology	6.46	7.99
Planning and Organizing	6.32	8.48
Applying Subject Knowledge	6.90	7.97
Problem Solving	7.58	8.00
Negotiating	8.62	8.31

Table 4.6 shows the mean rank of employability skills of both levels, which was an out put of Friedman test. The Friedman test for exit level undergraduates evaluated differences in medians among the 16 employability skills and the initiative skill was reported the highest mean rank of 12.62 while the lowest mean rank of 6.32 was reported in Planning and Organizing skill. Communication skill and the initiative skill reported highest and lowest mean ranks for the entry level undergraduates.

By looking at the mean rank only one cannot conclude whether there was any difference in medians. The chi-square value and the Kendall's coefficient of concordance were considered to determine whether there was a significant difference in development of employability skills of group of students. Table 4.7 represents the Chi-square value and the Kendall's coefficient of concordance (Kendall's W) for both levels. The Chi square value was calculated as a results of Friedman test to determine the acceptance of null hypothesis The Kendall's W is measured the strength-of-relationship index and is a normalization of the statistic of the Friedman test.

Table 4.7: Chi-Square and Kendall's W test Statistics for employability skills

	Exit	Entry
N	281	239
Kendall's W	.188	.063
Chi-Square	792.114	227.326
Df	15	15
Asymp. Sig.	.000	.000

The Friedman test for exit level undergraduates evaluated differences in medians among the 16 employability skills, was significant $\chi^2(15, N = 281) = 792.114$, p < .01(the critical value of the chi-square table is χ^2 (15, α =0.01) =30.57). Kendall's W is .188, indicating fairly strong differences among the 16 employability skills. At the same time entry level undergraduates reported $\chi^2(15, N = 239) = 227.326$, p < .01. That said the difference among 16 employability skills of them also was significant.

To check which employability skill had been developed in the given student group, it is required to conduct Wilcoxon test to compare the pairs. Since there are 120 pairs to compare for a single group of student, this has not been conducted.

However if there was a significant difference of employability skills between two levels of students, it indicates that there was a development of employability skills. The Mann-Whitney U-test can be used in these situations.

To check the differences, the following hypothesis was formulated.

H_0: There is no difference in employability skills development between entry level students and exit level students.

H_A: There is a difference in employability skills development between entry level students and exit level students.

To check this hypothesis, it was required to test each employability skills separately.

4.5.1 Development of Self Awareness

There were four questions in the questionnaire relating to assessing the self awareness skill and the questions measures the three indicators namely; realistic self-assessment, self-confidence, and self-deprecating sense of humor. To test whether the self awareness skill have been developed in exit level undergraduates compare to the entry level undergraduates, following hypothesis have been formulated.

H_0: self awareness skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

H_A: self awareness skill developed in entry level undergraduates compares to the exit level undergraduates.

Using SPSS executed the 2-independent samples test in non parametric test, considering the above ratings on an ordinal scale. Define the grouping variable as the level and dependent variable as the self awareness. Table 4.8 gives the descriptive statistics for the self awareness.

Table 4.8: Descriptive Statistics for Self Awareness

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.5042	.55570	1.00	3.75
Exit	281	4.1717	.31284	3.00	5.00
Total	520	3.405	.9414	1.00	5.00

There were 520 people (N) who responded to the self awareness question. They gave a mean response of 3.405 (between Neutral and Agree) with a standard deviation of .9414 (although standard deviation is not a valid statistic for an ordinally scaled variable). Then the table 4.9 shows the number (N) of people in each group (239 people in entry level and 281 people in exit level) and the mean rank and sum of ranks for each group. Self awareness in entry level had an average rank of 121.21, while Self awareness in exit level had average rank of 378.97.

Table 4.9: Ranks for Self Awareness

	Level	N	Mean Rank	Sum of Ranks
Self Awareness	Entry	239	121.21	28969.00
	Exit	281	378.97	106491.00

The next section of the output gave the values of the Mann-Whitney U test is shown in table 4.10.

Table 4.10: Test Statistics for Self Awareness

	SelfAwareness
Mann-Whitney U	289.000
Wilcoxon W	28969.000
Z	-19.635
Asymp. Sig. (2-tailed)	.000

The observed Mann-Whitney U value was 289.0. The p value was given on the row labeled Asymp. Sig (2-Tailed), is 0.00. To decide whether to reject H_0, used this p value. It was a two-tailed p value, although hypothesis was a one-tailed test. Therefore need to divide the two-tailed p value by 2 to get the one-tailed p value: 0.000 / 2 = .000. The results of the test were in the expected direction and significant, z = -19.635, p < .05.

Since the asymptotic significance p value was less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that self awareness skill developed in exit level undergraduates compared to the entry level undergraduates.

4.5.2 Development of Adaptability

To test whether the adaptability skill have been developed in exit level undergraduates compare to the entry level undergraduates, following hypothesis have been formulated.

H_0: adaptability skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

H_A: adaptability skill developed in entry level undergraduates compares to the exit level undergraduates.

Using SPSS executed the 2-independent samples test in non parametric test, considering the above ratings on an ordinal scale. Define the grouping variable as the level and dependent variable as the adaptability. Table 4.11 gave the descriptive statistics for the adaptability.

Table 4.11: Descriptive Statistics for Adaptability

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.4923	.66161	1.00	4.00
Exit	281	4.0830	.46143	2.33	5.00
Total	520	3.3519	.97225	1.00	5.00

There were 520 people (N) who responded to the adaptability question. They gave a mean response of 3.35195 (between Neutral and Agree) with a standard deviation of .97225 (although standard deviation is not a valid statistic for an ordinally scaled variable).

Table 4.12: Ranks for Adaptability

	Level	N	Mean Rank	Sum of Ranks
Adaptability	Entry	239	128.55	30723.00
	Exit	281	372.73	104737.00

The table 4.12 shows the number (N) of people in each group (239 people in entry level and 281 people in exit level) and the mean rank and sum of ranks for each group. Adaptability in entry level had an average rank of 128.55, while in exit level had average rank of 372.73.

The next section of the output gave the values of the Mann-Whitney U test is shown in table 4.13.

Table 4.13: Test Statistics for Adaptability

	Adaptability
Mann-Whitney U	2043.000
Wilcoxon W	30723.000
Z	-18.618
Asymp. Sig. (2-tailed)	.000

The observed Mann-Whitney U value was 2043.0.The p value was given on the row labeled Asymp. Sig (2-Tailed), is 0.00. To decide whether to reject H_0, used this p value. The results of the test were in the expected direction and significant, z = -18.618, p < .05.

Since the asymptotic significance p value was less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that adaptability skill developed in exit level undergraduates compared to the entry level undergraduates.

4.5.3 Development of Initiative Skill

Question 7, 8 and 9 were based on the initiative skill. To check the development of initiative skill, formulated the following hypothesis

H_0: Initiative skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.
H_A: Initiative skill developed in entry level undergraduates compares to the exit level undergraduates.

Execute the same test by defining the grouping variable as the level and dependent variable as the initiative. Table 4.14 gives the descriptive statistics for the initiative.

Table 4.14: Descriptive Statistics for Initiative Skill

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.4421	.65056	1.00	4.00
Exit	281	4.2800	.34261	3.33	5.00
Total	520	3.4353	1.04782	1.00	5.00

There were 520 people (N) who responded to the initiative questions. They gave a mean response of 3.4353 (between Neutral and Agree) with a standard deviation of 1.04782.

Table 4.15: Ranks for Initiative

	Level	N	Mean Rank	Sum of Ranks
Initiative	Entry	239	121.81	29112.00
	Exit	281	378.46	106348.00

The table 4.15 shows the number (N) of people in each group (239 people in entry level and 281 people in exit level) and the mean rank and sum of ranks for each group. Initiative in entry level had mean rank of 121.81, while in exit level had mean rank of 378.46.

The next section of the output gave the values of the Mann-Whitney U test is shown in table 4.16.

Table 4.16: Test Statistics for Initiative

	Initiative
Mann-Whitney U	432.000
Wilcoxon W	29112.000
Z	-19.578
Asymp. Sig. (2-tailed)	.000

The observed Mann-Whitney U value was 432.0. The p value was given on the row labeled Asymp. Sig (2-Tailed), is 0.00. The results of the test were $z = -9.578$, $p < .05$. Since the asymptotic significance p value was less than the specified α level (.05),

failed to reject H_0. Thus, it can conclude that initiative skill developed in exit level undergraduates compared to the entry level undergraduates.

4.5.4 Development of Willingness to Learn

Question 6, 10 and 11 were based on the willingness to learn skill. To check the development of this skill, formulated the following hypothesis

H_0: willingness to learn skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

H_A: willingness to learn skill developed in entry level undergraduates compares to the exit level undergraduates.

Execute the same test by defining the grouping variable as the level and dependent variable as the willingness to learn. Table 4.17 gives the descriptive statistics for the willingness to learn.

Table 4.17: Descriptive Statistics for Willingness to Learn

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.4449	.67336	1.00	4.00
Exit	281	3.8683	.37752	2.67	4.67
Total	520	3.2141	.88826	1.00	4.67

There were 520 people (N) who responded to the willingness to learn questions. They gave a mean response of 3.2141 (between Neutral and Agree) with a standard deviation of .8882.

Table 4.18: Ranks for Willingness to Learn

	Level	N	Mean Rank	Sum of Ranks
willingness to learn	Entry	239	130.15	31105.00
	Exit	281	371.37	104355.00

The table 4.18 shows the number (N) of people in each group (239 people in entry level and 281 people in exit level) and the mean rank and sum of ranks for each group. Willingness to learn in entry level had mean rank of 130.15, while in exit level had mean rank of 371.37.

The output of the Mann-Whitney U test is shown in table 4.19.

Table 4.19: Test Statistics for Willingness to Learn

	Willingness to Learn
Mann-Whitney U	2425.000
Wilcoxon W	31105.000
Z	-18.399
Asymp. Sig. (2-tailed)	.000

The observed Mann-Whitney U value was 2425.0. The p value was given on the row labeled Asymp. Sig (2-Tailed), is 0.00. The results of the test were $z = -18.399$, $p < .05$. Since the asymptotic significance p value was less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that willingness to learn skill developed in exit level undergraduates compared to the entry level undergraduates.

