A virtual university model for higher education in Saudi Arabia

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A Virtual University Model for Higher Education in Saudi Arabia

By:

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Supervisor:

Professor John P. Feather

A Doctoral Thesis
Submitted in partial fulfilment of the requirements for the award of Doctor of Philosophy of Loughborough University

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ABSTRACT

The purpose of this study is to investigate the feasibility, practicality and desirability of establishing a virtual university using Internet-based technology in Saudi Arabia. The intention would be to deliver higher education in order to accommodate the rapid growth in the number of secondary school graduates. This is regarded as one of the most important challenges currently facing higher education institutions, particularly universities in the Kingdom.

The questionnaire in this study was designed to obtain respondents’ views in relation to the proposed model. It was distributed to 996 teaching members (male and female) at three major universities: KSU, IMIU and KAU. The number of questionnaires returned was 538, this represents about 57% of the total sample. The majority of respondents (about 67.7%; N = 364) suggested that establishing a virtual university in Saudi Arabia was appropriate to meet the increasing demand for higher education. Group B represented the highest percentages of agreement at around 92.7%, while Group A represented nearly 60.2%. In contrast, the remaining 32.3% of the total number of respondents believed that there are alternative available solutions that can be utilised in order to overcome this problem. Almost 19.0% stated that they would like the private sector to take its responsibility seriously and begin autonomously, or collaboratively with the Saudi government, to construct more traditional colleges and universities in all regions of the Kingdom. Around 51.1% were in favour of the MHE, on behalf of the Saudi government, taking full control of higher education provision, introducing more traditional public colleges and universities throughout the Kingdom. Finally, almost 29.9% appreciated any effort made by the current traditional universities to increase their capacity to absorb more students now and in the future.

Interviews were carried out in order to gain respondents’ opinions on the overall situation. These interviews were composed of two sets: the first set was conducted with various decision-makers at the HESC, the MHE, KSU, IMIU, and KAU. The second set was conducted with the Director of IU at KACST, the Manager of Internet Services at STC, and one representative of the ISPs in the Kingdom. The outcomes revealed that, in recent times, the higher education system in general and universities in particular have encountered, in addition to the rising number of secondary school graduates who wish to pursue higher education, other problems such as a lack of equal educational opportunities, a lack of educational quality, increased drop-out rates and a lack of interest in learning by some students, a lack of well-forged and mutual relationships between universities and the private sector, and so on.

The application of SSM, which made use of the results of the questionnaires and interviews, determined and confirmed the improvements needed to surmount these limitations. The proposed system encompasses strategic planning, content, communication technology and relevant systems for central support. Each part of the system was logically built to carry out certain activities that work in harmony with the others in order to achieve the mission of the entire system.

The study concluded that a virtual university was both systematically desirable and culturally feasible; therefore, recommendations were made for its implementation.
This research work is dedicated entirely

To

Dr. Abdullrahman S. Al-Ekrish
&
Dr. Mohammed Makki Subai

Whose early support and encouragement largely provided the inspiration for the continuation of my studies.
ACKNOWLEDGMENT

All praise to ALLAH, most gracious, most merciful, for his help, blessing and guidance which has enabled me to complete this project. After this, my greatest debt is to my supervisor, Professor J. P. Feather, for his supervision, encouragement, guidance, immeasurable support and thoughtful remarks which have motivated me throughout this study and made this research work possible.

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<td>Compact Disc-Read Only Memory</td>
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<td>CGI</td>
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<td>CICS</td>
<td>Customer Information Control System</td>
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<tr>
<td>CMOS</td>
<td>Complementary Metal Oxide Semiconductor</td>
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<tr>
<td>CRT</td>
<td>Cathode Ray Tube</td>
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<tr>
<td>DASD</td>
<td>Direct Access Storage Device</td>
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<tr>
<td>ERMES</td>
<td>European Radio Messaging System</td>
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<td>ESCON</td>
<td>Enterprise Systems Connection</td>
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<td>ETHICS</td>
<td>Human Implementation of Computer-based Systems</td>
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<tr>
<td>FAQ</td>
<td>Frequently Asked Questions</td>
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<td>FOT</td>
<td>Fibre Optic Terminal</td>
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<td>FTF</td>
<td>Face-to-face</td>
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<td>GPA</td>
<td>Grade Point Average</td>
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<td>GSM</td>
<td>Global System for Mobile Communication</td>
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<td>HESC</td>
<td>Hyper Text Mark-up Language</td>
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<td>HTML</td>
<td>Higher Education Supreme Council</td>
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<td>IMIU</td>
<td>Imam Muhammad Bin Saud Islamic University</td>
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<td>IP</td>
<td>Internet Protocol</td>
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<td>Information System</td>
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<td>Information Systems Work and Analysis of Changes</td>
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<td>ISD</td>
<td>Instructional Systems Design</td>
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<td>ISDN</td>
<td>Integrated Services Digital Network</td>
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<td>ISP</td>
<td>Internet Service Provider</td>
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<td>ISU</td>
<td>Internet Service Unit</td>
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<td>IRC</td>
<td>Internet Relay Chat</td>
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<td>Information Technology</td>
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<td>IU</td>
<td>Islamic University</td>
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<td>JSD</td>
<td>Jackson Systems Development Approach</td>
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<td>KACST</td>
<td>King Abdulaziz City for Science and Technology</td>
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<td>KAU</td>
<td>King Abdulaziz University</td>
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<td>KFU</td>
<td>King Faisal University</td>
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<td>KFUPM</td>
<td>King Fahad University for Petroleum and Minerals</td>
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<td>KKU</td>
<td>King Khalid University</td>
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<td>King Saud University</td>
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<td>LAN</td>
<td>Local Area Network</td>
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<td>Mbps</td>
<td>Megabytes Per Second</td>
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<td>MHE</td>
<td>Ministry of Higher Education</td>
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<td>MHz</td>
<td>Megahertz</td>
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<td>MOPTT</td>
<td>Ministry of Post, Telegraph, and Telephone</td>
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<tr>
<td>OPAC</td>
<td>Online Public Access Catalogue</td>
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<tr>
<td>OSA</td>
<td>Objected-Oriented Systems Analysis</td>
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</table>
OU  Open University
PCS  Problem Content System
POCSAG  Post Office Code Standard Advisory Group
PPP  Pool Purchase Price
PSS  Problem Solver System
PSTN  Public Switched Telephone Network
RAID  Redundant Array of Independent (or Inexpensive) Disks
SAST  Strategic Assumption Surfacing and Testing Methods
SSADM  Structured Systems Analysis and Design Methodology
SSM  Soft Systems Methodology
STC  Saudi Telecommunication Company
STRADIS  Gane and Sarson Structure Approach
TSI  Total System Intervention
TCP/IP  Transmission Control Protocol/Internet Protocol
TSO  Time Sharing Option
UQU  Umm Al-Qura University
VM  Virtual Machine
VMS  Virtual Memory System
VGR  Video Graphic Recorder
VSM  Beer's Viable System Model
VU  Virtual University
WAN  Wide Area Network
WWW  World Wide Web
Chapter 1:

Introduction and Background

1.1 Introduction

One of the most astonishing aspects of the twentieth century is the overwhelming advancement of information and communication technologies in the world today. This ICT revolution is acknowledged by modern societies as a persistent force that is continually remodelling their life styles. All predictions suggest that this pace of change is not going to slow down, but will expand to include most nations of the world. Education in general, and distance education in particular, has been dramatically affected by this transformation which, at the same time, offers a striking opportunity to expand its geographical reach.

Utilising ICT, such as the Internet and related technologies, according to French (1) has the potential to affect radical change, not just for the design and delivery of online courses, but also in the way that conventional institutions are structured. Indisputably, the advent of the Internet, and more accurately the WWW, means that higher education is no longer confined to a conventional classroom. Instead, learners who are enthusiastic about proceeding with their education may study for academic degrees while at home or at work, and whether they come from an urban or a rural area. Education via the Internet and its resources has demolished any such constraint of time or location and provides a new means of high quality distance teaching and learning.

Baker and Gloster noted that (2)

"A paradigm shift is taking place in higher education instruction, from a mode of faculty-student interaction occurring in fixed locations at specific times to one in which students can access the same instructional resources in a variety of forms, regardless of location, at their convenience. This is possible because several technologies have matured, supporting major changes in how instruction can be delivered to students, in their homes, or in their work places".
The outcome of this paradigm shift as Helmi (3) pointed out will result in a networked society with equal access to knowledge and information; communities and individuals in charge of their learning environment; government, educators, and the private sector working in partnership; and an education and training system delivering the skills and knowledge needed for a free and prosperous society in the 21st century.

Indeed, today Internet-based technology can be seen as a major driving force in a technological sense for this paradigm shift. This presents higher education institutions with one of four options: firstly, life as usual, with no substantial changes to the university in general; secondly, a reengineering of the major processes of the university with the retention of the existing overall design; thirdly, the reinvention of the university organisational model; and fourthly, the elimination of the university due to obsolescence (4). Incontrovertibly, in the information age, higher education systems worldwide have been shaped by decreases in traditional funding, greater demand for business faculties, increased competition to attract consumers and the funding they bring with them, and pressure to reduce cost. Demand for advanced education is growing and yet this demand is often unmet, while new ICT media are altering the educational landscape (5).

In today’s mobile society, all higher education providers, whether public or private, in order to survive in a competitive environment, must construct an effective education system. This must have the ability to adjust to rapid social, economic and technological changes, and to improve the opportunities for education access to all citizens of all ages, in a variety of environments. The new developments in information technology present higher education institutions with marvellous opportunities to contain the rapidly increasing cost and expand their geographical reach by flexible means. The Internet, for example, opens a new revolutionary era through sophisticated tools which can be utilized to disseminate global information and allow free access to unlimited resources for mankind’s knowledge. All together, this will facilitate the distribution of learning to learners in diverse environments.

Since the introduction of the Internet into higher education, a remarkable growth has been noticed in the number of institutions which adapt these technologies as a delivery medium to reach an unlimited number of people, wherever they are, who have Internet access. Such institutions have realized the capabilities and potentialities of these new media to connect learners, resources and instructors from different places in a single
virtual learning environment. In fact, today, hundreds of universities, colleges, lifelong learning institutes, and a huge number of commercial organizations are turning to online learning via the Internet for very legitimate motives. In order to comprehend the scope of this phenomenon, it is necessary only to visit either the World Lecture Hall at the University of Texas at Austin, (http://www.utexas.edu.html) which offers hundreds of courses from universities all over the world (6). Also, Internet University web page (http://www.internet-university.com/homepage.html) currently lists over 1000 courses of distance education college courses being offered by over 150 individual institutions (7). Additionally, the National Centre for Education Statistics (NCES), as cited by King (8), reported that an estimated 25,730 courses were offered through distance education. Of these courses, 45% were offered by public 4-year colleges and universities, private 4-year institutions offered 16%, and 2-year colleges offered the remaining 39%. These institutions offered approximately 700 degrees and 170 certificates that could be completed via Internet-based technology.

These above-mentioned statistics are dramatically increasing which seems to suggest that the Internet will play a major role in transforming the delivery of education and be its vehicle for continuing education in the future. This is because the Internet is a universal network that has the capability of delivering educational courses anytime, anywhere. Halliwell (9) justified why higher education institutions should consider integrating the Internet and its associated technologies into their learning processes.

"Instead of having to be content with the cost and limitations of discrete experimental infrastructure, developers of network learning have been presented with a ready-made means of translating theory very rapidly into practice and of realizing their goal of new, potential global teaching and learning environments based on accessibility, flexibility, empowerment, alternative modes of communication and so on".

Such aspirations have been realized by numerous traditional institutions, which began to adapt these futuristic technologies in their educational operations both on and off campus. At the same time, other so-called 'virtual universities' have been born to initiate a new era of modernistic institutions and to rival the traditional institutions through expanding learning access to every potential learner with Internet connection on the globe. It is not surprising, therefore, that the first and foremost target group of such educational missions are learners who have been deflected from their learning opportunities for reasons such as personal or social circumstances, institutional
opportunities for reasons such as personal or social circumstances, institutional regulations, work responsibilities, transportation or geographical difficulties, economic and cultural barriers.

Farrell et al. (8) emphasised that the emergence of the virtual university phenomenon has been forcefully driven by the following factors:

- The increasing capacity, flexibility, and suitability of information and communication technologies to educational applications, together with a continuing decrease in hardware.

- The enabling capacity of the technologies to "unbundle" functions that have traditionally been provided by one institution.

- The growth of knowledge, with its attendant consequence of the obsolescence of much of what was previously learned, is placing an ever-increasing pressure on conventional models of education. People are seeking opportunities for lifelong learning, and with diverse personal circumstances, they require flexible access-to-learning opportunities and avenues such as the home, the workplace, the community learning centre, as well as the traditional campus-based education.

- The realisation that the quality of the learning experience can be enhanced by applying information and communication technologies. In the conventional classroom there has been increasing use of the Internet to access information which enriches the learning experience. Further, in the conventional distance education environment, technologies are being adopted to improve the learning process through interactive and collaborative learning to reduce the learner's sense of isolation.

- The increasing demand from isolated learners for more equitable access and services.

- The perception of many institutions, particularly in Europe and North America, that the application of information and communication technologies will enable them to increase their market share in an environment that is increasingly competitive.
Chapter 1 Introduction and Background

- The need to be seen to be "keeping up with the competition." Administrators worry that student recruitment, donations, and grants may decline if this expectation is not met.

- The expectation by policy makers and administrators that the development of virtual delivery models will reduce costs, increase productivity, and enable expansion without cost increase.

Unquestionably, a virtual university will come into existence and this fact has begun to be clear to various nations worldwide regardless of the status of their technological development. It is now necessary to respond effectively to the ever increasing demand from diverse learners for better access to education, cheaper fees and courses, the content of which is directly applicable to their learning interests.

This chapter begins with a general introduction in Section 1.1, while Section 1.2 presents a brief overview concerning Saudi Arabia's historical, geographical, political and economic conditions. In Section 1.3, the researcher discusses the cultural homogeneity and values of the Kingdom with special emphasis on the Islamic perception of IT utilisation in general, including the Internet network as an example. Finally, Section 1.4 provides critical background information regarding the research problem, its aims, objectives, hypotheses, questions, limitations, definition of terms and the organisation of the thesis.

1.2 The Kingdom of Saudi Arabia: A Brief Overview

The real modern history of Saudi Arabia can be traced back to the year 1902 when its founder, King Abdulaziz Bin Abdelrahman, who was born in about 1880 and who spent his early life in exile with his father in Kuwait, took over the city of Riyadh with a group of loyalist followers. He thus returned it to the control of the Al-Saud family (9). After this, he spent almost 30 years of his life attempting to consolidate his territories in the Arabian Peninsula; this he eventually achieved. On 23 September 1932, he declared the name of the country to be the Kingdom of Saudi Arabia or Al Mamlakaah al Arabiyah as Sudijah which was established as an Islamic state. Arabic is the official language and the
Holy Qur'an is the basis for its constitution (10). In 1953, the founder King Abdulaziz died after dedicating a greater part of his life to building his ambitious empire (11).

Riyadh, which is located in the centre of the Kingdom, became the capital city of Saudi Arabia. Other major cities include Jeddah, a port city on the Red Sea; Mecca, the Muslims’ holy place of pilgrimage; Medina, another holy and cultural city for Muslims; Dammam, an oil city on the Arabian Gulf; and Al-Jubayl and Yanbu which are two new industrial cities.

Saudi Arabia is divided, for administration purposes, into 13 provinces (Mantagah): Al-Riyadh, Makkah Al-Mukaramah, Al-Madinah Al-munawwarah Al-Qasim, Al-Sharqiyah, Asir, Al-Bahah, Najran, Jazan, Al-Hudud Al-Shamaliyah, Al-Jawf, Hail and Tabuk. Each region has a Regional Governor with the status of Minister who reports directly to the Interior Minister.

In political terms, Saudi Arabia is a monarchy, which is ruled by a king who is selected by members of the Al-Saud family. The appointed king will normally rule for the rest of his life. Besides the King there are two assistant and advisory councils: the Council of Ministers whose main responsibilities are planning and managing the implementation of general affairs in the Kingdom, such as the economy, defence, education, policies, international relations and so on, and the Consultative Council which was formed to provide the King with appropriate advice associated with issues of concern to the nation as a whole. However, the King normally appoints all members of both councils.

The Kingdom of Saudi Arabia is an active participant member in a great number of agencies and organizations world-wide. It is a founding member of the following agencies: the United Nations (UN), the Arab States League, the Islamic Conference, and the Gulf Cooperation Council (GCC). In addition, it is involved in activities related to the United Nations’ specialized agencies: the World Bank, the Non-aligned Movement Organisation, the Petroleum Exporting Countries’ Organisation, and the Arab Petroleum Exporting Countries’ Organisation.

Geographically, the Kingdom of Saudi Arabia is the largest country in the Middle East, entirely occupying almost four-fifths of the Arabian Peninsula. It is positioned in southwestern Asia and lies at the intersection of three continents: Europe, Asia and Africa. The country, as shown in Figure 1.1, is bordered by the Red Sea on the west, and by the...
Arabian Gulf, the United Arab Emirates and Qatar in the east. In the south there are borders with Yemen and the Sultanate of Oman, while in the north, Saudi Arabia has borders with Kuwait, Iraq and Jordan. The country's area is estimated to be some 2,149,690 sq km (829,995 sq. ml) comprising most of the Arabian Peninsula (12). It has a varied landscape including the Empty Quarter (Al-Rub al Khali) in the south of the country that is considered to be the largest sand desert in the world and which is also linked to another large, sandy desert, Al-Nafud, in the north of the country. In the southwest, there are mountains rising to over 9,000 feet (about 3,133 m) (13).

The general climate of Saudi Arabia is mixture of three predominant types of climate zones which is due to the large area occupied by the Kingdom. It is harsh and dry in almost 95% of the total land area, humid and mild temperature conditions predominate in Asir near the border with Yemen, and a steppe climate exists in the mountains. The general temperature of the Kingdom is cooler during the winter season (between 58 and 74 Fahrenheit) and extremely hot in the summer (between 100 and 129 Fahrenheit). According to the 2000 census, Saudi Arabia has a population of 22,023,506 persons with a population growth rate of 3.28%. Out of that number, about 5,360,526 persons are considered as non-Saudi citizens (14).

Economically, since the discovery of oil in the Kingdom in the 1930s, Saudi Arabia has undergone a rapid and radical transformation in every important aspect of life such as health, education, agriculture, industry, communication, transportation etc. The oil sector provides the Kingdom with about 75% of its total national budget revenue. The country has the largest petroleum reserve (26%) of the world's total oil reserve (15). It also has other mineral resources. However, the government of Saudi Arabia is trying to enhance and accelerate growth through direct support and encouragement to the private sector to take an active and influential part in building, developing and maintaining the stability of the economy and to generate sources of revenue other than oil. The Saudi economy could be seen as a true reflection of a free, economic-based system that allows every Saudi citizen to engage in economic activities. Recently, the government of Saudi Arabia issued a decree that permits international investors also to take part in the development and expansion of the economy (16).
1.3 Cultural Homogeneity and Values

Each civilization in the world today, whether in the east or west, in the north or in the south, in the jungle or on the mountains, in the desert or in the valley, has its own identity, values, knowledge, behaviour, attitudes, rituals, thinking and beliefs; its people share common purposes, goals and meanings, which distinguish them from the outside world. This is collectively called ‘culture’ which Williams defined, as quoted by Smith (18), as “the organization of production, the structure of the family, the structure of institutions, which express or govern social relationships, the characteristic forms through which members of the society communicate”. More precisely, it is the solid
foundation or the essential basis of every society or social group, which governs its behaviours and facilitates the exchange and interaction of ideas. It does not exist coincidentally; it has been founded and practised for centuries in the early generations of every society in the form of activities and inheritances to the next generation, learned by them through artefacts. Hofstede (19) provided two definitions of the concept of ‘culture’: the first sees culture as “a means of ‘civilization’ or ‘refinement of the mind’ and in particular the results of such refinement, like education, art, and literature”. The second definition regards culture as “a collective phenomenon, because it is at least partly shared with people who live or lived within the same social environment, which is where it was learned. It is the collective programming of the mind which distinguishes the members of one group or category of people from another.” Hofstede argued that the first definition is believed to be very narrow in its sense, whereas the second is more broad and comprehensive. He further identified six layers of culture that may integrate independently or jointly in collective individuals, which brings them together to represent an identical culture with a particular way of life, values, goals, intellectual symbols, spirituality etc: these differentiate one group from another. These layers are:

- A national level in which an individual belongs to a particular country (or countries in cases where people move around during their lives).
- An affiliation level which is marked by people being in one geographical area, and/or categories sharing common racial, spiritual and/or linguistic characteristics.
- A gender level that distinguishes an individual’s sex as male or female.
- A generation level that is based on dividing one generation into multi-stage groups according to their ages.
- A social class level, which depends on the type of education and/or profession that an individual occupies within a social group.
- An organization or corporate level that categorizes a group of people by the kind of work which they normally perform in an organization (20).

One of the above layers is national culture which, according to Hofstede (21), consists of the basic values that are more or less shared by the majority of inhabitants of a country or a nation. This exerts cultural pressure and affects a person or a group of persons
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according to the dominant issues of the nation. This may be concrete and very obvious, such as in the case of political integration that brings people together from different territories under central government, language or religion. However, it can also be intangible which is difficult to identify; for example the perception, philosophy or ideology of a group of people.

In the case of the Kingdom of Saudi Arabia, the original source of the national culture that links and connects people together is tangible and is derived from the religion of Islam which makes the people of Saudi Arabia a relatively homogeneous group. 100% of the population is believed to be Muslim. Islam is an Arabic word which means peace. It implies full and complete submission, obedience, surrender and acceptance of Allah's (God's) commands and revelations. A Muslim is one who believes in God (the creator of the universe), his angels, books, messengers, the judgment day, the resurrection from the dead, and the existence of good and evil. The five fundamental pillars of Islam are the profession of faith (shahada) "I bear witness there is no God but Allah; Mohammed is the Messenger of Allah"; praying five times a day (at dawn, midday, mid-afternoon, sunset and nightfall); fasting in the month of Ramadan from dawn to dusk and according charity to the needy; and finally, making a pilgrimage to Mecca once in a lifetime.

A Muslim also believes in Mohammad as the last messenger sent by Allah to the whole of humanity. He was the one to whom Allah dictated the Holy Qur'an through his angel, Gabriel. The Qur'an for Muslims is considered as the word of God, the sacred book which was revealed, in the Arabic language, to his messenger, Prophet Mohammed, over a period of twenty three years as appropriate to the circumstances or events. It stresses the oneness of God from beginning to end. Other main themes include issues related to mankind, including the creation of the universe. It covers both existing and extinct creatures, the purpose of human existence, faith and the awareness of God, knowledge, the judgment day, and life after death and its significance. It also lays down the basic foundation of certain other issues, such as basic principles for social, economic and political systems within the Islamic state as well as morals, attitudes and behaviour that affect an individual's life.

Obtaining knowledge in Islam is not just right for its followers. It is rather a prerequisite and an obligation or duty for every Muslim, regardless of sex. Islam, from its first inception, urges all capable individuals to read and learn continually. The first few
sentences of the Holy Qur'an which were revealed to the Prophet Mohammed indicated the importance of learning in Islam: "Read, in the name of your Lord, who has created all things; who created man from a clot of blood. Read in the name of the most high, who taught man the use of the pen; who sheds on this soul the ray of knowledge, and teaches him what before he knew not" (22). In addition, Prophet Mohammed reports that for a true Muslim "Seeking Knowledge (better education) is obligatory for every Muslim (male and female)" (23). On another occasion he said, "Whosever takes a path seeking knowledge (or beneficial education), Allah will pave a path for such an individual to Jannah (Paradise)" (24). Al-Saloom (25) sheds light on this principle by referring to Saudi Arabia's education system thus:

"Islam dictates that learning is an obligation for every Muslim, man or woman. This obligation, which gives education the status of a religious duty, is the cornerstone of education in the Kingdom of Saudi Arabia. It is the foundation upon which the state builds its educational responsibilities and, in light of which, the citizen performs duties towards himself, his community, and his religion."

This emphasis on the encouragement of learning is not limited to religious subjects. It can be extended to encompass every science such as biology, technology, physics, chemistry, geometrics, geology, anthropology, medicine, ecology, engineering and so on. A brief review of Islamic literature shows that Muslim scholars (male and female) are interested in both science and religious studies, separately or together. The capacity of Muslims to absorb human knowledge such as technology that facilitates and promotes human living standards and contributes to their spiritual and material welfare is not merely fostered and encouraged, but considered as mandatory. In reality, Islamic faith does not rule out creativity or invention in anyone as they in themselves are neutral devices; it is their usage and application that make them benefits or evils.

Saudi Arabian culture, as mentioned earlier, is rooted in the teaching of Islam which is originally drawn from the Holy Qur'an. The family in Islam is the primary foundation of the whole of society and also marks the individual's identity. The father in the family is a highly respected figure at the top of the family hierarchy. Families within society share a sense of mutual characteristics. Pride in and respect for the family is measured by the ability of its members to live according to the ideal social standard. Marriage is a social
contract between a male and a female and according to this they share the responsibility
of supporting and caring for their families. Society as a whole values behaviour and
attitudes that show generosity, dignity, kindness, altruism, individual independence from
others, the purity of women, compassion for others, total separation between men and
women in education and work and in all aspects of public life, willingness to support
each other, and a readiness to admit mistakes and errors.

Despite all of this commonality of culture and values among members of society in the
Kingdom of Saudi Arabia, there is a long-running debate and obvious conflict between
two eminent groups (26). On one hand, there is a group of people who are in favour of
accommodating traditional culture in a swiftly changing world. On the other hand, there
are those who prefer to regulate the wave of new development with traditional culture
and values. The essence of this dispute has arisen because of the wide differences
between their perceptions, viewpoints, and, more precisely, their public explanations of
the ideal meaning of living in accordance with God's law and the Prophet Mohammed's
teaching.

One of the most interesting examples is the introduction of the Internet to Saudi Arabia.
This topic has been under discussion for quite some time between these opposing
groups. Some of these see the Internet as no more than a delivery medium like any other
transmitted medium, such as television or radio, which can be modified to be used wisely
and appropriately for the benefit of society. The other faction deeply believes that
connection to the Internet threatens to destroy the morality of the individual and the
cultural values of the nation. However, this dispute ultimately has been resolved and the
government of Saudi Arabia found ways of approving public access to the Internet on 9th
January 1999 (27). From an Islamic perspective, the Internet, as well as other
technologies, can be employed in any society to endorse sound moral, ethical and social
values, if used wisely and appropriately. On the other hand, such technologies could be a
channel for the collapse of all basic and fundamental social principles and beliefs if
exploited inappropriately.

Generally speaking, Islam in essence does not contradict itself. Seeking knowledge in
Islam, as is clearly indicated, offers guidance to every individual, whether male or female,
to explore, discover, learn, understand, acquire and question all mankind's
accomplishments in the fields of science, literature and the acceptable arts. In addition, it
permits the use and development of whatever technology is available, as long as it can contribute to the welfare of society.

King Faisal, on a state visit to Malaysia, stated:

I am sorry for those who think Islam...impedes progress or stands as an obstacle in the way of advanced development. Those who think so must have not understood [the] essential principles of Islam. The opposite is the truth. The most important requirements Islam calls for are to maintain progress, to carry out justice, to create equality, and to breed in people good behaviour and a nation’s moral conduct. (28)

This is exactly what Islam is all about; it provides both the individual and society with the opportunity to advance and progress physically and spiritually. Each individual has the right to develop his /her various skills through learning, working and active participation in social, economic and political activities within society. Accordingly, an individual has to regulate his/her conduct according to Islamic rules and regulations. Society, on the other hand, has to facilitate and support individuals’ basic and more advanced needs which will eventually promote the prosperity of the nation as a whole.

1.4 Background

Since the inauguration of the Kingdom of Saudi Arabia in 1932 by its founder King Abdulaziz Bin Abdelrahman, a tremendous transformation has taken place in all areas of social, economic, technological and educational development. In the early years of the country, there was extensive illiteracy, despite the fact that there were religious schools founded in mosques in metropolitan areas; these, however, were not accessible to everyone. King Abdulaziz realised the critical importance of education both for individuals and for society as a whole as a basis for unification and the building of a strong economy. He also saw the need for a knowledgeable people who would participate in the development and growth of his state. Consequently, he expanded the responsibility of the Directorate of Education which initially had been established in 1925 when he was the King of Najd and Al-Hejaz before completing the entire unification of the Kingdom (29). This was considered to be the first well-organised, centralised, national education system whose main responsibility was to promote literacy to the general population irrespective of their ages, origins or gender. Alongside, the
system was dedicated to supporting the existing schools, opening more elementary, intermediate and secondary schools, as well as managing and protecting the institutes of learning. After unifying the Kingdom, this agency expanded its responsibility and mission to include all people in the freed land; it founded new schools and assisted in enlarging education development and opportunities. This revolutionary endeavour developed the underpinning of the modern education system in Saudi Arabia which paved the way to establishing the Ministry of Education in 1953. This ministry undertook the responsibility for boys’ education, junior college education, adult education, and education for those with special needs. The General Presidency for Girls’ Education, established in 1960, supervised the general education of girls, and the Ministry of Higher Education (MHE), formed in 1974, oversaw the rapid expansion of higher education institutions, and also administered higher education colleges and universities throughout the Kingdom.

The first well organised college of the modern higher education system in Saudi Arabia was the College of Islamic Law (Arabic: Al-Shar’ia) situated in Mecca (30). The chief goals of this institution were to proliferate Islamic knowledge, and to qualify, to a high standard, judges who specialised in Islamic law and teachers who were willing to teach Islamic studies to the people. This school began with very limited resources, which was indicated by the limited number of students who were accepted. It constructed its own admission regulations, which can be outlined as follows: firstly, prospective students had to be Saudi citizens although the school had the right to accept non-citizens when places were available for them; secondly, potential learners must hold a secondary school certificate or equivalent; thirdly, the prospective student must be between 22 to 25 years old; fourthly, the applicant's health and physical well-being must be approved by a specialist doctor; fifthly, the applicant, together with his guardian, must sign a declaration that he would teach in government schools for about the same number of years that he was provided with education at the government's expense; finally, the applicant must pass a personal interview designed by the college to exclude anyone who seemed lacking in personal appearance, confidence, or the ability to express his views in articulate manner (31).

The successful applicants were granted a monthly support fund or a stipend of about 100 Saudi Riyals, which is approximately equal to 20 UK pounds in today's money. In addition, study books were free of charge. However, due to the growth of the economy
after the discovery of oil in the 1930s and the increasing price of oil in the 1970s and 1980s, Saudi Arabia experienced remarkable economic expansion in a comparatively short period of time. The kingdom devoted a high percentage of its income to building a high standard education system aimed at providing literacy to virtually every individual in the Kingdom and to meet the massive demand for education of the people in general, and for higher education in particular. This led the government to construct higher education institutions in order to meet social demand. Also, more importantly, it was necessary to turn out a well-educated and trained people who could engage in achieving the goals and objectives of the ambitious government development plans efficiently and to keep pace with technological developments. Hence, a number of higher education institutions with a variety of purposes were established to accomplish these new requirements and to control such future change.

Since the early years of these higher education bodies, an open-door policy has been followed which was based on the notion that all individuals have the right to free access to their preferred choice of any higher education institution or college as long as they hold a secondary school certificate. This would enable qualified people to fill unoccupied vacancies which derived from the rapid and extensive infrastructure development and economical expansion throughout the Kingdom. Furthermore, every student would be granted free education, a monthly assistance fund and free housing. These new regulations were implemented precisely in the first comprehensive Development Plan (1970/71-1974/75), the Second Development Plan (1975/76-1979/80), and the Third Development Plan (1980/81-1984/85) in order to qualify personnel to deal with rapid technological change and developments in social and economic fields. Additionally, it would allow Saudi citizens to replace the foreign labour force. However, with the introduction of the Fourth Development Plan (1985/96-1989/90), the Fifth Development Plan (1990/91-1994/95), the Sixth Development Plan (1995/96-1999/00), and the current Seventh Development Plan (2000/01-2004/05), the open admission policy gradually began to dissolve. Lately this has utterly evaporated and has turned into a strictly selective policy that imposes certain conditions that every applicant is required to fulfil before getting full access into any college or institution. This dramatic change came as a result of the governments' exhaustive efforts to maintain a balance between the input and output of higher education institutions because of the unexpected growth in the number of students who graduated from secondary schools. This leapt from 15866
Figure is expected to rise from 20% to 30% within the period of 2000 to 2036 (34). Table 1.1 shows the drastic increase in the number of students who graduated from secondary schools (35).

These rules and regulations are still in effect and, therefore, higher education in Saudi Arabia has become a privilege. The conditions that students must comply with are to obtain a high GPA which can be no less than 80% in general. (It can be higher in some colleges.) Other conditions are: graduating from secondary school in the same year that he/she plans to enrol in any higher education institution; and succeeding in both achieving a competitive admission examination and in the personal interview with the admission board. Under certain circumstances, however, the admission board may accept a very limited number of students, and under specific conditions, from those who graduated up to four years before. Nevertheless, admission depends on the availability of places and cannot be granted to every applicant. The selected applicant in some colleges or disciplines will have to spend about one year or at least four months on an orientation programme which must be completed satisfactorily before obtaining full enrolment to the institution (36).

<table>
<thead>
<tr>
<th>Year</th>
<th>Boys</th>
<th>Girls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>10,024</td>
<td>5,842</td>
<td>15,866</td>
</tr>
<tr>
<td>1982</td>
<td>11,147</td>
<td>6,384</td>
<td>17,531</td>
</tr>
<tr>
<td>1983</td>
<td>11,507</td>
<td>8,729</td>
<td>20,236</td>
</tr>
<tr>
<td>1984</td>
<td>13,814</td>
<td>12,013</td>
<td>25,827</td>
</tr>
<tr>
<td>1985</td>
<td>13,735</td>
<td>12,508</td>
<td>26,243</td>
</tr>
<tr>
<td>1986</td>
<td>17,235</td>
<td>15,391</td>
<td>32,626</td>
</tr>
<tr>
<td>1987</td>
<td>17,631</td>
<td>16,458</td>
<td>34,089</td>
</tr>
<tr>
<td>1988</td>
<td>20,094</td>
<td>18,009</td>
<td>38,103</td>
</tr>
<tr>
<td>1989</td>
<td>21,494</td>
<td>19,453</td>
<td>40,947</td>
</tr>
<tr>
<td>1990</td>
<td>24,706</td>
<td>22,443</td>
<td>47,149</td>
</tr>
<tr>
<td>1991</td>
<td>28,192</td>
<td>27,893</td>
<td>56,085</td>
</tr>
<tr>
<td>1992</td>
<td>27,855</td>
<td>29,554</td>
<td>57,409</td>
</tr>
<tr>
<td>1993</td>
<td>28,697</td>
<td>32,495</td>
<td>61,192</td>
</tr>
<tr>
<td>1994</td>
<td>32,638</td>
<td>35,650</td>
<td>68,288</td>
</tr>
<tr>
<td>1995</td>
<td>37,847</td>
<td>40,871</td>
<td>78,718</td>
</tr>
<tr>
<td>1996</td>
<td>44,324</td>
<td>49,102</td>
<td>93,426</td>
</tr>
<tr>
<td>1997</td>
<td>58,018</td>
<td>64,243</td>
<td>122,321</td>
</tr>
<tr>
<td>1998</td>
<td>70,345</td>
<td>75,828</td>
<td>146,173</td>
</tr>
<tr>
<td>1999</td>
<td>78,813</td>
<td>86,217</td>
<td>165,030</td>
</tr>
<tr>
<td>2000</td>
<td>91,672</td>
<td>96,879</td>
<td>188,551</td>
</tr>
</tbody>
</table>

Table 1.1: The number of students graduated from secondary schools during the period 1980-2000.
1.4.1 The Research Problem

The tremendous growth in the number of students seeking higher education studies, and the persistent need to connect the input and output of higher education institutions with the aims, objectives and strategies of the national development plans in Saudi Arabia are the most important problematic issues that the higher education system encounters today. These issues were raised by many scholars in a Symposium entitled “Higher Education in the Kingdom of Saudi Arabia-Futuristic Visions” that took place in Riyadh City from 22 to 25 February 1998 (35). More recently, this was expressed officially by the Seventh Development Plan (2000-2004) (36) as one of the main concerns of the government as a whole in the education segment. This was noted under “The Basic Issues” as follows:

1. Capacity:

“Because of the accelerated growth of secondary school graduates, higher education institutions face a great challenge in accommodating them. This necessitates focusing on efforts to find solutions which best solve their problems. The higher education institutions then available were able to accommodate about two thirds of secondary school graduates during the Sixth Development Plan. This was achieved despite the limited facilities and low capacity available. There were certain measures, taken during the Sixth Plan, to increase the universities’ capacity. Of those worth of mentioning were the inauguration of some new Social Studies faculties in Jazan, Hayel, Tabouk and Hafr Al-Batin. Also, two branches of King Saud University and Imam Mohamed Bin Saud Islamic University at Abha were merged to form the King Khalid University. These steps undoubtedly helped to ease the issue. However, the Seventh Development Plan had to address major issues to solve this problem. This can be achieved through the efforts of both the private and the public sectors. The private sectors must have certain incentives to participate efficiently in this field”.