4.5.5 Development of Self Management

Question 13, 14 and 15 were based on the Self Management skill. To check the development of this skill, formulated the following hypothesis

H_0: Self Management skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.
H_A: Self Management skill developed in entry level undergraduates compares to the exit level undergraduates.

Execute the same test by defining the grouping variable as the level and dependent variable as the Self Management. Table 4.20 gives the descriptive statistics for the Self Management.

Table 4.20: Descriptive Statistics for Self Management

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.4826	.66354	1.00	4.00
Exit	281	4.0819	.44989	1.67	5.00
Total	520	3.3468	.97344	1.00	5.00

Whole sample had responded to the Self Management questions. They gave a mean response of 3.3468 (between Neutral and Agree) with a standard deviation of .9734. A mean value response from entry level was 2.4826 and exit level was 4.0819.

Table 4.21: Ranks for Self Management

	Level	N	Mean Rank	Sum of Ranks
Self Management	Entry	239	127.42	30454.50
	Exit	281	373.69	105005.50

The table 4.21 shows the number (N) of people in each group (239 people in entry level and 281 people in exit level) and the mean rank and sum of ranks for each group. Self Management in entry level had mean rank of 127.42, while in exit level had mean rank of 373.69.

Table 4.22 presents the values of the Mann-Whitney U test.

Table 4.22: Test Statistics for Self Management

	Self Management
Mann-Whitney U	1774.500
Wilcoxon W	30454.500
Z	-18.756
Asymp. Sig. (2-tailed)	.000

The observed Mann-Whitney U value was 1774.50. The p value was given on the row labeled Asymp. Sig (2-Tailed), is 0.00. The results of the test were $z = -18.756$, $p < .05$. Since the asymptotic significance p value was less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that Self Management skill developed in exit level undergraduates compared to the entry level undergraduates.

4.5.6 Development of Critical Analysis

Question 16, 17 and 18 were based on the Critical Analysis skill. To check the development of this skill, formulated the following hypothesis

H_0: Critical Analysis skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

H_A: Critical Analysis skill developed in entry level undergraduates compares to the exit level undergraduates.

Execute the same test by defining the grouping variable as the level and dependent variable as the Critical Analysis. Table 4.23 gives the descriptive statistics for the Critical Analysis.

Table 4.23: Descriptive Statistics for Critical Analysis

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.4798	.69508	1.00	4.00
Exit	281	3.7900	.52611	2.67	5.00
Total	520	3.1878	.89336	1.00	5.00

Sample gave a mean response of 3.1878 (between Neutral and Agree) with a standard deviation of .8933, while the entry level and exit level mean responses were 2.479 and 3.79 respectively.

The table 4.24 shows the number (N) of people in each group (239 people in entry level and 281 people in exit level) and the mean rank and sum of ranks for each group. Critical Analysis in entry level had mean rank of 140.77, while in exit level had mean rank of 362.33.

Table 4.24: Ranks for Critical Analysis

	Level	N	Mean Rank	Sum of Ranks
Critical Analysis	Entry	239	140.77	33644.50
	Exit	281	362.33	101815.50

The observed Mann-Whitney U value is shown in table 4.25 was 4964.5. The results of the test were z = -16.876, p=0.00. Since the asymptotic significance p value was less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that Critical Analysis skill developed in exit level undergraduates compared to the entry level undergraduates.

Table 4.25: Test Statistics for Critical Analysis

	Critical Analysis
Mann-Whitney U	4964.500
Wilcoxon W	33644.500
Z	-16.876
Asymp. Sig. (2-tailed)	.000

4.5.7 Development of Creativity

Question 19, 20 and 21 were based on the Creativity skill. To check the development of this skill, formulated the following hypothesis

H_0: Creativity skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

H_A: Creativity skill developed in entry level undergraduates compares to the exit level undergraduates.

Execute the same test by defining the grouping variable as the level and dependent variable as the Creativity. Table 4.26 gives the descriptive statistics for the Creativity.

Table 4.26: Descriptive Statistics for Creativity

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.5230	.60830	1.00	4.00
Exit	281	3.8031	.57388	2.00	5.00
Total	520	3.2147	.86898	1.00	5.00

3.214 was the mean response received from the entire sample with a standard deviation of .8689.

Table 4.27: Ranks for Creativity

	Level	N	Mean Rank	Sum of Ranks
Creativity	Entry	239	140.52	33584.00
	Exit	281	362.55	101876.00

The table 4.28 shows the number (N) of people in each group (239 people in entry level and 281 people in exit level) and the mean rank and sum of ranks for each group. Creativity in entry level had mean rank of 140.52, while in exit level had mean rank of 362.55.

Table 4.28: Test Statistics for Creativity

	Creativity
Mann-Whitney U	4904.000
Wilcoxon W	33584.000
Z	-16.904
Asymp. Sig. (2-tailed)	.000

The observed Mann-Whitney U value was 4904.0. The asymp. Sig (2-Tailed), was 0.00. The results of the test were $z = -16.876$, $p < .05$. Since the asymptotic significance p value is less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that Creativity skill developed in exit level undergraduates compared to the entry level undergraduates.

4.5.8 Development of Language Skills

There are four questions to measure the language skill. To check the development of this skill, formulated the following hypothesis

H_0: language skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

H_A: language skill developed in entry level undergraduates compares to the exit level undergraduates.

Execute the same test by defining the grouping variable as the level and dependent variable as the language skill. Table 4.29 gives the descriptive statistics for the language skill.

Table 4.29: Descriptive Statistics for Language Skill

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.4676	.58987	1.00	3.75
Exit	281	3.6963	.47446	2.25	4.75
Total	520	3.2147	.86898	1.00	5.00

The language skill gave a mean response of 3.2147 (between Neutral and Agree) with a standard deviation of .8689. Mean value of entry level was 2.4676 and exit level was 3.6963.

Table 4.30: Ranks for Language Skill

	Level	N	Mean Rank	Sum of Ranks
language skill	Entry	239	136.32	32580.50
	Exit	281	366.12	102879.50

The table 4.30 shows the number of responses in each group and the mean rank and sum of ranks for each group. Language skill in entry level had mean rank of 136.32, while in exit level had mean rank of 366.12.

The next section of the output gives the values of the Mann-Whitney U test is shown in table 4.31.

Table 4.31: Test Statistics for Language Skill

	Language Skill
Mann-Whitney U	3900.500
Wilcoxon W	32580.500
Z	-17.454
Asymp. Sig. (2-tailed)	.000

The Mann-Whitney U value was 3900.5 with the p value 0.00. The results of the test were $z = -17.454$. Since the asymptotic significance p value is less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that language skill developed in exit level undergraduates compares to the entry level undergraduates.

4.5.9 Development of Numeracy

Q26, Q27, and Q29 are included in the questionnaire to measure the Numeracy skill. To check the development of this skill, formulated the following hypothesis.

H_0: Numeracy skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

H_A: Numeracy skill developed in entry level undergraduates compares to the exit level undergraduates.

Execute the same test by defining the grouping variable as the level and dependent variable as the Numeracy skill. Table 4.32 gives the descriptive statistics for the Numeracy skill. The Numeracy skill gave a mean response of 3.012 (between Neutral and Agree) with a standard deviation of .8832.

Table 4.32: Descriptive Statistics for Numeracy skill

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.4965	.68317	1.00	4.00
Exit	281	3.4508	.79336	1.67	5.00
Total	520	3.0122	.88329	1.00	5.00

The table 4.33 presents the mean rank and sum of ranks for each group. Numeracy skill in entry level had mean rank of 172.73, while in exit level had mean rank of 335.15.

Table 4.33: Ranks for Numeracy Skill

	Level	N	Mean Rank	Sum of Ranks
Numeracy skill	Entry	239	172.73	41283.00
	Exit	281	335.15	94177.00

Although the two mean rank values were different, it is required to consider the test statistics to conclude whether there was any difference in the skill possession of two groups. To check that, the Mann-Whitney U test value was considered and shown in table 4.34.

Table 4.34: Test Statistics for Numeracy Skill

	Numeracy Skill
Mann-Whitney U	12603.000
Wilcoxon W	41283.000
Z	-12.358
Asymp. Sig. (2-tailed)	.000

The observed Mann-Whitney U value was 12603.0. Z value were z = -12.358, with p=0.00< .05. Since the asymptotic significance p value is less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that Numeracy skill developed in exit level undergraduates compared to the entry level undergraduates.

4.5.10   Development of Communication

Using six questions it was assessed the communication skill. To check the development of this skill, formulated the following hypothesis

H_0: communication skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

H_A: communication skill developed in entry level undergraduates compares to the exit level undergraduates.

Execute the 2 independent samples test by defining the grouping variable as the level and dependent variable as the communication skill. Table 4.35 gives the descriptive statistics for the communication skill.

Table 4.35: Descriptive Statistics for Communication Skill

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	3.0195	.55977	1.67	4.50
Exit	281	3.6085	.39664	2.50	4.50
Total	520	3.3378	.56116	1.67	4.50

The communication skill gave a mean response of 3.3378 (between Neutral and Agree) with a standard deviation of 0.5611 without considering two groups. However the entry level has 3.0195 (between Disagree to Neutral) mean responses while the exit level has 3.6085 (between Neutral and Agree) mean response.

Table 4.36: Ranks for Communication Skill

	Level	N	Mean Rank	Sum of Ranks
Communication skill	Entry	239	175.22	41878.00
	Exit	281	333.03	93582.00

The table 4.36 shows the number (N) of people in each group (239 people in entry level and 281 people in exit level) and the mean rank and sum of ranks for each group. Communication skill in entry level had mean rank of 175.22, while in exit level had mean rank of 333.03.

The next section of the output gives the values of the Mann-Whitney U test is shown in table 4.37.

Table 4.37: Test Statistics for Communication Skill

	Communication Skill
Mann-Whitney U	13198.000
Wilcoxon W	41878.000
Z	-11.990
Asymp. Sig. (2-tailed)	.000

The observed Mann-Whitney U value was 13198.0. The results of the test were z=-11.99, with p=0.00 (< .05). Since the asymptotic significance p value was less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that

communication skill developed in exit level undergraduates compared to the entry level undergraduates.

4.5.11   Development of Team Work

There were four questions to assess the team working skill in the questionnaire. By assessing the responses given to these questions it is required to identify whether the team working skill had been developed. To check this, formulated the following hypothesis

H_0: Team Work skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

H_A: Team Work skill developed in entry level undergraduates compares to the exit level undergraduates.

Execute the 2-independent samples test in non parametric test considering 2 samples are entry level and exit level. Table 4.38 gives the descriptive statistics for the Team Work skill.

Table 4.38: Descriptive Statistics for Team Work Skill

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	3.0021	.71044	1.50	5.00
Exit	281	3.6201	.48462	2.5	4.75
Total	520	3.3361	.67320	1.50	5.00

The Team Work skill gave a mean response of 3.3361 with a standard deviation of .6732 while the two group separated mean responses were 3.0021 and 3.6201 for entry level and exit level respectively. With these mean values, it did not show a significant difference in both levels. But for ordinal scale data, mean alone cannot make any decision. Hence mean rank has to be considered.

The table 4.39 presents the mean rank and sum of mean ranks. For entry level and exit level mean ranks of the scores are 189.29 and 321.06 respectively.

Table 4.39: Ranks for Team Work skill

	Level	N	Mean Rank	Sum of Ranks
Team Work Skill	Entry	239	189.29	45241.50
	Exit	281	321.06	90218.50

The next section of the output gives the values of the Mann-Whitney U test is shown in table 4.40. The Mann-Whitney U value was 16561.5. The test statistic $z = -10.034$, $p < .05$. Since the asymptotic significance p value is less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that team work skill developed in exit level undergraduates compares to the entry level undergraduates

Table 4.40: Test Statistics for Team Work Skill

	Team Work Skill
Mann-Whitney U	16561.500
Wilcoxon W	45241.500
Z	-10.034
Asymp. Sig. (2-tailed)	16561.500

4.5.12   Development of Technology Skill

To check the development of this skill, formulated the following hypothesis.

H_0: Technology skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

H_A: Technology skill developed in entry level undergraduates compares to the exit level undergraduates.

Execute the same test by defining the grouping variable as the level and dependent variable as the Technology skill. Table 4.41 gives the descriptive statistics for the Technology skill.

Table 4.41: Descriptive Statistics for Technology Skill

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.4948	.62613	1.25	4.00
Exit	281	3.5578	.50840	2.25	4.75
Total	520	3.0692	.77489	1.25	4.75

The Numeracy skill gave a mean response of 3.0692 with a standard deviation of .7748.

Table 4.42: Ranks for Technology Skill

	Level	N	Mean Rank	Sum of Ranks
Technology Skill	Entry	239	148.57	35507.50
	Exit	281	355.70	99952.50

The table 4.42 shows the number (N) of people in each group (239 people in entry level and 281 people in exit level) and the mean rank and sum of ranks for each group. Technology skill in entry level had mean rank of 148.57, while in exit level had mean rank of 355.7. Even though it seems that there were differences in mean ranks, it is required to perform a significant test to check the null hypothesis. To satisfy that, the Mann-Whitney U test was carried out and the output presented in table 4.43.

Table 4.43: Test Statistics for Technology Skill

	Technology Skill
Mann-Whitney U	6827.500
Wilcoxon W	35507.500
Z	-15.739
Asymp. Sig. (2-tailed)	.000

The observed Mann-Whitney U value is 6827.5. The p value is given on the row labeled Asymp. Sig (2-Tailed), is 0.00. The results of the test were z = -15.739, $p < .05$. Since the asymptotic significance p value is less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that Technology skill developed in exit level undergraduates compared to the entry level undergraduates.

4.5.13 Development of Planning and Organizing

To check whether the planning and organizing skill development in exit levels compared to entry level, following hypothesis was formulated.

H_0: Planning and Organizing skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

H_A: Planning and Organizing skill developed in entry level undergraduates compares to the exit level undergraduates.

Execute the same test by defining the grouping variable as the level and dependent variable as the Planning and Organizing skill. Table 4.44 gives the descriptive statistics for the Planning and Organizing skill.

Table 4.44: Descriptive Statistics for Planning and Organizing skill

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.5342	.66006	1.00	4.00
Exit	281	3.5006	.60757	1.67	5.00
Total	520	3.0564	.79459	1.00	5.00

The Planning and Organizing skill gave a mean response of 3.0564 with a standard deviation of .7945 for whole sample. The mean responses of two groups are 2.5342 and 3.5006 for entry level and exit levels respectively.

Table 4.45: Ranks for Planning and Organizing skill

	Level	N	Mean Rank	Sum of Ranks
Planning and Organizing skill	Entry	239	161.33	38559.00
	Exit	281	344.84	96901.00

The table 4.45 shows the mean rank and sum of ranks for each group. Planning and Organizing skill in entry level had mean rank of 161.33, while in exit level had mean rank of 344.84. To check the significance, perform the Mann-Whitney U test and the results were shown in table 4.46.

Table 4.46: Test Statistics for Planning and Organizing skill

	Planning and Organizing skill
Mann-Whitney U	9879.000
Wilcoxon W	38559.000
Z	-13.992
Asymp. Sig. (2-tailed)	.000

The Mann-Whitney U value was 9879.0 and test statistic z = -17.454, p =0.00. Since the asymptotic significance p value is less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that Planning and organizing skill developed in exit level undergraduates compared to the entry level undergraduates.

4.5.14 Development of Applying Subject Knowledge

How to apply theoretical knowledge into a practical situation is assessed by this question. The development of this skill was assessed, and formulated the following hypothesis.

H_0: Applying Subject Knowledge skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

H_A: Applying Subject Knowledge developed in entry level undergraduates compares to the exit level undergraduates.

Execute the 2 independent samples test in non parametric test by defining the grouping variable as the level and dependent variable as the Applying Subject Knowledge skill. Table 4.47 gives the descriptive statistics for the Applying Subject Knowledge skill.

Table 4.47: Descriptive Statistics for Applying Subject Knowledge Skill

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.4665	.81150	1.00	4.00
Exit	281	3.5409	.73504	2.00	5.00
Total	520	3.0471	.93847	1.00	5.00

The Applying Subject Knowledge skill gave a mean response of 3.0471 with a standard deviation of .93847. The entry level and exit level groups mean values are 2.4665 and 3.5409 respectively.

Table 4.48: Ranks for Applying Subject Knowledge Skill

	Level	N	Mean Rank	Sum of Ranks
Applying Subject Knowledge	Entry	239	169.02	40395.00
	Exit	281	338.31	95065.00

The table 4.48 shows the number (N) of people in each group, the mean rank and sum of ranks for each group. Applying Subject Knowledge skill in entry level had mean rank of 169.02, while in exit level had mean rank of 338.31. To test whether there is any differences of the development of this skill between two groups, Mann-Whitney U test executed and table 4.49 shows the output.

Table 4.49: Test Statistics for Applying Subject Knowledge

	Applying Subject Knowledge
Mann-Whitney U	11715.000
Wilcoxon W	40395.000
Z	-12.959
Asymp. Sig. (2-tailed)	.000

The Mann-Whitney U value is 11715.0 and z = -12.959, with asymptotic significance p value =0.00 (p < .05). Since the asymptotic significance p value is less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that Applying Subject Knowledge skill developed in exit level undergraduates compared to the entry level undergraduates.

4.5.15   Development of Problem Solving Skill

To check the development of problem solving skill among the graduates, following hypothesis has formulated.

H₀: problem solving skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

Hₐ: problem solving skill developed in entry level undergraduates compares to the exit level undergraduates. i.e. Hₐ: $\mu_{exit} < \mu_{Entry}$

Execute the same test by defining the grouping variable as the level and dependent variable as the problem solving skill. Table 4.50 gives the descriptive statistics for the problem solving skill.

Table 4.50: Descriptive Statistics for Problem Solving Skill

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.4927	.58040	1.00	3.75
Exit	281	3.6886	.53620	2.00	4.75
Total	520	3.1389	.81579	1.00	4.75

The Numeracy skill gave a mean response of 3.1389 (between Neutral and Agree) with a standard deviation of .81579.

Table 4.51: Ranks for Problem Solving Skill

	Level	N	Mean Rank	Sum of Ranks
Problem Solving	Entry	239	140.08	33479.50
	Exit	281	362.92	101980.50

The table 4.51 shows the number (N) of people in each group, the mean rank and sum of ranks for each group. Numeracy skill in entry level had mean rank of 140.08 while in exit level had mean rank of 362.92. The values of the Mann-Whitney U test which is performed to test the hypothesis is shown in table 4.52.

Table 4.52: Test Statistics for Problem Solving Skill

	Problem Solving Skill
Mann-Whitney U	4799.500
Wilcoxon W	33479.500
Z	-16.921
Asymp. Sig. (2-tailed)	.000

The observed Mann-Whitney U value is 4799.5. The p value is given on the row labeled Asymp. Sig (2-Tailed), is 0.00. The results of the test were z = -16.921, p < .05. Since the asymptotic significance p value is less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that Problem Solving Skill developed in exit level undergraduates compares to the entry level undergraduates.

4.5.16 Development of Negotiating

The last three questions are included to the questionnaire to measure the Negotiating skill. To check the development of this skill, formulated the following hypothesis

H_0: Negotiating skill developed in exit level undergraduates compares to the entry level undergraduates. Vs.

H_A: Negotiating skill developed in entry level undergraduates compares to the exit level undergraduates.

Execute the 2 independent samples test in non parametric test to check the above hypothesis. Table 4.53 gives the descriptive statistics for the Negotiating skill.

Table 4.53: Descriptive Statistics for Negotiating Skill

	N	Mean	Std. Deviation	Minimum	Maximum
Entry	239	2.5286	.66245	1.00	4.00
Exit	281	3.8031	.58280	2.33	5.00
Total	520	3.2173	.88809	1.00	5.00

The Negotiating skill gave a mean response of 3.2173 (between Neutral and Agree) with a standard deviation of .88809. However the entry level report 2.5286 mean response and exit level mean response is 3.8031.

Table 4.54: Ranks for Negotiating Skill

	Level	N	Mean Rank	Sum of Ranks
Negotiating skill	Entry	239	143.34	34259.00
	Exit	281	360.15	101201.00

The table 4.54 shows the number of respondents in each group and the mean rank and sum of ranks for each group. Negotiating skill in entry level had mean rank of 143.34, while in exit level had mean rank of 360.15.

The next section of the output gives the values of the Mann-Whitney U test is shown in table 4.55.