2. Balancing Need with Available Specialisations:

“The great pressure on the universities forced them to accept students beyond their capacity. This resulted in an imbalanced situation between the scientific and theoretical specializations since about two thirds of the students were admitted to the theoretical faculties. This then resulted in an increased number of graduates from the theoretical faculties, which was beyond the market needs. Therefore it is thought that there is an urgent need to restore the balance in the specializations
Chapter 1 Introduction and Background

in higher education as this has become a need to meet the current circumstances and the development requirements”.

Currently, higher education policy-makers have embarked on new admissions regulations after failing to accommodate all students, even with the establishment of a number of Colleges and the formation of a new university. In fact, these new admission rules assist in reducing the number of students being admitted to universities but, at the same time, they deprive many potential students from gaining equal access to and opportunities in higher education institutions as their counterparts.

1.4.2 Purpose of the Study

As noted in the Seventh Development Plan (2000/01-2004/05), the predominant challenge facing higher education institutions in Saudi Arabia is to contain the increasing number of students seeking continuing higher education studies. Tremendous efforts have been made by higher education policy-makers to overcome this problem through increasing the number of students being accepted. This, of course, is beyond the capacity of the existing universities, and is in spite of establishing new colleges of social faculties in many parts of the Kingdom, founding a new university, and eventually developing a new set of admission regulations. All of these solutions have been attempted but the problem still persists without fundamental change. The study addresses this problem.

1.4.3 Aim of the Study

The aim of this study revolves around investigating the feasibility, practicality and desirability of establishing a virtual university based on the Internet and related technologies so as to deliver higher education courses and programmes. These would constitute an alternative approach to the previously attempted solutions carried out by higher education decision-makers to cope with the proliferation of potential higher education students in the Kingdom of Saudi Arabia.
1.4.4 Objectives of the Study

This study aims to achieve the following objectives:

1. To analyse socio-cultural aspects of Saudi Arabia with particular emphasis on those related to information and communication technology.

2. To investigate the traditional higher education system in Saudi Arabia.

These objectives will be achieved by:

a) Analysing the organisational structure of the higher education system and its fundamental roles.

b) Summarising the basic objectives of the higher education system in general and the National Development Plans pertaining to higher education in particular.

c) Evaluating the various types of study systems available at higher education institutions.

d) Investigating the major aspects of the eight conventional universities which currently exist in Saudi Arabia and their academic centres for girls' education.

3. To investigate the information technology infrastructure and the development of the Internet in the Kingdom of Saudi Arabia. This can be accomplished through:

a) Examining government initiatives and policies regarding the development and implementation of information and communication technology via KACST.

b) Exploring the key components of the national information and communication technology infrastructure currently existing in Saudi Arabia that have been put in place by MOPTT and later by STC.

c) Scrutinising the existing ICT infrastructure which is currently available in Saudi university computer centres and libraries.

d) Presenting the progress and growth of the Internet in general and the extent to which Internet technology is employed in Saudi Arabia in particular.
4. To provide an extensive analysis of the chief benefits and the major drawbacks of utilising Internet-based technology in virtual education.

5. To identify, from other countries, current models of virtual universities which deliver higher education courses and programmes by using the Internet and related technologies in order to suggest a virtual university model for higher education studies in Saudi Arabia.

1.4.5 Research Hypotheses

The following two hypotheses have been formulated for this study in order to examine their validity:

1. Establishing a virtual university has the potential to extend higher education opportunities to every prospective applicant.

2. Establishing a virtual university has the potential to provide both male and female students with equal educational opportunities.

1.4.6 Research Questions

This research attempts to answer the following questions:

Q1. What are the major arguments that may support the establishment of a virtual university via Internet-based technology in providing higher education in Saudi Arabia?

Q2. What progress has been made in the development of the information technology infrastructure in Saudi Arabia?

Q3. What progress has been made in the development of the Internet network in Saudi Arabia?

Q4. What are the likely advantages that may support the exploitation of the Internet and associated technologies in delivering higher education in Saudi Arabia?
Q5. What are the likely limitations that may impede the utilisation of Internet-based technology in delivering higher education in Saudi Arabia?

Q6. What models of a virtual university based on the Internet and related technologies exist and are best to follow?

Q7. What other reasonable options might be available for higher education policymakers to solve the problem of accommodating the rapid growth of students looking for continuing higher education degrees in Saudi Arabia?

1.4.7 Study Delimitations

During the past three decades, the Saudi higher education system has experienced a rapid growth in terms of the number of institutions and enrolments. Most institutions are for men, but some are exclusively for women. These colleges and institutions are under the supervision of several government organizations such as the Ministry of Education, the Ministry of Defence, the Ministry of the Interior, and so on. Therefore, this study will consider only the eight universities that are overseen by the Ministry of Higher Education (MHE). These universities are King Saud University (KSU), Imam Mohammed bin Saud Islamic University (IMIU), King Fahd University of Petroleum and Minerals (KFUPM), King Faisal University (KFU), Islamic University (IU), King Abdulaziz University (KAU), and King Khalid University (KKU). These universities are scattered throughout the Kingdom and, due to the lack of time and other resources, the researcher will select for study three universities as representatives of the eight universities as a whole. These universities are KSU (Riyadh), IMIU (Riyadh) and KAU (Jeddah). The researcher will also include all academic centres for girls’ higher education studies attached to these universities in order to gain their views and perceptions regarding the prospect of establishing a virtual university based on the Internet and related technologies for higher education in the Kingdom of Saudi Arabia.
Chapter 1 Introduction and Background

1.4.8 Definition of Terms

For the sake of consistency, clarity and to avoid possible confusion, the researcher in this study will use certain terms very frequently. Therefore, it is crucial to identify and define these precisely and accurately. The terms can be described as follows:

- Internet, Internet-based technology, Internet and related technologies, Internet and associated technologies. These terms will be used interchangeably. All refer to the Internet network and accompanying tools such as FTP, the WWW, E-mail, Mailing Lists, Bulletin Board, Newsgroups, Audio and Video-conferencing, IRC and so on. All or any of these can be utilised in developing instructional materials and in delivering educational resources.

- Virtual education, the virtual learning environment, distance education, online learning, distance teaching and learning. These terms also will be used, as they are in the literature, interchangeably. All of them relate to an educational environment in which both learners and instructors are carrying out learning and teaching processes while separated in terms of space and place.

1.4.9 Thesis Organisation

This chapter (Chapter One) provides a general introduction to the research and provides a brief overview regarding the research problem, its aims, objectives, hypotheses, questions, and limitations. Additionally, it highlights geographical and political aspects of the Kingdom of Saudi Arabia. Furthermore, this chapter discusses the cultural homogeneity and values of the Kingdom with special emphasis on Islamic perceptions of IT utilisation, particularly with regard to such facilities as the Internet.

Chapter 2 describes the organisational structure of the higher education system in Saudi Arabia and the major objectives of the higher education system in Saudi Arabia. This chapter also explains types of study systems in Saudi universities, and provides a succinct description of each university in the Kingdom.
Chapter 3 offers descriptive analysis of the development of the IT infrastructure within KACST, STC, and the current eight universities in Saudi Arabia. Moreover, this chapter attempts to trace the growth of the Internet network in general and in the Kingdom specifically.

Chapter 4 reviews the literature related to this study. It is divided into two main sections. The first section reviews the literature related to the advantages and limitations of using Internet-based technology in virtual education, while the second section includes a definition of the virtual university and analyses the available literature concerning models.

Chapter 5 discusses in detail the research methodology pertaining to this study. It begins by analysing the major research methodologies which are frequently used by researchers in the field of IS. The review outlines the strengths and weaknesses of each methodology in order to select the most appropriate approach to suit this study. SSM was chosen and the rationale behind this selection will be discussed. This chapter also covers the two types of data collection methods used in this research. Questionnaires and interview techniques will be applied and the procedures which will be followed for their implementation will be described.

Chapter 6 reports the results of the questionnaire analysis and points out the main findings.

Chapter 7 highlights the major findings of the interview analysis with a number of key figures in HESC, MHE, KSU, IMIU, KAU, KACST, STC, and one representative of selected ISPs in Saudi Arabia.

Chapter 8 discusses the application of the first five stages of SSM in this study based on the findings of the data collected via questionnaires and interviews.

Chapter 9 will describe in detail the basic elements of the most desirable and feasible model and the changes that will be required for effective and efficient implementation.

Chapter 10 points out the major findings of this study, outlines hypotheses results, assess their value, and finally offer recommendations and suggestions for possible further research.
1.5 Conclusion

Goddard and Cornford (39) noted that the virtual university has emerged as a potent vision for the future of higher education, utilising new ICTs radically to restructure higher educational provision. This vision was driven in addition to the rapid advancement of ICTs, particularly Internet-based technology, by other factors such as the growth of knowledge, the increasing demand for higher education, the expectation of higher education decision-makers to reduce cost, the provision of equal access, high-quality education, limitless educational opportunities and so on to all prospective students.

This chapter reveals that the spectrum of historical, political, economic and cultural elements suggest that Saudi Arabia, with respect to its social standards as a nation, has the capabilities and opportunities to benefit from all human innovation and progress in every aspect of life, including Internet-based technology.

Additionally, this chapter provides a broad picture of several issues in relation to the overall research interest. It reveals that accommodating the increasing number of students who graduate from secondary schools in Saudi Arabia is currently one of the greatest challenges facing higher education decision-makers. Thus, a number of approaches and a set of measures have been established to overcome the dilemma of accommodating this over-abundance of students who have graduated from secondary school. These measures have come into effect and yet the problem still persists. This suggests that new workable methods should be initiated within the higher education system to be available as alternative solutions in order to respond effectively and efficiently to overcome the problem. A virtual university via Internet-based technology can be viewed as a promising avenue in achieving this.
Chapter 1

Introduction and Background

References

(Details of publishers are included in the bibliography at the end)


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13. **Royal Embassy of Saudi Arabia,** ref. 12.


25


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34. King Saud University, ref. 31, pp. 80-81.


Chapter 2:

Higher Education System in Saudi Arabia

2.1 Introduction

This chapter begins with a general introduction in Section 2.1 with Section 2.2 describing the organizational structure of the higher education system in Saudi Arabia. Section 2.3 highlights the major objectives of the higher education system in Saudi Arabia, while Section 2.4 explains types of study systems in Saudi universities. Section 2.5 focuses on providing a brief description of each university in the Kingdom and finally, Section 2.6 concludes the chapter.

In modern society, higher education plays an important role in qualifying and equipping professional personnel such as scientists, teachers, nurses, engineers, technicians and physicians with the necessary knowledge and skills that enable them to undertake the responsibility of maintaining economic growth and social development. Barnett (1) provides the following distinctive definitions of the concept of 'higher education': firstly, higher education is basically seen as the upper rank of the education system within a nation in terms of its status and the overall effect it has on other educational systems, students' advancement and their acquisition of educational knowledge and qualifications; secondly, higher education promotes understanding in the minds of students by endorsing and encouraging their critical and intellectual thinking. Accordingly, higher education is seen as fostering the creation of intellectual abilities and perspectives, is assumed to encourage and support research and academic freedom, and is a neutral forum of debate and rationality. Furthermore, it allows the pursuit of objective knowledge, the development and enhancement of a student's personal character, autonomy, competence and intellectual integrity (2).

Higher education in Saudi Arabia can be seen as the highest rung of the educational system, encompassing all types of education beyond secondary school except military education. It consists of:
Colleges and universities, offering four-year undergraduate programmes, professional programmes, and post-graduate programmes.

- Teachers' colleges.
- Technical and vocational training colleges.
- Two-year junior colleges.

2.2 The Organisational Structure of the Higher Education System

The Saudi higher education system is extremely centralized and is governed by the HESC, which was established by a royal decree in 1994 (3). It is designated as the highest educational authority, responsible for all educational activities beyond secondary school except military education. Its main tasks are planning, developing higher education policy, governing higher educational affairs, monitoring and directing all its activities, coordinating all its organizations, and allocating appropriate funding to all its institutions (4). This council consists of fifteen members, as shown in Table 2.1:

<table>
<thead>
<tr>
<th>Members</th>
<th>Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Prime Minister</td>
<td>Chairperson</td>
</tr>
<tr>
<td>The Minister of Higher Education</td>
<td>Deputy Chairperson</td>
</tr>
<tr>
<td>The Minister of Education</td>
<td>Member</td>
</tr>
<tr>
<td>The Minister of Finance and National Economy</td>
<td>Member</td>
</tr>
<tr>
<td>The Minister of Labour and Social Affairs</td>
<td>Member</td>
</tr>
<tr>
<td>The Minister of Planning</td>
<td>Member</td>
</tr>
<tr>
<td>The President of the General Civil Service Commission</td>
<td>Member</td>
</tr>
<tr>
<td>The Presidents of the Eight Universities</td>
<td>Members</td>
</tr>
</tbody>
</table>

Table 2.1: Members of HESC and their positions (5).

The HESC holds three sessions a year by official invitation from its chairperson. In certain situations, the chairperson or his deputy has the right to call the Council for an exceptional assembly. The Council cannot be held without the presence of at least two thirds of its members. Decisions issued by the Council are based on the majority verdict of the attending members (6). Although each university in Saudi Arabia has its own charter, functions, budget, and occasionally different purposes which are assumed semi-independently, all universities serve as a centre for disseminating knowledge, teaching, educating and training students, supporting and promoting research activities, and involving themselves vigorously in advancing the nation in all areas. However, each
institution is administered by a self-governing council (University Council) which consists of the following appointed members, as shown in Table 2.2.

<table>
<thead>
<tr>
<th>Members</th>
<th>Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Minister of Higher Education</td>
<td>Chairperson</td>
</tr>
<tr>
<td>The University President</td>
<td>Deputy Chairperson</td>
</tr>
<tr>
<td>The University Vice President</td>
<td>Member</td>
</tr>
<tr>
<td>The University Council Secretary General</td>
<td>Member</td>
</tr>
<tr>
<td>The University Colleges' Deans</td>
<td>Members</td>
</tr>
<tr>
<td>Three expert members appointed directly by the Minister of Higher Education for a three years period</td>
<td>Members</td>
</tr>
</tbody>
</table>

Table 2.2: Members of the University Council and their positions (7).

The major function of the University Council is to oversee all administrative, financial and scientific affairs, as well as to execute all general university policies. This Council has considerable influence over most decision-making processes concerning its organization. The Council holds a meeting once a month, called officially by its chairperson who may call for an extraordinary session whenever necessary. The Council cannot be held and may not make lawful decisions without the attendance of two thirds of its members (8). However, it is affected directly by all decision-making procedures issued by the HESC.

Due to the separation of males and females in higher education institutions in the Kingdom, girls' colleges are administered by the Colleges' Supreme Council. This is an independent body that is entirely dominated by male members. It is similar in its construction to the Supreme Councils of the universities. It reports directly to the University Supreme Council. This means that women's education policy is mostly shaped, influenced and affected by male decision-making because women do not participate in and are not represented at either the upper level of the administrative hierarchy of the Colleges' Supreme Council or in the University Supreme Council. They are, however, represented at lower levels of the university structure.
2.3 Objectives of the Higher Education System

The HESC has framed a number of guidelines for all institutions of higher learning, including universities:

- Education should develop in accordance with the country's needs and should attain the highest possible levels.

- Islamic studies are to be a basic and integral part of the curricula set for each level; institutes or universities should be established in various regions of the Kingdom with due regard for the nature and special requirements of the region.

- Universities should be uniformly administered so that the teaching staff and students can be conveniently transferred from one institution to another;
competition between institutions should be encouraged in the fields of scientific research and student services.

- Universities should be developed in a manner calculated to meet the country's manpower needs for expert and qualified cadres capable of participating to the full in overall national development plans (10).

Higher education in Saudi Arabia has numerous objectives, which reflect precisely the Kingdom's social needs, cultural background and national development goals. In practice, these objectives can be divided into basic objectives; national development plan objectives; and universities' objectives. The latter will be discussed in Section 2.4.

2.3.1 Basic Objectives

The basic objectives, which are proposed by the HESC, tend to provide each higher learning institution with a solid base from which to function and perform its roles and duties effectively, rendering maximum benefit for its students in particular and for society in general.

In its education policy, the Kingdom's Government made the basic aims of education the duty of acquainting the individual with his/her God and religion and adjusting his/her conduct in accordance with the teaching of religion, the fulfilment of the needs of society, and the achievement of the nation's objectives (11).

The success of any institution can thus be measured by the accomplishment of the following objectives:

- To make every possible effort to provide students with a clear understanding of Islam that will assist them in sustaining devotion to Allah (God) and inspire them with his sanctity in order to fulfil their spiritual needs which will, in turn, encourage them to behave in a way that is socially acceptable.

- To prepare and train citizens to qualify them to undertake their responsibility in the economic growth and social development of the nation in the light of Islamic principles.
• To improve conditions and provide opportunities for gifted and talented students to advance their higher education studies in their preferred field of knowledge.

• To take a leading role in the area of scientific research that will lead first, to the advancement of both the nation and consequently human knowledge in all fields; and secondly, by active participation in finding reliable ways of solving the social problems which have emerged in contemporary society as a result of technological expansion.

• To support and encourage researchers to contribute towards the developing body of scientific writing based on an Islamic perspective, to serve the nation in its growth and in taking its place alongside advanced countries worldwide.

• To promote the translation of books and other information resources from their native languages into the Arabic language (Arabisation) and to add new expressions and terminologies related to all human endeavours. This, in turn, will ease the spread of information among a growing number of people.

• To take on responsibility for providing adequate training services and continuing education to graduate students to enable them to accomplish their goals and to participate effectively in the overall development of the country (12).

2.3.2 Objectives of Higher Education in the National Development Plans

Planning is the most important mechanism of the overall development in Saudi Arabia as well as any other nation in the world today. Due to rapid social and economic growth in the last three decades, the government began expanding its future vision in terms of setting up a five-year national development plan that considered all social, economic, education, health and political aspects in order to respond effectively and sufficiently to whatever circumstances or changing conditions may occur in the life of the Saudi people. Since 1970, all government agencies, including the Ministry of Higher Education, have been engaged in some sort of planning process, with the key role given to the Ministry of Planning, which is mainly responsible for the preparation and co-ordination of all government organisations’ plans every five years. However, National Development Plans for higher education were originally tailored to fit the needs which resulted from dramatic changes in the social and economic aspects of the nation. These took the form
of gradual, well-thought out and pre-planned phases from 1975 up to the present day. In order to carry out its main responsibilities, the Ministry of Higher Education set a number of objectives which were embedded in the general national development plans. In this regard, it is important to comprehend the main issues embedded in these plans, so as to gain a broad picture of the gradual changes in higher education policies.

2.3.2.1 The First National Development Plan (1970/71-1974/75)

This plan did not offer a unified plan for all higher education institutions. Instead, it consisted of multi-plans, which were designed for each institution based on the essential needs of each. However, it was the first organised five-year national plan designed exclusively to guide the future direction of the existing higher education institutions within this particular period of time. The main objectives of this plan were to enlarge the capacity of the existing colleges and universities to accommodate all potential applicants on condition that they possessed a secondary school certificate or its equivalent, to raise the number of qualified academic teaching staff to meet the growth of the number of students being accepted, to relocate all colleges and departments in a single building, and to provide the required funds and facilities to carry out these objectives (13).

2.3.2.2 The Second National Development Plan (1975/76-1979/80)

Despite the fact that the second plan was more comprehensive in its contents and level of analysis of the situation in the higher education institutions at that time, it was, like the previous plan, devised to satisfy the requirements of each individual institution. The chief goals of this plan were to focus on allowing higher education institutions to accept more secondary school graduates, to provide the necessary funds, human resources and facilities to speed up the process of completing new buildings and infrastructure, to establish new colleges and department to enable students to pursue their preferred areas of study in line with other nations' developments, and to construct modern, well-equipped buildings to enable these institutions to accommodate the increasing number of students being admitted (14).
2.3.2.3 The Third National Development Plan (1980/81-1984/85)

The main characteristics which distinguish the objectives of the third plan from the first two were: launching an extensive evaluation and improvement programme for all higher education courses and curricula to ensure the quality of education being provided to students was in accordance with the nation's development and needs; creating additional colleges within the existing higher education institutions to accommodate the rapid increase in the number of students; facilitating coordination and collaboration among higher education institutions; and allowing more students to be accepted by higher education institutions (15).

2.3.2.4 The Fourth National Development Plan (1985/86-1989/90)

According to the results of the exhaustive evaluations of the previous three development plans, the policy of allowing all students to enrol at any college or university failed to bring about a high standard of qualified students. Therefore, this plan began to take a hard line towards the open door policy through a series of conditions that were to be met by a potential applicant before she/he was admitted to any institution. It emphasised the importance of concentrating on quality rather than quantity when accepting students. One of the major objectives of this plan was to insist that admission to higher education institutions must be limited to those who obtained a high GPA in order to control the quality of students. Those who were not accepted could pursue their education through two-year college programmes or through high-level vocational programmes. Further objectives were to set up a comprehensive appraisal plan to evaluate all higher education system activities, to increase productivity, reduce waste and extravagance, and to rationalise subsidies to achieve economies in investment and expenditure (16).

2.3.2.5 The Fifth National Development Plan (1990/91-1994/95)

This plan emphasised that the provision of higher education studies beyond the secondary schools was the primary concern and responsibility of the government through its accreditation agencies. The goals of this plan can be described as creating more interaction between higher education institutions and the requirements of social and economic developments, expanding the basis of higher education and providing a
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greater variety of programmes to address the most important development issues. The plan also aimed to provide higher education opportunities to committed citizens who were qualified scientifically to pursue their studies successfully, and to support and encourage progress through scientific research (17).

2.3.2.6 The Sixth National Development Plan (1995/96-1999/2000)

In addition to what has already been mentioned regarding the Fourth and the Fifth National Development Plans, this plan highlighted two other major issues. These were to enhance the quality of the input and output of higher education institutions, and to strengthen the relationships between higher education institutions and both public and private sector organisations (18).

2.3.2.7 The Seventh National Development Plan (2000/01-2004/05)

This plan was also quite different from the three previous plans except in pointing out the importance of the requirements of the private sector. This is regarded as important since higher education institutions must respond to the needs of the private sector in terms of supplying suitably qualified and skilled personnel if the private sector is to play a leading role in the development of the Saudi economy and continuing education. Traditionally, Saudi society has viewed education as coming to an end once a citizen begins employment. The government is keen to encourage its people to change this perception and to view education as continuing throughout life, allowing participants to develop, learn new skills and adapt to the needs of a changing world (19).

It is clear from what has been discussed that the objectives of higher education in Saudi Arabia have been largely determined by the society it caters for and by the type of growth and development that the country has encountered. Higher education must continue to adjust and respond to the new order and circumstances that the nation has to deal with in the foreseeable future.
2.4 The Study System in Saudi Universities

The study system in higher education institutions in Saudi Arabia is indistinguishable from some systems in most parts of the world today. It is composed of full-time, part-time, and external (or *Intisab*) models. Each university puts into practice one or more of these different systems to meet its underlying philosophy and to achieve its primary goals and objectives. The following paragraphs will explain each form succinctly.

2.4.1 Full-time Study

Full time study is the most common system used by Saudi universities. Every student has to commit him/herself to undertake a full schedule in order to meet the overall requirements of the study plans set by the university. Moreover, the university rules do not allow a student to sit an examination if he/she has been absent for more than 25% of each subject without an acceptable excuse (20). Within this system, Saudi universities practise two different study systems: a yearly system and a half-yearly or semester system (21). The yearly system is known as the traditional system which, until the last quarter of a century, has been applied to all education systems at all levels. At present, this system is implemented by the Islamic University in Madina and some colleges of medicine within other universities. In this system, a student does not have any choice in the selection of courses. Instead, he/she has to complete a predetermined schedule for a minimum of four successive years in theoretical colleges or five to seven years in colleges of medicine to be eligible for a Bachelor's degree. At the end of the academic year, the student is examined on-site once in each course. Unsuccessful students are given another chance to re-sit at the end of the annual vacation. If the student fails again, he/she has no other option but to repeat the year.

However, most universities in the Kingdom currently use the half-yearly (semester) system which replaced the old system that was based on credit hours. Students have to complete eight semesters (four years) successfully in order to be eligible for a Bachelor's degree in theoretical fields, and five to seven years in some scientific fields such as Medicine. Each year is divided into two semesters. Each semester consists of sixteen weeks including one week which is allocated for registration at the beginning of each semester. In addition, there is a summer semester comprising eight weeks, which is
introduced whenever necessary. In each semester students have study a fixed schedule of courses. Some courses may be divided into two equal parts. Thus, students study the first part in the first semester and the other part in the second. This means that each part does not have any relation to the other which appears to be one of the most obvious deficiencies of this type of system. Like the yearly system, this does not provide students with options in deciding their timetable but it differs from the previous one in the method of handling uncompleted courses. Students in this system may carry over two unfinished courses to the next semester and can then be examined in these two only. If a student fails in more than two, he/she is not qualified to move onto the next semester until these courses are successfully completed. In this system, the students must attend at least 75% of the lectures and the final examination at the end of the semester. They must complete the work assigned by the course teachers and follow their instructions. About 40% of the total course grades are assigned to course activities, and the remaining 60% allotted to the final course exam. Lectures are the main teaching method, particularly in theoretical fields, while lectures, problem-solving and experimental approaches are applied in all scientific subjects. The dominant teaching language in theoretical subjects is Arabic, while English is used at different levels in scientific fields.

2.4.2 Part-Time Study

Although this mode of study is less common in Saudi undergraduate programmes, it is offered in a large number of post-graduate programmes. It designed to respond to the needs of some students who cannot study full-time and yet who are eager to acquire a higher degree. The system enables every registered student to enrol on a number of courses (less than twelve credit-hours per semester) which are compatible with his/her work schedule. All part-time students have to engage in a regular on-campus course and have to fulfil all course requirements such as examinations, assignments and so on.

2.4.3 External Study (Intisab)

The underlying philosophy of the creation of this type of study system was to respond particularly to the needs of female students who did not have any sort of access to pursue their education through existing institutions which are dominated entirely by male
students. Imam Mohammed Bin Saud Islamic University first offered this system in 1965 in the College of Islamic Law (Shari'a) (22). This programme was later extended to encompass other specialties such as Islamic Preaching (dawa'), the Arabic Language and other subjects. This mode of study, which was available only to female students, ended in 1986/87, when female students became entitled to participate in higher education on campus (23). However, the system remains in place, and today both male and female students are able to join the programme. Prospective students, according to their type of study, have to have obtain a total GPA of at least 60% or an equivalent overall grade in the secondary school certificate. In addition, the university, at the start of the first semester each year, organises an orientation programme for two months for all potential students who must pass it with a total GPA of at least 75%. Furthermore, all working students have to have a clear authorisation from their employer to join and to attend any required examinations (24). Under this system students are not then obliged to attend any conventional classes throughout the academic year. The only attendance required is to sit the final on-site examination.

Following in the footsteps of IMIU, and for the same reason, in 1966 KSU initiated its own external study system for female students in some subjects including English, History and Sociology (25). These programmes did not differ from those offered to male students except in admission procedures, attendance and examination regulations. This programme was later cancelled once female students had the same chance as male students to participate in courses on campus.

In 1972/73, KAU was the third university to begin offering external courses but this time not for just female students; male students were also included (26). The main intention in establishing this programme was to assist in disseminating and facilitating continuing higher education whenever possible, to provide non-traditional students with an opportunity to pursue higher education at their own pace, and to support and sustain comprehensive national development in all directions. Students could be admitted to several subjects such as Administration, History, Sociology and the English Language. At this time, the courses used the yearly study system. Attendance based on this system is not mandatory. Nevertheless, students must physically participate in on-site examinations at the end of the academic year. Teaching methods and techniques are based on handouts and books that can be obtained from instructors and bookstores. These are the
main sources of knowledge for students in order successfully to accomplish registered courses.

However, in 1981/82 this yearly system was modified into a system of programmed study units. This required every student to complete six foundation units, twelve units in the student’s area of speciality, and six skills units (27). Also, all students must be present at an intensive introductory course for forty hours at the university’s base in Jeddah. Failure to gain a good grade in this course deprives the prospective student of the right to be accepted onto the entire programme. Although these external students are exempt from attending regular classes, they have to attend the final examinations, complete the work assigned by the course teachers and follow their instructions. The obvious deficiencies of this system are:

- Lack of interaction between instructors and students;
- Limited enrolment capacity;
- Subjects offered are limited to a small number of theoretical studies.

2.5 Saudi Universities

Due to rapid social and economic growth, the Saudi Arabian government has recognized the value of offering educational opportunities to all citizens. These opportunities equip them with the knowledge and skills to enable them to engage in achieving the goals and objectives of national development plans and to enable them to deal with likely future changes. As a result, the government founded and assists in funding eight autonomous universities throughout the Kingdom of Saudi Arabia. These universities are highly diverse in the programmes and courses they offer and therefore can be classified as:

- Multi-Discipline Universities:
  - King Saud University (KSU)
  - King Abdulaziz University (KAU)
  - King Faisal University (KFU)
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- Umm Al-Qura University (UQU)
- King Khalid University (KKU)
- Islamic Universities
  - The Islamic University (IU)
  - Imam Mohammed Bin Saud Islamic University (IMBSIU)
- Technological University
  - King Fahad University for Petroleum and Minerals (KFUPM)

The following paragraphs list these universities in chronological order according to their date of commencement and delineate some of their major features.

2.5.1 Multi-Discipline Universities

2.5.1.1 King Saud University (KSU)

This is considered to be the oldest university in the Kingdom according to its inception date; it is located in Riyadh, the capital city. It was officially established by a royal decree in 1957(28). The chief objectives of KSU are to create a convenient educational environment by providing highly qualified academic staff, services, and the necessary facilities and equipment. It also seeks to improve and develop educational programmes, to build strong relationships with other international Islamic and Arabic institutions and to enhance their interactions with Saudi society (29).

Presently, the University's main campus based in Riyadh is made up of fourteen colleges and one institute that serve various purposes. These include Arts, Education, Administration Science, Computer and Information Sciences, Sciences, Pharmacy, Veterinary Medicine, Design and Architecture, Engineering, Agriculture, Medicine, Dental Medicine, the Arabic Language Institute, the College of European Languages and Translation, and the College of Graduate Studies. The University also has two more colleges sited in its branch at Al-Gaseem City whose areas of study include Agriculture, and Economics and Administration. It also oversees two university hospitals. The
University awards Bachelor’s degrees in all almost colleges, Master’s degrees in a great number of specialties, and Doctorates in certain fields.

2.5.1.1 Academic Centre for Girls’ Higher Education at KSU

The Saudi Arabian government recognises the socio-religious right of women to participate in education. It was stated that the object of the education of a girl “is to bring her up in a sound Islamic way so that she can fulfil her roles in life as a successful housewife, ideal wife and good mother, and to prepare her for other activities that suit her nature such as teaching, nursing and the medical profession” (30). The first academic year for girls’ education at KSU was in 1961/62 when they were permitted to enrol in Arts and Administration Colleges in Riyadh (31). The academic centre for girls’ education was established in 1976 (32). One Dean and three deputies supervise the Centre and have responsibility for all academic affairs there. The Centre is now composed of the following faculties: Art, Administration, Medicine, Dental Medicine, Applied Medicine, Education, Agriculture, Pharmacy and Sciences. It should be noted that not all specialities within these colleges are accessible to female students. All lectures are normally taught by women; male teachers use CCTV.

2.5.1.2 King Abdulaziz University (KAU)

King Abdulaziz University is the only Saudi University of its kind since it was originally a private institution founded by an ambitious group of people who felt the need for higher education in the City of Jeddah. It was formed in 1963 to serve the whole population of the city and to assist in building the nation by modern means (33). The Saudi Arabian government supported its founders and provided them with the necessary assistance. In 1972, the University came under the complete control of the government by a royal decree (34). Its main objectives are to offer postgraduate studies, to qualify schoolteachers, make knowledge and science available through experimental scientific research, and to improve athletic as well as educational activities (35).

Currently, it has nine colleges in Jeddah; these are Economics and Administration, Arts and Humanities, Sciences, Engineering, Medicine and Medical Studies, Geological
Science, Marine Science, Meteorology and Weather Forecasting, and Dental Medicine. It also administers the Education College in Madina and the Community College in Tabuk. Like KSU, KAU provides female students with their own academic buildings and staff. One of the virtues of this university is its provision of traditional external studies (*Intitsal*) for non-resident students. It offers Bachelor's and Master's degrees, diplomas and doctorates.

### 2.5.1.2.1 Academic Centre for Girls' Higher Education at KAU

The University has established two branches in different locations for girls' education. The first was founded in 1967/68 and is situated in Jeddah; the other, situated in Madina, was created in 1979/80 (36). Each has its own administrative staff and supervisory committee. Moreover, each contains several departments and other educational services and activities. These sections are completely separated in physical terms from the male students' site. Like the Academic Centre for Girls' Education at KSU, all lectures are usually presented by female teaching members or by male teaching members via CCTV. Today, female students in Jeddah are permitted to enrol in Arts and Humanities, Economics and Administration, Science, Medicine and Medical Studies, Dental Medicine, and Home Economics. In the Madina branch, on the other hand, the female students must specialise in Education Studies. At the Academic Centre for Girls' Education at KSU, not all fields of study which are available to male students are open to women.

### 2.5.1.3 King Faisal University (KFU)

This university was founded by royal decree in 1975 in the eastern part of the Kingdom with its head office in Al-Hasa (37). It comprises faculties of Nutrition and Agriculture, Veterinary Medicine and Animal Husbandry, Education, and Administration. Because of the increasing demand for higher education and to alleviate some pressure on the main campus, the University decided to set up a branch in Dammam. This new campus consists of the Colleges of Medicine and Medical Science, Design and Architecture, Dental Medicine, and Applied Veterinary Medicine.
The major objectives of KFU are to provide higher education for citizens, encourage and support scientific research, meet the country's needs for technical manpower and schoolteachers, and finally, to promote social, educational, scientific and athletic activities (38). KFU offers a Bachelor's degree in all fields, several programmes for Master's degrees, and fellowships in many disciplines.

2.5.1.3.1 Academic Centre for Girls' Higher Education at KFU

The University has promoted education for female students since 1975/76 and hence has opened a number of colleges for them which, it is claimed, have been built and designed to offer programmes considered to be suitable for women, such as the Faculty of Medicine and Medical Science, the Faculty of Education, the Department of Interior Design, and the Department of Home Economics (39). However, female students do not enjoy equal opportunity with male students to study equivalent courses. Generally, all lectures are offered by female teaching members, or by male teaching members via CCTV.

2.5.1.4 Umm Al-Qura University (UQU)

The Islamic Law College (Al-Sharia) and Teachers' Education College are regarded as the root of this university which is located in Mecca; it was founded by royal decree in 1981 (40). It aims to employ whatever resources are available to provide higher education in order to qualify responsible citizens who are able to participate in the progress of their nation in the light of Islam, to endorse meaningful scientific research, to develop experienced manpower to supply the nation with specialized professionals in all aspects of knowledge, to extend educational access to accommodate students from other Islamic countries and to allow them to acquire the appropriate knowledge to participate actively in developing their nation (41).

At present, the University consists of colleges of Islamic Law and Studies, Education, Islamic Preaching and Fundamental Principles, Arabic Language Literature, Applied Science, Engineering and Islamic Architecture, Social Science, Medicine, and the Institute of the Arabic Language. In addition to these colleges and institutes, the University has
founded a new branch in Taif in order to provide higher education opportunities to students graduated from secondary schools and to ease some of the burden which exists in the central campus. For this reason, the Faculty of Education was installed in Taif to serve more students in that part of the Kingdom.