Table 4.55: Test Statistics for Negotiating Skill

	Negotiating skill
Mann-Whitney U	5579.000
Wilcoxon W	34259.000
Z	-16.494
Asymp. Sig. (2-tailed)	.000

The observed Mann-Whitney U value was 5579.0, with the p value 0.00. The results of the test were $z = -16.494$, $p < .05$. Since the asymptotic significance p value is less than the specified α level (.05), failed to reject H_0. Thus, it can conclude that Negotiating skill developed in exit level undergraduates compares to the entry level undergraduates.

Since all 16 skills have been developed in exit level undergraduates, there is no evidence to accept the First null hypothesis, (i.e. there is no difference in employability skills development between entry level students and exit level students) of the study. Hence it can conclude that there is difference in employability skills development between entry level students and exit level students. At the same time, the Mann Whitney U test performed to check the hypotheses on development of employability skills illustrated that the exit level undergraduates possessed the employability skills compared to the entry level undergraduates.

4.6 Analyzing on Principal Variables

The research framework includes three principal variables named personal skills, core skills and process skills which is affecting to the employability skills. Each of these principal variables consist several sub variables. Since there is no way to identify the

weight assigned to each sub variables to describe its principal variable, the researcher assumed that all the sub variables equally contributed to develop its principal variable. Hence the average value of the responses had been considered at the analysis.

To check whether there were any differences of the level of development of employability skills of the exit level undergraduates, following hypothesis was formulated.

H_0: There are no differences of the development of personal skills, core skills and process skills of the exit level undergraduates.

H_A: At least one of the skills development can be differ of the exit level undergraduates.

Execute the k-related samples test in non parametric test, to test the above hypothesis. In here scores were given to each employability skill was independent from other participants and the size of the sample was large (281). Hence it satisfied the requirements of performing Friedman test. Table 4.56 summarizes the output of the Friedman test, and shows the mean rank of each principal variable for the exit level undergraduates.

Table 4.56: Mean Ranks of the Principal Variables (Exit Level Undergraduates)

Principal Variables	Mean Rank
Personal Skills	2.82
Core Skills	1.83
Process Skills	1.35

The Friedman test for exit level undergraduates evaluated differences in medians among the three principal variables. Accordingly personal skills had the highest mean rank (2.82) while the lowest was the process skills (1.35). However by looking at the mean rank only one cannot conclude whether there was any difference in medians. The chi-square value and the Kendall's coefficient of concordance were considered to determine whether there was a significant difference in the possession of three

principal variables of the exit level undergraduates. Table 4.57 represents the chi-square value and the Kendall's coefficient of concordance for the exit level undergraduates.

Specified level of significant is 99% and the degree of freedom is 2 (Since there are three variables). Then the critical value of the chi-square table is 9.21. if the χ^2 greater than the 9.21 reject the null hypothesis.

Table 4.57: Chi-Square and Kendall's W test Statistics for principal Variables (Exit Level Undergraduates)

N	281
Kendall's W[a]	.564
Chi-Square	316.987
df	2
Asymp. Sig.	.000

The Friedman test for exit level undergraduates evaluated differences in medians among the three principal variables, was significant χ^2 (2, N = 281) = 316.987, p < .01. Kendall's W is .564, indicating fairly strong differences among the three principal variables. That said reject the null hypothesis and it can conclude that there are differences of the development of personal skills, core skills and process skills of the exit level undergraduates.

Next, follow-up tests will need to be conducted to evaluate comparisons between pairs of medians. To check which variable had the largest value in this group, it is required to conduct Wilcoxon test to compare the pairs.

To make comparison, following hypothesis was formulated.
H_0: There is no difference of the means of two pairs. Vs.

H_A: There is a difference of the means of two pairs

Table 4.58 shows the number of negative ranks, positive ranks and ties, mean rank and sum of ranks in each pair.

Table 4.58: Wilcoxan Signed Rank Test on Principal Variables (Exit Level Undergraduates)

		N	Mean Rank	Sum of Ranks
Core Skills – Personal Skills	Negative Ranks	240[a]	150.52	36124.50
	Positive Ranks	37[b]	64.28	2378.50
	Ties	4[c]		
	Total	281		
Process Skills – Personal Skills	Negative Ranks	268[d]	144.09	38616.50
	Positive Ranks	11[e]	40.32	443.50
	Ties	2[f]		
	Total	281		
Process Skills – Core Skills	Negative Ranks	195[g]	146.11	28490.50
	Positive Ranks	86[h]	129.42	11130.50
	Ties	0[i]		
	Total	281		

a. Core Skills<Personal Skills
b. Core Skills>Personal Skills
c. Core Skills = Personal Skills
d. Process Skills<Personal Skills
e. Process Skills>Personal Skills
f. Process Skills = Personal Skills
g. Process Skills<Core Skills
h. Process Skills>Core Skills
i. Process Skills = Core Skills

Table 4.59 presents the test statistics of the principal variables.

Table 4.59: Test Statistics Based on Wilcoxan Signed Rank Test on Principal Variables (Exit Level Undergraduates)

	Core Skills – Personal Skills	Process Skills – Personal Skills	Process Skills – Core Skills
Z	-12.644[a]	-14.154[a]	-6.366[a]
Asymp. Sig. (2-tailed)	.000	.000	.000

a. Based on positive ranks

The Least Significant Difference (LSD) procedure controls adequately for Type I error across pair wise comparisons if there are three levels and the overall test is significant. In this study, all three comparisons were significant at the .01 alpha levels.

Hence reject the null hypothesis and can concludes that there is a difference of the means of each two pairs. According to the table 4.59, the median possession of personal skill was significantly greater than the median possession of core skills, p<0, the median possession of personal skill was significantly greater than the median possession of process skills, p<0, and the median possession of core skill was significantly greater than the median possession of process skill, p<0.

Table 4.60: Median values of Principal Variables (Exit Level Undergraduates)

		Personal Skills	Core Skills	Process Skills
N	Valid	281	281	281
	Missing	0	0	0
Median		4.1538	3.7500	3.6154

A Friedman test was conducted to evaluate differences in medians among the three principal variables for personal skills (Median = 4.15), for core skills (Median = 3.75), and for process skills (Median = 3.61). The test was significant χ^2 (2, N = 281) = 316.987, p < .01, and the Kendall's coefficient of concordance of .564 indicated fairly strong differences among the three variables. Follow-up pair wise comparisons were conducted using a Wilcoxon test and controlling for the Type I errors across theses comparisons at the .01 level using the LSD procedure. The median possession of personal skill was significantly greater than the median possession of core skills, p < .01, and the median possession of process skills, p < .01. At the same time the median possession of core skills was significantly greater than the possession of process skills, p < .01.

Therefore there is no evidence to accept the second, third and fourth null hypotheses (i.e. there is no difference of the possession of personal skills and core skills, there is no difference of the possession of personal skills and process skills and there is no difference of the possession of core skills and process skills) of the study. Hence it can conclude that there is difference of the possession of each skills and the possession of personal skills was greater than both the core skills and process skills. Then the possession of core skill is greater than the process skills. Therefore the process skills were the least skills that possessed by the exit level undergraduates.

4.7   Reliability Testing (Employers)

The Reliability Analysis procedure calculates a number of commonly used measures of scale reliability and also provides information about the relationships between individual items in the scale.

Following is the calculated alpha value for the data gathered from the employers and standardized alpha value for those data.

Table 4.61: Cronbach's Alpha for Employers' data

Reliability Coefficients 55 items	
Cronbach's Alpha	.702
Cronbach's Alpha Based on Standardized Items	.716

The cronbach's Alpha value is .702, suggesting acceptable internal consistency reliability for the scale with this sample.

The alpha value is in the acceptable level of Cronbach's alpha, 0.7. So it can be concluded that the data in the sample are reliable and there were no any biased responses in the selected samples.

4.8   General Profile of the Employers

4.8.1   Response Rate

Although there are many business organization employed applied science graduates in their organizations, only 110 questionnaires could be distributed through personal contacts. Within the allowed time period only 62 responses received and used for the analysis. Figure 4.10 shows the response rate of the employers.

Survey Participants
Survey Non Participants

56%
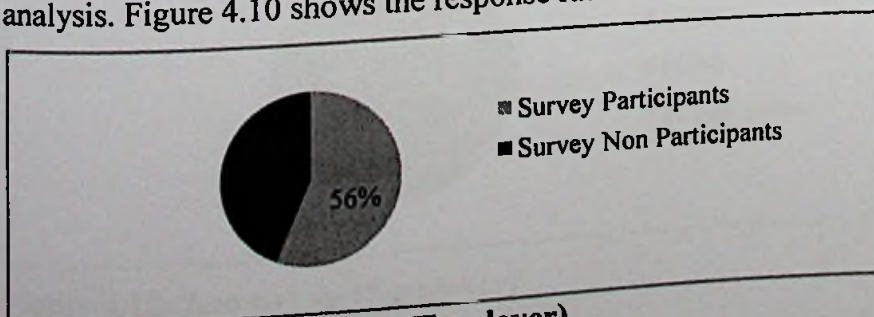
Figure 4.10: Response Rate (Employer)

The response rate of employers was about 56%.

4.8.2   Demographic Profile

Data collected from employers can categorized as demographic profile and professional profile. Under the demographic profile, gender, age group and academic qualification has been considered.

Figure 4.11 illustrates the gender of the survey participants. Most of the respondents were male (37) and it is about 60% of the sample.
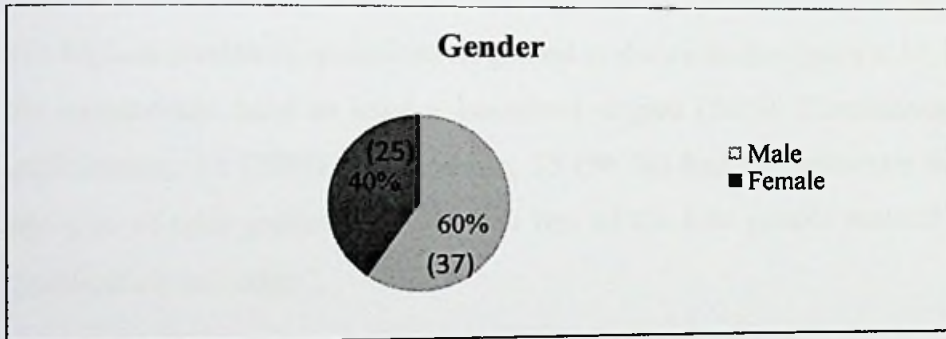
Figure 4.11: Gender (Employer)

Figure 4.12 presents the age of the employers. Age has been collected as an age group. According to the figure 4.12 majority respondents were in the age group of between 20 and 30 (37%), followed by age group between 31 and 40 (29%). The least number of responses received from the age group of 51 and above and it was about 15%.
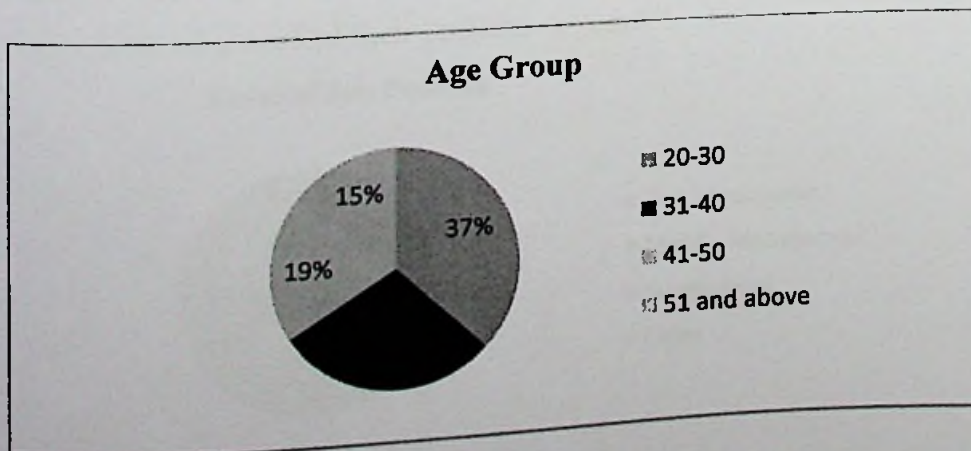
Figure 4.12: Age Group (Employer)

Highest Academic Qualification

6%
(4)

23%
(14)

15%
(9)

56%
(35)

Diploma

Bachelors degree

Postgraduate degree

Other
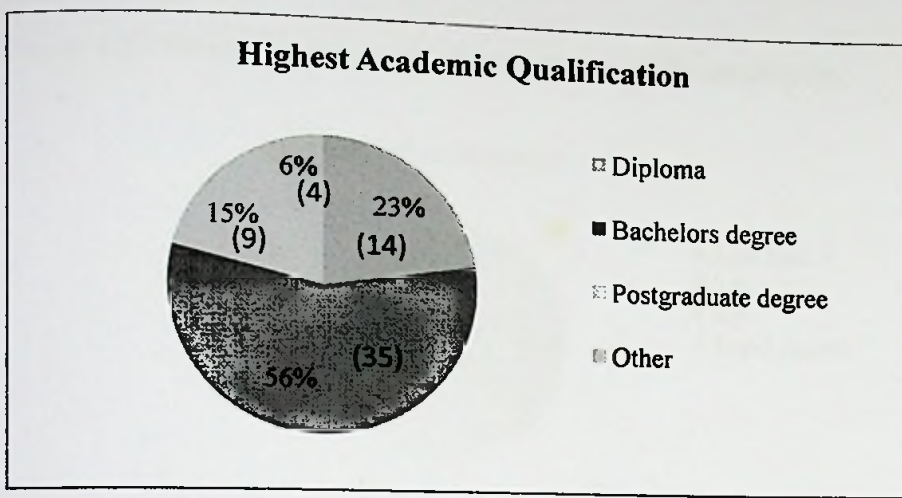
Figure 4.13: Academic Qualification (Employer)

The highest academic qualification gained is shown in the figure 4.13, and majority of the respondents have at least a bachelors degree (56%). Considering the academic qualification, 14 (23%) had diploma, 35 (56 %) had the bachelors degree, nine had any type of post graduate degree and rest of the four people marked their academic qualification as "other".

4.8.3   Professional Profile

Under the professional profile of the employer, the level of the job position, years of experience, nature of the company and the industry background were collected.

Figure 4.14 represents the level of the job position of the respondents. The most of the responses were working as supervisors (49%), 15 working in the middle management capacity and 12 were in the top level management capacity. There are five respondents who marked their position as "other".

Level of Job Position

8%
(5)

19%
(12

(30)
49%

Top Management

Middle Management

Supervisors

Other
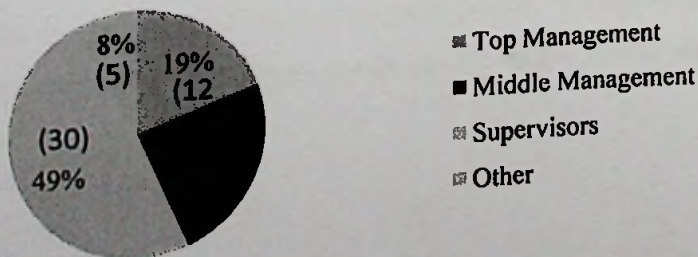
Figure 4.14: Level of Job Position

Figure 4.15 illustrates the years of experience of the employers.

Years of experience
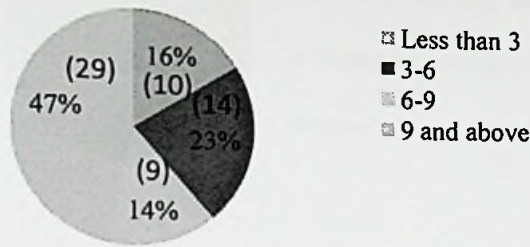
Figure 4.15: Years of Experience

Most of the respondents had more than 9 years of experience (29 responses and as a percentage 47%), while 10 (16%) indicated less than 3 years of experience. There were 14 (23%) and 9 (14%) people who have between 3-6 and 7-9 years of experience respectively.

Nature of the Company

Figure 4.16: Nature of the Company

Figure 4.16 demonstrates the nature of the company that they are working in. Majority of the respondents were working in the private sector local company and it was about 63% of the sample. 23% were working in multinational company and only 4 respondents were working in public enterprises. 5 respondents had marked their company nature as "Other", and it was about 8% of the whole sample.
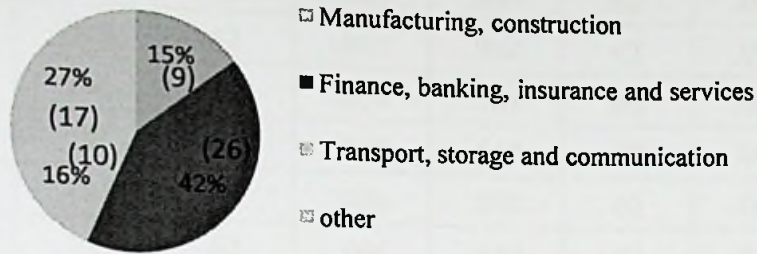
Figure 4.17: Background of the Industry

Figure 4.17 shows the industry background that the employers presently engaged in. Considering the employers industry background 26 (42%) were from finance, banking, insurance and services sector, 10 were from transport, storage and communication sector. Only 9 were from manufacturing and construction sector. 17 respondents indicated their industry as "other".

4.9   Testing for Normality (Employers)

Since an assessment of the normality of data is a prerequisite for many statistical tests (normal data is an underlying assumption in parametric testing) normality test has to be conducted for each variable in the model. Normality test has been conducted using the Kolmogorov-Smirnov test (K-S) and Shapiro-Wilk (S-W) test. If the test is not significant, then the data are normal, so any value above .05 indicates normality. If the test is significant (less than .05), then the data will not normal.

Table 4.62: Tests of Normality of Employersdata using Kolmogorov-Smirnov test (K-S) and Shapiro-Wilk (S-W) test

Question Item	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SelfAwareQ1	.208	62	.000	.884	62	.000
SelfAwareQ2	.200	62	.000	.835	62	.000
SelfAwareQ3	.174	62	.000	.880	62	.000
SelfAwareQ12	.175	62	.000	.903	62	.000
AdaptQ4	.171	62	.000	.889	62	.000

	Statistic	df	Sig.	Statistic	df	Sig.
AdaptQ5	.219	62	.000	.858	62	.000
AdaptQ6	.164	62	.000	.860	62	.000
InitiatQ7	.216	62	.000	.860	62	.000
InitiatQ8	.141	62	.004	.901	62	.000
InitiatQ9	.196	62	.000	.858	62	.000
WillingQ6	.181	62	.000	.861	62	.000
WillingQ10	.151	62	.001	.885	62	.000
WillingQ11	.169	62	.000	.898	62	.000
SelfMgtQ13	.176	62	.000	.884	62	.000
SelfMgtQ14	.185	62	.000	.892	62	.000
SelfMgtQ15	.161	62	.000	.889	62	.000
CriticalAnaQ16	.187	62	.000	.909	62	.000
CriticalAnaQ17	.173	62	.000	.886	62	.000
CriticalAnaQ18	.241	62	.000	.859	62	.000
CreatiQ19	.181	62	.000	.892	62	.000
CreatiQ20	.145	62	.002	.889	62	.000
CreatiQ21	.227	62	.000	.838	62	.000
LanguQ22	.217	62	.000	.844	62	.000
LanguQ23	.171	62	.000	.890	62	.000
LanguQ24	.190	62	.000	.874	62	.000
LanguQ25	.174	62	.000	.875	62	.000
NumeraQ26	.179	62	.000	.904	62	.000
NumeraQ27	.173	62	.000	.875	62	.000
NumeraQ28	.174	62	.000	.891	62	.000
CommuQ29	.155	62	.001	.885	62	.000
CommuQ30	.156	62	.001	.888	62	.000
CommuQ31	.156	62	.001	.903	62	.000
CommuQ32	.165	62	.000	.891	62	.000
CommuQ33	.189	62	.000	.872	62	.000
CommuQ34	.148	62	.002	.882	62	.000
TeamQ35	.193	62	.000	.876	62	.000
TeamQ36	.202	62	.000	.896	62	.000
TeamQ37	.222	62	.000	.882	62	.000
TeamQ38	.157	62	.001	.904	62	.000
TechQ39	.215	62	.000	.885	62	.000

TechQ40	.163	62	.000	.883	62	.000
TechQ41	.190	62	.000	.890	62	.000
TechQ42	.159	62	.000	.879	62	.000
PlanQ43	.186	62	.000	.885	62	.000
PlanQ44	.211	62	.000	.807	62	.000
PlanQ45	.213	62	.000	.883	62	.000
ApplicQ46	.216	62	.000	.847	62	.000
ApplicQ47	.190	62	.000	.880	62	.000
ProbQ48	.203	62	.000	.855	62	.000
ProbQ49	.167	62	.000	.858	62	.000
ProbQ50	.176	62	.000	.871	62	.000
ProbQ51	.156	62	.001	.916	62	.000
NegotiQ52	.186	62	.000	.872	62	.000
NegotiQ53	.216	62	.000	.882	62	.000
NegotiQ54	.195	62	.000	.885	62	.000

The table 4.62 presented the results of the Kolmogorov-Smirnov Test and the Shapiro-Wilk Test. From the above table, it can be concluded that the data gathered from the employers was significantly deviate from a normal distribution since the significant value of both tests was less than 0.05. Hence the data was not normally distributed. Therefore researcher undertook the non parametric tests for further analysis of the employers' data set.