2.5.1.4.1 Academic Centre for Girls' Higher Education at UQU

In 1967/68, higher education study for females at UQU began as an external course (Intisab) in Islamic Law that aimed to produce well-qualified female teachers (42). In 1969, the University opened a new separate building for female students with its own administrative personnel and, for the first time, it started admitting females as regular full-time students (43). Despite the fact that female students are not able to study identical courses to male students, the Centre offers female students reasonable opportunities to study a variety of subjects such as Education, Geography, Psychology, Islamic Law and Studies, History, Arabic and the English Language. Lectures are given face-to-face by female teachers, or by male teachers via CCTV.

2.5.1.5 King Khalid University (KKU)

This is the newest university in Saudi Arabia and was created by a royal decree issued in 1999 (44). It was derived from the amalgamation of the branches of KSU and the IMIU in Abah. It has four colleges in its headquarters; these are Education, Islamic Law and Fundamental Principles, the Arabic Language, Social Science, and Medicine. It also has a community college in Jazan in the northwest of the Kingdom.

2.5.2 Islamic Universities

2.5.2.1 The Islamic University (IU)

As the name of the University implies, its mission and objectives are that it was founded as an Islamic institution to accept, educate, train, prepare and qualify Muslims students from all over the world to serve as disseminators and ambassadors of the Islamic religion within their own nations and elsewhere. It was established by royal decree in 1961 and is
situated in Madina (45). The major objectives of this university can be summarised as: to disseminate the Islamic message worldwide; to plant, deepen and promote Islamic teaching in the individual’s behaviour; to encourage scientific research in Islamic and Arabic studies in particular and knowledge in general as a whole, and to translate and publish such work; to preserve the Islamic and Arabic civilization; to build educational and scientific relationships with other international universities and organisations to serve the Islamic faith; to give Islamic education to students from all over the world; and to prepare and train individuals in Islamic preaching to answer the call for Islam (46).

The University incorporates five colleges offering Bachelor’s degrees: Islamic Law, Islamic Preaching and Fundamental Principles, Quranic and Islamic Studies, the Arabic Language, Hadith (the Sayings of the Prophet) and Islamic Studies. Furthermore, IU provides Master’s and Ph.D. degrees in nine disciplines in these faculties. IU provides higher education exclusively for male students.

2.5.2.2 Imam Mohammed Bin Saud Islamic University (IMIU)

This was originally formed from the amalgamation of the Islamic Law College and the Arabic Language College in Riyadh and was officially established by royal decree in 1974 (47). Its main goals are promoting the knowledge and understanding of Islam wherever necessary, and enhancing Islamic missionary activity wherever needed. It provides Islamic and Arabic higher education, focusing on Islamic research, translating and publishing studies, and emphasizing Islamic law studies. It qualifies students as Islamic Arabic scholars, meeting the needs of the country and other Islamic states (48).

IMIU directs all its activities towards teaching and supporting research which is relevant to Islam. Like KAU, it offers conventional external studies (Intisab) to non-traditional students. The degrees being offered range from Bachelor’s and Master’s to doctorate degrees. Female students have very limited access to a few specialities.

The University currently has seven colleges in Riyadh: Islamic Law, the Arabic Language, Higher Judiciary, Preaching and Media, Islamic Fundamental Principles, and Social Science. Additionally, IMIU contains the Institute of the Arabic Language which was created specifically to teach the Arabic language to non-Arabic speakers. In order to
extend and provide higher education opportunities to more students in different parts of the Kingdom, the University established the Colleges of Islamic Law and Fundamental Principles, and the Colleges of Social Science and Arabic Literature in Al-Gaseem, as well as the Preaching College in Madina.

2.5.2.2.1 Academic Centre for Girls’ Higher Education at IMIU

The first attempt made by IMIU to provide female students with the possibility of higher education was launched in 1965 by enabling them to enrol as external students in the College of Islamic Law (49). Then the University expanded its external programmes to embrace other subjects such as Islamic Belief (Agida), Islamic Preaching (Dawa), the Teachings of the Prophet Mohammed (Sunna), and the Sacred Book (the Holy Quran) and its Science.

In 1984, a dramatic change occurred in the University policy when it decided to terminate the external study programmes for girls and replace them with conventional full-time programmes (50). For that reason the University established an autonomous centre for girls’ education. The Centre was headed by a Dean who assumed control of all female students’ educational matters. Nowadays, the Centre offers, besides the above-mentioned subjects, the Arabic Language, and Library and Information Science. As with other academic centres for girls’ higher education in Saudi universities, female students are deprived of access to all fields of studies on an equal basis with male students. Unexceptionally, lectures are given to students by female staff, or by male staff via CCTV.

2.5.3 Technological University

2.5.3.1 King Fahad University for Petroleum and Minerals (KFUPM)

This University began in 1963 as a single college specialising in Science and Engineering Studies (51). In 1975, the University was created by royal decree to be connected directly to the Ministry of Petroleum and Mineral Resources from an administrative point of view. The university set up the following objectives: to balance the rapid economic and technological growth of Saudi Arabia; to increase the emphasis of the Saudi government
on global energy resources; and to support research and knowledge in the fields of energy, economics and technology (52).

The university is divided into eight colleges situated in Dahran (the main campus). These are Engineering, Applied Engineering, Sciences, Industrial Management, Environmental Design, Computer Engineering and Higher Studies. The university offers a one-year orientation programme as a compulsory introductory course that must be completed satisfactorily by students who have just been admitted to the university. All university programmes are for male students only.

<table>
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<tr>
<th>University</th>
<th>Students</th>
<th>Academic Staff</th>
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<tr>
<td></td>
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<td>Female</td>
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<tr>
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<tr>
<td>KFUPM</td>
<td>7157</td>
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Table 2.3: Number of students and academic staff at Saudi Universities (53).
* No statistical data are yet available.

2.6 Conclusion

Despite the fact that Saudi universities share common aims and objectives, they are not alike in providing equal educational opportunities in terms of access, types of fields of study and quality of education to female students compared with male students. These factors widen the gap between higher education provision for males and females and
have a direct and detrimental effect on accomplishing the goals and objectives of both
the individual and the nation as a whole.

The inequality of access and fields of study has been pointed out by Al-Rawaf (54) in her
study of women’s education in Saudi Arabia. She noted the key factors which affect
higher education for females. These include the conservative or negative attitudes of the
majority of Saudis towards female education in general and higher education in
particular. These attitudes stem from the culture of the people who believe that women
must play a traditional role within the home and should be respected in this sense. As a
result, women have been given very restricted access to higher education institutions and
are offered limited chances to study a limited range of subjects.

The poor quality of education being offered to female students was raised by Al-Manea
(55) who surveyed 134 female students randomly at four Saudi universities. The data
analysis showed that only 23.7% of them believed that closed-circuit television which was
being used to maintain segregation between male and female and to overcome the
shortage of female teaching members is a useful method of instruction. Although CCTV
classrooms are equipped with telephones for students to question their male lecturers,
this technique of instruction has been criticised for many reasons. Among the criticisms
are difficulty in communication due to classroom noise, boredom, and the lack of
positive participation and group discussion.

In fact, in recent years, the Saudi government and society have become more aware of
the urgent need to provide women with far more educational opportunities for the
increasing number of female students who have graduated from secondary school. They
recognise that they must take part, moving side by side with men, if they want them to
contribute to the overall development of the nation. This issue was officially raised in the
Fifth Development Plan as a major issue that must be addressed because it had become a
“source of concern to economic planners and policy makers because training and hiring
women would not only help solve the difficulties of indigenising the work force, but
would also help to satisfy the rising expectations of the thousands of women graduating
from secondary schools, colleges, and universities” (56). Consequently, the higher
education authorities have begun deliberating this issue to provide women with more
opportunities in deciding and planning their education although this is, as yet,
unresolved.
In 1992, a discussion took place among the highest education authorities to set up an exclusive girls' university and to open more colleges in a variety of subjects that would suit female students (57). This remains a proposal that may or may not come to be a reality in the future.

It can be concluded that the Saudi government is the chief provider of higher education studies to the entire population through its centralised funding and supervision. It plays a major role in setting up policy, and controls any possibility of future expansion, development and growth in terms of quality and quantity.

By looking at the geographical distribution of Saudi universities and their associated branches, it is noted that these institutions are mostly located in big cities, and are relatively few in number compared with the rapid growth of secondary school graduates. Certain institutions, such as IMIU in Riyadh and KAU in Jeddah, have made some effort to overcome this problem by extending their educational reach to people in other urban and rural locations through traditional methods (Intisab). However, these institutions do not have the capacity to provide a general solution to accommodate the huge growth of students in all parts of the Kingdom.

Saudi universities are of three kinds, defined by their field of study: multi-disciplinary, Islamic, and Technological. Each university robustly attempts to serve, provide and respond to particular educational and intellectual needs, desires and preferences within Saudi society. They are not competing with each other because all of them have one fundamental aim. This is to enhance the quality of life of every person as an individual and society as a whole in a constructive way and with the purpose of achieving maximum participation in carrying out the national development plans without abandoning the moral ethics and values of Saudi society.

Although the government recognises the importance of female participation in the overall development of the nation, females still lack equal access, opportunities and quality compared to men.
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Chapter 3:

IT Infrastructure and the Internet in Saudi Arabia

3.1 IT: Introduction & Definition

3.1.1 Introduction

In the course of human history, three eras can be distinguished: the agricultural age, which lasted through the 1800s, the industrial age that began after 1750 and lasted until the 1960s, and the information age, which is hallmarked by the evolution and pervasive use of information technology (1). IT has become an integral part of most nations of the world today. They are experiencing, in one way or another, substantial transformations in IT that have significant implications for and a profound effect on all aspects of social, political and economic life. IT alters the way people live, play and communicate with each other. It increases work productivity and, at the same time, decreases its total volume. It has a tremendous value for improving public services, the efficiency of business enterprises, management tasks, decision-making processes and educational provision, including virtual teaching and learning.

Generally speaking, all organisations, whether they are business firms, manufacturing plants, government agencies, public services, or educational institutions, now rely on some kind of IT. IT can be exploited to manipulate and produce information and to generate high-level multimedia presentations. Moreover, networks such as LAN, WAN, and ATM can be used to facilitate collaboration and coordination in terms of exchanging data and information instantly. CD-ROMs, which offer amplified storage capacity and capabilities, the telephone, fax, and satellites can be used as channels for enormous information pools and function as efficient communication platforms. Elliott, and Starkings (2) stated:

"The IT revolution has been significant for integrating and advancing the bounds of computer hardware and software tools and techniques. Furthermore, the IT revolution has been significant in the proliferation and advances made in transmitting and
telecommunications technology, from global terrestrial and extraterrestrial communications and networks, to local area networks and client-server technology”.

IT is continually progressing and now is the world’s third largest industry after healthcare and banking. The IT equipment and services industry estimated its size at US$748 billion in the late 1990s and anticipated exceeding $3 trillion in 2003 (3).

The Kingdom of Saudi Arabia is one of the nations that have been changed by the use of IT. The remarkable growth of IT use in almost all public and private organisations can be attributed to the government’s ambitious and enthusiastic effort to maximise the capacity of all government and non-government sectors, and improve the quality of life of the people.

This chapter does not attempt to trace every aspect of IT development and expansion in Saudi Arabia, but will focus on the current state of IT infrastructure available in KACST and the STC (Section 3.2 and Sub-Section 3.2.2) because those agencies are the backbone of IT in the Kingdom and play an outstanding role in the development of IT in both the public and private sectors in Saudi Arabia. In addition, the chapter will shed light on the current state of IT resources available in universities and their libraries (Sub-Section 3.2.3). This will complement Chapter 2, in which the general characteristics of the universities were described. The chapter will also touch on some of the major phases in the growth of the ‘Internet’ and its related technologies (Section 3.3). Section 3.4 will describe Internet provision in Saudi Arabia. There are conclusions in Section 3.5.

3.1.2 IT: Definition

After meticulous review of the existing literature, it is clearly evident that two general approaches have been taken to define the term ‘information technology’. Some authors attempted to confine themselves to the overall meaning of the term without debating the philosophical background of its origins (4,5). On the contrary, a number of other writers tend to be more intellectual and begin by tracing its derivation and then breaking it down
Chapter 3 IT Infrastructure and the Internet in Saudi Arabia

into two concepts: ‘information’ and ‘technology’; after an extensive discussion of each notion and the rationale behind them they reach a communal definition (6,7).

However, whatever definition has been used by them, it appears that the reason for this ongoing dispute is because the term ‘information technology’ is a relatively new term (8). Additionally, this question has been considered by authors from various disciplines who have dissimilar views. While this obviously adds some value, at the same time it enhances the confusion. Furthermore, information technology is rapidly changing, and therefore it is difficult in a practical sense for one definition to capture this swiftly shifting situation (9). The purpose of this section is not to argue the rationale behind the term; it aims to provide a general understanding of its meaning.

The Macmillan Dictionary of Information Technology (10) defines IT as ‘The acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a microelectronics-based combination of computing and telecommunications’. The definition of IT which was adopted by UNESCO, and as quoted by Hawridge (11), is ‘The scientific, technological and engineering disciplines and management techniques used in information handling and processing; their applications; computers and their interaction with men and machines; and associated social, economic and cultural matters’. In addition, Turban, Mclean and Wetherbe (12) argued that the term IT can be used interchangeably with ‘information system’ and then it has narrow and broader definitions. IT in its narrowest sense refers to information systems from a technological point of view. In this sense, it is composed of a range of devices such as hardware, database, software, networks and so on, whilst, in its broad definition, it refers to an array of information systems, clients and management for the whole organisation. Furthermore, Haag and Keen (13) noted that information technology means ‘a set of tools that helps you work with information and perform tasks related to information processing’. In summary, these definitions outline a number of elements, as shown in Figure 3.1, that collectively shape the essence of IT jargon.
In this study, the term 'Information Technology' indicates the integration, utilisation and application developments of all devices such as hardware, software, networks, databases and so on, whether in public or private organisations, with the purpose of achieving maximum efficiency in carrying out functions and tasks.

3.2 IT Infrastructure in Saudi Arabia

3.2.1 Government Initiatives and Policies

The Saudi government has played a major role in introducing IT into the Kingdom. It has vigorously attempted to connect all public offices with the latest technologies to improve the quality of work and services. In the meantime, it encourages all private agencies to follow in its footsteps by adopting and applying highly developed technology to smooth the progress of their organisations in competing in a changing business world. These efforts are an exact reflection to its long-term objectives, which were expressed...
firmly in the Fifth, Sixth and Seventh National Development Plans (1990-2004) as follows:

- Formulating and implementing science and technology policies, taking into account Saudi Arabian national, social and economic goals.
- Promoting the quality of locally produced goods and services which, in turn, will enhance the individual's living standard and the quality of people's lives.
- Motivating the expanding use of well-advanced technologies in all economic sectors, with particular emphasis on the use of capital-intensive procedures in the agriculture and industry sectors.
- Encouraging investments in the growth and utilisation of technologies in all public and private sectors in order to increase their work and the effectiveness of their services.
- Supporting continual development and improvement to create a solid national base for scientific research and technology, besides contributing to the development of national scientific and technological manpower.
- Organising and supporting joint international Saudi Arabian research programmes (15, 16, 17).

In order to meet the increasing demand for the free flow of information and to achieve these objectives in the area of IT and other related scientific issues, the Saudi government formed the Saudi Arabian National Centre for Science and Technology (SANCST) in 1977 which, in 1985, was renamed as King Abdulaziz City for Science and Technology (KACST). It is an independent scientific organisation, overseen by a supreme committee, chaired by the Prime Minister (the King) and composed of a number of defence, education and planning, economics and other ministers.

KACST is charged with formulating the national science and technology policies of the Kingdom, and with promoting and coordinating research activities among scientific institutions and research centres. Its basic mission includes:
- Proposing and recommending national policies and strategies for the development of science and technology applications and implementations.

- Administering and supervising all research projects in various scientific fields which involve providing award scholarships and training grants to support and encourage researchers and research institutions to conduct applied scientific research that will be used to assist the Saudi government in accomplishing its social and economical development plans.

- Coordinating the activities of the scientific research institutions to meet the Kingdom's rapid growth requirements, and encouraging cooperation with competent organisations to identify the national priorities and policies in the area of science and technology.

- Establishing and operating laboratories for applied scientific research in areas of particular relevance to the Kingdom.

- Fostering and encouraging the utilisation of computers and other related technologies in all public and private organisations (18).

In order to carry out these responsibilities effectively and efficiently, KACST is divided into several directorates and institutes (Figure 3.2) (19).
KACST strives ambitiously to obtain, make accessible and free the dissemination of scientific and technological information to all interested researchers and to the Saudi academic community. Such users can be connected directly to access various online databases including the Arabic S & T Bibliographic databases, the Latin S & T Bibliographic databases, and the S & T Terminology Data Bank in order to obtain data on almost all subjects. Its communication and information system infrastructure relies on an in-house developed system called Sun Spark 2000, which is based on the UNIX operating system and Windows NT Servers. It also uses IBM ES/9000 with 32 MB of memory with a VM/ESA operating system, which supports KACST's administrative applications. These computing facilities are accessible from the KACST-Intranet.

KACST has been involved in operating wide area networks (WANs) in the Kingdom since 1985. The network activities provided by KACST are as described below (20, 21, 22):

(A) **KACSTNET:** A dial-up communication network connecting about 93 scientific and research centres within government organisations in Saudi Arabia with KACST's central computer system via telecommunication lines transmitting at a speed not less than 2400 bauds/sec. It was initiated in 1982 to allow these institutions to access and retrieve information that is available in its own 18 national bibliographic databases, four of them with full text searching capabilities and stored in KACST's central computer. KACSTNET is also linked to the computers at the National Computer Centre (NCC) in Riyadh via a leased line. PASSTHRU software provides recipients of the KACST computer with internal communication with the NCC computers.

(B) **GULFNET:** KACST is a host site for GULFNET services. GULFNET was the first academic computer network in the Arab world, founded by governments of participating network members in 1985 to provide information support for academic institutions and scientific research. The network consists of fourteen nodes; eleven in Saudi Arabia and three in Kuwait. It is a store-and-forward computer network and not a distributed processing network that has been used to links numerous academic and research institutions in the Arab Gulf States with each other. It exploits the transmission techniques of RSCS (Remote Spooling Control System) protocol or JES2/JES3 subsystems of the IBM operating system VM and MVS respectively.
In an effort by KACST to increase its usefulness to the research community, in 1987 GULFNET was connected to a number of international networks such as BITNET (through a 9600 baud leased line between KACST and George Washington University in Washington, D.C.), NETNORTH in Canada, EARN (European Academic and Research Network), DPN in Germany and other international networks. However, in the early part of 1997, KACST disconnected its link with BITNET, which was planned to be shut down later in 1997. Simultaneously, it upgraded the automatic control system of GULFNET in order to have more communication lines to respond efficiently to the growing demand of researchers to obtain more access to national and international databases. Moreover, KACST set up a dial-up national communication network called KACSTNET with the purpose of providing scientific and technical information for researchers and the research community in the Kingdom with links to more than 55 research institutions and libraries in Saudi Arabia. Currently, the GULFNET topology (Table 3.1) consists of 15 nodes, of which eleven are in Saudi Arabia, three in Kuwait and one in Bahrain. The GULFNET hub node is located in Riyadh and is administered by affiliated members’ institutions through a steering committee. Its membership is open to not-for-profit academic institutions and government agencies. The main services provided by GULFNET include allowing users to transfer files, text, data and programmes to other nodes, to receive or send electronic mail to one or more recipients on the network, and to access information services available at KACST such as the National Bibliographic Database. It also allows access to other library services in institutions such as KSU, KFUPM and KAU.
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<table>
<thead>
<tr>
<th>Institution</th>
<th>Nodes</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>KACST King Abdulaziz City for Science and Technology</td>
<td>SAKACS00</td>
<td>Riyadh</td>
</tr>
<tr>
<td>KSU King Saud University</td>
<td>SAKS00U</td>
<td>Riyadh</td>
</tr>
<tr>
<td>IPA Institute of Public Administration</td>
<td>SAIPA00</td>
<td>Riyadh</td>
</tr>
<tr>
<td>GCCH Gulf Cooperation Council Headquarters</td>
<td>SAGCC00</td>
<td>Riyadh</td>
</tr>
<tr>
<td>SMH Saudi Ministry of Health</td>
<td>SASMH00</td>
<td>Riyadh</td>
</tr>
<tr>
<td>KFSHRC King Faisal Specialist Hospital and Research Centre</td>
<td>SAKFSH00</td>
<td>Riyadh</td>
</tr>
<tr>
<td>KFUPM King Fahad University of Petroleum and Minerals</td>
<td>SAUPO00</td>
<td>Dhahran</td>
</tr>
<tr>
<td>KFU King Faisal University</td>
<td>SAKFU00</td>
<td>al-Ahsa</td>
</tr>
<tr>
<td>KAAU King Abdulaziz University</td>
<td>SAKAUS03</td>
<td>Jeddah</td>
</tr>
<tr>
<td>IRTI Islamic Research and Training Institute</td>
<td>SASI0T00</td>
<td>Jeddah</td>
</tr>
<tr>
<td>UQU Umm Al Qura University</td>
<td>SAUQU00</td>
<td>Mekka</td>
</tr>
<tr>
<td>KISR Kuwait Institute of Scientific Research</td>
<td>KUKIS0R0</td>
<td>Kuwait City</td>
</tr>
<tr>
<td>IKSC IBM Kuwait Scientific Centre</td>
<td>KUIKSC00</td>
<td>Kuwait City</td>
</tr>
<tr>
<td>KUU Kuwait University</td>
<td>KUKU00</td>
<td>Kuwait City</td>
</tr>
<tr>
<td>BHU Bahrain University</td>
<td>BHUOBO0</td>
<td>Bahrain</td>
</tr>
</tbody>
</table>

Table 3.1: GULFNET nodes and locations
(C) CD-ROM Net: This technology is being used more commonly in Saudi Arabia by a number of higher education institutions, libraries and business enterprises because of its vast storage capabilities which do not require any telecommunication infrastructure and additional expense. However, in 1991, KACST formed a CD-ROM network to provide academic institutions and research centres with direct multiple access to more than 80 bibliographic, numeric and full text compact disk databases in science, technology and business through LAN.

(D) Saudi Net: This was the proposed name of the ongoing IP network in Saudi Arabia. It aimed to outline the required infrastructure that was needed for KACST to be connected to the Internet. KACST envisages a nationwide network, to connect all educational institutions, the government, and non-profit organisations in the Kingdom to one another and to the Internet through a national data backbone.

The Saudi government is continuing to provide large-scale support to KACST to achieve its basic mission of building a strong foundation for science and technology and ensuring that national development goals and objectives in these fields are served professionally.

3.2.2 National Telecommunication Infrastructure

The Saudi telecommunications sector is growing at a remarkable rate in terms of amenities and services. The government is continually devoting a large part of its resources to build a modern telecommunication infrastructure which will enable people, government and private organisations to communicate nationally and internationally. In the beginning, the MOPTT was appointed as the monopoly that assumed the responsibility of operating and regulating the telecommunication sector as well as the postal services (23). The MPOTT played a major role in establishing various networking facilities and services as described below (24, 25, 26, 27).

3.2.2.1 Switching Network

This includes a X.25 packet-switching network which consists of three switching nodes, in Riyadh, Dammam and Jeddah; 95 concentrators (Advanced Network Nodes) in 45
locations; and an international X.75 link to more than 50 foreign data networks. It also has point-to-point data communications that are available over 9.6 Kbps leased lines and more than 300 exchanges, wire-based phone lines with a capacity of 2 million phone lines, and wireless phone lines (analogue and digital) with a capacity of 200,000 lines. In addition, it has about 230,210 national trunks to ease the communication among various exchanges in different cities and 3850 junction routes to connect the exchanges within the same city.

3.2.2.2 Transmission Network

This contains about 3,500 Km of fibre optic cable with a 2.5 Gb/s SDH system. The FOT consists of 24 fibres and 5,000 Km of 12, 18, & 60 MHz. Approximately 4,000 Km of analogue coaxial cable system carry no less than 32,000 national telephony circuits between Riyadh and Dammam and between Riyadh and Jeddah. More than 26,800 circuits are special services, and there are 1,500Km of microwave system, 450 towers and 450 repeaters equipped with telephone and television breakout facilities.

3.2.2.3 Mobile Networks

In the Kingdom, there are two paging systems, POCSAG and ERMES, that have been installed to serve fifty-one cities. The ERMES-based digital paging network is connected with the packet switching network to provide personal computer (PC) users a means of sending alphanumeric pages from their individual computer. Additionally, there are two cellular systems that have been installed. The first is the analogue cellular system that was introduced as early as 1980 with a capacity of 30,000 lines. The second is the more advanced GSM 900 digital network. It has been in place since 1996, and serves more than 800,000 subscribers in almost all regions.

3.2.2.4 Submarine Cables

The existing coaxial submarine cables are based on the SEA-ME-WE (Southeast Asia/Middle East/West Europe) project that links Saudi Arabia with Egypt, a 70 km 565
Mbps fibre optic link the Kingdom with Bahrain and a point-to-point terrestrial microwave connection with Sudan. In 1998, the Kingdom entered a new era of its telecommunication infrastructure by signing and joining the FLAG agreement (Fibre optic Link Around the Globe) Telecom. It is a cable link based on Synchronous Digital Hierarch (SDH) technology, which comprises eleven countries including the United Kingdom, Spain, Italy, Egypt, the United Arab Emirates, India, Malaysia, Thailand, China, South Korea and Japan. The landing site for this project is located in Jeddah.

3.2.2.5 Satellite and Coaxial Cables

In 1985, the Kingdom launched the King Fahad Telecommunication City, and the country's seventh standard earth station for satellite transmission and reception. It is linked with the Intelsat, ARABSAT and INMARSAT satellite systems to allow recipients to dial over 200 countries worldwide directly. At present, Saudi Arabia has about 6,000 satellite circuits and 3,100 miles of coaxial cables.

In 1994, the Saudi Government awarded AT&T the largest contract in telecommunication history outside the United States: a $4 billion project to install a nationwide, fully digital telecommunication network (28). In 1997, the government decided to privatise a portion of the telecommunication sector through a private company, the STC, which was to be the sole telecommunication service provider in the country (29). The STC provides, in addition to standard telephone services, specialised services such as Internet services, data transmission and so on. The government has transferred all technical, financial and administrative facilities related to the telephone network and data transfer system to the new company. In 1998, the Saudi government awarded Lucent Technologies contracts totalling $810 million to add 575,000 GSM lines, and to upgrade the telephone switching network that covers more than 900,000 land lines (30).

By 2000 STC, as part of TEP-6 project, had successfully installed 1.5 million new telephone lines. Approximately 1,500 rural villages have been connected to the network using digital microwave radio and a fixed wireless local loop; the telephone network has been fully digitalised. Switching, transmission, fibre optics, intelligent network
management systems, a microwave network, and nearly 35,000 km of new copper and fibre optic cable have been installed. A new digital line with a capacity of 155 million pulses per second linking KACST with Internet cables in the United States and the world using sea cables has also been installed (31). Moreover, in 2001, STC began to offer the Asymmetric Digital Subscriber Line (ADSL) service which provides clients with limitless Internet access at speeds of 256 Kbps downstream / 128 Kbps service upstream, and with higher speed options planned for a later date (32). More recently, STC announced an innovative decision by introducing the first wireless communication network to the Saudi public transportation system (33).

3.2.3 IT Infrastructure in Saudi Universities

Each university in Saudi Arabia is entirely different in its existing IT infrastructure in terms of growth and development. Due to the lack of available literature on these issues, the following paragraphs have been devised from a variety of sources such as interviews with the directors of the computer centres of KSU, IMIU and KAU, and brochures, directories and web sites.

3.2.3.1 King Saud University (KSU)

The reasons for instituting the General Directorate of Computer and Information Systems (GDCIS) and related IT departments at KSU were to provide, install, operate, utilise, control and sustain the computer resources of the University. This in turn will support academic, research, administrative and other functions of the university. The prevailing objectives of GDCIS and associated IT departments are indicated in the following points:

- To devise a unified strategic plan for information technology to support the information and computing needs and requirements of the university.

- To develop an IT implementation plan and execute this plan to provide the hardware, network and software to support the goals set forth in the strategic plan.
To develop a System Reengineering Plan (SRP) to reengineer the university business processes using IT solutions and to launch the implementation of SRP starting with critical processes including student academic services, administration services, healthcare services, and technical support services.

To acquire, develop and implement IT and computing solutions to put into operation the Systems Reengineering Plan.

To design and implement the University Enterprise Database and to integrate and unify the information and data resources of the university as a by-product of the implementation of SRP.

To develop IT standards, policies and procedures to be used throughout the university.

To define, procure and install the hardware and system software to support the production of the IT solutions and SRP.

To define the network and communication requirements of the university to support the production of all IT applications and solutions.

To design and implement an integrated network and communication system to support the network and communication requirements of the university.

To provide the required IT training to all university staff.

To conduct the operation and administration of the computer and network systems of the university and to provide the required support for the production of the application software (34).

In order to achieve these goals, the GDCIS is divided into a number of units such as system administration, network administration, Internet/Web support, training and library and so on. The personnel at the centre numbers 48 workers (10 system analysts, 7 programmers, 10 operators, 13 keypunchers, and 8 administration staff). The centre provides consultations and necessary technical support to other computer labs that are scattered through several colleges. Every computer lab has its own technical staff.
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GDCIS serves more than 1900 academic staff, 40,000 students and over 4,000 employees.

Since the early days of the university, the computer centre has played an important role in adopting a practical IT infrastructure to assist in performing various educational and administrative functions and to keep up to date with the latest technology based on its existing funds. According to the Director of the computer centre of KSU, the centre at present has the following hardware (35):

- IBM S/390 Multiprise 2000 (CMOS-based technology) Model 2003-124 with two-way processor. It has 08 Escon, 15 parallel, 06 ISD and 02 OSA channels. It has a memory of 1 GB with a processing speed of 40 MIPS. It is equipped with 144 GB RAID-1 internal DASD (4 drawers of IBM-3390 model DASDs each of 9.9 GB capacity), which can be expanded to 288 GB. The operating system is OS 390 version 2.10. It has four logical partitions: Production System LPAR-P10, Development System LPAR-D10, System Programming LPAR-S10, and LINUX.

- IBM-3494 Automatic Tape Library (ATL) with two cartridge drives of model IBM-3590.

- IBM-2105 model E20-ESS Enterprise Storage Server which is connected to the mainframe via ESCON channels. It is equipped with 582 GB RAID-1 internal DASD (8 drawers of IBM-3390 model DASD, each of 18.2 GB capacity), which can be expanded to 1164 GB. In addition to the mainframe there are 2 server based midrange computers and six servers installed in the Computer Centre.

- Two SUN ultra enterprise E-5000: each has 6 processors and a storage of 63 GB. The memory of each is 1 GB and the speed is 167 MHZ. The operating system is SUN OS 506 / Solair 2.6.

- SUN-30 Netra Proxy Cache Server is used for e-mail. The operating system is Solaris 2.6.

- SUN ultra enterprise E-450 Server is being used for the Internet. The operating system is Solaris 2.7.
- SUN E-250 Zero-Based Server is used for a firewall. The operating system is Solaris 2.6.

- SUN ultra 10 servers are used for network management.

- Dell Power Edge is used as an anti virus server.

- Alpha-2000A-4/274 server is used for Windows and the NT workgroup. The operating system is Windows NT R4 and Oracle 8 release 8.0.5.

KSU WAN is a network of its various LANs that include the Diriyah Campus, Malaz, Ulaish and Qasim LANs. The new backbone of the LAN is based on ATM high-speed technology designed for both the LAN and WAN; the latest protocol TCP/IP has been used. Smart switches of Cabletron Systems are used to provide switched fast ETHERNET emulation to the end users. CISCO routers are installed in the Computer Centre and other remote colleges and administrative offices for remote access. Also, XYLOGICS and ASEND remote access servers are installed and connected through high-speed analogue and digital telephone lines to provide a Dial-up facility from homes as well as from campus. Additionally, a MAX TNT multi-protocol WAN access switch is also installed which gives a high capacity, multi-service platform and manages up to 960 concurrent calls over a dynamic mix analogue, ISDN, and T1/E1 lines.

The mainframe is connected to hundreds of terminals and printers, including the university library. These are available to the users in almost all colleges and administration departments through local controllers or modems at remote locations. The two servers (SUN-30 Netra Proxy Cache Server and SUN Ultra Enterprise E-450 Server) are connected to KACST through high-speed (2 Mbps) digital lines. It is now possible to communicate with all the universities of the Kingdom and other national and international networks. Users can access multiple systems, servers and multiple applications including e-mail and the Internet from home as well as from local or remote colleges and offices. All computing facilities are available to students as well as to teaching members at the university.

The academic centre for girls' education is connected to the computer centre through the fibre optic network. It has a very limited number of computers that are basically used to
perform administration functions. These are maintained entirely by the computer centre on the main campus.

3.2.3.1.1 Electronic Services at KSU Library

The Central library at KSU was opened in 1964. The first attempt which was made to automate the library services was in 1984 when the library installed the DOBIS/LIBIS system to provide computerised functions for acquisitions, cataloguing, circulation, serials, and to provide OPAC. The library adopted CD-ROM LAN to enable users to search these through terminals connected to the LAN. It has more than 15 CD-ROM bibliographic databases covering almost all major fields offered by the university. The library provides online search services via KACST. Recently, the library has provided users with Internet access which has been regarded as a remarkable step forward in library services. The Internet will promote the library services because it provides a quick, simple, cost-effective way of transferring and exchanging up-to-date information and accessing hundreds of libraries, archives, information centres and databases throughout the world in a short period of time. The library in its future plan intends to transfer all its material to the Internet in order to facilitate its access to limitless users. The library holds over 1 million volumes and 12,000 current periodicals with 91 professional and 118 non-professional staff (36).

3.2.3.2 Imam Muhammad Bin Saud Islamic University (IMIU)

The computer centre at IMIU installed the DG Eclipse C330 (DG 4000) 4MB computer to assist in performing online administrative functions. It is used to support more than 40 CRTs scattered all through its campus. At present, the IMIU computer centre is undergoing a massive transformation to renew its existing infrastructure in order to meet its current needs and possible future expansion (37). The Arabic on-line applications carry out several tasks, such as the payroll and personnel system records, the library system, the budget system, the student registration system, and so forth. The IMIU computer centre has Internet connection and thus teaching staff easily can access the network. The organisational structure of the IMIU consists of numerous entities, such as
the Internet Service Unit, Data Processing and Technical Support, Application Unit and so on. The centre is overseen by the computer council which encompasses in its membership those who have been selected by the university president. The main duties of this council are planning, supervising, assessing and executing these plans (38). The number of PCs available to teaching members is not yet sufficient. Unlike KSU where almost all colleges have computer labs, only a small number of colleges, such as the College of Social Science at IMIU, have computer labs. The centre employs about 18 personnel (1 faculty member, 4 system analysts, 2 programmers, 5 operators and 6 administration staff,) serving more than 15,000 academic members, 2000 employers and employees, and 30,000 students. It provides technical support and consultation to the university academic and administration staff. The academic centre for girls' education is linked to the main centre via a WAN. All computer facilities are entirely controlled and maintained by the Computer Centre. Computers are available only for administrative purposes. This means that female students and teaching staff have poor access to IT compared to those at the main campus.

### 3.2.3.2.1 Electronic Services at IMIU Library

IMIU library was established in 1974 to sustain and support its educational mission. In 1980, the library developed its own in-house systems to automate library-cataloguing services. The library provides its clientele with databases and online search services through KACST. The library collection is estimated at over 135,000 volumes and 1200 current periodicals with 54 professional and 28 non-professional staff (39).

### 3.2.3.3 King Fahad University for Petroleum and Minerals (KFUPM)

KFUPM created its Data Processing Centre as early as 1964, and renamed it in 1996 as the Information Technology Centre (ITC). The organisational structure of ITC comprises six departments: Academic Computing Services (ACS), Administrative Applications Services (AAS), External Computing Services (ECS), Networking and Hardware Group (NHG), Systems and Operations (S&O) and the Systems Development Group (SDG). Administrative applications such as student information systems, payroll,
personnel and accounting inventory are supported by AAS. An on-line library application DOBIS/LIBIS, providing search and other library services in the university library, is supported by SDG. ACS publishes a monthly publication titled *ITC In-Focus* reporting on various ITC activities and developments. The ITC mission seeks to provide:

- Development and maintenance of more than 30 administrative applications.
- Maintenance and support of university library automation hardware and services.
- Maintenance and support of the university enterprise network.
- Maintenance and support of computer hardware university-wide.
- Software installation, consultation and support on all various platforms.
- University course exams, entrance exams, faculty performance and course evaluation services.
- Seminars and user orientation on university computing facilities.