4.10   Analyzing the Perception of Employers Regarding the Development of Employability Skills of Graduates

The analyzing the perception of employers on the graduates' employability skills was based on the responses provided by the employers to the questionnaire.

To analyze the each employability skills, calculated the mean value of responses for indicated questions relating to the particular employability skill. The table 4.64 summarizes the mean rank of each employability skills when executed the Friedman test.

Table 4.63: Mean Rank of the Employability Skills (Employers Perception)

Employability Skills	Mean Rank
Self Awareness	8.58
Adaptability	7.32
Initiative	9.10
Willingness to Learn	7.88
Self Management	8.63
Critical Analysis	10.27
Creativity	8.64
Language Skills	8.36
Numeracy	8.16
Communication	7.80
Team Work	8.71
Technology	7.81
Planning and Organizing	9.30
Applying Subject Knowledge	8.73
Problem Solving	8.12
Negotiating	8.60

The Friedman test for the employers' data set evaluated differences in medians among the 16 employability skills. Critical analysis skill perceived the highest mean rank of 10.27, followed by planning and organizing (9.3) and initiative (9.1). Adaptability reported the lowest mean rank of 7.32.

The chi-square value and the Kendall's coefficient of concordance were considered to determine whether there was a significant difference of the perception among the employability skills.

Table 4.64: Chi-Square and Kendall's W test Statistics (Employers' Dataset)

N	62
Kendall's W[a]	.022
Chi-Square	20.228
Df	15
Asymp. Sig.	.163

The critical value of the chi-square table is χ^2 (15, α =0.01) =30.57. The test statistics obtained through the Friedman test was 20.228. Hence the differences in medians among the 16 employability skills, was not significant χ^2 (15, α =0.01, N = 62) = 20.228, p > .01. Kendall's W is .022 indicating less differences among the 16 employability skills.

Since there were no significant differences on the perception of employability skills, next attempt was to check whether there were any differences on the perception of the three principal variables; personal skills, core skills and process skills. Following hypothesis was formulated to check whether there is any difference of the perception of the possession of employability skills.

H_0: There are no differences of the perception of the possession of personal skills, core skills and process skills.

H_A: There are differences of the perception of the possession of at least one skills among personal skills, core skills and process skills of the exit level undergraduates.

Table 4.65: Mean Ranks of the Principal Variables (Employer)

Principal Variables	Mean Rank
Personal Skills	1.94
Core Skills	2.19
Process Skills	1.88

The Friedman test for exit level undergraduates evaluated differences in medians among the three principal variables. Accordingly core skills had the highest mean rank (2.19) while the lowest was the process skills (1.88). However by looking at the mean rank only one cannot conclude whether there was any difference in medians. The chi-square value and the Kendall's coefficient of concordance were considered to determine whether there was a significant difference of the perception of possession of three principal variables of the employers. Table 4.66 represents the chi-square value and the Kendall's coefficient of concordance for the employers' dataset.

Specified level of significant is 99% and the degree of freedom is 2 (Since there are three variables). Then the critical value of the chi-square table is 9.21. If the χ^2 is greater than the 9.21, reject the null hypothesis.

Table 4.66: Chi-Square and Kendall's W test Statistics for principal Variables

N	62
Kendall's W^a	.027
Chi-Square	3.325
df	2
Asymp. Sig.	.190

The test statistic obtained from the Friedman test was χ^2 (2,α=0.01 N =62) = 3.325, p =0.19 >0.01. Thus the differences in medians among the three principal variables, was not significant. There was no evidence to reject the null hypothesis and concluded that there were no differences of the perception of the employers regarding the possession of personal skills, core skills and process skills of the graduates. Kendall's W is .027, indicating weak differences among the three principal variables.

4.11 Analyzing the Perception of the Employers Against the Graduates Regarding the Employability Skills Possession of the Graduates

One of the objectives of the study is to examine whether there is any significant differences between the perception of employers and the perception of exit level undergraduates with regards to employability skills. Considering that the following hypothesis was formulated.

H_0: There is no difference between the perception of employers and the perception of undergraduates with regard to employability skills.

H_A: There is a difference between the perception of employers and the perception of undergraduates with regard to employability skills.

Level of significance, α =0.01

Summary for the mean rating and median rating on perceived employability skills of the undergraduates and employers were calculated and illustrated in table 4.67.

Table 4.67: Exit Level Undergraduates and Employers Mean and Median Ranks

Employability Skill	Mean Scores		Median Scores	
	Undergraduate	Employer	Undergraduate	Employer
Self Awareness	4.17	3.05	4.25	3.00
Adaptability	4.08	2.84	4.00	3.00
Initiative	4.28	3.15	4.33	3.33
Willingness to Learn	3.87	2.94	4.00	3.00
Self Management	4.08	3.09	4.00	3.00
Critical Analysis	3.79	3.30	4.00	3.33
Creativity	3.80	3.06	4.00	3.00
Language Skills	3.70	3.02	3.75	3.00
Numeracy	3.45	2.98	3.67	3.00
Communication	3.61	2.94	3.67	2.83
Team Work	3.62	3.01	3.50	3.00
Technology	3.56	2.90	3.50	3.00
Planning and Organizing	3.50	3.17	3.33	3.17
Applying Subject Knowledge	3.54	3.10	3.50	3.00
Problem Solving	3.69	3.00	3.75	3.00
Negotiating	3.80	3.07	4.00	3.00

Both the mean and median ratings scores indicated that the undergraduates rated their employability skills as being relatively high. The mean and median scores of employers' perception of graduates' employability skills is lower than that of the graduates. For example, for the adaptability skill, the average mean score of employers was 2.84, while the undergraduates' median score was 4.08. However the highest mean score for undergraduates was initiative (4.28) while the employers recorded it in the third place when ordering the mean scores of skills in descending order. Although it seems that the differences were existing, it had to be measure statistically, whether the differences were significant or not.

To check that for each individual skill, conducted the Mann Whitney U test. Table 4.68 shows the number of responses in each group, mean rank and the sum of ranks.

Table 4.68: Ranks for Employability Skills

Employability Skills	Group	N	Mean Rank	Sum of Ranks
Self Awareness	Undergraduates	281	198.53	55787.00
	Employers	62	51.76	3209.00
Adaptability	Undergraduates	281	198.19	55692.00
	Employers	62	53.29	3304.00
Initiative	Undergraduates	281	195.96	55065.50
	Employers	62	63.40	3930.50
Willingness to Learn	Undergraduates	281	193.91	54487.50
	Employers	62	72.72	4508.50
Self Management	Undergraduates	281	193.01	54235.00
	Employers	62	76.79	4761.00
Critical Analysis	Undergraduates	281	184.05	51717.50
	Employers	62	117.40	7278.50
Creativity	Undergraduates	281	188.89	53077.00
	Employers	62	95.47	5919.00
Language Skills	Undergraduates	281	190.09	53414.50
	Employers	62	90.02	5581.50
Numeracy	Undergraduates	281	181.23	50926.50
	Employers	62	130.15	8069.50
Communication	Undergraduates	281	193.94	54496.00
	Employers	62	72.58	4500.00
Team Work	Undergraduates	281	186.86	52507.50
	Employers	62	104.65	6488.50
Technology	Undergraduates	281	187.92	52805.50
	Employers	62	99.85	6190.50
Planning and Organizing	Undergraduates	281	179.48	50433.50
	Employers	62	138.10	8562.50
Applying Subject Knowledge	Undergraduates	281	179.38	50404.50
	Employers	62	138.57	8591.50
Problem Solving	Undergraduates	281	188.72	53030.00
	Employers	62	96.23	5966.00
Negotiating	Undergraduates	281	189.87	53354.00
	Employers	62	91.00	5642.00

The mean ranks of undergraduates' perception of employability skills were higher than that of the employers. Self awareness had the highest mean rank (198) of the undergraduates while both the planning and organizing and applying subject knowledge had the highest mean ranks (138) of employers. Although the mean rank values were different for two groups, it is required to consider the test statistics to conclude whether there was any difference in the perception on skill possession. To check that, the Mann-Whitney U test value was considered and shown in table 4.69.

Table 4.69: Mann-Whitney U Test Statistics for Employability Skills

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Self Awareness	1256.000	3209.000	-10.802	.000
Adaptability	1351.000	3304.000	-10.642	.000
Initiative	1977.500	3930.500	-9.812	.000
Willingness to Learn	2555.500	4508.500	-8.913	.000
Self Management	2808	4761	-8.531	0
Critical Analysis	5325.5	7278.5	-4.877	0
Creativity	3966	5919	-6.81	0
Language Skills	3628.5	5581.5	-7.26	0
Numeracy	6116.5	8069.5	-3.699	0
Communication	2547	4500	-8.779	0
Team Work	4535.5	6488.5	-5.968	0
Technology	4237.5	6190.5	-6.385	0
Planning and Organizing	6609.5	8562.5	-3.011	0.003
Applying Subject Knowledge	6638.5	8591.5	-2.98	0.003
Problem Solving	4013	5966	-6.701	0
Negotiating	3689	5642	-7.186	0

The observed Mann-Whitney U value, with the Z value, for each employability skills was shown in the table 4.69. Since for each employability skills, the asymptotic significance p value is less than the specified α level (.01), reject H_0. Thus, at the 0.01 level of significance, there is enough evidence to conclude that there is a difference between the perception of employers and the perception of undergraduates with regard to employability skills. As a conclusion it can say that the undergraduates rated

their employability skills as being relatively high and employers' perception of graduates' employability skills is lower than that for the graduates.