The ITC operates and maintains the following hardware resources:

- A Unix environment consisting of an IBM RS/6000 (7015-R24) UNIX server with 256 MB main memory and 26 GB disk space with the AIX 4.3 operating system, a UNIX server and a UNIX-workstation lab with 20 IBM RS/6000 (7011-25T) workstations. This is the main computing environment for academic users. Software packages available on the UNIX server and workstations include language compilers, text formatters, X-windows applications, simulation packages and E-mail services.

- A state-of-the-art IBM Enterprise Server IBM 2003-215, running on a 29 MIPS processor with 512 MB memory and 54 GB internal mirrored disk storage, is the main computing platform for administrative applications, such as Students' Information Systems, Material Management Systems, Human Resources Systems, etc. The server utilises the latest IBM operating system OS/390 with full online and batch processing support. The enterprise server is connected to the university token-ring backbone. More than 350 concurrent TSO and five CICS partitions are available.
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- Seven PC labs with a total of 7 servers, 150 PCs, 5 laser printers, and 7 heavy-duty dot-matrix printers connected in LANs are distributed in various buildings. The labs enable their users to use various PC applications such as word processors, spreadsheets, presentation software and specialised software.

- A large number of connected peripheral devices, including high-quality printers, communications controllers for remote dial-up facility and tape drive are also available (40).

Presently, the infrastructure provided by the fibre optic backbone is being expanded to connect all the computer resources of the university. The university is also connected to the Internet via KACST.

3.2.3.3.1 Electronic Services at KFUPM Library

The library was the first university library in Saudi Arabia to be established. It was created in 1964 to provide KFUPM members with access to its existing materials. In 1980, the library obtained the DOBIS/LIBIS system in its original English version to give students and teaching members access to its vast non-Arabic collections. An Arabised version was later developed locally to provide clients with appropriate access to the Arabic collections using Arabic scripts. The first online search service provided by the KFUPM library to its patrons was via the international telex network and then through International Database services with a low speed modem. Due to the rapid development and growth of library services, users are currently able to access more than 450 international databases via DIALOG and ORBIT databases search services, in addition to national databases provided by KACST via GULFNET. The library subscribes to ten CD-ROM databases: five in the science, engineering and business management areas; three in the reference area; and two in various parts of the library. It has approximately 22,000 Arabic books, 210,000 non-Arabic books, and about 1,600 serials titles to provide reference materials for almost 7531 students and 859 teaching members. The number of professional librarians is 29, while the number of non-professionals is 20 (41).
3.2.3.4 King Faisal University (KFU)

The Information Centre of KFU, which is situated in its headquarters in Al-Hasa, was established in 1984 to support academic, research and administrative functions. It began by installing an IBM 4342 machine with a central memory capacity of 8,000,000 characters connected to more than 159 terminals and printers distributed around the campus. Due to the rapid technological developments, it was decided to terminate the central machine in early 2000, and rely on LAN and WAN technologies beside other operation systems such as UNIX, Windows NT and Windows 95. For this purpose, the KFU Information Centre used fibre optic technology to link about 1200 PCs placed in various locations. The centre provides application system services, maintenance, training, electronic communications, statistical processing and so on. The Computer Centre is connected to the Internet through KACST with a high-speed 512 KB digital line. This service is accessible to all teaching members and students. The Centre consists of six units: Application Systems Unit, Computer Networks Unit, Maintenance Unit, Internet Service Unit, Technical Support Unit, and Training Unit (42).

3.3.3.4.1 Electronic Services at KFU Library

Electronic services were initiated in 1975, with the purpose of supporting the university's educational missions. The library utilised the MINISIS system from 1985 to automate its operational functions such as OPAC, cataloguing, acquisitions, circulations and reference. MINISIS was developed to support and conduct research into the problems of the developing regions of the world by the International Development Research Centre (IDRC) based in Canada. It operates on Hewlett-Packard 3000 minicomputers (43). The system was Arabised by the Arab League Documentation Centre (ALDOC). The KFU library was connected to GULFNET to access KACSTNET and other available databases on GULFNET. The library has more than 153,000 Arabic and non-Arabic books and nearly 1,240 serial titles. It has 13 professional librarians and 30 non-professionals to support about 12,000 students and 793 academic staff.
3.2.3.5 King Abdulaziz University (KAU)

The Computer Centre at KAU was started in 1976 using a small machine called DEC PDP-170. Because of the swift progress and demands for computer services from both academic and administrative outfits, the centre installed a number of machines including a 6MB IBM 3031 running under VM supporting more than 100 CRTs, IBM 3083, IBM 4381, IBM / ES – 9000 and finally an IBM OS390. KAU, through its computer centre, planned to implement a campus-wide area network. At present, KAU has a partial campus network, with three ETHERNET LANs located in the computer centre building (44). Most of the colleges and departments are connected and operate a token ring fibre optic network backbone at speeds of up to 16 MB/s. PC labs are positioned in certain colleges and departments to provide educational services for both students and faculties. The centre has developed and maintains several systems, with sub-systems to perform a variety of educational and administrational applications such as the Student Housing Sub-system, the Finance Sub-systems, and so on.

The mission of the computer centre at KAU includes participating in setting up an information technology strategy; developing and automating all administrative work; constructing central databases for all colleges, departments and administrative offices; providing technical support; planning and carrying out training activities related to computer usage; and serving the outside community through consultations, exchange of expertise, exhibitions and training programmes linked to computers and communications issues in general.

3.2.3.5.1 Electronic Services at KAU Library

KAU central library was founded in 1965. The library utilized DOBIS/LIBIS systems from 1986. The library provides online search to local databases stored at KACST and to almost 600 international databases through DIALOG, ORBIT and UNCOVER, STN, NEWSNET, NEXIE/LEXIS and EASYNET. This service is accessible to the university’s academic community as well as to the general public at no cost. The library has 35 CD-ROM databases, including six full-text images. It built a LAN to facilitate the flow of information to end-users whether on campus or at remote sites. The library encompasses no less than 435,000 volumes and 5210 serial titles and periodicals, and has
a staff of 45 professionals and 50 non-professionals to support more than 31,000 students and 1248 academic staff (45).

3.2.3.6 Umm Al-Qura University (UQU)

The UAQU Computer Centre was established in 1981 with the aim of supporting all colleges, departments and administrative offices in improving the efficiency of their jobs through proper computer deployment; designing and creating the necessary communication networks to link the central computer system with the available national systems; and supervising and controlling all computer activities within the university. These activities include peripherals’ preparation, installation and operation, in order to maximise the benefit of IT to the entire university community and to provide the necessary technical support and training. The centre has already installed a 4 MB IBM 4331 running under DOS/VSE supporting more than 20 CRTs. It has also a CD-ROM unit and a great number of PCs and printers. The organisational structure of the centre is divided, as described below, with a director of the computer centre, a deputy director, an application systems unit, a research and training unit, and an operational unit. The centre has purchased and modified in-house a number of software applications to assist in accomplishing the exact functions and requirements of the university educational and administrative applications (46).

3.2.3.6.1 Electronic Services at UQU

The library was founded in 1981. In 1986, it installed the DOBIS/LIBIS system for cataloguing, acquisition and circulation functions. Its connection to GULFNET allowed the library to benefit from the available databases on KACSTNET via GULFNET. It can conduct online searches through KACST. It houses about 400,000 Arabic and non-Arabic books, 545 serial titles, and currently serves more than 26,000 students, 1,229 teaching members, and 170 administration staff. The library employs 26 professional librarians and 35 non-professionals (47).
3.2.3.7 The Islamic University (IU)

Work on the IU Information Centre is still in progress. It relies on the National Computer Centre (NCC) facility which was established in 1974 by the Ministry of Finance and National Economy to perform the following functions:

- To run the Ministry's cheques & payroll system;
- To automate national budget preparation;
- To support other governmental agencies connected to the system;
- To monitor and maintain government expenditure, accounts and properties;
- To approve other governmental information centres;
- To train government employees from different agencies (48).

The Information Centre at IU has plans for further development. The Centre has software applications in the Arabic language which are used to carry out administrative functions. These applications, which can be updated on-line, include the student registration system, the personnel system, the payroll system, and the inventory system records (49). The university has Internet connection via KACST.

3.2.3.7.1 Electronic Services at IU

The library was established in 1961. It has developed its own in-house library system to automate cataloguing and reference functions. The library provides its users with online search services conducted through KACST. It contains more than 125,000 books in different languages to serve almost 2,845 students from 95 countries, and 222 academic staff. It has 10 professional librarians and 57 non-professionals (50).

3.2.3.8 King Khald University (KKU)

The KKU is the newest university in the Kingdom and is still under development (51).
In spite of all of the progress and development which has been made in IT utilisation in the Kingdom, there have been many challenges to both individuals and organisations for a variety of reasons:

- Inadequate policies, regulations and guidelines set by the government to ensure equal exploitation of IT in all government agencies;
- Computer illiteracy particularly within top management;
- Shortage of a skilled IT workforce;
- Lack of Arabic IT systems;
- Lack of technical support;
- Lack of top-management support (52).

However, in recent years and in order to minimise the potential effects of these limitations, the government has increased its investment in establishing IT infrastructure within all public organisations. It also, encourages KACST and STC as the two major IT provision to be actively involved in setting up short and long-term plans, and in developing and acquiring the latest IT to maximise the efficiency of their functions and improve their services.

3.3 The Internet International Network

3.3.1 Definition and Historical Overview

The Internet is an electronic worldwide collection of networks built on the TCP/IP protocol that allows an infinite number of computers to be connected with each other and to allow access to people to communicate and exchange data and information. This pioneering worldwide network system had its origin in the United States and Western Europe in the 1960s and 1970s. It had its origins in the U.S. Department of Defense. Its purpose was to design a network to function effectively and efficiently, even in a war. Its basic idea can be linked to the development of the "galactic" network concept, and the development of the packet switching theory, which was implemented in the early 1970s (53). In 1969 the DOD launched an experimental long-distance telecommunication
network called ARPA (Advance Research Projects Agency) which later changed its name to the Defence Advance Research Projects Agency (DARPA) with four nodes. The aim was to develop communication protocols that would enable networked computers in science labs throughout the United States to communicate transparently. This project, named the "internetting project", comprised two phases. The goal of the first phase was to develop a system of networks. This came to be known as the Internet. The second objective was to develop a system protocol known as the TCP/IP Protocol Suite, which describes the routing of messages over the Internet, computer naming conventions, and commonly used Internet services such as e-mail. This comes as a consequence of the developments of the Transmission Control Protocol (TCP) and the Internet Protocol (IP) (54).

The National Science Foundation (NSF), through the development of the NSFNET, now called the vBNS (very high Bandwidth Network Services) network, started the backbone communication service for the Internet in 1985 to provide high-speed links between various regional and local networks and to provide overall leadership and policy direction for the Internet (55). This effort proceeds by providing additional backbone facilities for the Internet in the U.S. through the NASA Science Internet (NSINET) and Electronic Support Network (ESNET). Major international backbones, such as the Nordic Union Network (NORDUNET) in Europe and others, provide connectivity to more than hundred thousand computers on a large number of networks. Commercial network providers in the U.S. and Europe participated in offering Internet backbone and access support on a competitive basis to a variety of patrons, nationally and internationally.

During the 1990s, however, the population of Internet users and network constituents expanded globally. It is estimated that the Internet consists of over 40 million computers, while the number of Internet users is 171.25 million worldwide and is expected to reach 500,000,000 by the end of 2003 (56). These include private networks, governments and non-government organizations, businesses, educational, health and research institutions and so on. The growth of the Internet can be measured in three ways: the number of host computers connected to the Internet, the number of users connected to those computers, and the amount of traffic carried. The increasing growth of the Internet encouraged the U.S. government to establish the National Research and Education
Network (NREN) as an electronic superhighway system in order to ease the exchange of data and information within research communities, to provide them with sufficient access to enormous information resources, and to facilitate their communication (57). Furthermore, two key objectives were envisaged: first, to re-establish some of its international competitiveness, and second, to provide an educational facility for both schools and the public (58).

Another noticeable development in the era of the Internet occurred when Senator Al Gore proposed, and Congress approved in December 1991, the High-Performance Computer Act which was officially known as PL 102-194 (NREN Bill). It provided funding for a National Research and Education Network (NREN). The suggested plan of the NREN included upgrading and interconnecting existing agency networks into a 1.5Mbps national networking test bed, integrating national networks into a 45Mbps backbone by 1993, and implementing a technological leap to a 2-3 Giga-bps speed from the mid-1990s (59).
<table>
<thead>
<tr>
<th>Years</th>
<th>Internet Key Developments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1969</td>
<td>ARPANET was established by DOD (56Kbps)</td>
</tr>
<tr>
<td>1970</td>
<td>E-Mail first used</td>
</tr>
<tr>
<td>1973</td>
<td>TCP/IP was developed</td>
</tr>
<tr>
<td>Late 1970s</td>
<td>First BBs COMMUNITREE Computer Bulletin Board System (CBBS) was developed</td>
</tr>
<tr>
<td>1980/81</td>
<td>Computer Science Network (CSNET) and BITNET were established</td>
</tr>
<tr>
<td>1983</td>
<td>ARPANET divided into two networks: ARPANET for Research and Development (R&amp;D) and MILNET for military operation.</td>
</tr>
<tr>
<td>1986</td>
<td>1986 NSFNET was formed to connect six NSF funded supercomputer centres (56Kbps).</td>
</tr>
<tr>
<td>1989</td>
<td>- NSFNET backbone upgraded to 1.5 Mbps (T1)</td>
</tr>
<tr>
<td></td>
<td>- CSNET and BITNET were merged to form CREN (Corporation for Research and Educational Networking)</td>
</tr>
<tr>
<td></td>
<td>- Internet Relay Chat (IRC) was developed</td>
</tr>
<tr>
<td>1990</td>
<td>- ARPANET was finally decommissioned</td>
</tr>
<tr>
<td></td>
<td>- Archie, a device for searching ftp sites, was released</td>
</tr>
<tr>
<td></td>
<td>- Wide Area Information Servers (WAIS) were released</td>
</tr>
<tr>
<td>1991</td>
<td>- NREN (high speed network) High Performance Computer Act or PL 102-194 (NREN Bill)</td>
</tr>
<tr>
<td></td>
<td>Gopher, an application for searching and retrieving information, was circulated</td>
</tr>
<tr>
<td>1992</td>
<td>- Advanced Network Services Inc was created NSFNET, through ANS, and upgraded to 45 Mbps (T3) on trunk routes</td>
</tr>
<tr>
<td></td>
<td>- The World Wide Web was developed</td>
</tr>
<tr>
<td></td>
<td>- Mosaic, an interface for WWW, was developed</td>
</tr>
<tr>
<td>1993</td>
<td>Plans for National Information Infrastructure (NII)</td>
</tr>
<tr>
<td>1994</td>
<td>Calls for the development of Global Information Infrastructure (GII)</td>
</tr>
<tr>
<td>1995-</td>
<td>NSFNet (NREN) backbone transferred to transnational companies (ANSnet)</td>
</tr>
<tr>
<td>1996-97</td>
<td>NREN backbone upgraded to 650Mbps</td>
</tr>
<tr>
<td>1997-</td>
<td>The University Corporation for Advanced Internet Development (UCAID) created the Internet 2 project.</td>
</tr>
</tbody>
</table>

Table 3.2: The most important developments in the history of the Internet (60, 61, 62, 63)

3.3.1.1 Internet Management and Administration

Currently, the Internet is not owned by a single organization. It is in essence a confederation of independent organizations that has committed itself to cooperate in order to make the Internet work. Each organization administers its own network, sets its own rules and procedures, and has different responsibilities. The Internet Society and
Engineering Task Force (IETF), that sought to advance the progress of Internet technology have been replaced and take the lead after the NSF in setting up appropriate policy regarding the Internet.

Figure 3.3: The organisational structure of the Internet (64).

3.3.1.2 Internet Connection

Generally, there are three popular approaches used to connect individuals and organisations to the Internet network. They include full connection dial-up connection and gateway connection (65). Figure 3.3 illustrates various types of Internet connection. Fundamentally, all these different methods depend on the capacity of the recipients and the nature of the requested services.

**Full Internet Connection:** According to this technique, the recipient's computer possesses a unique Internet registered name and address and obtains enduring telecommunication links with other network users.

**Dial-Up Internet Connection:** This approach means that the recipient does not own an Internet registered name and address on his/her machine. Therefore, it is compulsory that the recipient makes a dial-up connection to a qualified machine which has full access.
to the Internet and is capable of connecting the user’s machine to further machines on the network.

**Gateway Internet Connection:** This kind of connection allows the potential recipient to be linked to the Internet via a mediator such as American Online, CompuServe and so on. In this case, the recipient has to identify his/her machine to the mediator in order to be linked to the Internet and other machines on the network.

![Diagram of three common styles of Internet connection](image)

**Figure 3.4:** Three common styles of Internet connection.

### 3.3.1.3 Internet Applications

The Internet is an electronic superhighway. To give some examples, it can be used to:

- Exchange personal or official messages with colleagues, friends or relatives at other networked sites.

- Engage users in group discussions, exchange information and ideas with people who share a common interest, and seek information from them.

- Automatically receive information on world events, leisure interests, business matters, technological developments, and other professional issues by subscribing to electronic journals, conferences, newsletters and alerting services.

- Search in reference works, databases and libraries worldwide.
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- Retrieve journal articles, books, computer programmes and graphic images, and transfer them to a personal computer.
- Make use of computer facilities that are not available locally.
- Download new software or updates for existing applications.
- Browse catalogues of goods and services and make credit card purchases.
- Enable users to participate in distance learning and academic conferencing.
- Engage users in real-time 'chat' and multi player interactive games.
- Communicate with individuals or groups by means of voice only or voice and image.
- Publish information for access by other Internet users (66).

These tasks are performed through a number of software applications that combine the client-server and host terminal models of computing associated with the Internet. The most popular software applications on the Internet can be classified, according to the types of service they provide, into four categories as follows (67, 68, 69, 70):

- **Information Retrieval Tools.** The most common software application or protocols pertaining to this category is FTP.

- **Information Search Tools.** Search engines such as Google, Dogpile, Northern Light, MetaCrawler and so on are the most prominent application tools in this category.

- **Internet Communication Tools.** Several tools can be classified in this category, the most commonly used protocols being E-mail, Telnet, Mailing lists, Usenet, and Chat Rooms (IRC).

- **Internet – Multimedia Information Tools.** The World Wide Web is the most common tool in this group and also is the most commonly used Internet application.
3.3.2 The Internet in Saudi Arabia

Saudi Arabian links to the Internet can be traced back to 1994, when the King Faisal Hospital and Research Centre for Telemedicine established a satellite link with John Hopkins Hospital in Baltimore in the United States via the International Medical and Educational Data link (IMED). This was a connection managed by the Washington Coordinating Centre (71). Saudi ARAMCO, a commercial organisation, had been linked to the Internet for several years. Both organisations provided limited Internet access to some of their staff and a few government organisations. On the whole, Saudi citizens as well as non-citizens before the official announcement of Internet services in the Kingdom had to obtain Internet access via a dial-up service to foreign ISPs in neighbouring countries such as Bahrain, Kuwait or the United Arab Emirates. Otherwise, they had to subscribe to local networks such as Al-Naseej (www.naseej.com.sa), which provided limited services. For example, subscribers could obtain a national or international e-mail service, and connections to numerous national databases mostly via KACST.

In 1994, KACST was registered as (sa), the Saudi Arabia Top-Level Domain (TLD) Manager, with the aim of coordinating Internet services within the Kingdom. Later, KACST initiated a pilot project to provide exclusive and regulated dial-up connections to staff members at KACST and faculty members at KSU (72). This project was suspended in June 1996 due to government concerns about unacceptable information being available. Hamade, as quoted by Al-Turki (73), attributes the late introduction of Internet services in Saudi Arabia to the following reasons:

- Lack of overall national IT strategy and policy;
- Inadequate IT infrastructure to provide these services to the general public;
- Insufficient skilled human resources;
- Unavailability of control systems that would monitor the flow of information on the Internet;
- Shortage of Arabic browsers and software on the Internet;
- Lack of competency in the English language of many people in Saudi society;
The conservative and religious views concerning the introduction of the Internet into the Kingdom;

The conservative policy of the Saudi government pertaining to any technology that might change the social and political stability of Saudi society.

However, in April 1997 public access to the Internet was approved by the Council of Ministers with strict control measures. These new measures were put in place in the same year and the MOPIT, later STC, was directed to work jointly with KACST to begin offering Internet services to the general public. KACST and the STC provided the official regulatory and technical requirements for Internet services in Saudi Arabia. The STC was ordered by the Ministers' Council to boost its telecommunication infrastructure to meet the anticipated public demand for Internet services. It is the gateway for this service and provides leased lines to connect KACST and the ISPs at speeds of 512kbps, 1.024 Mbps, 1.536 Mbps (T-1), and 2.048 Mbps (E-1) with the major international ISPs (74). KACST, on the other hand, and according to the official arrangement, will be responsible for providing the know-how and the necessary technical support to government agencies wishing to have their own space on the Internet. KACST was appointed by the Council to be the only international connection point for the Internet in Saudi Arabia, to issue Internet Service Provider (ISP) licences that must be linked to the Internet through KACST, and finally to install a firewall or any other available technology to assist in monitoring and preventing the Saudi public from obtaining access to materials, such as gambling and pornography, that might conflict with cultural, ethical and social values.

In order to play its new major role in the Internet service world, KACST formed the Internet Service Unit (ISU). This consists of a network information centre, a network operation centre, an information security centre, and a support services and ISP relations department. This is designed to lease international communication channels with a large capacity from STC to make this service obtainable on request by any local ISP, maintain the national Internet hub and firewall, and to manage, approve and issue ISP licences to interested parties. Moreover, this unit will be responsible for directing Internet Protocol (IP) routing, for providing Proxy Servers in order to speed up the process of accessing the most auspicious sites and to filter objectionable sites in order to weed out
information deemed by the authorities to be socially or politically undesirable. It will also provide the network with all the necessary technical support and maintenance and finally will suggest and prepare all the required regulations and rules that will regulate Internet services in the Kingdom (75).

In January 1999, Saudi Arabia began a new era by allowing its people to have Internet access via domestic commercial ISPs. Out of almost 170 companies and small businesses which submitted an application to KACST for Internet services for the general public, only 39 were granted licences. Presently, just 27 ISPs, including STC, are providing this service in the Kingdom. These ISPs have been selected on the basis of the size and quality of their IT, the security available to them, subscription prices, the number of expected subscribers, telephone lines and connection capacity, and the channels owned by them. Accordingly, the ISP provides Internet services to end-users and offers all necessary technical support, advice and consultation (76).

3.3.3 The Current State of the Internet Network in Saudi Arabia

According to Metz, as quoted by Al-Tawil (77), Internet communication is structured on three levels as follows:

- Level One: ISPs (Internet Service Providers) are business enterprises that make the Internet accessible to the general public, and government and private organizations via dialup and leased lines. Every ISP is connected directly to the ISU at KACST via the National ATM Backbone.

- Level Two: The National Backbone which is being developed by the STC as a high-speed network (ATM) to most parts of the Kingdom. The ISU and all ISPs are connected to the National Backbone which carries Internet traffic inside the Kingdom.

- Level Three: The International Link that is operated by the ISU connects the National Backbone to the International Internet at a speed of 155 Mbps bandwidth.
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The process of obtaining Internet services in the Kingdom comes in three main forms:

1. Dial-up access which allows any potential recipient to obtain Internet connection by using the Public Switched Telephone Network (PSTN) that is used to link the end-user's computer via a telephone connection with the ISP using protocol PPP and by dialling a local number. Service providers under this scheme usually have two different subscription formats. Customers can either subscribe for a limited number of hours, where each extra hour is at an extra fixed cost, or for an unlimited subscription period (one month, three months, one year).

2. Through 64k and 128k leased lines, which connect a user's machine with the prospect ISP via a Digital Data network (DDN) or through ADSL lines. The ATM network is used to connect the ISP with KACST-ISU, while protocol SDH is used to link KACST with the Internet.

3. Through a one way satellite connection which is currently available via a number of ISPs in Saudi Arabia. Internet access cost is 0.075 SR per minute which is 33% more than local phone calls. The cost of a subscription account ranges between 25$-100$ per month.

In Saudi Arabia, there are more than 50 modem pools consisting of 15,000 modem ports. The ISPs can lease as much as is needed. The virtue of this approach is to allow the ISP to serve clients from any region in Saudi Arabia without any additional cost or even a physical presence. Protocol L2TP is used to pass protocol PPP from the modems set to the ISP through an ATM network. The ATM network consists of several core ATM switches in the major cities with a large capacity, while the rest of the country is linked with the nearest core ATM switches, taking into consideration the possibility of future development and complete independence (78).

Since 1999, Internet services have rapidly expanded and have been accepted more readily in Saudi society. The number of Internet users has shown a dramatic increase since the commencement of this service in 1999. Without actual official statistics, it has been estimated that the number of Internet users is now more than 200,000 subscribers and that this is likely to grow at 20 percent annually (79).
3.4 Conclusion

The principal aim of this chapter has been to provide a general background to illustrate the development and growth of IT within KACST, STC and the Saudi universities. It is clear from an overview of the IT infrastructure that KACST and STC are playing a major role in the development and progress of IT. They have built a variety of networks and established state of the art technologies in order to facilitate communication and the free flow of information nationally and internationally. This has been associated with a number of challenges including inadequate policies, regulations and guidelines set by the government to ensure the equal exploitation of IT in all government agencies. Other problems include computer illiteracy, particularly within top management; and the lack of a skilled IT workforce, an Arabic IT system, suitable technical support, and top-management support.

The chapter has also revealed that there are obvious variations in the development and growth of IT in Saudi universities. It is noticeable that KSU, KAU and KFUPM are
more advanced in terms of the availability of IT than other universities. This is because of the funds allocated and the administrative support which is provided for the advancement of IT in these institutions.

Finally, the chapter has pointed out that the development and growth of Internet services in Saudi Arabia is progressing rapidly and is gaining more and more acceptance within Saudi society. This has been validated by the dramatic increase in the number of Internet users since its foundation.
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Chapter 4:

Literature Review

4.1 Introduction

The aim of this study revolves around investigating the feasibility, practicality and desirability of establishing a virtual university based on the Internet and related technologies so as to deliver higher education courses and programmes. Therefore, the chapter aims to provide a thorough and extensive analysis of the literature related to this topic. In this regard, the chapter is divided into Sections 4.2 and 4.3. The first section will cover the advantages and limitations of using Internet technologies in virtual education; most of the literature which has been found pertaining to these topics tends to cover similar areas. In Section 4.3, on the other hand, the definitions of a virtual university will be covered from a number of different perspectives, as well as virtual university models. Very few studies have been identified pertaining to these subjects.

4.2 Advantages and Limitations of Using Internet-based Technology in Virtual Education

4.2.1 Advantages of Using Internet-based Technology in Virtual Education

The literature contains numerous studies from both theoretical and experimental perspectives that discuss the advantages and/or the value of using the Internet and related technologies such as the WWW, news groups, list servers, bulletin boards, FTP, video-conferencing and so on, in higher education institutions as a delivery medium for virtual degree and non-degree courses for on and off-campus learners. However, this study attempts to focus and concentrate on the major potential contributions of these new media in delivering virtual courses to those learners who are seeking higher education degrees and who cannot, for a variety of reasons, attend on-campus classes.
From theoretical viewpoints, Bates (1); Daniel (2); Cohen (3); Carr-Chellman and Duchastel (4); Lee, Hong, and Ling (5); and Helmi (6) indicated in their studies that the use of Internet-based technology in delivering distance learning courses or programmes presents higher education institutions with tremendous opportunities to expand access to education while enhancing its quality and decreasing its cost. There is increasing pressure on higher education institutions to respond effectively without additional spending to encompass an increasing numbers of students. This may be to meet the needs of those seeking higher education degrees, to meet the massive demand of adults who return to colleges to pursue their education, or to support lifelong learning and the needs of the workforce. The Internet is a global access network, which can reach and benefit certain disadvantaged groups of people who have been unable to attend traditional place-based educational institutions because of their gender, status, race, origin, religious beliefs, physical disability, geographical isolation, work-commitment, and/or lack of financial support.

Generally, it could reach almost anyone, regardless of time or space, once the required infrastructure and connection has been provided. Enhancing the quality of education comes from the multimedia capabilities of the Internet that can deliver courses synchronously (real-time) and asynchronously (non-real-time). This gives it further advantages in terms of interaction and collaboration that have been missing in previous media used to deliver distance education courses.

The multi-media capabilities of the Internet permit online instructors when collaborating with software developers to apply a variety of educational strategies in designing and developing high quality Internet-based courses that match each learner’s cognitive learning style. In addition, the Internet-based course is measurable and can be evaluated on a regular basis to ensure quality.

The cost of establishing the whole Internet-based programme may be higher in the initial stages because it requires an adequate infrastructure (hardware, software, technical support, high speed connection, and so forth), course design, development and management, staff development programmes, and other related matters. But all of this expenditure can be reduced through partnerships, consortia or private/public sector alliances. It also can be cost-effective for distance learners compared to the total cost of fees/tuitions required by traditional institutions. Another point worth mentioning is that
an Internet-based programme can be cost-effective for traditional institutions that cannot accommodate the increasing number of students because of limited resources.

In the case of Saudi Arabia, the higher education system has gradually begun to lack adequate resources in terms of staffing, facilities, space and funding to accommodate the rising number of secondary school students who are motivated to continue higher education studies. They may realise the value of utilising these technologies in delivering higher education courses and programmes to students widely spread throughout the Kingdom through the accessibility of the Internet. Its moderate cost and high quality will probably attract students who have been denied access to universities for whatever reason and encourage them to enrol in Internet programmes.

Mason (7); Berge and Collins (8); Bates and de los Santos (9); Houweling (10); Swan, Bowman and Holmes (11); and Kahle (12) suggested that utilising Internet-based technology in education offers the possibility of equity in the dissemination of educational opportunities within society. This refers to the provision of fair educational opportunities to whoever wants to proceed with his/her learning without restriction. In this sense, the Internet is most likely the best existing medium that can deliver education to an infinite audience worldwide regardless of their status.

The inequalities involved in providing higher education studies for both sexes and the unbalanced regional distribution of colleges and universities in Saudi Arabia creates a gap in higher educational opportunities that should be granted to every citizen living within the Kingdom. This issue can be improved by exploiting Internet-based technologies to facilitate the distribution of courses and programmes to whoever needs them.

A more recent analytical study of the pros of online learning via the Internet is provided by Taylor (13). He arrived at a rational conclusion pertaining to the potential reasons which have persuaded countless institutions and commercial organisations to utilise Internet-based technology in education and training programmes. First, for institutions, online teaching and learning has the ability to extend their educational reach far beyond their existing location. Secondly, for employers, online learning via the Internet can substantially reduce the cost of training, especially if the organisation has a remote location. Besides, since less time is spent away from the office, lower management costs result and productivity is increased. Thirdly, for students, online learning will enable them
to take control of their own learning and to learn at their own pace. Fourthly, for instructors, online learning represents a new and challenging medium with the availability of graphics and multimedia enhancements, automated submissions of assignments, and the ability to change the course virtually instantaneously. Finally, because of the accessibility of online learning anywhere around the world, faculties and students have the opportunity to build a global network of colleagues.

Lin and Hsieh (14) briefly reviewed several learning models such as Objectivist, Constructivist, Cooperative, Cognitive, Information Processing, Sociocultural, and Computational models in order to outline their assumptions, goals and instructional implications. According to several previous findings, they believe that teaching via the Internet, particularly the Web-based environment, is capable of giving the learner more responsibility to take control of his/her learning process. Certainly, the non-sequential learning, provided through the WWW via its various nodes and links, allows learners to search, locate, analyse, synthesise and assimilate the desired knowledge. Learners in this environment are no longer told what they have to do; instead they are able to develop their own learning and understanding at their own pace and in conjunction with their perceived needs and desires. However, this cannot be generalised to include every learner because some of them will find this new environment more enjoyable and attractive than they had previously experienced, while others do not. However, in both cases, the Internet-based course designer should carefully consider these individual differences in the development and production of the Internet courses.

Locatis (15) revealed that the Internet has unique features which offer new opportunities to educationalists to implement cooperative learning strategies in their online teaching. Likewise, Schneider and Block (16); Porter (17); Box (18); and Bates (19) pointed out that the most powerful aspect of the Internet, and more specifically the WWW, is the ability to demolish the distance learners' sense of isolation by offering interaction and collaboration. Volery and Lord (20) asserted that Internet-based technology has advantages over traditional technologies in two ways because it offers:

- Collaborative tools which offer a rich, shared, virtual workspace in which interaction occurs, not between an individual and technology, but as many-to-many, interpersonal communication among students.
Interactive tools such as simulations or self-administered quizzes which allow the students progress at their own pace through required exercises and self-assessments.

One of the major criticisms of the early distance education technologies, such as correspondence study, radio and television broadcasts, and audio and videocassettes, were that these technologies are just one-way communications which do not permit interaction and collaboration in a distance learning environment. Internet-based resources have overcome these problems and have introduced a variety of technologies for presenting text, sound, images, animations and video, which can provide one and two way communications. They have the ability to deliver courses either asynchronously (allowing learners to interact with the learning environment at a predetermined time and immovable location through some technologies such as e-mail, newsgroups or web pages), or synchronously (letting learners choose the time and place that are best for them through the use of videoconferencing or chat rooms, for example). These new functionalities are playing significant roles in changing the method of delivering distance education courses. They permit interaction between learner-learner, learner-peers, learner-instructor, learner-content, and learner-outside world, and promote collaborative working.

Correspondingly, Ragoonaden and Bordeleau (21) stated that the interactive media of the Internet, such as e-mail and hypertext navigation would give the learner the chance to participate actively in the learning process and to communicate easily with other learners due to their accessibility, level of interactivity and their ease of use. The possibility of interaction and feed-back in a virtual education situation because of e-mail would be likely to surmount some of the negative ramifications of asynchronous communication and isolation which are most often felt by distance learners. These interactive tools would enable learners to interact with one another, with their peers, their professor, and the hypertext content of the course site. In addition, it allows them to do research, either individually or in a collaborative manner.

These features of Internet technology provide instructors or Internet course producers with an opportunity to design a rich interactive learning environment that will fully explain a variety of concepts provided by an instructor or learner and eliminate possible
ambiguities that may occur through the learning process; they will also provide a clear sense of direction for the participant learner.

Bates (22) argued that the rapid advancements of Internet technology are changing the way of constructing and delivering teaching and learning materials. He also outlines several advantages of these new technological developments pertaining particularly to distance learners. Among these are:

- Tailoring education based on the learner's learning style.
- Inciting active learning participation.
- Stimulating a learner's critical thinking, problem-solving and decision-making skills.

The Internet means that courses are no longer constrained by geographical boundaries. This puts much pressure on online instructors to design and develop courses that can travel and gain acceptance across multi-cultural nations. The instructor must understand and manage these technologies effectively to design courses based on the actual needs and interests of learners. In addition, course designers should not restrict learners simply to factual knowledge; they have to provide learners with materials that challenge their thinking skills through problem-solving, case studies and group discussions. The emphasis here will be on a constructive learner-centred approach rather than the conventional teacher-directed approach. Learning in an Internet-based technological environment provides students with an opportunity to develop their cognitive abilities that allow them to research, identify, analyse and synthesise new information in order to construct their knowledge.

Takle and Taber (23); Lee et al. (24); and Atkinson (25) believed that the World Wide Web has several advantages which might encourage the use of these technologies in a virtual learning environment. These advantages include ease of use, flexibility, quick updating of materials, and materials that can be distributed across multiple platforms. The simplicity of using the Web is attracting and motivating distance learners to enrol in virtual classes without fear. Flexibility of the Internet-based classes gives distance learners independence in time and place; they can virtually learn anytime and everywhere. On the other hand, the Web is considered to be the fastest publication technology, thus, online
instructors could add or omit information related to the Web course rapidly and without much effort. Furthermore, conferences, including reports, video, slide images, and so on, can be published on the Web, allowing greater and more rapid dissemination. In addition, the TCP/IP protocol capability of the Internet allows different computers with different operating systems to communicate and to exchange information and materials freely. Moreover, the Web Interfaces exist on all computer platforms, which will allow materials to be accessed from any networked computer.

Wang and Ouyang (26) suggested that the WWW supports learner autonomy as well as group studies. Moreover, it allows a learner to study at his/her own pace. The World Wide Web lends itself to the concept of a learner-centred approach where the learner can take control of his/her learning outcomes. Because of this, the instructor should be aware of the uniqueness of each individual and design a Web course that matches the cognitive learning style of the learner. In addition, the instructor should consider group participation in developing Web-based instruction; this will encourage learners to work collaboratively, exchange thoughts and ideas, and benefit from each other's experiences. Furthermore, the nature of the WWW allows instructors to design courses that enable learners who have other commitments to study at their own pace. In this respect, Willis (27) mentioned that designing and developing a home page is considered to be an advantage of incorporating the WWW in distance education. It allows the instructor to provide information related to the course in one set and link students to information resources and databases. Students, on the other hand, can access the instructor's home page easily to view course activities such as course assignments, course instructions and course evaluations. Materials on the home page related to online courses can be easily updated regularly at no extra cost. Distance learners may build their own home page for publishing their work. They may use it as a way of introducing themselves to each other. Creating a home page is a straightforward process. It depends on using Hyper Text Mark-up Language (HTML) and can be learned in a short time. There is also a good deal of ready-made software available that can be obtained from the market or downloaded freely from the Internet. Tian (28) also indicated that, when utilising Internet-based technology to facilitate teaching and learning in a virtual learning environment, students could submit their assignments over the network to a server, where an acknowledgment of receipt of the work would be sent back to the students and the assignments would be assessed by the computer according to predefined standards. There are several
applications, such as the BOSS system, that can be exploited to carry out these functions effectively. With the support of the system, it is possible to have students' assignments submitted, compiled and tested automatically. This undoubtedly will alleviate the pressure of an increasing workload due to the growing number of students; it can also promote students' learning experiences, providing them with instant feedback.

Bates (29) identified two main reasons for the rapid application of the World Wide Web in virtual education.

- Through the use of browsers and a relatively simple programming language (HTML), the Web provides universal standards and interoperability between different machines and operating systems, which allows for global reach and access.

- The Web can be transmitted both through already-existing infrastructure, such as analogue telecommunications networks, as well as through high-speed digital networks, giving it a wide range of technical flexibility.

Altekruze and Brew (30) noted that the World Wide Web has unique features and distinctive advantages that can add value to distance learners. The Web provides convenient access to distance learners and links to libraries, databases, and other web sites that are relevant to the topic for the web class. Another study by Fahy (31), in a paper presented at the Quality Learning Inaugural International Symposium, outlined several potential advantages of using the Internet as a teaching and learning tool. These included providing online learners with widespread connections to a variety of information resources, multi-media accessibility, and encouraging personalised experience. Learning via the Internet and its associated resources opens a new era for distance learners to consult an unlimited number of information resources related to their courses; this will provide them with the knowledge and experience they need. A similar study is presented by McManus (32) who stated two advantages of using the Internet as an instructional medium for distance learners. The first advantage is the ability and power of the Internet to communicate instantaneously and cheaply across national borders, and the second advantage is the wealth of information available on the net.

It can link people from around the world cheaply. The second advantage, and one that is often overlooked when discussing the
Internet as a delivery system, is that it can also be a content provider. The Internet is, arguably, the largest and most diverse information resource in the world today. It is possible to incorporate the wealth of information available on the Net in your design. For instance, if you are designing a module on Renaissance Art History, you can include links to the Vatican Library and the Louvre, as well as to the Art History exhibition of the Australian National University, just to name a few. This sort of immediate access to information and resources cannot be found with any other medium.

Obviously, the Internet is a world wide network which assists distance learners through its accessibility and low cost to keep in touch with their instructors and peers, and to consult experts and seek advice pertaining to their work. In addition, the wealth of information that is available on the net is not just for the use of the instructor in designing online courses; it also allows students to access supplementary reading materials.

Cartwright and Valentine (33) argued that an experiment using Internet-based technology offers a number of significant advantages including enhancement of distance learning courses, access to dangerous environments, access to rare or expensive equipment, engagement of young students in science, cross-linking of scientific fields, and reducing the cost of conducting experiments. They further point out that these benefits do not, in essence, lessen the value of authentically practical experimental work but, to a great extent, they will promote science courses and contribute considerably to research.

Palloff and Pratt (34) confirmed that students who participate regularly in online classes are capable of acquiring technology skills. Since they are actively involved in the class and with the machine, they can also learn through time more skills related to the Internet such as, for example, sending and replying to e-mail messages, searching and locating interesting Web sites, downloading files, installing software, participating in newsgroups and so on.

From an experimental standpoint, Bartolic-Zlomislic and Bates (35) investigated three Canadian institutions in an attempt to justify the proliferation of online learning through the Internet. The study was built on data collected from student questionnaires, and from student and faculty interviews. The major findings indicated that the reasons behind the growing trend towards online learning were the ability of the Internet to reach those who could not participate in conventional classes, convenience of time and place of study,
cost-effectiveness, international collaboration between learners, and partnership and collaboration between institutions world-wide; this leads to a minimisation of cost and risk.

Owston (36), in his study, attempted to answer three questions aimed to measure the possible major contributions of using the WWW by distance education institutions. These questions are:

Q1. Does the World Wide Web make learning more accessible?

Q2. Does it promote improved learning?

Q3. Does it accomplish the above while containing, if not reducing, the cost per unit cost of education?

After a thorough investigation and analysis of several existing distance education institutions that deliver distance courses through the WWW, he found that the Web could make education more accessible to geographically scattered people; it could also increase the quality of education and minimise the cost.

Hobbs & Taylor (37) discussed the advantages of Web-based projects in information exchange and collaborative group work that had been conducted between sites in the UK and Australia. The general result of the project suggested that the major contributions of the WWW to virtual education are: encouraging collaborative work, facilitating discussion, offering numerous sources of information, providing a navigator, as a delivery medium, offering tutorials, and as an assessment tool.

Weller (38) described a web-based entry-level course (T171) that provided an introduction to the Internet and computers which was delivered by the UK Open University (OU). The course was initiated in 1999, ran for 32 weeks and had 900 learners over the Internet. He discussed a number of techniques including teaching through the use of narrative, collaborative group work, an activity-based approach, generic teaching of software, and structured study patterns incorporated by the course team. The course was successful in achieving its aims and student satisfaction was high. He pointed out that the use of the Internet in distance education has many advantages over traditional-based education. Amongst these are learning flexibility, quick development time, easy
updating and enhanced interaction, and feedback with learners. Weller further states: "The estimated student cohort for the course in 2000 is in excess of 6,000, many of whom will be studying degree profiles in areas such as Business, the Arts and Social Sciences, as well as Computing and Technology."

McLellan (39) discussed the experience of delivering a cyber course in Library and Information Management via the Internet to distance learners. After evaluating the course, she concluded that the most precise advantages of the Internet-based class are improving learners' technology skills, enhancing students' learning experiences, that it is cost-effective, it appeals to distance learners, and is flexible.

Schutt (40) conducted a study at California State University, Northridge, and aimed to evaluate the effectiveness of online instruction. The online class consisted of 37 learners studying the 364 Sociology course. Learners were divided randomly into two groups of equal previous academic performance. The first group consisted of 19 learners taught traditionally through listening to lectures and handing in assignments and homework, while 18 learners in the second group learned electronically through the World Wide Web via e-mail, newsgroups and a chat room. After an orientation session, students in the online class went to Schutt's classroom for a mid-term and final exam only. The study showed that the scores of learners who were taught in a virtual classroom were 20% higher than their counterparts who had learned in a traditional classroom.

Yazon, Mayer-Smith and Redfield (41) explored how students of a third-year university Genetics course experienced learning and teaching in a web-based course environment. Data related to students' attitudes towards the online course were collected through semi-structured interviews and covered two years of on-going study. The sample that had been extracted in the first year of the study represented about 33% of the students (13 of 40). Of those who volunteered to participate in interviews in Year Two, 48% of the students (24 of 50) took part in the study. During the interviews, students were asked about their beliefs about teaching, both generally and in the course, and their experiences of learning via the online course. The results suggested that the majority (58%) of the undergraduate students found the web-based instructional design helpful and well suited to their particular learning approach. They felt that the course presented a more holistic and practical orientation to the study of genetics than the traditional method. Nearly 64%
of volunteers believed that the web-based course provided them with greater flexibility for study periods and allowed them to go through the material at their own pace.

Similarly, Katz (42) conducted an empirical study of 67 first year students registered in two distance education courses offered through the School of Education at the Safed Regional College in Israel. The study was carried out in order to examine their psychological attitudes (independence in the learning process, level of control of the learning process and motivation to study by distance learning) towards the use of Information and Communication Technology (ICT). Both courses applied two different interactive technologies. In the first course, the instructor used a sophisticated interactive synchronous video conferencing system which allows professors and students to interact simultaneously. On the second course, on the other hand, students studied and interacted with their instructor by means of an online chat-room and email correspondence with questions and responses which supplemented the Internet-based study materials. Both approaches utilised email to facilitate instructor-student communication in the time between lectures. The findings showed that students were in favour of the interactive synchronous video-conferencing approach. It was significantly characterised by student satisfaction with learning (75.56%), students feeling in greater control of the learning process (71.42%), and motivation to study (73.97%). Additionally, this highly interactive course provided students and the instructor with instructional and learning opportunities very similar to those available to students in the conventional lecture room. At the same time, for students who were characterised by independence in their learning process, 62.61% preferred to study via the Internet-based distance learning system.

Another exploratory study was carried out by Motiwalla and Tello (43) on 550 students enrolled on 31 courses, most of them from an Information Technology programme. The intention was to measure students’ satisfaction with the Web-course model that incorporated real-time (synchronous) and non-real-time (asynchronous) modes. The overall results indicated general satisfaction with the course pedagogy and delivery mechanism. 75% of students were satisfied with a Web-based structure and format, 65% with material presentation, 52% with quality of discussion, 63% with quality of feedback, 75% with quality of assessment and 74% with quality of instruction.
Internet-based technology, with its vast capacity and facilities, could be adapted to fit a number of different pedagogical approaches. Fundamentally, it can serve as a catalyst for changing the approach to learning, as well as the practice of teaching. Obviously, through a carefully constructed Internet course, the instructor is able to motivate students to engage actively in the online course and to delve into a new way of thinking. Interaction can be promoted and materials can be presented in an interactive manner that will both sustain students' interest and provide opportunities for meaningful engagement with the learning materials, with fellow students and with instructors in a new way. Its features allow instructors to provide students with instant feedback and to monitor their academic progress.

McGorry (44) investigated the perceptions of two hundred and seventy part-time MBA programme students regarding Internet-based courses. The primary objectives of the study were to explore students' familiarity with the Internet, and to determine students' preferences for the Internet as a delivery vehicle for MBA education. McGorry reported that three hundred surveys were distributed to current active students; 270 were returned for a response rate of 90%. Of the 270 surveys returned, 262 were valid and analysed. However, of all the students surveyed, only 86 had completed the online course. The study reported that 88% of students were interested in learning more about the Internet, while 56% of the respondents indicated that they were interested in taking completely online courses. In general, students believed that the course material was appropriately adapted for the Internet and that they learned just as much as they would have had the courses been taught in a traditional classroom setting. An overwhelming majority said they would like to take more online courses and would recommend online courses to their friends and colleagues (67.5% and 78.3% respectively).

Madjidi et al. (45) reviewed some of the technologies available to educationalists and education institutions that can be used in the virtual learning environment to deliver courses in real time interaction (synchronous) through chat rooms and video conferencing or in non-real time interaction (asynchronous) through web pages, e-mail and newsgroups. They analysed the major strengths of these technologies and concluded that the Internet and related resources held great promise for the expansion of higher education opportunities to reach and benefit almost anyone who has Internet access. In
addition, these opportunities are likely to have an influential impact on the provision of virtual education in general.

Arbaugh (46) conducted a survey on MBA students at the University of Wisconsin Oshkosh to examine whether graduate business students learn effectively via the Internet and what factors are most likely to motivate MBA students to learn through Internet-based courses. The students were enrolled on Internet-based courses as well as traditional classes. In the Internet-based classes, students were taught remotely via websites using Lotus Learning Space software. The courses were Investment Management (MBA elective), Organisational Foundations (MBA foundation), Organisational Leadership and Change, Process and Quality Improvement, and two sections of Professional Skills (all MBA core). The major finding of the study was that MBA students perceived Internet-based classes as easy to use, more flexible, fostering interaction and encouraging students' involvement.

Fredericksen, Pickett and Shea (47) reported an evaluation of an Internet-based class in travel and tourism offered by the Internet Academy at Herkimer County Community College. 94% of students who completed the online courses in summer 1999 indicated that they learned as much as or more than they would have done in a traditional classroom. 82% of students completed the Internet-based courses in spring 1999, while 78% of students taking the same courses in the classroom completed. 70% of the students revealed that they intended to take more courses on the Internet and 45% wished to do all of their coursework on the Internet. In addition, the total number of student enrolments increased from 36 students in 1997 to 390 in the autumn of 1999.

Furthermore, Kekkonen-Moneta and Moneta (48) reported the outcomes of evaluating the effectiveness of Web-based, highly interactive and multimedia-rich e-learning materials by comparing students' learning outcomes in the lecture and online versions of an introductory computing course. The course (Computing Fundamentals) was taught in spring 2000 in the lecture format to about 105 students with two 50 minute lectures each week throughout the semester. In the online format, the course was taught to 180 students in the fall of 2000 and to 129 in spring, 2001. In this course, the semester began with two 1 hour 50 minute lectures to introduce the course and the new self-regulated learning mode to ensure that all students acquired the necessary familiarity with the university's computing environment. The weekly 1hr 50min. laboratory sessions were
arranged and organised in the same way in both the lecture and online courses and students were divided into groups of about 35 students. All students completed the same laboratory exercises in all courses. Students' learning outcomes were assessed in midterm and via final examinations. The midterm test had 21, and the finals 25, multiple-choice questions. Overall results suggested that the online course proved to be at least as effective as the lecture course in terms of students' learning outcomes. The online students' capacity to answer factual questions improved from midterm to finals, as it did for the students of the lecture course; the overall factual learning outcomes were similar in the two course versions.

In summary, the literature, both from theoretical and experimental standpoints, suggests that Internet-based technology will have a profound effect on the delivery of distance education courses. There are some advantages inherent in the technologies themselves such as flexibility, multiple platforms, multi-media capabilities, accessibility and ease of use, and lower costs. Other advantages evolve from the kind of instructional techniques that are incorporated into Internet course design. These may include the promotion of active participation, an increase in the quality of virtual education and a decrease in learners' sense of isolation through interaction and collaboration. The use of the Internet to deliver virtual classes could assist higher education institutions that have been constrained by their physical infrastructure in the increasing growth of students by expanding access to provide equal educational opportunities. Furthermore, these technologies will benefit those learners who reside a long way from traditional institutions, and allow them to achieve their learning goals and satisfy their egos.

4.2.1 Limitations and Challenges of Using the Internet in Virtual Education

The literature includes several studies that raise some potential challenges and limitations which may be encountered in using the Internet and the World Wide Web in delivering virtual education. These challenges cluster around five main issues:

- **Pedagogical**
- **Technical**
- **Cultural**
4.2.2.1 Pedagogical Issues

Mick (49) raised some concerns about student discipline and evaluation in a virtual learning environment. Because students and faculties are separated by time and space, it is the online instructor's responsibility to ensure the commitment of students to the online course and to know whether or not their work is original and authentic. This may be achieved by requiring them to do weekly graded assignments or by raising controversial issues and requesting them by name to participate in the discussions and make comments or ask questions. Also, an end of semester assessment of the student's overall performance can be based on the total grade of in-term assignments or by asking him/her to carry out a project on paper.

Hill (50) highlighted a number of problematic issues associated with creating a virtual learning environment via the WWW. These include information overload on the net that might cause learners to be frustrated or to be disappointed because of the time constraints placed on them. Indeed, distance learners can be overwhelmed by the information on the net when they lack instructor guidance. The online instructor should locate a number of useful sites that can be accessed by distance learners in order to avoid such disappointment. Moreover, information overload can occur as a result of increasing the amount of e-mail messages that distance learners may receive at once, or through class discussion in large groups. Some possible solutions to these issues are to secure distance learners' e-mail addresses and to limit the number of participants in the online class.

Luchini (51) considered the lack of proper and adequate collaboration and co-ordination among educators and technical professionals as one of the most serious obstacles to the development of effective educational instruction software. Obviously, a lack of proper collaboration between the online instructor and software developers can result in poor or unattractively designed courses. For premium online course design, the instructor has to present the instructional materials and learning strategies that he/she will apply to the
course and the software developers can then construct new learning software or suggest the best media and the most effective methods for adapting these materials and strategies.

Lawhead et al. (52) pointed out one of the pedagogical issues which should be recognised before adopting an Internet-based learning environment. The Internet learning environment has certainly changed the roles of both the teacher and the learner. On the part of the teacher, his/her role has changed from one who controls the whole learning process to one in which his/her main task is more to do with guiding, counselling and mentoring. Although the online instructor is no longer the 'sage on the stage', he/she is still equally crucial and valuable in a virtual class. He/she is still the creator of the course structure and of the activities within and surrounding it. The online instructor will remain the facilitator of interaction and of collaboration. Distance learners, on the other hand, are much more self-administered and will be deemed as true partners in the whole learning process. They must be trusted to follow their learning on their own with minimum supervision.

McIsaac et al. (53) conducted a qualitative study to examine students' perception of interaction in the Internet learning environment. Overall, the students' responses suggested that online courses did not provide them with appropriate feedback from the instructor; this caused them to feel isolated.

Wegner, Holloway and Garton (54) studied the effects of Internet-based instruction on student achievement and their attitudes to the learning experience. They reported that 50% of the experimental group indicated there was a lack of instructor direction and 29% mentioned a lack of course content and background as the major concerns in an Internet-based learning environment.

Garson (55) argued that distance education via the Internet and the Web may face issues regarding its lack of ability to stimulate a learner's critical thinking skills; it may even lower educational quality. Online courses should be designed to enhance and encourage learners' problem-solving skills through discussions, debate and questions, while the educational quality of online courses should be measured and evaluated continuously using quantitative and quantitative methods.
Distance learning via the Internet-based technology, as has previously been mentioned, is much different from that in a traditional classroom. Therefore, a good course designer should consider this and apply instructional strategies that are best suited to this new environment.

### 4.2.2.2 Technical Issues

Harrison (56) outlined several technological issues associated with using the Internet and the WWW in a virtual learning environment, including inadequate hardware and software, inappropriate infrastructure, lack of technical support and the increasing cost of state-of-the-art equipment.

Hara and Kling (57) conducted a qualitative case study on eight Master’s students who were taking a web-based distance education course, called B3002. This was an educational technology course in which students learn how to use information technologies in their areas of expertise. Six of the students completed the course. Observation, interview and documentary data were used for data collection. The study concluded that there are a number of factors which contributed to the non-completion of the course by two students. These included frustration with the technology, anxiety and confusion. Likewise, Saunders et al. (58) conducted a qualitative study to examine learner responses to Internet opportunities in a virtual learning environment. They reported that 44 percent of the students reported feelings of anxiety concerning their computer competency and 30 percent of the students mentioned the lack of a computer or of Internet accessibility as an obstacle, which impeded them from full participation in their Internet class.

Rockwell et al. (59) reported the survey responses of 207 faculty members teaching academic courses and 30 administrators regarding what they perceived as impediments to effective teaching online. The major obstacles they perceived were a lack of technology skills and technical support. The success of any virtual education programme depends heavily on the effort which has been made by the institution’s faculty members. An institution’s top management should prepare their faculties to cope with the shift from pattern-based conventional teaching and learning methods to a wide range of information and communication technologies. Faculty members should be able to access
hardware and software that support presentations; they should also be able to design and
construct online courses, develop online course evaluation methods and be able to
administer efficiently a virtual learning environment. These skills can be obtained
through workshops or short-course training.

Wegner, Holloway and Wegner (60) indicated that a learner's lack of technical and
technological expertise might preclude him/her from participating in a virtual learning
environment. Learners who intend to participate in a networked learning environment
have to have a basic knowledge of how to navigate, use commands to sign on/off line,
access software programmes, send e-mail messages, use the keyboard, and save and print
documents. All these foundation skills can be learned through orientation or introductory
classes at the beginning of online courses. However, these problems have gradually
begun to disappear due to the development of user-friendly and easy-to-use Internet
applications.

4.2.2.3 Cultural Issues

Berge (61) and Furnell et al. (62) discussed the potential barriers to effective online
distance learning through the WWW which have been identified by academic staff. These
barriers relate to fear and reluctance to deal with cultural change caused by the advent of
online distance teaching and learning methods. Apparently, this seems a universal
phenomenon; people often resist change, as they feel threatened and intimidated by any
new movement that might change their stability and the daily routine of their job.
Therefore, they show reluctance and an inability to adjust to this new move. Academic
members are not exceptional; they can sometimes be a barrier to such innovation,
particularly when institutions decide to incorporate information and communication
technologies (ICT) to support existing teaching and learning methods or to initiate new
distance education courses or programmes. However, change cannot occur all at once; it
takes time before full integration can be achieved. Institution decision-makers who are
ambitious and enthusiastic regarding ICT in their educational programmes must be
willing to adapt new methods when dealing with such change. They first have to make a
substantial effort to develop awareness within their faculties regarding the potential
advantages and possible pitfalls of this radical change. Second, they must identify the job
requirements of every faculty member who will participate in using ICT in teaching and
learning processes. Finally, they must provide faculty members with an infrastructure (hardware and software) and the technical support, training, time, funds, incentives, and rewards needed to perform effectively in this technological environment.

Wilson (63) and Ellis (64) pointed out what might be considered as major barriers to faculty participation in the Internet learning environment. These include: a lack of sufficient time to establish, develop, organise and maintain online course material; and an absence of administrator encouragement and support in terms of promotion, incentives, rewards and tenure processes. The online instructor has to overcome the absence of face-to-face interaction and collaboration in designing and developing Internet-based courses. These require him/her to prepare the courses knowing the equipment and its functionality; to adapt a variety of learning techniques, and to use different technology tools that meet individual learning styles. Thus he/she needs sufficient time to carry out all of these activities. Decision-makers must find ways to motivate support and encourage faculty members who take the time to build effective Internet-based courses.

Gladieux and Swail (65) reported that new information technologies would widen the digital divide between those who have and those who have not. This issue arises from the cost of obtaining state-of-the-art technology, Internet connections and telephone calls. This problem is more obvious in most developing countries where the majority of people cannot afford such technology. Governments and higher education institutions must take the initiative in bridging the gap between advantaged and disadvantaged people by providing adequate facilities and Internet connectivity to those who lack access to education.

Parrish and Parrish (66) examined the issue of accreditation and approval beyond state and national borders, which should be taken into account when delivering virtual education. The aim of accreditation is to maintain educational quality and to reduce the possibility of educational fraud. However, at an international level, this issue will remain unresolved unless governments and educational institutions world-wide agree on universal certification standards that can be used to measure the quality of education provided through Internet-based technology.
4.2.2.4 Ethical Issues

Albright (67); Douvanis (68); Colyer (69); Hobbs (70); Baird and Hallett (71); and Diotallevi (72) suggested that violation of ownership and intellectual property rights is one of the most fundamental issues that must be addressed and resolved before any attempts are made to initiate distance education courses or programmes. Copyright is intended to protect the creator's intellectual property. It permits a limited use of the original works after obtaining permission from the copyright owner. The use of Internet-based technology as a teaching and learning delivery mechanism poses great concerns about the potential for copyright infringement by a member of a distance education community. This occurs because the Internet makes it very easy to download or disseminate any digital information immediately at no cost. However, in order to avoid possible copyright violations, distance education providers must take proactive measures to put in place clear, readable and specific guidelines and policies regarding copyright and the ownership of materials. This policy may include an explanation of the meaning of copyright protection law, how to use other work appropriately without infringing it, and the consequences of violations. In addition, they may rely on security software or impose charge for access to limit access to enrolled students.

Lawhead et al. (73) pointed out that a lack of privacy and integrity might face distance learners in a virtual learning environment. Institutions that provide distance learning programmes through the Internet must guarantee confidentiality to their students by designing and implementing information security systems that prevent anyone other than the original distance learners from accessing the course.

Altekruse and Brew (74) considered the possibility of students cheating on online courses. This would negate the value of the whole programme. This is certainly a serious concern voiced by almost all Internet-based programme providers. The anonymity of the learner in a virtual learning environment makes it hard to identify any particular online student in examinations, or even in course discussions, unless the instructor incorporates video-conferencing, sets up an on-site exam as part of the course or requires specific access, control or authentication mechanisms to address identity questions.
4.2.2.5 Cross-cultural Issues

Collis and Remmers (75) discussed some problems associated with delivering distance learning through the WWW beyond national boundaries. The problems that they identified are educational and cultural differences, misunderstanding of language, misuse of vocabulary, shortage of well-designed, cross-cultural educational software packages, and a lack of technical standardisation.

Rumble (76) presented several potential challenges which an institution might encounter when planning to extend its distance education programmes across a number of countries. These include: insufficient funding, low quality education, political instability, inadequate tutorials, improper assessment procedures, violations of copyright, lack of access, and inappropriate technical support. Any institution participating in cross-cultural education should anticipate all of these problems. An alternative solution to whatever problem might occur must be suggested. Comprehensive planning is an integral part of delivering virtual education. Although it may not solve all the issues that are mentioned above, at least it will help in minimising their effects.

Downes (77) argued that one of the implications of using the Internet in trans-national education is increasing economic competition between educational institutions in developed countries and their counterparts from abroad. As a result of this competition, institutions based in less developed nations will recruit their faculties from more developed nations, in order to obtain improved expertise and credentials. At the same time, institutions based in the developed world will recruit faculty members from around the world in an attempt to add breadth to their teaching staff and to take advantage of the lower salary requirements of some of those teachers. In principle, education should not be treated as a commodity. It is a service that must be provided to everyone without such restrictions. When higher education institutions in any part of the world intend to deliver Internet courses outside their borders, they have to concentrate on the contents of the courses they are delivering and the effectiveness of the teaching strategies that they are emulating, rather than focusing on the amount of money they will get in return.

In conclusion, the literature highlights several issues that might affect the implementation of Internet-based technology in virtual education. These issues could be pedagogical, technological, cultural, ethical and cross-cultural. They must not be underestimated when planning and developing distance education programmes. However, to overcome, or at
least minimise, the effects of these challenges, comprehensive planning of virtual educational programmes must be put in place. This should include careful course design that takes into consideration the educational needs of the learners including their learning style and the capacity and capability of the Internet learning environment. Furthermore, the success of any virtual education programmes via Internet-based technology relies heavily on the availability of a number of viable factors including:

- Strong commitment and leadership is crucial to provide equal access and continuing educational opportunities to every potential learner.

- Devotion and commitment of the government or institution to provide the necessary funds and infrastructure (i.e. hardware, software, connection and technical support) to develop virtual education programmes.

- Equal education opportunities for both genders.

- Collaboration and co-operation between parallel educational providers in terms of sharing resources and experience.

- Time allocation for faculties to design online courses.

- Administrative support for faculties working in a virtual learning environment through training, promotion, incentives and other supportive procedures.

- Collaborations between faculties and software developers to generate well-designed courses that match individual cognitive learning styles.

- Course quality measurements and standardizations.

- Knowledge of the learners’ educational needs.

- An appropriate student support system.

- Continuous evaluation and assessment.

- Staff development programmes.

- Ethical conduct regulations.
4.3 Virtual University Models

4.3.1 Definition of a Virtual University

The term "virtual university" is relatively new and has emerged in the field of distance education literature to indicate the rapid growth of the use of ICT in delivering education on and off campus. It is a new form of organisational structure which is assumed to be similar in its basic functions, such as teaching, administration, support and research, to its counterpart, the conventional institution. The difference is that it offers courses and instructional programmes through the Internet and related technologies to allow prospective learners to have the opportunity to learn at their own pace, space and place.

In the literature, several authors attempt to define the concept of the virtual university. Wilson (78) described the virtual university as "one which loses much or its entire geographical locus (geographical virtuality)...and (it) makes the best use of virtual capability." Wilson further noted that the geographical virtuality represents the consequence of the application of technology and its obvious uses; and the virtual capability represents the most effective use of this technology in building higher levels of capability in a university. According to Comford (79), the virtual university (VU) is a university without walls which is seen as "an institution that has torn itself free from the geographical confines of the campus, using the new communications technologies to connect learners, potential learners, teachers, researchers, alumni, employers, research funders and administrators in a flexible ever-changing network organisation."

Whittington (80) defined the virtual university as anything that delivers higher education to students via the World Wide Web. He further stated that this encompasses new but fully-fledged degree-awarding institutions offering distance education initiatives within existing traditional institutions. Davies (81) pointed out that "a virtual university must be a real university offering learning opportunities otherwise denied. It must be, above all, a network for life-long learning that meets the new learning needs of a new century."

It is evident from the above definitions that the term "virtual university" has been described and defined in a variety of ways, which reflects the wide disagreement between specialists in establishing a unified definition. Nevertheless, it can be observed that the concept of a virtual university implies the following common characteristics:
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- The use of sophisticated ICT will have a major impact on the concept of the virtual university.

- The virtual university is not a traditional institution and it does not have an existing campus, offices, instructors and locus libraries. Instead, it has an electronic network which is capable of performing the same functions as a conventional university but in more democratic and flexible way.

- The emergence of the virtual university is derived from the urgent need to acquire knowledge and skills.

- Co-operation, collaboration and communication are significant elements of the virtual university.

- The mission of a virtual university is to increase educational opportunities, reaching widely dispersed learners who were barred from taking traditional university classes.

- The organisational structures of a virtual university can be represented in various models.

4.3.2 Virtual University Models

The current state of ICT has a major influence on the recent development of virtual universities. However, while the literature has embraced much writing about virtual education as a new paradigm providing learning to on/off-campus learners and the empirical initiatives of forming virtual universities in many developing countries, there is a paucity of valid and systematic studies dealing with the issue of virtual university models. In this respect, the literature can be classified into two main categories regarding this issue. The first has a greater focus on the overall organisational structure of the virtual universities, while the second is more concerned with the components that comprise the virtual university.

One of the major and most comprehensive studies of virtual education models in general is that of Farrell et al. (82) who differentiated between two dimensions that have a substantial impact on the development of virtual education models worldwide. The first
is the tendency to introduce ICT into teaching and learning processes causing the creation of new forms of virtual educational institution models, though Farrell further notes, "these models are not mutually exclusive and undoubtedly others will develop quickly." Based on this dimension, he divided the current examples of virtual education into five main categories:

- Traditional multi-institutions that are offering virtual programmes as well as on-campus programmes. (e.g. the University of Phoenix Online).

- Single-mode distance teaching organisations using print-based delivery and created originally with relatively clear and exclusive mandates. They have had to reinvent themselves by using ICT to support their distance programmes.

- Broker-type organisations established to obtain and deliver programmes from other institutions. Adding value through flexibility of access and transferring of credits are the main advantages of this type of organisation.

- Information and facility provider-type organisations such as the University for Industry in the UK. This type was founded to support learners and institutional needs.

- Institutions created with no intention to supplement learners with direct instructions; instead they have authority to award credentials and provide other services. One example is the Western Governors University in the United States.

The second dimension that has fostered the emergence of new virtual education models is the meteoric growth of the private sector. This has created three distinct models:

- For-profit institutions such as The University of Phoenix and Jones International University that were created to deliver direct instruction to a more focused target niche market.

- Corporate organisations that established network training for internal training needs are now attracting outside training opportunities and are striving to gain official recognition. One example is South Africa Telecom.

- For-fee service organisations that concentrate on providing certain kinds of service such as consulting, project management, technical support and so on.
Farrell concludes that, although these models are not yet having a concrete impact on education at primary and secondary level, they promise to develop quickly. Similarly, Baer (83) presented a variety of virtual university models that are being affected by the integration of the Internet in delivering distance education courses and programmes. The most noticeable models are:

- Traditional (non-profit) colleges and universities.
- Non-profit open universities.
- Non-profit virtual universities.
- For-profit universities.
- Internet software and networking firms.
- Content and training firms.

He believes that collaboration between non-profit and for-profit organisations is essential for the success of any of these models in delivering distance learning courses or programmes to learners in different locations. Certainly, this sort of mutual partnership project, whether it is direct or a third party alliance, is considered to be crucial and inevitable for the success and achievement of the vision of a virtual university. Through mutual development projects with IT vendors and other institutions and organisations whether public or private, the overall cost of operating and maintaining the IT infrastructure may be partially met. This reduction in cost can be used to enhance the quality of the educational programmes, the development of faculty technological skills, advancing and upgrading the existing IT to promote the quality of online courses, or conducting scientific research to name a few. Another aspect of major interest in partnership would be in the area of developing, designing and delivering Internet-based courses and programmes with a variety of like-minded institutions and companies that had sufficient skills and knowledge, as well as joint research projects and the development of technologies with potentially wide applications.

Similarly, Khakhar (84) identified four main types of virtual university:

- Single-mode institutions, where the main focus is to design and deliver courses to distance learners. This means that all management functions and responsibilities
such as planning, funding, staffing and other resources are dedicated to achieve this goal.

- Dual-mode institutions which, besides delivering on-campus classes, also deliver virtual education to non-traditional students.

- Mixed-mode institutions where both conventional and distance education is designed, delivered and supervised by the same academic members.

- Consortia, in which a number of institutions within a state or nation engage in partnerships to provide distance teaching under a single management unit.

Khakhar further emphasised that in all these diverse types, procedures will be needed for defining and reviewing the institutional mission; for allocating human and financial resources among competing student demands and markets; for selecting, appointing, training and monitoring teachers; for recruiting, registering and supervising students; for selecting and controlling the use of technologies; for controlling materials production systems; and for managing budgets and finance.

These evolving new organisational structures of a virtual university have been influenced and stimulated by the advancement of digital communication and learning technologies. This comes together with the growing demand of learners, instructors and institutions for more cost-effective and anytime, anywhere high-quality education. Every model has its own conceptual basis and thus incorporates particular features which have been developed and designed specifically to compete with other models on the one hand and with its parent ‘traditional university’ on the other. Furthermore, each organisational model is produced to comply with a variety of new educational opportunities. In practice, some of these models are still in their infancy but others are highly complex and well organised.

Stallings (85) examined in detail the pros and cons of adapting either for-profit or non-profit models for the virtual university. He noted that “the dominant model must successfully cope with many issues concerning the status of the faculty, the role of government, the priority of technologies, the costs of resources, and of course, how effectively and efficiently that model promotes the preparation of the student for career
and society.” After an exhaustive examination of both the for-profit and non-profit models he argues that the for-profit model is the only model that could meet the needs of a changing society. He encourages other virtual institutions to take into account this model as a primary option if they are going to survive and compete in the changing world of the future. This view is supported by another study by Sperling and Tucker (86). They emphasised that institutions that aimed at providing education to adult learners should be started up as for-profit institutions because the following factors:

- For-profit universities are labour but not capital intensive.
- The primary goals are growth and profit.
- They have a responsibility for providing high quality education to adults at the learners’ convenience.
- They have accountability for operational efficiency.
- They respond to national educational change with less cost and in less time.
- There is greater focus on achieving learners’ goals.
- They incorporate quality management and a faculty governance system to ensure that a quality product is being delivered.

In the for-profit institution, setting, a number of issues must be resolved before carrying out such a project. First, maximising revenue is considered to be a critical factor in progress and success. This can be achieved through a feasibility study or meetings between the academic communities of the university (academic staff and decision-makers) and the corporate enterprise. These must find proper ways to increase revenue through increases in student enrolment, by providing on-demand training programmes tailored to a particular company, conducting for-fees workshops or seminars related to technical or vocational training courses, or providing other additional educational services. The value of this process is to give an estimate of potential revenue prior to the inception of the whole programme. Another crucial feature of a for-profit virtual university is the time available to market its courses and programmes to the potential recipients. This is usually constrained by the rapid advancement of technologies which must be taken into account in setting it up. Furthermore, a systematic approach to course
development and implementation, as well as standardisation of the curriculum, is of great importance in the overall measurement of its educational outcomes. However, despite all of these fundamental elements which can be denoted in the successful implementation of for-profit virtual university institutions, a majority of educational authorities view for-profit institutions as a means of delivery of education, that is, as a commodity not as a service; this may reduce the quality of the provision of education in general.