4.12 Analysis of Employers by their Age

The Kruskal Wallis Test was carried out to find out if employers of different age group have any significant differences in their perceptions of how they rate the graduates. The following hypothesis has been formulated to check this.

H_0: Employers of different age groups have no difference in perception of employability skills of graduates

H_A: Employers of different age groups have difference in perception of employability skills of graduates

Level of significance, $\alpha = 0.05$

Perform the K independent samples test and table 4.70 shows the output of the test.

Table 4.70: Employers' Age Group and Employability Skills

	Chi-Square	df	Asymp. Sig.
Self Awareness	6.701	3	0.082
Adaptability	8.665	3	0.034*
Initiative	1.284	3	0.733
Willingness to Learn	1.218	3	0.749
Self Management	1.778	3	0.62
Critical Analysis	1.692	3	0.639
Creativity	2.205	3	0.531
Language Skills	2.673	3	0.445
Numeracy	1.612	3	0.657
Communication	3.016	3	0.389
Team Work	2.803	3	0.423
Technology	3.474	3	0.324
Planning and Organizing	9.974	3	0.019*
Applying Subject Knowledge	1.36	3	0.715
Problem Solving	2.666	3	0.446
Negotiating	1.124	3	0.771

The results in table 4.70 shows that the above hypothesis was not fully supported, as there were only two skills (Adaptability, p=0.034<0.05 and Planning and Organizing, p= 0.019 < 0.05) in particular that were significantly different. The Kruskal Wallis test was further carried out to identify which age group among the employers created the differences.

Table 4.71: Employers' Kruskal Wallis test for Age Group and Adaptability and Planning & Organizing skills

Age Group		20-30	31-40	41-50	51 & above
N		23	18	12	9
Adaptability	Mean Rank	37.80	31.78	19.12	31.33
	Chi Square	8.665			
	Df	3			
	Asymp. Sig.	0.034*			
Planning and Organizing	Mean Rank	39.39	24.31	34.04	22.33
	Chi Square	9.974			
	Df	3			
	Asymp. Sig.	0.019*			

The Kruskal Wallis test as shown in table 4.71 aims to determine, if differences in age group exist for the two skills. The number of respondents from the 20-30 age groups was the largest compared to the other groups. The mean rank for those in age group 20-30 was the highest (37.8 and 39.39 for adaptability and planning & organizing respectively) for both skills followed by 31- 40 age group (31.78) for adaptability skills and 41-50 age group (34.04) for planning and organizing skills. The age group 20-30 ranked graduates more favorably than the other groups. The lowest mean rank for adaptability given by the 41-50 age groups (19.12) while that is for planning and organizing (22.33) is given by 51 and above group. Hence there is a significant difference in opinion about graduates' adaptability skills and planning & organizing skills among the four different groups.

4.13   Analysis of Employers by their Position

The Kruskal Wallis Test was carried out to find out different job positions of employers have any significant differences in their perceptions of how they rate the graduates. The following hypothesis has been formulated to check this.

H_0: Employers with different job position have no difference in perception of employability skills of graduates

H_A: Employers with different job position have difference in perception of employability skills of graduates

Level of significance, α =0.05. Perform the K independent samples test and table 4.72 shows the output of the test.

Table 4.72: Employers' Job Position and Employability Skills

	Chi-Square	df	Asymp. Sig.
Self Awareness	5.93	3	0.12
Adaptability	4.55	3	0.21
Initiative	2.81	3	0.42
Willingness to Learn	2.65	3	0.45
Self Management	1.50	3	0.68
Critical Analysis	1.14	3	0.77
Creativity	3.56	3	0.31
Language Skills	1.56	3	0.67
Numeracy	1.58	3	0.67
Communication	5.32	3	0.15
Team Work	0.75	3	0.86
Technology	1.89	3	0.60
Planning and Organizing	3.36	3	0.34
Applying Subject Knowledge	0.28	3	0.96
Problem Solving	1.64	3	0.65
Negotiating	4.42	3	0.22

Job position of the employers was tested against the employability skills, as indicated by the above hypothesis. The results show all the 16 skills not significant since the

significant value > 0.05. Hence there is no evidence to reject the null hypothesis and there is no significant difference in the perception of the employers with their job position.

4.14 Analysis of Employers by their Experience

The Kruskal Wallis Test was carried out to find out whether there is any significant difference in perceptions of graduates' employability skills with the experience of employers. The following hypothesis has been formulated to check this.

H_0: Employers with various experience level have no difference in perception of employability skills of graduates

H_A: Employers with various experience level have difference in perception of employability skills of graduates

Level of significance, $\alpha = 0.05$. Perform the K independent samples test and table 4.73 shows the output of the test.

Table 4.73: Employers' Experience and Employability Skills

	Chi-Square	df	Asymp. Sig.
Self Awareness	1.54	3	0.67
Adaptability	4.66	3	0.20
Initiative	1.08	3	0.78
Willingness to Learn	2.67	3	0.45
Self Management	4.05	3	0.26
Critical Analysis	0.27	3	0.97
Creativity	2.18	3	0.54
Language Skills	0.75	3	0.86
Numeracy	0.54	3	0.91
Communication	4.56	3	0.21
Team Work	0.98	3	0.81
Technology	0.71	3	0.87
Planning and Organizing	6.66	3	0.08
Applying Subject Knowledge	2.12	3	0.55
Problem Solving	1.03	3	0.79
Negotiating	4.02	3	0.26

Years of experience of the employers was tested against the employability skills, as indicated by the above hypothesis. The results show all the 16 skills not significant since the significant value > 0.05. Hence there is no evidence to reject the null hypothesis and there is no significant difference in the perception of the employers with the years of experience.

4.15   Summary of the Analysis

In the undergraduate survey, the majority of responses were from the University of Sri Jayewardenepura. Also there were 281 responses from the Exit year undergraduates while the 239 responses were from Entry year undergraduates.   Only about 38% willing to be self employed and rest of the 62% indicated as they do not desire to be self employed. However the majority of the sample willing to join managerial job position (totally 90% of the sample) than school teaching and also there is no considerable differences on the sector that the managerial job is belongs to.

In the employers' survey, about 60% are males. About 48% of responses are from the supervisor category. More than 78% of the respondents were had at least bachelors degree and about 84% had more than 3 years of experience.

There were significant differences between the entry level and exit level undergraduates regarding the perception on employability skills possession.

According to the analysis, personal skills developed most at the university and process skills were the least developed skills.

The research was intended to identify if there are any differences in perceptions with regard to the employability skills inherent in graduates. It should be noted that in the study there was a significant difference between employers' and undergraduates' perception for all 16 employability skills.

The Kruskal Wallis Test was performed to determine if employers of with the different age group have any significant differences in their perceptions of how they rate the graduates. Results show that other than the adaptability and planning and

organizing skill other skills do not significantly different. Also with the different position or with the different years of experience, the ratings on the employability skills of graduates do not different significantly.

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Objectives of this research were to find the employability skills development of the graduates. Employability skills model developed based on the set of employability skills which were included in existing research studies. Considering the behaviors of skills, those are grouped into the three principal variables: personal skills, core skills and process skills. Then the analysis was done to find whether the graduates have been developed employability skills by being at the university and whether there was any difference between employer and graduates perceptions for all 16 employability skills. The findings of this research are expected to produce meaningful implication for the universities and practice this approach for 'work ready' graduates.

5.2 Conclusions

It can be seen that there is a less entrepreneurial inclination among the graduates and only about 38% of the sample are willing to be self employed. Hence the majority of graduates will not try for any businesses even they do not secure a job after graduation and will be waiting until they find a suitable job. However, the majority willing to join managerial job position (nearly 90% of the sample) than school teaching and also there is no considerable differences on the sector that the job is belongs to.

The main conclusions are:
1. Two levels of students have different views on the possession of employability skills and exit level students rated high levels of employability skills.
2. Three skills identified namely personal skills, core skills and process skills have not been developed equally in graduates. Personal skills developed most and the least developed skills were process skills.
3. Employer's perception of graduates' employability skills is lower than that of the graduates.

5.3   Recommendations

Following recommendations can be provided.

- Renew higher education institutions (HEI) focus on employability; consider employability holistically in producing graduates with life-long learning skills necessary for careers through employability skills development.
- Through the curricula designing and modifications, HEIs could tailor-make courses according to prevalent market demands.
- Work experience programmes should include to the curricular such as industrial training, internships or job attachments.
- Lecturers' should also be given opportunities to work in industry and organizations for better exposure them to the practice and also to strengthen the academic environment
- Employers can communicate their needs by having multilateral cooperation with both HEIs and Government
- Continue with training programmes for the unemployed include the workshops on introducing and practicing of employability skills
- Revise educational policy as it should stress the importance of employability skills to avoid the oversupply of graduates in certain sectors.

5.4   Suggestions for Future Research

A similar study could be conducted in the future with graduates and respective employers matching sets of graduates and particular graduates rather using the future graduates. Hence the exact perceptions concerning the employability skills that the graduates possess could be assessed.

A similar study could be carried out comparing the perceptions of graduates and their employers concerning employability skills using a larger sample ignoring the discipline of the graduates. The perceptions of employers may vary with the type of work experience and environment.

Furthermore a study can be conducted to assess employability skills possession of graduates in various disciplines. Compare graduates, relating to the employability skills and one could identify the disciplines that produced unnecessary graduates and

make changes to the particular curricular. This type of research will be more useful in policy making as it is crucial decision to avoid the oversupply of graduates in particular disciplines.

An extremely useful and important study might be the comparison of the perceptions of employers of students from vocational and technical institutions, with the perceptions of employers of students who are from universities, concerning the employability skills which students possess upon graduating from a particular educational institution.

Another valuable and justifiable research might be the comparison of the perceptions of employers of students from public universities, with the perceptions of employers of students who are from private universities (although there are not many private universities locally, can select graduates who are from foreign universities) concerning the employability skills which students possess from public universities and private universities.

Unemployment of the graduates is a serious problem and a study can be carried out to identify what hinder them to find a job. This can be done, collecting data from the employers on unsuccessful candidates immediately after interviews conducted.