Davies and Stacey (87) evaluated the performance and experience of the Open University in the UK as a single-mode example, and Deakin University in Australia and Florida State University in the USA as dual-mode models. These institutions highlighted the major reasons behind their success and outlined their roles in delivering a high quality education at university level in those countries. The effectiveness and success of a single or a dual-mode depends heavily on the availability of political and community commitment and an effective student support system. The study concludes that while both modes are effective and successful,

"The advantage of the dual-mode approach is that it can be applied to an existing institution... such a model may well be a way of helping to deal with the problems that higher education institutions face in meeting the increasing demand for student places, for life-long learning and for affordable professional development."

Whittington and Sclater (88) started their study by distinguishing four virtual university models currently offering education and training courses and programmes via the Internet. These are:

- Virtual front ends for single, existing institutions. In this model, an existing university founds a separate virtual faculty or department that is responsible for delivering online courses to off-campus learners.

- A collaborative venture between existing institutions. This is a model where the participant universities work together as a unit. They agree to establish a new institution to deliver accredited online courses.

- A virtual university model that is specifically created to respond to the increasing demand of adult learners for virtual educational courses.
Commercial enterprises which build their own websites to meet the training needs of a single company. These institutions do not offer accredited degree courses.

They then propose a three-layer model for a virtual university. These are: the organisational layer which defines the structure of the organisation and addresses issues such as copyright and quality assurance; the infrastructure layer that is involved in issues related to the technological infrastructure required for the delivery of Internet-based courses and assessment; and the content layer that is concerned with the kind of learning formats being offered. They suggest that these issues and others that will emerge as the virtual university develops need to be carefully addressed if they are to prove effective.

Another perspective, presented by Carswell (89), argued that understanding the concept of a virtual university that can be realised using Internet-based technology, requires ample knowledge of the core components of distance education: teaching and learning. These elements include content (teaching materials) assessment, socialisation, participation tutoring and student administration which can be generalised and intrinsic in programmes, whether conventional or distance. However, an evaluation of the experience of the Open University in this regard has been used as an example of a virtual university that utilised the Internet in delivering virtual education. Carswell further commented that failing to be acquainted with these factors will unquestionably end with a failed project. Similarly, Elena Barber (90) outlined the key elements that structured the University Oberta De Catalunya which is an entirely virtual university that was founded by the regional government of Catalonia to offer degree programmes in business administration, educational psychology, law, humanities, computer science and philology leading to an official university certificate. The framework consists of various areas: management (registration, records, academic standards, etc.); communication between members of the university (letters, cafeteria, announcements, and so on); university services (virtual store, computer assistance, cultural activities); and other resources (virtual library and Internet access). In addition to the above-mentioned areas, the virtual campus enables students to interact with their peers and with their instructors through three main areas: debates in which the students discuss a particular topic with colleagues and with the instructor (the forum has the capacity to facilitate the process of transferring knowledge between students themselves or between students and their instructor in an informal manner); the instructors’ bulletin board which provides space
for the academic staff to introduce their teaching subject, learning and any additional activities that the instructors regard as integral to comprehend the study materials; and responding personally on the overall course assessments or questions posed by students.

Likewise, Aoki and Pogroszewski (91) aimed to present a Virtual University Reference Model (VURM) that can be used by colleges and universities as a framework or guideline when they plan to utilise Internet-based technology to deliver instruction and support services or to create a new virtual university project. This can be achieved through identifying its necessary elements and the mechanisms for offering online distance education courses or programmes. The model consists of four major components: administrative services, student services, resource services and faculty services. In order to illustrate their model using a real situation, they describe two case studies: the Western Governors University and the University of Phoenix. These institutions were chosen mainly due to their wide publicity in the U.S. Both institutions are called virtual universities as they offer degree programmes completely online. The four components of the VURM are discussed for each of the two institutions.

Bothun (92) argued that for a virtual university to be effective and viable as an educational medium, it has to deal with seven issues. These are access, accreditation, curriculum development, evaluation, marketing, mentoring and pricing. Bothun further pointed that these issues should be weighted equally in evaluating the probability of success. Each issue, according to the author, represented an obstacle or point of failure that could prevent the university from duplicating the on-campus experience and hence impact on the quality of its educational products.

These studies come as a result of the increasing interest and rapid involvement in virtual education among higher education institutions worldwide and call for a new paradigm, not only in terms of the organisational structure of higher education institutions, but also in the mechanism of delivering instructional courses and services to students. They suggest that new higher education institutions, which in essence exist only in cyberspace, must cope with the changing roles of administration, faculties and students, and adopt new techniques in designing, developing and delivering courses and programmes. These alterations in structure and functions provided by the creation of this novel institution must be carefully planned and constructed in a way that suits student learning needs and at the same time aids the institution in carrying out its educational mission successfully in
a competitive world. These studies reveal that there is no ideal virtual university model. This may due to the underlying philosophy of the institution itself which may be established to meet only the needs of a particular segment of learners or trainers within a specific company, society or country, or may be extended to provide educational services globally. However, despite all of these different points of views about the basic infrastructure required for the creation of a virtual university, there is a common concept behind their enthusiastic efforts which relate to their aim to offer high-quality educational and support services to clients parallel to what one would find in geographical educational institutions.

In conclusion, the literature pertaining to virtual university models has disclosed four pre-eminent providers of virtual education who are responsible for the spread of this movement. These are:

1. Traditional public educational institutions.
2. Traditional private educational institutions.
3. Private entities.
4. Corporate educational and training providers.

In addition, the literature has revealed the following six main types of existing virtual university models, which this researcher has categorised below:

4.3.2.1 For-profit Consortium Virtual University Model

This model represents a pioneering project in providing virtual higher education courses through a corporate investment that has entered the educational market, and has become one of the most successful enterprises in providing anytime anyplace education. These are accredited institutions and use the Internet and related technologies to deliver courses to distance learners. Increasing revenue and continuous development are the two main objectives of this model. Adult learners aged 21 or over who are unable to attend traditional, place-based institutions for social, personal, financial, physical, geographical or employment reasons are the target market of this model. Ensuring the delivery of high quality teaching and learning courses is crucial and is regarded as a primary goal of this
model through annual assessment. The University of Phoenix Online (http://www.phoenix.edu/) is an example of a for-profit consortium Virtual University Model (93).

4.3.2.2 Joint Venture Virtual University Model

In this model, participating institutions agree to establish a partnership to meet future needs, common interests, socio-economic change, and to share existing resources based on trust and co-operation. These universities have traditional, physical campuses and administrative buildings. They have established a unified virtual catalogue of existing courses, and they agree to accept credits from each other. In addition, they offer virtual Internet-based degree and non-degree courses, aimed at adult learners who are seeking continuing higher education and cannot attend traditional place-based institutions for whatever reason. All virtual courses provided by these universities are fully accredited and learners who participate in any of these virtual classes can earn a valid certificate upon their completion of the classes. They have chosen to create a separate virtual department with its own identity to take the responsibility of providing learners with access to online courses. New Jersey Virtual University (http://www.njvu.org/) is an example of a joint venture between existing institutions (94).

4.3.2.3 Non-profit Aggregated Virtual University Model

Based on this model, several existing universities agree to establish a private, non-profit, independent, virtual institution to undertake the responsibility of delivering Internet-based degree and non-degree courses for adult working people. Unlike the participating universities which have physical campuses, this new institution does not have a physical presence except an administrative headquarters. Learners can take courses from participating universities and store up credits towards a virtual university degree. At present, courses at this new virtual university are not yet accredited. Western Governors University (http://www.wgu.edu/wgu/index.html) is an example of a new non-profit Virtual University Model (95).
4.3.2.4 Dual-Mode Virtual University Model

The virtual university in this model begins to recognise the significance of using Internet-based technology as a means of moving beyond its physical boundaries to expand its educational access with the aim of reaching those who have been deprived, for whatever cause, from pursuing their educational aspirations at a conventional campus to study at a non-pre-determined pace, space or place. The great virtue of this mode comes as a result of, firstly, its flexibility in offering traditional on and off-campus courses, and second, its accreditation that adds value and authenticity to its educational system. Athabasca University, Canada’s Open University, (http://www.athabascau.ca/main/intro.htm) is considered as an actual prototype that has successfully maintained an equilibrium between these two modes (96).

4.3.2.5 For-Profit Single-Mode Virtual University Model

This is a cyberspace, for-profit institution that has neither traditional classrooms nor is constrained by a geographical location. However, this similarity does not apply to the administrative function. It has been created specifically by private entities to expand educational access and opportunities to meet the massive demands of an unlimited number of prospective learners seeking higher education studies in various locations at no particular time. Although profit may be perceived as the driving force of the proliferation of this mode, it enthusiastically attempts to provide a premium education. The virtual university in this mode depends primarily on the Internet and associated technologies to offer degree and non-degree courses. Jones International University (http://jiu-web-a.jonesinternational.edu/eprise/main/JIU/home.html) is an accredited for-profit single-mode virtual university model (97).

4.3.2.6 Non-Profit Single-Mode Virtual University Model

Minimising the overall cost of education to expand educational opportunities to reach a wider population and to maximise the excellence of education is the main feature of this model. It is a novel way of providing virtual education with no intention of gaining
profitable benefit from participants. It has no concrete campus location except an administration site. Athena University (http://www.athena.edu), administered by VOU Services International, is a tangible paradigm of this mode. In addition, this mode encompasses institutions that have been known as long-standing distance education providers. They are dedicated institutions that were established to expand educational opportunities to serve non-traditional learners through a variety of technologies (print-based, CD-ROMs, audio-videos etc). Due to new developments in information and communication technologies, such as the Internet, and the success of their educational applications, institutions in this model started adapting these new media to empower their present distance courses. Furthermore, they began to experiment in delivering full Internet-based courses to reach wider audiences. They are accredited institutions and have a physical campus and administration building. The UK Open University (http://www.open.ac.uk) is an example of a non-profit single-mode virtual university model (98).
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Chapter 5:

Research Design and Methodology

5.1 Introduction

One of the most fundamental principles in any research design is the selection of an appropriate methodology. This is always a difficult task which must be treated thoughtfully and pragmatically because failure on the part of the researcher to choose an effective method will end with impractical and unrealistic outcomes. Ideally, a well-designed research phase must embrace a method and also include extensive planning of tactics to investigate, sample, and collect data that will be needed for the study (1). From the literature, there is no consensus on one methodology that can be used to solve all problems in all circumstances. Instead, there are a number of different approaches that may be selected for a study. Each of these methods is suited to solving a specific problem in a specific situation and each has its advantages and disadvantages. These approaches must always be weighed against each other before making a decision regarding the research technique to be adopted for a particular project. This researcher feels that it is indispensable to understand some of the major research approaches in Information Systems (IS). This will later help to rationalize the final selection of the most appropriate research strategies for this work. For this reason, the intention of this chapter is to provide a concise review of a number of research methodologies currently available for researchers in IS and examine their strengths and weaknesses in order to make the most appropriate selection. This will be covered in Section 5.1, while Section 5.2 will revolve around certain concepts related to Soft Systems Methodology which will be used as a framework for this study. These concepts include systems, systems thinking, and ‘Hard’ and ‘Soft’ approaches. After that, and in the same section, SSM will be discussed in detail, in addition to the rationale behind its selection and development. Section 5.3 will involve the selection, design and procedures involved in the data collection techniques. Finally, Section 5.4 will include the overall conclusion of this chapter.
5.1.1 Laboratory Experiments

This technique is one of the most common forms of research. Like much experimental social research, it is concerned with studying the relationships between cause and effect, and between dependent and independent variables. Experiments are conducted in an artificial environment similar to that in which events normally occur, but with the difference that "treatment" is given to one or more groups. The researcher constructs the conditions in a way that can control the variables in order for them to be manipulated, with the intention of formulating suitable measurements while keeping other pertinent factors unchangeable (3). The most significant characteristic of laboratory experiments is the identification of the exact relationships between selected variables by implementing quantitative analytical approaches in a well-devised environment (4). The chief benefit of this technique is the ability of the researcher to isolate and control a small number of variables that can be studied rigorously. Laboratory study also presents investigators with the convenience of conducting their experiments at any time and in any place. In addition, it helps researchers in repeating their experiment several times to ensure validity, helping them to establish a clear direction of causality (5). The major weakness of this approach includes the difficulty of creating the necessary environment for results to be measurable, and manipulating a number of variables at the same time (6). A further limitation includes the fact that laboratory studies may lack adequate similarity to the real world situation; this will affect any attempt to generalise the results. Also, under certain conditions, laboratory study may be a costly technique to employ.

5.1.2 Field Experiments

The field experiment is an information systems research technique in which the investigators select the sample (persons, groups or organizations) to receive the experimental "treatment" randomly or by matching them through some key variables (7). The purpose of the field experiment is to test and verify theories and hypotheses. This technique is based on the assumption that change in one variable causes a change in another variable (8). The field experiment attempts to form an experimental study in a more natural environment in order to see the relationship between an independent and a dependent variable. The fundamental parts of the field experiment are: introducing the experiment, manipulating the independent variable, measuring the dependent variable
and concluding the activities (9). In the field experiment, the researcher intentionally introduces or causes change in the environment under examination, and then monitors or measures the effects of the changes. For example, the experimenter may wish to determine if using technologies as a support in teaching traditional classes is more effective than teaching without technologies. The researcher might divide the traditional class into two equal groups. The “treatment” provided to both groups, such as lectures, notes and settings, would be identical, the only difference being the kind of technologies used. In this example, the researcher establishes conditions in which half of the students, the experiment group, are taught under one set of conditions (independent variable) which includes technology support, and the other half (the control group) are taught entirely by the traditional method and are therefore subjected to the other condition (dependent variable). The variable is the use of technology, the other factors, such as lectures, notes and settings, being kept constant. The experimenter would then compare the results with a list of criteria related to his/her previous assumptions. The major strengths of this technique, in addition to those mentioned above, are that it provides instant feedback and information on the usefulness of the experiment (10) determining the influence that certain conditions have on particular behaviours (11) and allowing the experimenter to segregate and control a small number of variables that can be later studied thoroughly (12). However, the main limitations, besides those already stated for laboratory studies, relate to the difficulties in finding volunteers willing to participate in the field experiment. Also, there may be difficulties in repeating the experiment with adequate controls since this is not usually possible just by changing the study variables (13). Moreover, the field experiment may sometimes be considered both unethical and time-consuming (14).

5.1.3 Forecasting/Future Research

Basically forecasting, or future research, is a means of predicting what might happen in the future. It is based on a comprehensive understanding of the past in order to initiate necessary change in social behaviours and attitudes. It “involves careful study of the past performances of the variable, leading to the formulation of a function which fits the past, and may do so in the future” (15). Future research depends heavily on the availability of time, effort, expertise, comprehension, theory development and methodological sophistication (16). Any failure properly to manage the resources will end with a false
future prediction. Emery (17) identifies four trends which he feels contribute to the emergence of forecasting research. These include increasing pressure from societies to meet environmental conditions, the strong and mutually dependent relationships between economic and other aspects of society, the growing dependency on scientific research to attain the ability to meet possible challenges and the speedy advancement in the development of information and communication technologies. Forecasting studies can be related to economic forecasting, market forecasting, manpower forecasting, population forecasting or environmental forecasting.

The major strength of the forecasting technique is that it helps decision-makers and administrators to plan in advance for social change or development. It can assist in preventing devastating incidents from happening such as economic or political crises, flooding, war or famine. The greatest limitation of this method relates to the changeability of some factors or elements that might happen after the forecasting research has been conducted.

5.1.4 Simulation

Simulation is a research technique which allows researchers to use whatever theory is available at the moment of launching the study to configure the experimental situation in order to produce in-depth data that are related to the relationship which the researcher regards as imperative for investigations. It allows investigators to examine and understand more complex social phenomena through simulation. Chatfield (18) noted that simulation is normally "used to solve problems which are difficult or impossible to solve analytically by copying the behaviour of the system under study by generating appropriate random variables". Smith (19) divides simulation into three major types: Man Simulation, Machine Simulation and Man–Machine Simulation. Simulation techniques normally rely on observation and interview procedures as a method of collecting data to make available regular measurement. Researchers tend to apply simulation in their research because it allows them to:

- Imitate multiple process social events.
- Observe the effect of different kinds of variable manipulations through simulations.
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- Study complex social phenomena through simulation. This is more economical than studying these in their natural environments.

- Simulation occurs when analytic solutions to a scientific problem depend on sets of probabilities and where the model is stochastic rather than deterministic (20).

One of the greatest advantages of simulation is that it allows the researcher, who may be unable for ethical or practical reasons, to manipulate variables in an unnatural micro-sociological setting (21). In addition, it can help investigators in producing data of a more continuous nature so that long sequences of phenomena can be examined (22). Its weaknesses include the fact that researchers may have difficulty in reflecting precisely the real world situation through simulation. In addition, it could be time-consuming.

5.1.5 Phenomenological Studies

This is a form of information systems research methodology that focuses on individual experience to identify phenomena through how these are perceived from the individual’s own viewpoint. Orleans (23) stated:

“The central task in social phenomenology is to demonstrate the reciprocal interactions among the processes of human action, situational structuring, and reality construction. Rather than contending that any aspect is a causal factor, phenomenology views all dimensions as constitutive of all others. Phenomenologists use the term reflexivity to characterize the way in which constituents manifest the incessant tangle or reflexivity of action, situation, and reality in the various modes of being in the world. Phenomenology commences with an analysis of the natural attitude. This is understood as the way ordinary individuals participate in the world, taking its existence for granted, assuming its objectivity, and undertaking action projects as if they were predetermined. Language, cultural, and common sense are experienced in the natural attitude as objective features of an external world that are learned by actors in the course of their lives”.

It enables researchers to extract conclusions and highlight the basic notions that people consider to be factual. In phenomenological studies, the researcher must be involved personally with the subject’s feelings and experiences in order to examine the participant’s personal perspectives (24). A variety of data collection methods, such as interviews, observations, discussions, and published and unpublished materials, can be used in phenomenological studies. The advantages of this method are that it enables
researchers to understand individual subjective experience, motivation and action, helping them in constructing new ideas, perspectives and insights. In addition, when a researcher adds an interpretive dimension to phenomenological research, it can be used as a foundation for practical theory that allows it to inform, support or challenge policy and action (25). It also generates detailed comment and suggestions regarding individual situations. The main problems associated with this approach is the huge amount of unorganised data that is extracted by the researcher such as interview notes, tape recordings, and so on that need to be analysed (26). Furthermore, the research findings cannot be generalised as the technique depends heavily on people's opinions and perceptions. Also, the approach is subjective by nature.

5.1.6 Case Studies

The case study approach is a form of qualitative research strategy that describes and examines a particular person, social group, organization, event, family, life history or role in a more detailed way. It focuses on exploring and describing the case under study and this can be used to understand the process of organizational change and capture the dynamics of the situation during implementation (27). Investigators who intend to apply case studies in their research are frequently more interested in forming hypotheses than examining them. Researchers typically use multiple instruments such as observations, interviews and so on for data collection. Edwards and Talbot (28) differentiate between two notions of the case study. The first is the case study in social science, which the researcher uses to regulate exploration of multifaceted sets of inter-relationships. The case might be a person, a group of people or an institution. The second, normally studied in the medical field and related disciplines, focuses on studying individual cases. Denzin and Lincoln (29) identified three types of case studies. The first is The Intrinsic Case Study which the researcher carries out to comprehend clearly the case being studied; the second is Instrumental Case Study, which is a study undertaken by the researcher to examine a specific case in order to impart a new perspective to an issue; the third kind of case study is Collective Case Study in which the researcher might be interested in studying a number of cases mutually, in order to gain a greater understanding about a larger number of other cases. Designing case studies requires researchers clearly to identify the questions that
they intend to observe and the underlying philosophy in approaching the case. The common theories adopted by researchers are:

- **Individual Theories** which focus on individual development, personality, cognitive behaviour, learning and disability, and interpersonal interactions of a particular subject.

- **Organizational Theories** which focus on bureaucracies, institutions, organizational structures and functions, or excellence in organizational performance.

- **Social Theories** which relate to urban development, group behaviour, cultural institutions, or marketplace functions (30).

The main strength of case studies lies in their ability to provide a comprehensive explanation and detailed representation of a particular social phenomenon through the use of a variety of data collection techniques. They also have the flexibility to give researchers the opportunity to focus on single or multiple cases and to examine different dependent variables simultaneously (31). Also, the technique helps in understanding human behaviour. The major weakness of case studies is the lack of generalisation, as well as the lack of deductibility, repeatability and controllability (32). Furthermore, the results and findings of case studies may be shaped and affected by the researcher’s point of view (33).

### 5.1.7 Survey Research Methods

The survey research method is basically a descriptive study which attempts to identify, diagnose and draw out information about the characteristics, behaviours, beliefs, values, attitudes or opinions of the particular group of people being studied by asking them a number of similar questions. It is “the systematic gathering of information about individuals and collectivists, using interview or mail questionnaire methods to elicit information directly and interpreting the resulting data by means of statistical analysis” (34). It seeks to gather information directly from the respondents by asking them certain questions. The task of the researcher is to obtain information relating to the variables and, based on this, to probe the patterns of the relationships between the variables based
on the responses presented at the time the questions were asked (35). Researchers may choose the survey technique to ask for opinions from the sample of the population that has been chosen for the study relating to a particular problem and its likely solution. It may be used to assess the quality of a commodity or marketing services or to find out about the influence of introducing new policies or programmes.

The obvious benefits of a researcher implementing this technique are that it measures public perceptions regarding an issue and reaches a large population that could not have been surveyed directly. This method has the ability to generate results whose accuracy and consistency can be estimated through the use of repeated approaches (36). Moreover, it is a fairly simple approach to use in order to study attitudes, behaviours, values, norms, beliefs and motives. The greatest limitations of the method are its inferior control over the data collection situation, difficulties in establishing a standard for deducing cause/effect relationships and the fact that respondents may hesitate to answer frankly questions which are related to sensitive issues. This may lead to a potential systematic measurement error (37). Another drawback of the survey technique is that people are often reluctant to respond to the questionnaires.

5.1.8 Action Research

Action research is a term that is attributed to Lewin (38), who developed this practical technique in order to explain and solve critical social issues. It “refers to ways of investigating professional experience which link practice and the analysis of practice into a single productive and continuously developing sequence, and which link researchers and research participants into a single community of interested colleagues” (39). Kemmis (40) defines action research as

“a form of self-reflective enquiry undertaken by participants in social (including educational) situations in order to improve the rationality and justice of (a) their own social or educational practices, (b) their understanding of these practices, and (c) the situations in which the practices are carried out. It is most rationally empowering when undertaken by participants collaboratively, though it is often undertaken by individuals, and sometimes in cooperation with ‘outsiders’.”

It is a method that may enable researchers to gain a better understanding of social systems and, at the same time, to bring about potential improvement to the situation
under investigation. It is a multi-process technique that involves action, review, planning and action and is a continually modifying procedure that may never stop. Action research can depend on questionnaires, interviews, observations or content analysis as sources of data collection.

![Kemmis Cycle](image)

**Figure 5.1: Kemmis Cycle**

The strength of this kind of technique is that it gives professionals more chance to take advantage of their practice as a research opportunity (41). It allows researchers, through its recycling steps, to redefine the problem being studied, together with its hypotheses, which may lead to changing and re-evaluating the research strategies. The limitations of this technique are that the different perceptions of researchers will inevitably lead to different interpretations; the results generated by researchers cannot be generalized (42); and the lack of control over individual variables will affect any attempts to differentiate between cause and effect (43).

### 5.1.9 Choice of Research Method

Briefly, each research paradigm from all the above-mentioned methodologies is seen as best suited in dealing with a particular problem under particular circumstances and no one method could be used to solve all problems in all situations. Therefore, common sense should be used here to select the most relevant methodology for this study after rationalising the reasons behind the selection.

As has been stated in Chapter One, this study revolves around the prospect of establishing a virtual university based on the Internet and the World Wide Web to
accommodate the growth in the number of students seeking higher education in the Kingdom of Saudi Arabia. The researcher feels that action research methodology is the most appropriate method in undertaking this project for the following reasons:

- Action research or interpretive analysis is a collaborative and participative technique that requires the researcher to invite and encourage all actors or stakeholders involved in the situation to take part in all stages of the research. It considers their perceptions in order to debate and to bring about a desirable change or improvement.

- Action research is the technique best able to ascertain the probability of, or conditions which will be necessary to bring about, change in behaviour or attitudes within a certain social group. As such, it is more useful than other types of research methodology based on "inductive" inference, that is, those derived from past actions, and "deductive" inference, those which may occur in specific future instances.

- It aims to achieve two significant objectives: 'research' and 'action'. The aim of research is to augment knowledge and understanding of the researcher's clientele. Action derived from debating and negotiating with all actors, including the researcher, is likely to lead to change or improvement (44).

- Action research is an educative approach that gives researchers the opportunity to explore, identify, learn and tackle problems in their real situations. This makes the method and its results more realistic and authentic.

- Action research enables researchers to carry out rigorous research that is relevant to their practice, particularly when supported by perspectives such as critical hermeneutics (45).

Action research is a growing field and contains a great number of research methodologies. Flood and Jackson (46) pointed out seven types of Soft Systems Methodologies that are assumed to be classified under the umbrella of the action research paradigm. These encompass the Strategic Assumption Surfacing and Testing Methods (SAST); Viable System Diagnosis (VSD); System Dynamic (SD); Interactive Planning (IP); Soft Systems Methodology (SSM); Critical Systems Heuristics (CSH); and Total System Intervention (TSI). In addition, Avison and Fitzgerald (47) identified a
number of information system methodologies including the Gane and Sarson Structure Approach (STRADIS); Structured Systems Analysis and Design Methodology (SSADM); the Jackson Systems Development Approach (JSD); Information Systems Work and Analysis of Changes (ISAC); Effective Technical and Human Implementation of Computer-based Systems (ETHICS); Soft Systems Methodology (SSM); and the Multiview Approach.

Most, if not all, these methodologies are still evolving or are 'moving targets'. This may affect any attempt to compare them with each other in order to establish a clear judgment regarding the appropriate approach for such a study (48). Checkland, as cited by Avison and Fitzgerald (49), insists that the process of selecting a suitable methodology is a dilemma because it is difficult to be certain that the success or failure in handling a problem is linked to the use of one method or another. This study will make use of Checkland's Soft Systems Methodology and the logic behind this selection will be discussed within the following section. However, before elaborating on SSM, it is crucial to assimilate some fundamental key concepts that will facilitate overall understanding of the ideas behind SSM. These concepts, as indicated in the introduction, are systems, systems thinking, and 'soft' and 'hard' approaches.

5.2 Systems

In the literature, the word 'system' is perceived and defined in a variety of ways. For example, Maier and Rechtin (50) define a system as "a collection of different things which together produce results unachievable by elements alone". Checkland (51), however, describes a system as "A model of a whole entity; when applied to human activity, the model is characterised fundamentally in terms of hierarchical structure, emergent properties, communication, and control. An observer may choose to relate this model to real-world activity. When applied to natural or man-made entities, the crucial characteristic is the emergent properties of the whole". According to Wetherbe, Dock and Mandell (52), a system is "a collection of interrelated parts which is unified by design to obtain one or more objectives". They further identify some characteristics that are normally common to all systems. These are organisation, interaction, interdependence, integration and central objective. Bellinger (53) identified a system as "an entity that maintains its existence through the mutual interaction of its parts" while Daellenbach,
George, and McNickle (54) characterised the concept of a system as “a set of interrelated parts or subsystems, each one of which is in charge of some mission or task, with the following properties:

- Each part contributes towards the objectives of the system. These contributions are measurable in terms of the objectives of the system as a whole.
- Each part’s effectiveness depends on the contributions of at least one other part.
- Every possible subgroup of parts has properties 1 and 2. Hence, the parts cannot be organised into independent subsystems.
- The system has an outside environment which gives inputs into the system and receives outputs from the system”.

Obviously, all the definitions stated above reveal that the term ‘system’ is an ubiquitous concept that has varied meanings for different people, the ultimate interpretation of which depends solely on the situation in which the phrase is applied. But, despite this inconsistency, they all seem to agree that the ‘system’ is a collection of entities that are connected to each other. For this project, the word ‘system’ means a compilation of interrelated elements which have been purposefully established and systematized in such a way as to accomplish predetermined goals and objectives. In real life, people are living, working and interacting to some extent within certain kinds of systems such as social systems, political systems and legal systems, to name but a few. Various systems are created and formed to serve varied purposes and to accomplish definite goals and objectives. A number of systems were even founded before living things existed, systems such as ‘universe systems’. People, on the other hand, have themselves generated other systems such as ‘human activity systems’, ‘design systems’ and ‘social systems’. Generally speaking, people are incessantly bounded by such systems, to which they are intrinsically linked or which they have produced. A system can embrace people (e.g. a family is considered as a social system in which members share the responsibility of living with and supporting each other), be an abstract entity (e.g. information, data) or also have physical parts (e.g. a computer is a system that consists of numerous components which work together to process and manipulate data). Wilson (55) classified systems into:
a) Natural or physical systems that form the whole universe in a hierarchical manner by the power of its inventor (God) such as galactic systems, subatomic systems, animal systems, human-being systems etc.

b) Designed systems which are man-made systems that can be tangible (such as machines, tools, etc.) or intangible (for instance, data, language, philosophy and so on).

c) Human activity systems in a general sense mean any purposeful activity that is carried out by people, (for example, political systems, economic systems, legal systems and so forth).

Social and cultural systems embrace people who perform activities within social systems, such as the family and the community.

A human activity system is considered crucial for this study because it assists in examining a variety of management problem situations. It can be described as “an interacting set of subsystems or an interacting set of activities” (56). The basic shape of a human activity system model can be seen in Figure 4.1. This consists of input(s), a transformation process and output(s).

![Figure 5.2: The components or basic concepts of a 'system' (57)](image)

Wetherbe, Dock, and Mandell (58) shed light on the most common essential elements that must be considered in constructing or reconstructing the organisation of the system’s framework. These components, as shown in Figure 5.2, are:

- Input(s) (factors or elements that enter the system for processing)
- Transformation (the conversion process that transforms input into outputs)
- Output(s) (the value generated from converting input into output)
- Sub-systems (elements that rest within the system that have exclusive functions)
- System Environment (the settings in which the system exists)
- Boundaries (constraints or limitations of the system that separate it from its environment)
- Information System: Measurement that constitutes Control Feedback (negative)
- Disturbances (acting as the transformation process from the system environment)

![Diagram of system environment](image)

Figure 5.3: The basic interacting elements of a system (59)

Furthermore, 'systems' may be categorised as open or closed, simple or complex, stable or dynamic, adaptive or non-adaptive, permanent or temporary (60). Table 5.1 highlights the main differences between each of these.

The purpose of exploring the concept of a 'system' is to enhance knowledge related to the variables. This entails accomplishing managerial functions with the intention of taking appropriate decisions which are recognised as such by the general outcome of them upon the organisation and its objectives (61).
**Open system:** An open system is simply known as a system that normally interacts with its environment in order to survive. People are considered as open systems in that they must interact with their environment in order to maintain their existence.

**Closed system:** A closed system (feedback) is one that operates independently without interacting with its environment for survival such as mechanical systems.

**Simple:** A simple system consists of a number of interacting elements. The relationships between these components are not convoluted but are easy to comprehend.

**Complex:** A complex system is typically made up of numerous components that are characterised as extremely connected and unified.

**Stable:** A stable system is a system that takes a long period of time before moving or altering into another state.

**Dynamic:** A dynamic system is defined as a system which is usually in the form of speedy and steady change through its life span.

**Adaptive:** An adaptive system is influenced and affected by any change in its environment. This means that the environment is considered to be the main source of stability or rapid movement for the system.

**Non-adaptive:** A non-adaptive system is considered as disconnected from its environment. If change occurs in its environment, the system remains constantly passive or unchangeable.

**Permanent:** A permanent system is objectively created to exist, survive and function within its environment for quite a long period of time.

**Temporary:** A temporary system is established with the determination to perform and undertake its roles inside its environment for a moderately short period of time.

| Open system: An open system is simply known as a system that normally interacts with its environment in order to survive. People are considered as open systems in that they must interact with their environment in order to maintain their existence. | Closed system: A closed system (feedback) is one that operates independently without interacting with its environment for survival such as mechanical systems. |
| Simple: A simple system consists of a number of interacting elements. The relationships between these components are not convoluted but are easy to comprehend. | Complex: A complex system is typically made up of numerous components that are characterised as extremely connected and unified. |
| Stable: A stable system is a system that takes a long period of time before moving or altering into another state. | Dynamic: A dynamic system is defined as a system which is usually in the form of speedy and steady change through its life span. |
| Adaptive: An adaptive system is influenced and affected by any change in its environment. This means that the environment is considered to be the main source of stability or rapid movement for the system. | Non-adaptive: A non-adaptive system is considered as disconnected from its environment. If change occurs in its environment, the system remains constantly passive or unchangeable. |
| Permanent: A permanent system is objectively created to exist, survive and function within its environment for quite a long period of time. | Temporary: A temporary system is established with the determination to perform and undertake its roles inside its environment for a moderately short period of time. |

Table 5.1: Different types of systems

**5.2.1 Systems Thinking**

System thinking at a very basic level is a way of helping individuals to understand social phenomena from a very broad perspective. It is "a way of thinking that focuses on the relationships between parts, forming a connected whole for a purpose" (62). It is a holistic, analytic and pragmatic framework of thoughts and ideas that can be used in tackling complexity by methodological means. It can assist in determining certain rules that can help in predicting the future, preparing to meet its challenges, and will, in turn, lead to a greater level of control over it. The systems thinking approach replaces the mechanistic traditional thinking approach that involves breaking a problem into components, then studying each part autonomously, finally drawing conclusions about
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the whole. Systems thinking, on the other hand, expands its view to focus and study the interrelationships between all elements within systems in order to explain complex social phenomena (63). Systems thinking is "a conceptual framework. Rather than viewing an organisation as driven by a set of 'factors', most of them external, we represent it as the continuous interplay of the interactions between elements because the behaviour of a system is largely generated by those interactions between its elements" (64). It is a way of understanding the nature or manner in which systems operate by interpreting interrelationships within them. It seeks to go beyond events and looks instead for patterns of behaviour. Balle (65) characterised systems thinking as:

- Focusing on the relationships between system components rather than the parts.
- Attempting to understand the forces that caused events to occur by identifying their ongoing patterns.
- Using circular causality. This means that causes become effects and vice versa.

These characteristics promote the effectiveness of applying systems thinking to real world applications and of dealing with a variety of complex problems from a broader perspective. Aronson (66) points out some examples of areas in which systems thinking has proven its value:

- Complex problems that involve helping many actors see the "big picture" and not just their part of it.
- Recurring problems or those that have been made worse by past attempts to fix them.
- Issues where an action affects (or is affected by) the environment surrounding the issue, either the natural environment or the competitive environment.
- Problems whose solutions are not obvious.

However, when applying systems thinking or systems ideology to the real world of complex management problem situations that exist within a socio-technical organisation, it can improve the effectiveness of handling such complexity efficiently by allowing decision-makers to take purposive courses of action including their risks, costs and benefits (67). Likewise, understanding the concept of systems thinking may provide the following advantages:
More self control over events through predicting their occurrence. This will lead to making effective preparations to meet them and provide a deeper understanding of their elements.

More efficient tactics and strategies in dealing with a variety of problems in different situations.

Increasing knowledge about the problems and offering better ways of solving them.

Facilitating communication and demolishing the ambiguities associated with the problem, leading to more effective action.

Offering opportunities for self-confidence and for taking responsibility.

As a significant aid for managing individuals and groups more efficiently (68).

Checkland and Scholes (69) argued that the world is perceived by individuals through the framework of ideas that are considered to be internal to them. It is the source of most of these ideas and is used continually to interpret the perceived world itself. This is described in Figure 5.3 below:

![Figure 5.4: Systems thinking as an iterative process.](image-url)
An individual cannot entirely understand this perceived world unless he/she uses a certain kind of methodology. However, Checkland and Scholes (70) indicated that the major contributions of systems thinking to Soft Systems Methodology could be summarized as follows:

- The notion of the whole entity is fundamental to systems thinking.
- Incorporating systems thinking in dealing with problems requires the analyst to construct a ‘conceptual model’ against the perceived real world situation in order to gain a more detailed explanation.
- Systems thinking has embedded within it two philosophical approaches: the ‘hard’ which believes the perceived world contains ‘holons’ and the ‘soft’ that produces the process of enquiry as a system.
- When local agreement has been established to engineer a system, SSM and hard approaches use a systemic process of enquiry in order to create systems models.
- For systems thinking, the use of the word ‘holon’ is more fitting than ‘system’ for the constructed abstract wholes.
- A specific type of ‘holon’, labelled as a ‘human activity system’ which is based on a set of interrelated activities to form the whole, is the main target of SSM to be engineered.
- In order to take a purposeful action in any situation that is characterised as systematically desirable and culturally feasible, it is essential to build several human activity systems and to debate their significance to the real world application.

5.2.2 ‘Soft’ Vs ‘Hard’ Systems Approaches

Generally, systems analysis and design can be classified under two major approaches: ‘hard’ and ‘soft’ methodologies. Checkland (71) argued that distinctions between ‘hard’ and ‘soft’ systems thinking is a corner stone in understanding Soft Systems Methodology. He further noted that hard systems thinking is built on a belief that the ‘holon’ is rooted in the perceived world, while soft systems thinking is based on the idea that the ‘holon’
can be formulated in the methodology, \( M \), the process of enquiry. In terms of perceiving the world, the hard approach is defined as systemic, while the methodology \( (M) \) can be systematic. The soft approach on the other hand perceives the world as problematic, while the methodology \( (M) \) can be systemic.

In real world practice, both approaches are regarded as practicable approaches that have evolved purposefully to integrate systems ideas in dealing with real world problem situations. The hard systems approach was the first methodology to be designed and is still the dominant methodology. It was developed to solve problems that were frequently encountered in management in modern manufacturing organisations. Checkland and Holwell (73) note that hard systems thinking is based on the assumption that the system and its sub-systems are not problematic and that systems can simply be ‘engineered’ in order to accomplish their objectives. Soft systems thinking, in contrast, considers the world as problematical but that it can be organised through a process of enquiry. Flood and Jackson (74) advocate that:

"The hard view regards problems as real and solvable, assuming that ends are easily and objectively definable. The primary concern of hard methodologies, therefore, is how we should reach predefined ends, what are the best means available, or how should we do it? SSM, by contrast, believes that problem situations arise when people have contrasting viewpoints and consequently acceptance of many “relevant problems” emerges. SSM, therefore, rejects the means-end approach. The much more interesting questions concern the ends themselves: “What should be done?” becomes the main focus of SSM. To answer this question SSM attempts to draw in and explore a diversity of viewpoints as part of the decision-making and intervention process”.

In real world applications, the hard systems approach (positivist view) sees organisations as made up of parts that perform individually without being interrelated to each other, while soft systems thinking sees an organisation as a collection of elements that interact with each other to form a complex situation. The hard approach focuses on hard problems that seem to be highly-structured and clearly defined and where the solution can be predicted and determined in advance. It is based on the assumption that the problem which the analyst faces can be formulated in the ‘How’ question; this can be determined at the initial stage of the intervention. It is a goal-oriented approach that requires certain procedures to be followed in order to reach a predictable objective or goal. The soft approach, on the other hand, is a problem-oriented technique dealing with a soft problem that can be expressed in the form of ‘How’ and ‘What’ questions. It is a technique that seeks to investigate and learn about a problem situation and is most
suitable where the problem is perceived as messy, ill-structured and difficult to define, often involving human relationships and cultural considerations. The underlying assumption is that people usually have different perceptions, views and interpretations of the situation. These discrepancies of points of view are natural and can be used wisely to design systems that are systematically feasible and culturally desirable with the purpose of motivating change to improve the situation. Both approaches, whether 'hard' or 'soft', are valuable techniques and can be seen as appropriate in dealing with a particular problem in a particular situation. Checkland (75) stressed the importance of grasping the main distinction between the ideas behind 'soft' and 'hard' systems thinking as a means of understanding the concept of Soft Systems Methodology. Figure 5.5 simplifies the variation between these two hypothetical approaches.

Observer 1 ('hard')

"I spy systems which I can engineer"

Observer 2 ('soft')

"I spy complexity and confusion; but I can organise the exploration of it as a learning system"

Figure 5.5: The dissimilarities between 'hard' and 'soft' systems (76).
5.2.2.1 Soft Systems Methodology

SSM is a holistic social investigation inquiry and learning technique that is deliberately and purposefully designed. It uses systems thinking to deal with a variety of blurry-structured management problems that involve human activities through the use of a series of iteration tactics to solve or improve the problems under investigation. It is a participative, collaborative and pragmatic problem-solving technique and was developed over three decades of successful practical application and experience in a variety of managerial systems by its chief proponent, Peter Checkland, Professor of Systems at Lancaster University. Travis and Venable (77) characterised SSM as “an inquiry system in essence, based on building models of purposeful activity from declared perceptions. These declared points of view are always the basis for structured debate about the situation. The objective of this debate is to enable accommodations to be achieved that will motivate action”. SSM does not exist in a vacuum, but instead emerged as a remedy to the failure, limitation or inadequacy of the traditional hard system thinking to deal with fuzzy and poorly-defined complex problem situations that are embedded in social, political and human interactions. Checkland (78) declared that “SSM grew out of the failure of systems engineering - excellent in technically defined problem situations to cope with the complexities of human affairs, including management situations”. SSM is a human activity system, designed to deal with these complex situations through debating and intervention with all key figures in the situation under examination. In practice, when applying SSM, the analyst does not intend to focus on finding or imposing a definite solution; as an alternative, he/she examines the external environment and the relationship between the system components, including human activities. Then, through negotiation, the analyst learns about the situation in stages by involving all the interested parties who have different views, perceptions and assumptions about the problem situation to take purposeful action to improve it.

5.2.2.1.1 Why Select Soft Systems Methodology for this Study?

Certain imperative reasons stand behind the decision for selecting SSM as a framework for this study. These can be explained as follows:

- It is claimed that SSM can be implemented successfully in various projects including issues related to health care services, agriculture, education, industry,
management, information systems, government services, performance evaluation, telecommunication, communication applications, businesses, and library and information services (79-96).

- The literature contains a number of studies (97-101) that highlight numerous benefits of implementing SSM in dealing with a variety of problem situations. Some of these advantages are:
  - Learning is a key factor for using SSM. Hence, this approach was developed through action research to allow the learning process to take place and to be clearly understood and managed. It can also be used as a guidance framework for learning and to understand information and its management.
  - Due to the emphasis on and recognition of cultural metaphors in analysing problems that are characterised as vague, SSM provides a means of exploring some critical cultural issues that are deemed to be sensitive and disputable as is the case in this study.
  - The nature of the methodology is to invite all actors interested in the situation under examination to engage voluntarily, and to work collaboratively, in identifying what seems to be the problem and to use systems ideas to design the ideal system framework by debating and negotiating. This will eventually lead to taking appropriate action to improve the problem situation. All of these factors make SSM one of the leading approaches in integrating theory and practice, and enhancing the knowledge of both the analyst and the participants.
  - SSM is a cyclic approach that commences with a general idea associated with the problem under analysis, and then develops it accordingly in more detail. Additionally, these cyclic iterations provide the investigator with flexibility to shift freely forward and backward from one stage to another so as to ensure validity and accuracy of the analysis of each stage and to avoid any shortcomings and deficiencies.
  - Each stage of SSM has been specified and elucidated exhaustively to offer step-by-step guidance to the analyst throughout his/her investigation.
This significantly contributes to greater confidence and better control and management over the investigation as a whole.

- SSM uses the perceptions, views and feedback of stakeholders as regular points of reference; it also consults agents in suggesting the appropriate course of action. This process means that the system that is designed is based on the views of those who will, in the end, work with it.

- Usefulness, usability, flexibility and adaptability are clear indicators of the widespread advantages of SSM, which has been applied productively in various projects and research studies under diverse conditions.

- Although SSM is a technique which was developed in the West and which presumably was designed specifically to meet the needs of management organisations in dealing with problems that encompass human activities in western society, it seems to be a universal approach in nature since it has been incorporated effectively and efficiently in identical situations in many countries world-wide.

For these reasons, SSM (Mode 1), or the conventional seven-stages, will be applied in this study.

5.2.2.2 Development of Soft Systems Methodology

SSM is not static; it is an evolving methodology that has been developed and modified over a period of time to deal with a wide variety of complex problem situations that face numerous managerial systems. Today, two modes of Soft Systems Methodology are now available: the conventional Seven-Stage version and the Two-Stream version (102).

5.2.2.2.1 Mode 1: The Conventional Seven-Stage Version of SSM

SSM is a process of inquiry with seven distinctive stages, as depicted in Figure 5.6. There are distinctions between activities which pertain directly to the problem in its real world, and activities that relate to the world of systems thinking. The order of these stages is not fixed; the analyst can start at any point, progress in any direction and/or repeat any of
the stages. The seven stages will first be summarised and then explained in more detail as follows:

**Stage One:** The analyst enters the problem situation in an attempt to find out what the problem is.

**Stage Two:** A 'rich picture' of the problem situation is built and the primary tasks and issues are identified.

**Stage Three:** The root definition (the minimum that can be agreed on) is created to formulate an appropriate relevant activity system. Once the root definition has been agreed on, participants forget the existing system.

**Stage Four:** The ideal system or the conceptual models are then constructed and compared with the real world.

**Stage Five:** The conceptual model is compared with the existing system in order to define possible changes to improve the situation.

**Stage Six:** The analyst at this stage seeks to identify changes in terms of what is legitimately desirable and culturally feasible.

**Stage Seven:** Action can now be taken to improve the situation through recommendations. The problem now becomes a different one and the process can begin again.

![Figure 5.6: The conventional seven-stages of Soft System Methodology (103).](image-url)
Stage 1: The Problem Defined

This is the first attempt by the analyst to intervene, examine and define the problem situation under investigation. The problem at this stage is still vague and ambiguous, and the role of the analyst is to clarify what the problem is. This can be done by assembling information about the problem in an unstructured way, aimed at building the richest possible picture of the situation. However, objectivity is somewhat difficult to achieve in this stage because of bias in the analyst that may affect the process (104). During this stage the researcher will begin by identifying the roles of the key figures in the situation: who are the clients (who cause the study to take place), the problem-solvers (who are interested in improving or changing the situation), and the problem-owners (who “own” the problems being studied).

Stage 2: The Problem Stated

Proceeding to the next stage, the analyst here begins to gather a wide range of relevant data pertaining to the problem situation. The researcher has to use a variety of data collection techniques, such as interviews or questionnaires, to collect and record opinions, views and perceptions of all stakeholders. In addition, document analysis techniques will be applied to highlight hard or factual data which will be used as background information to represent the organisational layers, the hierarchy of authority and so on. The analyst should also look for soft data (issues) which people normally express through opinions, attitudes, behaviour, feelings and emotions. Checkland (105) suggests that this stage is carried out to gather information that is related to elements (structures) which are somewhat ‘slow-to-change’, (such as the university hierarchy or the physical layout of the university’s buildings); elements (processes) that are ‘continuously-changing’, (such as some organisational activities); and elements (environment). The main point here is to comprehend the relationships between the structures and the processes within the situation under analysis. Furthermore, the analyst at this stage should obtain information concerning the main tasks related to the performance of the systems. All of the qualitative and quantitative data generated will be gathered together in the ‘rich picture’ which is a cartoon representation of the situation. The aim of sketching this cartoon is to stimulate discussion about the problem being studied.
Stage 3: Selection of a Root Definition and Naming of Relevant Systems

In the first two stages, the analyst tries to identify tasks and issues assumed to be relevant to the problem. In the third stage, the investigator has to isolate each task and issue in order to select and formulate a conceptual ‘relevant system’ for each one of these tasks and issues. These ‘relevant systems’ do not exist in the real world; they are built on a theoretical basis because they seem relevant in some way to the situation under investigation. However, this is regarded as an iterative process which can be changed and modified as understanding of the problem situation deepens (106). For each of these relevant systems that are being inspected extensively, the analyst originates a ‘root definition’. This ‘root definition’ is a specific explanation of the ideal function of each of the ‘relevant systems’. It is a concise statement that can be formulated around the following six elements (107):

- **Customers**
  The people who gain advantage from or are being damaged by the outputs of the systems.

- **Actors**
  Those who carry out the activities of the systems.

- **Transformation**
  The changing process of the systems from input into output.

- **Weltanschauung or Worldview**
  The worldview implied in the root definition in which gives the human activity systems consistency and significance.

- **Owners**
  Those who have power over the systems and who have the authority to terminate them.

- **Environmental constraints**
  The environmental limitations surrounding the systems.

At this stage, each derived ‘root definition’ will perhaps differ in essence for each selected ‘relevant system’.
Stage 4: Building Conceptual Models of Relevant Systems

After identifying each relevant system and its root definitions, the analyst at Stage Four begins to assemble these agreed root definitions and to develop a desired 'conceptual model' of the human activity system. The 'conceptual model' is an abstract model which does not belong to the real world. It entails indicating rationally what the system has to perform to satisfy the requirements of the 'root definition'. However, building the 'conceptual model', as Checkland (108) points out, should be simple rather than complex. It should start by listing activities and then arrange them in a logical order, consistent with each other in their reliance and performance in the actual systems. These models should contain around six to twelve activities (109). Each activity (sub-system) is described by a number of verbs which highlight the main tasks of that sub-system, the procedures for carrying them out, and the process of monitoring and controlling them. After constructing these sub-systems for each activity, they are grouped together, using arrows to link the logically connected sub-systems (110).

Stage 5: Comparing Conceptual Models with the Real World

In this phase, the investigator compares the 'conceptual models' which he/she has built in Stage Four with the real world problem that has been presented through the rich picture in Stage Two. The nature of this comparison is to discover any variance between the 'conceptual models' and what exists in reality. There are various ways of carrying out the comparison including:

- Comparing a number of models against the real world situation in order to identify possible differences that are clear.

- For each conceptual model, the analyst points out a formal listing of difference, annotated with questions for which answers are sought in the situation itself.

- The idea of scenario writing may be carried out. This describes how the system captured in the conceptual model is expected to behave in the future. The output suggests a scenario that can be compared to any knowledge of such events in the past by those in the problem situation.
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- A model of the part of reality which is like the model can be constructed, with a view to mapping the two in order to outline significant differences worthy of discussion for potential change.

The underlying reason for this comparison is to generate debate with all actors in the problem situation, thus yielding an agenda that includes a series of topics for discussion for possible change (111).

Stage 6: Defining Feasible and Desirable Changes

The agenda that has been generated in Stage Five from the comparison between the ‘conceptual models’ and the real world of the problem situation, will be the basis of the debate by all stakeholders in the system, including the clients, problem-owners and problem-solver. The purpose of this debate is to see whether an agreement has been reached between all the actors for improving or changing the problem situation in terms of change which is both systematically desirable and culturally feasible. However, if agreement has not yet been reached which leads the analyst to accept this fact as a solution, then another relevant system is developed or the methodology is worked to again in order to look for new ideas (112).

Stage 7: Taking Action to Change or Improve the Problem Situation

When agreement is reached between all the interested actors in the problem situation on change or improvement that is systematically desirable and culturally feasible, the analyst at this stage uses the methodology to implement changes that may create new structures, processes, procedures or policies (113). However, at this late phase of the methodology, the problem now becomes a different one and the process can begin again.

5.2.2.2.2 Mode 2: The Two Streams

The Two Streams model, as described in Figure 5.7 and developed by Checkland (114), consists of a logic-driven stream of enquiry and a culturally driven stream which includes:
Analysis One: The Intervention Analysis: This requires at least the identification of three possible roles in the situation. Firstly, the role of the 'client' who may be an individual or individuals who have realised the seriousness and potential negative aspects of the problem and who have, therefore, caused the study to be carried out. This role is not tailored for a particular person or persons but may be initiated by whoever is enthusiastic enough to take on the role. Secondly, the 'problem-solver' is the person or persons who are interested in improving or changing the situation by methodological means (115). The 'problem-solver' must be keen to do something about the problem through understanding and willingness to spend the time and effort to take purposive action. Thirdly, the problem-owners are the individuals or groups of people who perceive some sort of problem within a situation and have the authority, influence and resources to effect change in the situation. Davies and Ledington (116) argue that the role of the problem-owner is more perplexing because, in a real-world situation, it is more complicated to name the absolute problem-owner in any given situation. There will be several assumptions about who may possibly be the problem-owner. For that reason, the 'problem-solver' must determine who conceivably will play the role of 'problem-owner'. Essentially, in all the above three analyses of the intervention, the analyst must clearly state who will execute these roles.

Analysis Two: The Cultural Analysis

SSM acknowledges the vital role of history in any social system; it will determine what should be seen as significant for people and be the standard that is used to judge this significance. It also recognises the importance of understanding the culture or 'social system' of the situation which will lead to differing perceptions, views and conflicting interests on the part of stakeholders. Cultural or 'social system' analysis consists of three constantly changing interacting elements: roles, values and norms. Davies and Ledington (117) indicate that roles in cultural analysis mean the social status of the individual or individuals that is considered as important by collective individuals in the problem situation. Values refer to social standards that are regularly used to assess the actual performance in a role. Norms are related to the anticipated behaviour of the person or persons in the social position. In the 'social system', these three elements, as expressed in Figure 5.7, will be analysed and repeatedly defined by the others.
Davis and Ledington (118) argue that understanding the cultural metaphor of an organization emerges from analysing certain attributes. These are history, contingency, symbolic forms, formalisms and behaviours. This list of attributes is not meant to be final; instead it provides the analyst with some guidelines for an appropriate way to undertake cultural analysis. The analyst at this stage is not restricted to these attributes. He/she has the freedom to expand these attributes by adding more that may be discovered throughout the analysis. This is aimed at expressing the situation comprehensively.

**Analysis Three: The Political Analysis**

The theoretical basis for this analysis is that any problem situation involving human beings has a political dimension which cannot be disregarded under any circumstances throughout the investigation because any later attempts to change or improve the situation will depend on obtaining the approval of those who are in charge or control of it. The general aim of this analysis is to be aware of how the power is circulated within an organisation. Checkland and Scholes (119) suggested that political analysis can start by analysts asking practical questions such as how is power expressed? What are the 'commodities' (embodiments) through which power is expressed in the situation? How are these commodities obtained, used, protected, preserved, passed on and relinquished, and through what mechanisms? Due to the lack of openness in discussing power issues within human situations, answers to these questions must be arrived at with great compassion and diplomacy.
Accomplishing these three analyses successfully will provide the analyst with a broad and profound picture related to the situation, and hence taking action that is regarded as systematically desired and culturally possible.

This model (Figure 5.8) emphasises the importance of cultural analysis and does not follow the sequential nature of the previous methodology. It permits the analyst who knows about the situation to begin by selecting, naming, modelling and comparing relevant systems with the real world which will sum up the logic-driven stream of enquiry. All of these processes were implied in the basic seven-stage procedure via activity models. The cultural-driven stream of enquiry on the other hand is not represented formally in the basic stage model whereas this model gives it more attention. It is obviously important for the analyst to understand the cultural and political situation of the problem being investigated, particularly when selecting potential relevant human activity systems and debating action which may be taken to improve the problem situation that is systematically feasible and culturally desirable.
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Tasks, issues

Analysis of the relevant systems

Social system' analysis

Political system' analysis

STREAM OF CULTURAL ANALYSIS

Real-world problem situation

Models

Compare

Situation

Would-be improvers of the problem situation

Differences between models and real world

Changes: Systematically desirable culturally feasible

Action to improve the situation

LOGIC-BASED STREAM OF ANALYSIS

Figure 5.8: Mode 2 of SSM (Two Streams) (120).
5.3 Data Collection Methods: Selection Techniques and Designs

It has been argued that in order to build the richest possible picture at Stage Two in SSM, it is necessary to obtain detailed in-depth information in relation to the problem situation (121). In practice, the process of data gathering at this stage can take a variety of forms, including, but not limited to, questionnaires, interviews, document analysis and participant observations. It is imperative to use as many techniques as possible to attain the required data that will illuminate the situation under investigation. Thus, in this study, the major techniques that will be used for data collection are questionnaires and interviews.

5.3.1 Questionnaire

The questionnaire is the most commonly used data technique in social science research. It can be employed by the researcher to measure the opinions and reactions of a statistically valid proportion of a population. Therefore, findings can be generalized to include the whole population from which the sample was obtained. There are several advantages of implementing this method of data collection. For example, the questionnaire survey is an economical technique which allows the researcher to reduce sampling error at a relatively low cost. In addition, it enables the researcher to reach a large sample of the population who may be scattered across a wide area. Questionnaire surveys produce fewer response biases than might result from using the interview technique. In a questionnaire survey, respondents have enough time to think and consult other sources before answering questions, while the absence of the interviewer provides the respondent with a sense of privacy and anonymity (122). On the other hand, the technique has a number of limitations. For example, questions have to be simple so that they are easily understood by the respondent, and the response rates generated by questionnaires are lower than those generated by personal interview even when questionnaires are completed. This may be due to ambiguity in the questions, the lack of immediate clarification, inaccurate or incomplete information, the lack of control over the situation, completion of the questionnaire by someone other than the selected respondent, and the fact that a respondent may possibly change his/her earlier answer (123). In practice, the most popular types of questionnaires are mail surveys, telephone interviews, and face-to-face interviews (124). Mail questionnaires are carried out by the
researcher sending the questionnaires to the potential respondents by mail and the respondents answering all the questions personally at their own pace. In telephone surveys, the investigator selects the intended sample from a telephone directory, a particular list, or any other random number technique which is designed specifically to be used in the absence of an adequate list for a public survey. The researcher in this technique interviews the respondent by telephone at his/her convenience and, at the same time, records the answer manually or electronically. A face-to-face interview is best described as a questionnaire in which individuals normally answer in the presence of the researcher or any of his/her assistants. A drop-off questionnaire merges face-to-face interviews and mail surveys. In these questionnaires, the researcher distributes questionnaires personally to every potential respondent. After the respondents have completed the survey, they return it by mail or keep it to be collected by the researcher. Selecting the best method for a particular study depends on the resources available to the researcher such as budget, staff and time constraints and on the type of errors that the researcher will probably encounter (125). The drop-off survey was applied in this study since it was felt it might encourage respondents to complete the questionnaires within the time frame.

5.3.1.1 Questionnaire Design and Structure

According to Frankfort-Nachmias and Nachmias (126), the question is the primary method that underpins all types of questionnaire. It must translate the research objectives into specific questions, the answers to which will provide the researcher with the required data to examine certain hypotheses. Conducting a questionnaire survey is the process of translating concepts into measurable variables. Forming questions requires skill, practice, patience and creativity. Oppenheim, Fowler and Mangione; De Vaus; and Schuman and Presser (as quoted by May (127)) emphasise the importance of considering the following points when drafting questionnaire questions:

- The order of the questions should be planned.

- Questionnaire questions should be specific and precise in order to extract the information that is needed.
The wording of the question should be simple and clear. It should convey the meaning accurately without misinterpretation or misunderstanding on the part of the respondent.

The potential respondents should be knowledgeable concerning the issue being investigated.

Prejudicial questions should be avoided.

The researcher must ensure that each question is about one, and only one, topic.

The questionnaire’s design should avoid leading the respondents to choose one response over another by the wording of questions such as “Do you think”, “You do not think that” and so on.

Hypothetical questions that may lead to hypothetical answers must be avoided when devising a questionnaire.

The investigator should use introductory or filter questions and must not assume that the respondents will follow the pattern of behaviour he/she wishes to explore.

It is necessary to minimise the number of memory questions that may be answered erroneously.

The research variables were tested by questions in a quantitatively measurable way using existing scales in the literature, such as Likert-style ratings and dichotomous questions. The questionnaire was developed by the researcher after carrying out an extensive literature review (128-134). It was designed with complete instructions, unambiguous wording, understandable content, an easy response structure and a suitable format. The first draft of the questionnaire was constructed and written in English, and submitted to the researcher’s supervisor to check its reliability and validity. The supervisor suggested some modifications which were made. The second phase of drafting the questionnaire was to translate it into Arabic, with the translation’s correctness being verified by a number of professors at King Saud University.

The questionnaire consisted of six major parts. Each part, as described below, involved specific ideas related to the research interests.
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Part I: The intention of this section was to gather necessary demographic characteristics about the respondents, such as gender, age, academic qualifications, Internet experience and so on.

Part II: The purpose of this part was to obtain respondents' views concerning the concept of establishing a virtual university technology in Saudi Arabia.

Part III: This part aimed to identify the potential reasons that might or might not support the establishment of a virtual university in Saudi Arabia.

Part IV: The objective of this part was to point out respondents' opinions pertaining to the organizational structure, administration, finances, teaching member appointments, student admissions, and tuition and fee systems at the proposed virtual university.

Part V: This part sought respondents' views regarding degrees, specialities, course developments, study languages, media usage, study systems and assessment methods.

Part VI: This part explored the limitations that might impede the progress of the proposed university.

Part VII: The aim of this part was to investigate other choices that might be considered by respondents to solve the problem of accommodating the rapid growth in the number of secondary school graduates seeking higher education in Saudi Arabia.

The questionnaire attempts to answer the following major research questions as stated in Chapter 1:

Q1. What are the likely advantages that may support the exploitation of the Internet and associated technologies in delivering higher education in Saudi Arabia?

Q2. What models of a virtual university based on the Internet and related technologies are best to follow?

Q3. What are the likely limitations that may impede the establishment of a virtual university in providing higher education in Saudi Arabia?
Q4. What other reasonable options might be available for higher education policymakers to solve the problem of accommodating the rapid growth of students looking for higher education?

Most of the questions in this research instrument were closed-ended and simply required the respondent either to tick an appropriate box, that is, to insert a (✓). Additionally, at the end of some questions, the respondents were given the chance to make comments or to add any information which they felt necessary.

5.3.1.2 Pre-Testing (Pilot-Study)

IS researchers emphasize the importance of conducting a pilot study to ensure that the proposed questionnaire is equally understandable and clear to all members of the target population. So, as soon as the initial draft of the questionnaire is constructed, it is vital to test it in order to ensure the questionnaire's reliability and validity (135). The pilot study fulfils this role and it is helpful for the researcher in drafting the final version of the questionnaire to understand how it will be understood by potential respondents. Bourque and Fielder (136) suggested that a pilot test, undertaken before carrying out the main survey, provides the researcher with an opportunity to find out: Are all questions understood? Are instructions clear? Is the order of the questions suitable? Are the objectives of the study clearly understood by both surveyors and respondents? Have costs been accurately projected? Likewise, it provides a clear indication of the appropriateness of the content of the questionnaire and shows up any obscure problems that might come to light when executing or administering the main survey. For the purpose of this research, the pilot study was carried out to check the satisfaction of the participants with the questionnaire's wording, clarity and length. This pilot test was conducted on 36 teaching members from KSU, IMIU and KAU (male and female) who were invited to participate in completing the questionnaire. This was accomplished while the researcher was still in the UK. All the participants in this pilot test returned the questionnaire and their valuable comments were used to enhance its clarity and to make it reasonable with regard to length and the time required to complete it. Obviously, the pilot added value to the final version of the questionnaire, and assisted the researcher in adding additional questions and in taking out others in order to suit the aims and objectives of the study. This process confirms the validity of the questionnaire and
consequently its reliability because, as Sekaran (137) pointed out, assuming the reliability of the questionnaire as an instrument derives from the ability of the researcher to demonstrate its validity. The resultant questions are listed in Appendix A.

5.3.1.3 Population Frame

The population refers to the total set of factors that the researcher aims to investigate or examine within a specific time in a particular setting. It is the first task of the researcher to identify the target population as specifically as possible, taking into account the aims and objectives of the study. He/she must also find a list of the target population and finally select the sample (138). In this study, the aim is to investigate the possibility, practicality and desirability of establishing a virtual university model in Saudi Arabia. Therefore, the target population for the questionnaire is limited to teaching members (male and female) officially listed at three universities. These were KSU, IMIU and KAU. The major reason behind the selection of the respondents is because academic teaching members are the individuals who will be expected to take the initiative and responsibility in establishing and running a virtual university. Therefore, their views and perceptions on the feasibility of a virtual university are essential to the study. The reason for selecting these three universities and three academic centres for girls’ education that are currently supervised by them from the total eight institutions which currently exist in the Kingdom is because these have relatively adequate information technology infrastructures and Internet connection. Additionally, the selection includes the two leading Saudi universities currently running external studies (Intisab) to non-traditional students: these are IMIU and KAU. Another reason was that the time available for the researcher to carry out the survey was restricted to a pre-planned time frame. It should be noted, however, that this study is not intended to present an exact enumeration of the whole population; instead it aims to provide an accurate qualitative representation of the general population.

5.3.1.4 Sampling

Much research, whether quantitative or qualitative, involves sampling. This is the process of selecting a group from the entire population under investigation that is believed to be
representative of the genuine population. A sample is defined as “a subset of elements from the population selected according to a sample design, which specifies the rules and operations by which the sample is to be chosen from the population” (139). It assists in providing “a mechanism whereby we can make an estimate of a population’s characteristic and get, based on probability theory, a numerical measure of how good that estimate is” (140). The advantages of drawing a sample that represents the characteristics contained in the population are that data are often cheaper to collect, it requires fewer people to collect and analyse the data and the sample size allows more information to be obtained about fewer cases, and time is saved in analysing and processing a sample (141).

In addition, sampling may increase accuracy and improve management and control in the area under scrutiny (142). The reasons for selecting and examining a sample rather than the whole population is because of the large size of the population under investigation, inadequate funds or time on the part of the researcher to examine the whole population at once, and lack of knowledge of the total number of the population. Generally, there are two processes by which samples may be obtained (143). Firstly, non-probability or non-random sampling which can be defined as a rational approach that typically gives the researcher no clear indication of who will be selected in the sample and who will be excluded. According to this commonsensical process, the researcher normally uses his/her own judgment to pick cases that seemed more suitable or because they are simply easier to reach than others (144). This technique is typically appropriate in exploratory studies or when the survey is conducted to organize communities, identify leaders or to build networks (145). It can also be used when there is a lack of time and money on the part of the researcher. In addition, researchers may prefer to apply non-probability in a particular study because they do not wish to generalise their findings to the entire population, or when they do not have an access to the complete list of the whole population. The major weakness of this type of sampling lies in the danger of bias on the part of the researcher in the selection of units or cases for study, and the difficulty in estimating the accuracy of the sample (146). The major forms of non-probability sampling are quota sampling, multi-purpose sampling, networking or snowball sampling, outcropping sampling, and advertising sampling (147).

Probability or random sampling is the second category. It gives each member of the target population an identical probability of being selected in the sample. It is scientifically more acceptable than non-probability sampling because an estimation of sample precision can be attained mathematically and it eliminates any risk of bias in the
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Selection of the sample on the part of the researcher (148). Salant and Dillman (149) identified four major types of probability sampling: simple random sampling, systematic sampling, stratified sampling and cluster sampling. These techniques are briefly defined and their potential advantages and disadvantages pointed out in the following paragraphs.

5.3.1.4.1 Simple Random Sampling

This is a process in which each sample unit of the total population has an equal and known probability of being selected. The advantage of this approach is that it allows the researcher to obtain an unbiased sample without much technical difficulty. Its main disadvantage lies in its failure to collect all the elements in a population that are of interest. Furthermore, the task of selecting a simple random sample from a list can be extremely tedious and time-consuming.

5.3.1.4.2 Stratified Random Sampling

This refers to a process of sampling in which the population under investigation is divided into subpopulations based on key independent variables. Then a simple or systematic random sample is taken from each of these subpopulations as a representative of the entire population (150). The sample obtained from each stratum comes in two forms: a proportionate or disproportionate sample. A proportionate sample involves selecting the same number of sampling units from each stratum because the sample size pulled out from each stratum is proportionate to the population size of the stratum. A disproportionate sample indicates the selection of a different number of sampling units from each stratum since the sample size extracted from each stratum is proportionate to the stratum's whole population size. The potential advantages of the stratified sampling technique in addition to a population estimate are conducting parameter estimates for subgroups of the population with the possibility of increased statistical efficiency of the estimates and lower sampling variations (151). The potential disadvantages relate to its cost, the fact it is time-consuming, and its complexity in selection and estimation. Moreover, dramatic increases in the required sample size would occur in designs consisting of a relatively large number of stratifying variables and when a minimum sample size is needed for every combination.
5.3.1.4.3 Systematic Random Sampling

Systematic sampling means selecting the first sampling unit from the total population randomly, and after that, selecting every Nth (152). This is more convenient and simpler than simple random sampling and more appropriate for use with a very large population. One problem that may be associated with systematic sampling design is the possibility of systematic bias creeping into the sample when the lists’ entries are not selected randomly (153).

5.3.1.4.4 Cluster Random Sampling

This type of sampling consists of dividing the entire population into a number of broad categories called ‘clusters’, then selecting the sample unit from the clusters. The main advantages claimed for this method are that it is economical, convenient and easy to use (154). Its major drawback relates to its dependence on the particular clusters that have been selected when measuring their accuracy (155).

5.3.1.5 Sample Selection

For the purpose of obtaining appropriate sampling units, proportionate stratified random sampling was applied in this study in order to represent the entire population as efficiently as possible. In order to achieve this aim, the population under investigation was divided into two main groups: Group A represented male teaching members at the three selected universities and Group B represented female teaching members at the three centres for girls' education. The total official number of teaching members (male and female) at the chosen three universities, as they are illustrated in Table 5.2, was 3,052. This figure is restricted to Saudi teaching members. Systematic random sampling was used to select the target respondents from each group. Every fourth name from the university's 2001 teaching members’ list was chosen at each institution. This represents exactly 25% of the total population at each university. The total sample selection of respondents, as shown in Table 5.2, was 774 male teaching members in Group A and 222 female teaching members in Group B.
### Table 5.2: Number of recipients of questionnaires

<table>
<thead>
<tr>
<th>University</th>
<th>Group A</th>
<th>Sample</th>
<th>Group B</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>KSU</td>
<td>1,132</td>
<td>283</td>
<td>313</td>
<td>78</td>
</tr>
<tr>
<td>IMIU</td>
<td>1,021</td>
<td>266</td>
<td>90</td>
<td>23</td>
</tr>
<tr>
<td>KAU</td>
<td>899</td>
<td>225</td>
<td>482</td>
<td>121</td>
</tr>
<tr>
<td>Total</td>
<td>3,052</td>
<td>774</td>
<td>885</td>
<td>222</td>
</tr>
</tbody>
</table>

5.3.1.5 Questionnaire Distribution

Before carrying out the main survey, the researcher had to make a request to each university Vice-President in order to obtain a letter of authorisation to allow him to distribute the questionnaires (see Appendix A-1, A-2, and A3). He was granted this permission and circulated a total of 996 copies of the questionnaire as described previously. The questionnaire was distributed in its Arabic version based on respondents’ feedback in the two pilot studies. Each questionnaire, attached to a stamped, self-addressed envelope giving a local address, was provided with an accompanying letter which named the researcher, his institution, the subject under study, the purpose of the study, its usefulness, an explanation of why the respondent is important to the study, and a description of the degree of confidentiality that the respondent could expect. The full address of the researcher, who could be contacted if any respondent had enquiries, and appreciative words for their co-operation were also included (156). Furthermore, each questionnaire was handed personally to every college and/or department secretary where the target respondent was a member and they were informed of the expected return date of the questionnaire. This helped in sending a reminder letter to respondents who had not replied within the time frame.

5.3.2 Interview

The interview is perhaps one of the most widely used data elicitation techniques because it is a manifestation of the typical practice that people utilise when they want to acquire information from other people to learn about an issue of concern. An interview is a purposefully pre-arranged verbal interchange with an individual or individuals, either
face-to-face or through other communication media with the intention of obtaining precise views or perceptions regarding an issue of concern. Broadly speaking, "it is a method by which the human world may be explored, although it is the world of beliefs and meanings, not of actions that is clarified by interview research. Since what people claim to think, feel or does not necessarily align well with their action, it is important to be clear that interviews get at what people say, however sincerely, rather than what they do" (157). Specifically, it provides the researcher with an absolute understanding of the reality of people's lives from their own perspective. Normally, the interview is designed to obtain information related to the perceptions, attitudes, feelings, views, opinions, ideas and experiences of the people under examination, which may not be obtained by using other techniques such as the questionnaire or even observation. It is a non-numerical data collection method that can be used to collect detailed information about a relatively small number of people and cases, in order to provide deeper and better understanding of the phenomenon under investigation. When applying Soft System Methodology in this study, the qualitative interview was a vital technique for data collection. It helped in understanding stakeholders' points of view concerning the problem situation. Avison, and Fitzgerald (158) emphasised that:

"There will be many different views as it is unlikely that the views of the problem owner, that is, the person or group on whose behalf the analysis has been commissioned, the other people taking part as 'actors' in the problem situation and other stakeholders, will coincide. There will be different views that the analyst can take regarding the problem situation and at this stage it is important to reveal as wide a range of them as possible".