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Appendix A
Research Survey on Employability Skills of the Graduates in Faculty of Applied Sciences in Sri Lankan Universities

Dear Participant:

I am a post-graduate student in the department of mathematics, university of Moratuwa, reading for M.Sc. in Operational Research. I am conducting a research project on **"Employability Skills of the Graduates in Faculty of Applied Sciences in Sri Lankan Universities"** as a partial fulfillment of the degree. I would be thankful if you could spend a few minutes to fill this questionnaire. Most of the questions require you to tick on the answer of your choice.

I assure you that all correspondence, including completed survey forms will be kept confidential and will be used only for this research project.

P.A.A.U. Jothirathne

1. University:

	university of Sri Jayawardenepura	Rajarata University of Sri Lanka	Sabaragamuwa University of Sri Lanka	Wayamba University of Sri Lanka

2. Academic Year: ☐ Level I   ☐ Level III   ☐ Level IV

3. Degree Programme: ☐ General   ☐ Special   ☐ Joint Major

4. Gender: ☐ Male   ☐ Female

5. A/L- Z Score: ☐ 0.0000-1.0000   ☐ 1.0001-2.0000   ☐ 2.0001-3.0000

6. Do you wish to be self employed? ☐ Yes   ☐ No

7. I like to work in private sector managerial job/ government administrative job/ school teaching. (cut inappropriate word by a single line)

Please tick (√) the appropriate cage where your responses is closest.

S/No		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Q1	I always accept the corrections and learn things from others					
Q2	I have enough confidence to do things which I believe to be right					
Q3	I accepts humor with the sense of not being deprecating					
Q4	I can adapt to the changes easily					
Q5	I can make suggestions for increasing the effectiveness of any changes taken place					
Q6	I like to learn new methods, procedures, or techniques which are going to adapt by the organization					

S/No		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Q7	I am eager to be successful					
Q8	I want to finish assigned task beyond the expectation.					
Q9	I make sure all possibilities are explored					
Q10	I search for information what I want to learn					
Q11	I try to understand equipment characteristics, technical capabilities, limitations and procedures					
Q12	I am able to challenge views expressed by others if I think they are wrong					
Q13	I like to take responsibility of planning and organizing my own work					
Q14	I tend to achieve what I set my mind on					
Q15	I have a methodical approach to tasks					
Q16	I can specify goals and constraints, generate alternatives, consider risks, and evaluate and choose the best alternative.					
Q17	I can recognize problems and devise and implement a plan of action					
Q18	I can organize and process symbols, pictures, graphs, objects and other information.					
Q19	I can generate new ideas					
Q20	I prefer novelty over generality/ familiarity					
Q21	I suggest new ways of looking at problems					
Q22	I can grab the important when I heard something					
Q23	I find it easy to express my views when speaking					
Q24	I am good at collecting, collating, classifying and summarizing data					
Q25	I can develop my ideas easily in writing					
Q26	I can perform basic computations and approach practical problems with different mathematical techniques					
Q27	I can use statistics effectively					
Q28	I can easily read and interpret graphs and tables of data					
Q29	I can organize basic ideas; communicate orally.					
Q30	I have the ability to locate, understand, and interpret basic written information in documents such as manuals, graphs, and schedules.					
Q31	I can organize basic thoughts, ideas, and messages in writing; create documents such as letters, directions, manuals, reports, graphs, and flow charts					

S/No		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Q32	I can receive, attend to, interpret, and respond to basic verbal messages/cues.					
Q33	I'm good at gathering information systematically to establish facts and principles					
Q34	I find it easy to communicate over the phone					
Q35	I contribute to group efforts.					
Q36	I can demonstrate understanding, friendliness, adaptability, empathy, and politeness in group settings.					
Q37	I can work confidently in a group					
Q38	I enjoy working on tasks in a group					
Q39	I can choose procedures, tools or equipment including computers and related technology.					
Q40	I understand overall intent and proper procedures for the setup and operation of equipment.					
Q41	I can prevent, identify, or solve problems with equipment, including computers and other technology					
Q42	I can employ computers to acquire, organize, analyze and communicate information, and demonstrate some proficiency with standard software.					
Q43	I maintain "to-do" lists or appointment calendars or follow-up file system					
Q44	I am good at managing my time					
Q45	I usually manage to meet deadlines					
Q46	I can connect theory in practical situations					
Q47	I can build a model or complete a project for assigned task					
Q48	I can discover a rule or principle underlying the relationship between two or more objects and apply it when solving a problem					
Q49	I am able to assess and summarized complex, detailed information					
Q50	I have a methodical approach to tasks					
Q51	I am good at analyzing information					
Q52	When there are issues, I can reach an agreement after discussion/s					
Q53	I am tactful and diplomatic					
Q54	I can be very persuasive					

Appendix B

Research Survey on Employability Skills of the Graduates in Faculty of Applied Sciences in Sri Lankan Universities

Dear Participant:

I am a post-graduate student in the department of mathematics, university of Moratuwa, reading for M.Sc. in Operational Research. I am conducting a research project on **"Employability Skills of the Graduates in Faculty of Applied Sciences in Sri Lankan Universities"** as a partial fulfillment of the degree. I would be thankful if you could spend a few minutes to fill this questionnaire. Most of the questions require you to tick on the answer of your choice.

I assure you that all correspondence, including completed survey forms will be kept confidential and will be used only for this research project.

P.A.A.U. Jothirathne

1. Job Position:	Top Management	Middle Management		Supervisors		Other
2. Age Group:	20-30	31-40		41-50		51 and above
3. Gender	Male			Female		
3. Nature of Company:	Public Agency	Private Company		Multinational		Other
4.Highest Academic Qualification	Diploma	Bachelors Degree		Masters Degree		Other
5. Years of Experience	Less Than 3	3-6		7-9		9 and above
6.Background of Industry	Manufacturing, Construction	Finance, Banking, Insurance & Services		Transport, Storage & Communication		Other

Please tick (√) the appropriate cage where your responses is closest.

S/No		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Q1	Newly recruited graduates accept the corrections and learn things from others					
Q2	Newly recruited graduates have enough confidence to do things which they believe to be right					
Q3	Newly recruited graduates accepts humor with the sense of not being deprecating					
Q4	Newly recruited graduates can adapt to the changes easily					
Q5	Newly recruited graduates can make suggestions for increasing the effectiveness of any changes taken place					
Q6	Newly recruited graduates like to learn new methods, procedures, or techniques which are going to adapt by the organization					

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S/No		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Q7	Newly recruited graduates are eager to be successful					
Q8	Newly recruited graduates want to finish assigned task beyond the expectation.					
Q9	Newly recruited graduates make sure all possibilities are explored					
Q10	Newly recruited graduates search for information what they want to learn					
Q11	Newly recruited graduates try to understand equipment characteristics, technical capabilities, limitations and procedures					
Q12	Newly recruited graduates are able to challenge views expressed by others if they think they are wrong					
Q13	Newly recruited graduates like to take responsibility of planning and organizing their own work					
Q14	Newly recruited graduates tend to achieve what they set their mind on					
Q15	Newly recruited graduates have a methodical approach to tasks					
Q16	Newly recruited graduates can specify goals and constraints, generate alternatives, consider risks, and evaluate and choose the best alternative.					
Q17	Newly recruited graduates can recognize problems and devise and implement a plan of action					
Q18	Newly recruited graduates can organize and process symbols, pictures, graphs, objects and other information.					
Q19	Newly recruited graduates can generate new ideas					
Q20	Newly recruited graduates prefer novelty over generality/ familiarity					
Q21	Newly recruited graduates suggest new ways of looking at problems					
Q22	Newly recruited graduates can grab the important when they heard something					
Q23	Newly recruited graduates find it easy to express their views when speaking					
Q24	Newly recruited graduates are good at collecting, collating, classifying and summarizing data					
Q25	Newly recruited graduates can develop their ideas easily in writing					
Q26	Newly recruited graduates can perform basic computations and approach practical problems with different mathematical techniques					
Q27	Newly recruited graduates can use statistics effectively					
Q28	Newly recruited graduates can easily read and interpret graphs and tables of data					
Q29	Newly recruited graduates can organize basic ideas; communicate orally.					

S/No		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Q30	Newly recruited graduates have the ability to locate, understand, and interpret basic written information in documents such as manuals, graphs, and schedules.					
Q31	Newly recruited graduates can organize basic thoughts, ideas, and messages in writing; create documents such as letters, directions, manuals, reports, graphs, and flow charts					
Q32	Newly recruited graduates can receive, attend to, interpret, and respond to basic verbal messages/cues.					
Q33	Newly recruited graduates are good at gathering information systematically to establish facts and principles					
Q34	Newly recruited graduates find it easy to communicate over the phone					
Q35	Newly recruited graduates contribute to group efforts.					
Q36	Newly recruited graduates can demonstrate understanding, friendliness, adaptability, empathy, and politeness in group settings.					
Q37	Newly recruited graduates can work confidently in a group					
Q38	Newly recruited graduates enjoy working on tasks in a group					
Q39	Newly recruited graduates can choose procedures, tools or equipment including computers and related technology.					
Q40	Newly recruited graduates understand overall intent and proper procedures for the setup and operation of equipment.					
Q41	Newly recruited graduates can prevent, identify, or solve problems with equipment, including computers and other technology					
Q42	Newly recruited graduates can employ computers to acquire, organize, analyze and communicate information, and demonstrate some proficiency with standard software.					
Q43	Newly recruited graduates maintain "to-do" lists or appointment calendars or follow-up file system					
Q44	Newly recruited graduates are good at managing their time					
Q45	Newly recruited graduates usually manage to meet deadlines					
Q46	Newly recruited graduates can connect theory in practical situations					
Q47	Newly recruited graduates can build a model or complete a project for assigned task					
Q48	Newly recruited graduates can discover a rule or principle underlying the relationship between two or more objects and apply it when solving a problem					

S/No		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Q49	Newly recruited graduates are able to assess and summarized complex, detailed information					
Q50	Newly recruited graduates have a methodical approach to tasks					
Q51	Newly recruited graduates are good at analyzing information					
Q52	When there are issues, newly recruited graduates can reach an agreement after discussion/s					
Q53	Newly recruited graduates are tactful and diplomatic					
Q54	Newly recruited graduates can be very persuasive					