The benefits of adopting this technique are enabling the interviewer closely to view and record the perspectives, attitudes and behaviour of the respondent in his/her original setting; providing the interviewer with a deeper understanding of the phenomenon being studied; and providing a higher response rate than alternatives because a respondent who is reluctant or unwilling to respond to, for instance, a mail questionnaire can be reached at his/her convenience in terms of time and place. The interviewer has more control over the interviewing situation and circumstances of answering the questions, and the flexibility of the interview technique allows the interviewer to explain, clarify and modify questions in accordance with the situation and whenever it is needed to elicit in-depth
information (159). In addition, it assists the interviewer in obtaining additional information about the situation being studied, such as personal information about the respondents and their internal and external environment which, without doubt, helps the interpretation of data collected.

Despite all of these definite advantages, some drawbacks are associated with this technique. These include the fact that data are collected from a small number of people, results cannot be generalised or even be said to be representative, and the cost of conducting an interview could be higher than carrying out a mail questionnaire. Interviews can also be time-consuming, particularly when potential respondents cannot be contacted electronically since they are spread over a large geographic area. The interviewer can potentially also introduce bias into the data collected in a variety of ways. For example, he/she may deliberately or subconsciously manipulate data, add comments or opinions, or suggest answers. On sensitive issues, respondents may hesitate to provide the interviewer with in-depth information, such as regarding personal behaviour, and respondents may feel a lack of anonymity when they are interviewed (160).

Interviews typically come in four major formats that fundamentally can be distinguished in terms of the degree of structure and formality. These are: the standardized open-ended interview (structured interview); the general interview guide approach, (the semi-structured interview); the informal conversational interview, (the unstructured interview); and the group interview (161). Each technique has its own theoretical basis, preparation process, mechanism and procedures, and strengths and weakness that can best be used to generate data in a particular situation. This study used the standardised open-ended interviews. The interview consisted of a set of questions that were carefully designed in terms of wording and sequence with the purpose of asking each potential respondent the same question in the same order with the same words. The major strengths of this approach are that any researcher bias or the effect the researcher has on the outcomes of the interview are minimised. This approach also generates systematic and comprehensive data from each respondent and enhances the possibility of comparing respondents' answers. The possible drawbacks of this technique are its lack of flexibility and the tendency for respondents to reply on the spur of the moment (162).
5.3.2.2 Interview Procedures

The researcher had to send an official letter (Appendix B) to interviewees about the survey and to request cooperation and assistance. The letter indicated the aim of the survey and conveyed its importance; it assured confidentiality and encouraged replies. This was followed by a telephone call to confirm the date, time and place of the interview. The interviews took place in the interviewees' offices. Each interview lasted for about twenty-five minutes. Weisberg, Krosnick and Bowen (163) suggest a variety of interviewing guidelines to be followed by any interviewer in conducting an interview. These can be outlined as follows:

- A personal rapport and a sense of mutual interest should be built with the respondent.

- The interviewer is expected to avoid using vague or inappropriate questions. Instead, questions should be clear, logically ordered, appropriate and understandable. Moreover, the interviewer should not ask more than one question at a time.

- Preferably, the interviewer should use a tape-recorder or computer-assisted personal interviewing (CAPI) package such as a notebook computer to record respondents' exact answers. This practice allows the researcher to analyze the answers without relying on his/her own interpretations or judgments.

- The primary purpose of the interview is to measure the respondents' attitudes and this must be kept central throughout all phases of interviewing.

- The interviewer should focus on collecting information, and not express his/her own opinions to the respondents.

- Probing and follow up-questions should be used to make the respondents' answers clear, complete and relevant.

- The interviewers should take whatever steps are necessary to gather authentic and consistent information.

- The interviewees should be treated with respect and dignity.
5.3.2.2.1 Population Frame and Interview Contents

For the purpose of obtaining a broad picture of the feasibility, practicality and the desirability of establishing a virtual university in Saudi Arabia, it is crucial to acquire an adequate knowledge of all surrounding circumstances relevant to the present study. Interviews were conducted with several key figures to satisfy the aim and objectives of this study. Table 5.3 shows the number of interviewees selected. Questions for every interview during the course of this project are given in Appendix B-1. The following elements were considered for the interviewing process.

a) Members of Higher Education Supreme Council

These are people who oversee all education affairs above secondary school with the exception of military education. The interview was conducted with presidents of the three universities who are also active members of the Higher Education Supreme Council and who supervise and oversee all academic management and financial procedures at their institutions. The main objective of the interview was to identify:

- Problems that are currently being encountered in higher education in Saudi Arabia.
- Short and long-term plans to deal with the increasing numbers of students seeking higher education and the resources which are available to support the accomplishment of such plans.
- Perceptions and views regarding the prospects of establishing a virtual university, and what difficulties may hamper this.

b) Deputy Minister of the Ministry of Higher Education for Academic Affairs

The major function of the Deputy Minister is to coordinate all education and academic matters between the Ministry of Higher Education, the universities and other higher education institutions throughout the Kingdom. Additionally, he plays a major role in defining, specifying and strengthening the relationship between the Ministry and other
universities in many parts of the world. The same issues were discussed as in the interview with members of the Higher Education Supreme Council.

c) The University Vice-presidents

Usually such personnel are in charge of the university’s strategic planning and/or the management of finance, staffing, research, development and all other planning of academic activities on the campus. One member from each of the three institutions was interviewed in order to explore issues related specifically to the university, such as challenges, short and long-term plans, available resources and their views on the idea of establishing a virtual university.

d) College Deans

These are appointed by the university Rector to undertake the responsibility of administering their colleges financially and managerially. Six college deans (three male and three female) from the three universities were interviewed with the aim of obtaining information pertaining to:

- Problems that are currently being encountered in their colleges.
- Short and long-term plans of their colleges to contain the increasing numbers of students seeking higher education and the resources that are available to support the accomplishment of such plans.
- Perceptions and views regarding the prospects of establishing a virtual university, and what difficulties may hamper this.

e) Directors of Computer Centres

Normally, such personnel are appointed and authorized by university presidents to plan, develop and manage all computer services on campus. One computer centre director from each university was interviewed to elicit the following:

- Functions of the computer centre, its policy and structure.
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- IT infrastructure and services.
- Internet connection.
- Problems and future plans.

f) Director of Internet Services Unit at KACST

The main function of the Director of Internet Services Division at KACST is to supervise the international connection point in Saudi Arabia with the Internet network. The interview sought to point out:

- Responsibilities.
- Internet policy in the Kingdom.
- IT infrastructure.
- Problems and future plans.

g) Manager of Internet Services at STC

The major responsibility of the Internet Service Manager at STC is to oversee the development of Internet services and ensure the adequacy and appropriateness of the available technological infrastructure.

The interview was constructed to bring to light the following issues:

- Responsibilities.
- IT Infrastructure.
- Problems and future plans.
h) Internet Service Provider

The interview was conducted with an ISP in order to determine its major responsibilities and the main obstacles that are currently facing this service in Saudi Arabia. The interview was conducted to generate views regarding the following issues:

- The main functions of the ISP.
- The major challenges that face the ISP.

<table>
<thead>
<tr>
<th>Types of Interviewees</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members of the Higher Education Supreme Council</td>
<td>3</td>
</tr>
<tr>
<td>Deputy Minister of the Ministry of Higher Education for</td>
<td>1</td>
</tr>
<tr>
<td>Academic Affairs</td>
<td></td>
</tr>
<tr>
<td>The University Vice-presidents</td>
<td>3</td>
</tr>
<tr>
<td>College Deans</td>
<td>6</td>
</tr>
<tr>
<td>Directors of Computer Centres at KSU, IMIU, KAU</td>
<td>3</td>
</tr>
<tr>
<td>Director of Internet Services Unit at KACST</td>
<td>1</td>
</tr>
<tr>
<td>Manager of Internet Services at STC</td>
<td>1</td>
</tr>
<tr>
<td>Internet Service Provider</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>19</td>
</tr>
</tbody>
</table>

Table 5.3: Interviewees

Timetable for implementation of the survey

The survey was carried out between 21st of October 2001 and 10th of January 2002 with the order of institutions chosen based on their geographical location. Timetabling was followed exactly as stated below.
<table>
<thead>
<tr>
<th>Date</th>
<th>Job</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 Oct. 2001</td>
<td>Leave for Saudi Arabia (Riyadh)</td>
</tr>
<tr>
<td>28 Oct. to 13 Nov. 2001</td>
<td>KSU-Riyadh (conducting interviews, distributing and collecting questionnaires).</td>
</tr>
<tr>
<td>14 Nov. to 4 Dec. 2001</td>
<td>IMIU-Riyadh (conducting interviews, distributing and collecting questionnaires).</td>
</tr>
<tr>
<td>5 Dec. to 10 Dec. 2001</td>
<td>KACST (conducting interview only).</td>
</tr>
<tr>
<td>10 Dec. to 18 Dec. 2001</td>
<td>STC (conducting interview only).</td>
</tr>
<tr>
<td>31 Dec. to 8 January 2002</td>
<td>Official Holiday</td>
</tr>
<tr>
<td>10 January 2002</td>
<td>Leaving Saudi Arabia</td>
</tr>
</tbody>
</table>

Table 5.4: Timetable

### 5.4 Conclusion

In conducting a research project, it is necessary to develop an appropriate research methodology and to adopt acceptable data collection techniques. The quality of the data depends on the selection of an appropriate data collection approach. It can be seen from this extensive discussion that in the field of Information Systems research, there are numerous techniques available for researchers which have been proved to have been used successfully in investigating particular phenomena. Every technique has its own strengths and weaknesses which must be measured in order to select the most suitable one for a particular study. The choice of a methodology for a specific study rests on its scope, its aims and objectives, and the target population, as well as the resources available to the researcher.
To overcome some of the deficiencies of implementing a single technique in exploring a specific situation, researchers usually rely on or combine two or more approaches as this study has done. The researcher had to unify two popular methods used in ISR to fulfil the aims and objectives of the study. These methods were Action Research in the form of SSM, and the Survey method in the mode of questionnaires and interviews. These approaches have been rationally synthesized.

Additionally, this chapter has reported the procedures adapted in the design and development of the questionnaire and interview techniques. It has also explained the sampling techniques used, and how these were conducted. Finally, it has provided details of the questionnaire and interview fieldwork procedures.

The next two chapters discuss the major findings of the questionnaires and interviews and explain these findings in detail.
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115. Davis and Ledington, ref. 97, pp.14-16.

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117. Ibid. pp. 42-44.

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Chapter 6:

Questionnaire Results: Analysis

6.1 Introduction

The purpose of this chapter is to present the results of the survey based on the points of view of the participants about their perception of establishing a virtual university for continuing higher education in the Kingdom of Saudi Arabia. The analysis was executed mainly in terms of the two main groups of respondents: Group A (male teaching members) and Group B (female teaching members) affiliated to three major universities in Saudi Arabia. These are KSU, IMIU and KAU. The data collected was edited to check its accuracy and consistency with other previously secured facts, and then uniformly entered, as completely as possible, and arranged to facilitate coding and tabulation. The analysis of the responses was carried out on a Personal Computer using the Statistical Package for Social Science (SPSS-10.0), statistical software often used in social studies. As pointed out in Chapter 5, the number of questionnaires that had been distributed was 996 for the main study. The number of questionnaires returned was 538. This represents about 57% of the total sample, which is considered to be a reasonable response rate by most experts (1). Table 6.1 gives a breakdown of the distributed questionnaires and the return rate.

<table>
<thead>
<tr>
<th>University</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number issued</td>
<td>Number analysed</td>
</tr>
<tr>
<td>KSU</td>
<td>283</td>
<td>160</td>
</tr>
<tr>
<td>IMIU</td>
<td>266</td>
<td>140</td>
</tr>
<tr>
<td>KAU</td>
<td>225</td>
<td>115</td>
</tr>
<tr>
<td>Total</td>
<td>774</td>
<td>415</td>
</tr>
</tbody>
</table>

Table 6.1: A breakdown of the distribution and return rate of questionnaires
6.2 The Statistical Test

In order to achieve the purpose of this research and to answer some of the questions put forward in Chapter 1, descriptive statistics, including frequencies of numbers and percentages, were used to report the data obtained from the returned questionnaires. Additionally, the data were examined using the Chi-square test which is based largely on actual observed frequencies compared with those that could be expected to occur by chance. It is a non-parametric test which makes no assumptions about the populations from which the sample has been drawn, in contrast to parametric tests which require data to be drawn from a population with a normal distribution and homogeneity of variance. The higher the Chi-square value and the bigger the sample size, the more significant the result of the test. It is the most widely used non-parametric test because it is relatively easy to follow and is pertinent to various research problems (2).

6.3 Background Data Variables

6.3.1 Group Distribution

For the sake of description, respondents were divided into two main groups, as explained in Chapter 5, and after conducting the analysis, it was discovered, as shown in Table 6.2, that the majority of respondents represented Group A (77.1%; N = 415), and the remaining participants formed Group B (22.9%; N = 123). This is due to a number of reasons: first, the sampling selection has to be equally drawn from each group; secondly, Group A participants were more willing to respond than Group B; and finally, Group A was numerically larger than Group B because they were working at large universities that were composed of numerous faculties and a large number of students. On the other hand, Group B respondents were employed at small academic centres that incorporated only a few colleges and had a relatively smaller number of students, as discussed in Chapter 2.
6.3.2 Age Distribution of Respondents

In an attempt to estimate the age of the respondents, they were asked to specify their age groups and it was found, as illustrated in Table 6.3, that most respondents (36.4%; N = 196) were aged between 40-49 years old. Group A had a greater number of these ages (38.8%; N = 161) than Group B (28.5%; N = 35). In contrast, Group B had the largest section of respondents aged 30-39 (41.5%; N = 51) than Group A (32.8%; N = 136). Furthermore, Group B had the greatest number of participants aged less than 30 (22.0%; N = 27), while Group A had a tiny percentage of respondents aged under 30 (about 6.7%; N = 28). Looking for feasible significance between the main groups and the age of respondents, the Chi-square test was used and the result was 35.683 (df3, P=0.000). This statistical result shows that Group A had a significantly larger proportion of older teaching members than Group B. This was because the opportunities for females to continue higher education studies are relatively new when compared to the opportunities of their male colleagues, as pointed out in Chapter 2.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 30 years</td>
<td>28</td>
<td>27</td>
<td>55</td>
</tr>
<tr>
<td>30-39</td>
<td>136</td>
<td>51</td>
<td>187</td>
</tr>
<tr>
<td>40-49</td>
<td>161</td>
<td>35</td>
<td>196</td>
</tr>
<tr>
<td>50 and over</td>
<td>90</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 6.3: Age distribution of respondents
6.3.3 Academic Qualifications of Respondents

The majority of respondents (76.2%; N = 410) were Ph.D. qualified (see Table 6.4), followed by those with Masters’ degrees (18.4%) and then Bachelor degrees (5.4%; N = 29). The Chi-square test was used to define significance within each group regarding their academic qualifications. It was revealed that the Chi-square was 26.80 (df2, P = 0.0001). According to this analysis, Group A had more Ph.D. qualified members (81.2%; N = 337) than Group B who had 59.3% (N = 73). Group B, on the other hand, had larger numbers of respondents who hold Masters and Bachelors’ degrees (29.3% and 11.4% respectively) than Group A (15.2% and 3.6%). To identify significance between the two groups regarding academic qualifications, the Chi-square was applied and the result was 26.80 (df2, P = 0.000). The primary reason behind this result was because members of Group A had more advantages than members of Group B in the higher education system in Saudi Arabia. They had more opportunities to pursue their postgraduate and graduate degrees inside and outside the Kingdom in a variety of subjects without any potential restriction as long as they were consistent with their institution’s rules and regulations regarding this matter. Conversely, Group B members had few opportunities to pursue their higher education studies, because of the imbalanced and unequal opportunities provided for them by higher education policymakers.
6.3.4 Internet Usage of Respondents

Around 73.8% of respondents (see Table 6.5) used the Internet network, only 26.2% of the whole sample did not use it. Table 6.7 shows the Internet usage of respondents. Group B represents the largest percentages of those who used the Internet, (about 91.1%; N = 112), while 8.9% (N = 11) did not. In Group A, on the other hand, 68.7% (N = 285) used the Internet and only 31.3% (N = 130) did not. In order to determine whether there was any significant difference between the views of the two groups regarding the use of the Internet network, it was found that the Chi-square result was 24.57 (df 1, P = 0.000). These results are considered to be the only available source of data that measures Group B utilisation of the Internet in Saudi Arabia. It was ascertained that members of Group B were less reluctant to access the Internet as had been thought than were members of Group A.
6.4 The Perception of Establishing a Virtual University

The purpose of this question is to understand whether the respondents agree or not to the idea of establishing a virtual university in the Kingdom of Saudi Arabia. The results show that the majority of respondents supported this concept as about 67.7% (N = 364) said “yes” while just 32.3% (N= 174) said “no”. Table 6.6 demonstrates the respondents’ views on the concept of establishing a virtual university in the Kingdom of Saudi Arabia. Group B represented the highest percentages of respondents at around 92.7%, while Group A represented almost 60.2%. The Chi-square test was applied to pinpoint any significance between the groups’ different perspectives on this matter and the outcome was 45.63 (df1, P = 0.000). This clearly indicates that Group B was significantly more appreciative of the idea of establishing a virtual university in Saudi Arabia than Group A. This implied that Group B was enthusiastic and eager to find alternatives to a higher education system that takes no account of sex in providing equal higher education opportunities. Additionally, the Chi-square test was applied to determine any significance between age of respondents and their gender on perception of establishing a virtual university in Saudi Arabia. The result was 32.411 (df3, P = 000). This analysis result indicated that the younger of Group B aged 30-39 about 41.2% were more supportive of the concept of establishing a virtual university than other age groups. In contrary, aged less than 30 years of Group A 6.0% were less supportive to this idea. This was due to their realisation of the importance and necessity of constructing such a project in order to meet the increased educational needs of female sex.

<table>
<thead>
<tr>
<th>The perception of establishing a virtual university</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Yes</td>
<td>250</td>
<td>60.2</td>
<td>114</td>
</tr>
<tr>
<td>No</td>
<td>165</td>
<td>39.8</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>538</td>
</tr>
</tbody>
</table>

Table 6.6: The respondents’ perceptions of establishing a virtual university
6.5 Opinions Related to Establishing a Virtual University

The outcomes of the analysis, as illustrated in Table 7.6, suggested that the overall general attitudes towards the concept of establishing a virtual university in Saudi Arabia are highly positive within the groups. In this part, respondents were asked to respond carefully to selected opinions concerning the likely advantages of a virtual university in the Kingdom. Item one, for example, stated that establishing a virtual university would extend higher education opportunities to every potential applicant, whether male or female. Table 6.7 shows that nearly 33.2% \((N = 121)\) strongly agreed and 51.6% \((N = 188)\) agreed that a virtual university had the capacity to provide higher education to every prospective student. Out of the total number of participants, only 4.4% were undecided about this, 4.1% did not agree with the idea, and 6.6% strongly disagreed. The moderate number of respondents who were uncertain or disagreed might have been influenced by the rules and regulations of admission that still exist in the higher education system and which limit the number of students who are admitted every year. This result points out that most respondents who agreed with this view assumed that establishing a virtual university via the Internet would overcome the existing barriers in terms of facilities and availability to provide educational opportunities to both genders simultaneously. This confirms the validity of the first hypothesis in Chapter 1, which stated that 'establishing a virtual university has the potential to extend higher education opportunities to every prospective applicant'. In order to prove any possible significance between this view and the responses of the two main groups, a Chi-square test was used and it was found that there was no significant difference.
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Questionnaire Results: Analysis

Extend higher education opportunities to every prospective applicant.

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Strongly Agree</td>
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<td>34.0</td>
<td>36</td>
<td>31.6</td>
<td>121</td>
</tr>
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<td>128</td>
<td>51.2</td>
<td>60</td>
<td>52.6</td>
<td>188</td>
</tr>
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<td>Undecided</td>
<td>11</td>
<td>4.4</td>
<td>5</td>
<td>4.4</td>
<td>16</td>
</tr>
<tr>
<td>Disagree</td>
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<td>3.6</td>
<td>6</td>
<td>5.3</td>
<td>15</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>17</td>
<td>6.8</td>
<td>7</td>
<td>6.1</td>
<td>24</td>
</tr>
</tbody>
</table>

Table 6.7: Respondents' agreement regarding extending higher education opportunities

The response to item two is also very optimistic. Most respondents (81.6%; N = 297) thought that establishing a virtual university in the Kingdom would provide female students with equal opportunities; 4.9% were undecided, and 13.5% disagreed. (See Table 6.8.) Although these figures are small, they make sense. Respondents who were undecided or disagreed assumed that establishing a virtual university under the current higher education system would not provide female students with any chance to study courses identical to those available to their male colleagues. Therefore, new rules and regulations regarding females' education would need to be established in order to achieve educational equality. In reference to the second hypotheses, which stated that 'establishing a virtual university has the potential to provide both male and female students with equal educational opportunities', the above analysis also confirms its validity. The Chi-square test was used to identify any possible significance between this item and the two major groups and it was found that there was no significant difference between their responses in this regard.

Provide female students with equal opportunities to males in studying equivalent courses.

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>85</td>
<td>34.0</td>
<td>52</td>
<td>45.6</td>
<td>136</td>
</tr>
<tr>
<td>Agree</td>
<td>120</td>
<td>48.0</td>
<td>41</td>
<td>36.0</td>
<td>161</td>
</tr>
<tr>
<td>Undecided</td>
<td>12</td>
<td>4.8</td>
<td>6</td>
<td>5.3</td>
<td>18</td>
</tr>
<tr>
<td>Disagree</td>
<td>20</td>
<td>8.0</td>
<td>8</td>
<td>7.0</td>
<td>28</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>13</td>
<td>5.2</td>
<td>8</td>
<td>7.0</td>
<td>21</td>
</tr>
</tbody>
</table>

Table 6.8: Participants' opinions pertaining to equality of education provision

205
When respondents were asked to respond to item three, about 75.9% (N = 276) expected that a virtual university would be competent in allowing both male and female learners to learn together. (See Table 6.9.) However, 7.7% of the total number of respondents were undecided, and 16.5% disagreed. This outcome means that many respondents recognized that a virtual university based on the Internet would demolish any sense of isolation and give learners the opportunity to work in a collaborative environment.

<table>
<thead>
<tr>
<th>Allow learners to learn collaboratively</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>74</td>
<td>29.6</td>
<td>34</td>
</tr>
<tr>
<td>Agree</td>
<td>113</td>
<td>45.2</td>
<td>55</td>
</tr>
<tr>
<td>Undecided</td>
<td>19</td>
<td>7.6</td>
<td>9</td>
</tr>
<tr>
<td>Disagree</td>
<td>31</td>
<td>12.4</td>
<td>10</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>13</td>
<td>5.2</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 6.9: Respondents’ views on collaborative learning opportunity

In item four, nearly 76.9% (N = 280) indicated with certainty that a virtual university would provide students with the required knowledge in IT at their own pace and learning ability. Merely 4.9% were undecided, 11.8% disagreed, and 6.3% strongly disagreed. (See Table 6.10.)

<table>
<thead>
<tr>
<th>Provide students with the required knowledge in IT at their own pace and learning ability</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>83</td>
<td>33.2</td>
<td>38</td>
</tr>
<tr>
<td>Agree</td>
<td>111</td>
<td>44.4</td>
<td>48</td>
</tr>
<tr>
<td>Undecided</td>
<td>8</td>
<td>3.2</td>
<td>10</td>
</tr>
<tr>
<td>Disagree</td>
<td>31</td>
<td>12.4</td>
<td>12</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>17</td>
<td>6.8</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 6.10: Respondents’ opinions on IT knowledge

Respondents to item five were requested to state their view on the possibility of allowing students who have dropped out of Saudi universities to continue their studies at the proposed virtual university. Approximately 33.2% strongly agreed and 42.6% agreed that a virtual university using the Internet would be able to accommodate those students who had left Saudi universities for whatever reason. At the same time, 3.8% of the respondents were
undecided, and 20.4% disagreed. (Table 6.11.) The Chi-Square test was conducted and there was no significance.

<table>
<thead>
<tr>
<th>Allow students who have dropped out of Saudi universities to proceed with their studies at the proposed virtual university.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A</strong></td>
<td><strong>Group B</strong></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>88</td>
</tr>
<tr>
<td>Agree</td>
<td>97</td>
</tr>
<tr>
<td>Undecided</td>
<td>9</td>
</tr>
<tr>
<td>Disagree</td>
<td>41</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>364</td>
</tr>
</tbody>
</table>

Table 6.11: Respondents' viewpoints on accommodating students who had dropped out.

For item number six, respondents were asked whether they thought a virtual university could assist the existing Saudi universities, which lack adequate resources and facilities, in coping with the rapid growth of students seeking higher education. Around 33.8% (N = 123) strongly agreed, 41.5% agreed, 6.6% were undecided, 10.2% disagreed and 8.0% strongly disagreed. (Table 6.12.) Nowadays, Saudi universities in general, as acknowledged by the Seventh Development Plan of the Kingdom in Chapter 1, are facing tremendous challenges in dealing with the output of secondary schools. For this reason, a large percentage of respondents thought that establishing a virtual university using the Internet could reduce the possible consequences of this problem because large numbers of students could be admitted and provided with higher education without confining them to a particular setting or time. Nevertheless, the results also revealed that some of the respondents were cautious and provided negative responses which may be due to the uniqueness of the project.

<table>
<thead>
<tr>
<th>Assist the existing Saudi universities, which lack adequate resources and facilities, in coping with the rapid growth of students seeking higher education degrees.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A</strong></td>
<td><strong>Group B</strong></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>91</td>
</tr>
<tr>
<td>Agree</td>
<td>106</td>
</tr>
<tr>
<td>Undecided</td>
<td>16</td>
</tr>
<tr>
<td>Disagree</td>
<td>22</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>364</td>
</tr>
</tbody>
</table>

Table 6.12: Respondents' opinions in coping with the rapid growth of students.
Item seven stated that a virtual university might assist in minimising government expenditure on higher education. About 34.9% strongly agreed and 41.8% (N = 152) agreed whilst 9.3% were undecided, and 14% disagreed. (see Table 6.13). The results suggest that large percentages of respondents were encouraged by the vision that establishing a virtual university in Saudi Arabia would prevent the higher education authorities from any likely spending on constructing new buildings, laboratories or other necessary facilities at this time of budget deficit.

<table>
<thead>
<tr>
<th>Minimise government expenditure on higher education.</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>82</td>
<td>32.8</td>
<td>45</td>
</tr>
<tr>
<td>Agree</td>
<td>111</td>
<td>44.4</td>
<td>41</td>
</tr>
<tr>
<td>Undecided</td>
<td>23</td>
<td>9.2</td>
<td>11</td>
</tr>
<tr>
<td>Disagree</td>
<td>20</td>
<td>8.0</td>
<td>8</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>14</td>
<td>5.6</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 6.13: Respondents' opinions in reducing government funds

6.6 Organisational Structure

6.6.1 Virtual University Models

This part of the questionnaire was concerned with the overall organisational structure of the proposed virtual university. It began by outlining the more conspicuous models obtained and found in the literature. The respondents were provided with six models, each of which was briefly described. They were requested to select only one out of five models that matched their interest or preference. The largest percentage of the whole sample (about 50.3%; N = 183) thought that a For-profit Single Mode Virtual University was the most favoured model that should be followed. Table 6.14 indicates that 13.2% (N = 48) preferred a Non-profit Aggregate Virtual University Model, 2.1% (N = 44) selected the For-profit Consortium Virtual University Model, 9.1% (N = 33) opted for the Dual-Mode Virtual University Model, 8.2% (N = 30) chose the Non-profit Single Mode Virtual University model, and finally, 7.1% (N = 26) wanted the Venture Virtual University Model.
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<table>
<thead>
<tr>
<th>Virtual University Model</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>For-profit Consortium Virtual University</td>
<td>31</td>
<td>13</td>
<td>44</td>
</tr>
<tr>
<td>Joint Venture Virtual University</td>
<td>17</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td>Non-profit Aggregated Virtual University</td>
<td>36</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>Duel-Mode Virtual University</td>
<td>16</td>
<td>17</td>
<td>33</td>
</tr>
<tr>
<td>For-profit Single Mode Virtual University</td>
<td>130</td>
<td>53</td>
<td>183</td>
</tr>
<tr>
<td>Non-profit Single Mode Virtual University</td>
<td>20</td>
<td>10</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 6.14: Respondents' views regarding the most appropriate virtual university model

#### 6.6.2 Supervision

The purpose of this question was to understand the views relating to which organisation is best suited to take control over the proposed virtual university. A large percentage of the respondents, as shown in Table 6.15, (55.8%; N = 203) deemed that shared management between the MHE and private organisations was their first choice. Nearly 39% (N = 142) recommended the MHE, and the rest (5.2%; N = 19) mentioned that private organisations were appropriate. It is clear from the analysis of these results that the MHE was the preferred choice for the majority of respondents to manage the university. This may be because the Ministry is more effective than private organisations in terms of government financial and policy support, facilities, manpower and expertise.

<table>
<thead>
<tr>
<th>Supervision of the envisaged virtual university</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Ministry of Higher Education</td>
<td>94</td>
<td>37.6</td>
<td>48</td>
</tr>
<tr>
<td>Private Organisation</td>
<td>11</td>
<td>4.4</td>
<td>8</td>
</tr>
<tr>
<td>Joint Supervision between Ministry of Higher Education and Private Organisation</td>
<td>145</td>
<td>58.0</td>
<td>58</td>
</tr>
</tbody>
</table>

Table 6.15: Respondents' views concerning the supervision of the virtual university
6.6.3 Headquarter Location

When respondents were asked to designate the most appropriate location for the university’s Administration Office, the largest number of respondents, as indicated in Table 6.16, (80.8%; N = 294), chose Riyadh whereas a small proportion of participants (19.2%; N = 70) suggested Jeddah as a suitable site for this. This may be because Riyadh houses the MHE, KACST, STC, large private company headquarters, and major ISPs which would provide greater support for the proposed university.

<table>
<thead>
<tr>
<th>Location</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Riyadh</td>
<td>207</td>
<td>82.8</td>
<td>87</td>
</tr>
<tr>
<td>Jeddah</td>
<td>43</td>
<td>17.2</td>
<td>27</td>
</tr>
</tbody>
</table>

Table 6.16: Respondents’ opinions relating to the most appropriate location for the virtual university

6.6.4 Funding-Body

This component of the questionnaire was intended to assess respondents’ attitudes towards a number of possible methods that could be used to finance a virtual university. Table 6.17 reveals that a great number of respondents were in favour of a partnership between the Saudi government and the private sector. This represented 54.1% (N = 197) of the sample. However, 24.7% (N = 90) preferred a government entity to provide financial backing for the envisaged university, while the remaining 21.2% elected the private sector as the most important funding body for the proposed university. This conspicuously stresses the necessity for the private sector to play its role in supporting education in general and higher education in particular in Saudi Arabia. This was noted in the Seventh National Development Plan discussed in Chapter 2.
Chapter 6  

Questionnaire Results: Analysis

### Funding body of the envisaged virtual university

<table>
<thead>
<tr>
<th>Funding Body</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Public Sector</td>
<td>56</td>
<td>22.4</td>
<td>34</td>
</tr>
<tr>
<td>Private Sector</td>
<td>51</td>
<td>20.4</td>
<td>26</td>
</tr>
<tr>
<td>Cooperative enterprise between Government and Private Sector</td>
<td>143</td>
<td>57.2</td>
<td>54</td>
</tr>
</tbody>
</table>

364 100

Table 6.17: Respondents' view concerning the funding body of the virtual university

### 6.6.5 Academic Staff Appointment

In this section of the questionnaire the intention, as demonstrated in Table 6.18, was to understand the respondents' views regarding teaching members' appointment procedures. The first item of this set aimed to find out whether a virtual university should appoint only teaching members who hold a Ph.D. degree. More than half of the respondents were against this notion. 54.4% (N = 198) disagreed, while just 40.4% agreed and the rest were undecided (5.2%). Group B (female teaching members) singled out one of the problematic issues that relates to the teaching appointment system in higher education universities in the Kingdom. As a rule, teaching members must hold a Ph.D. except in a few very exceptional circumstances. Based on the results, respondents thought that academic staff appointments should not be confined only to those who possess a Ph.D.

<table>
<thead>
<tr>
<th>A virtual university should appoint just teaching members who hold a Ph.D. degree.</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>45</td>
<td>18.0</td>
<td>13</td>
</tr>
<tr>
<td>Agree</td>
<td>64</td>
<td>25.6</td>
<td>25</td>
</tr>
<tr>
<td>Undecided</td>
<td>13</td>
<td>5.2</td>
<td>6</td>
</tr>
<tr>
<td>Disagree</td>
<td>93</td>
<td>37.2</td>
<td>53</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>35</td>
<td>14.0</td>
<td>17</td>
</tr>
</tbody>
</table>

364 100

Table 6.18: Participants' opinions on appointing just those who hold a Ph.D. degree

Respondents were then asked whether obtaining Internet skills and prior experience in teaching at degree level should be a precondition for appointing teaching members at the virtual university. Table 6.19 reveals that 41.8% (N = 152) strongly agreed, 34.6% agreed,
5.5% were undecided, 10.4% disagreed, and 7.7% strongly disagreed. "Internet skills" are best described as the ability to exploit a variety of Internet software, particularly Web browsers, e-mail programmes, news readers, and FTP clients, in addition to mastering other Internet operational commands. The skill of academic staff in these areas is vital in order for them to perform their duties effectively in the virtual university. Nevertheless, the small percentages of respondents who were opposed to this point of view may have believed that experience and Internet skills are not sufficient as a qualification for teaching in an Internet-based environment.

Obtaining Internet skills and prior experience in teaching higher education degrees are an important prerequisite condition for appointing teaching members at the proposed virtual university.

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>107</td>
<td>42.8</td>
<td>45</td>
<td>39.5</td>
<td>152</td>
</tr>
<tr>
<td>Agree</td>
<td>86</td>
<td>34.4</td>
<td>40</td>
<td>35.1</td>
<td>126</td>
</tr>
<tr>
<td>Undecided</td>
<td>12</td>
<td>4.8</td>
<td>8</td>
<td>7.0</td>
<td>20</td>
</tr>
<tr>
<td>Disagree</td>
<td>26</td>
<td>10.4</td>
<td>12</td>
<td>10.5</td>
<td>38</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>19</td>
<td>7.6</td>
<td>9</td>
<td>7.9</td>
<td>28</td>
</tr>
</tbody>
</table>

Table 6.19: Respondents’ opinions concerning Internet skills

Part Three in this compilation of opinions aimed to discover whether the respondents agreed or not that teaching members should be appointed entirely on a part-time basis. Table 6.20 shows that 32.1% (N = 117) strongly agreed, 35.4% agreed, 6.9% were undecided, 18.1% disagreed and 7.4% strongly disagreed. Plainly, the largest part of respondents supported the idea that teaching members should be appointed on a part-time basis in order to allow them to undertake research or any other teaching duties.

A virtual university should appoint teaching members as a part-time profession.

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>80</td>
<td>32.0</td>
<td>37</td>
<td>32.5</td>
<td>117</td>
</tr>
<tr>
<td>Agree</td>
<td>84</td>
<td>33.6</td>
<td>45</td>
<td>39.5</td>
<td>129</td>
</tr>
<tr>
<td>Undecided</td>
<td>17</td>
<td>6.8</td>
<td>8</td>
<td>7.0</td>
<td>25</td>
</tr>
<tr>
<td>Disagree</td>
<td>52</td>
<td>20.8</td>
<td>14</td>
<td>12.3</td>
<td>66</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>17</td>
<td>6.8</td>
<td>10</td>
<td>8.8</td>
<td>27</td>
</tr>
</tbody>
</table>

Table 6.20: Respondents’ views on appointing faculty as a part-time profession

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The fourth opinion is contrary to this view. It declared that a virtual university should appoint teaching members as full-time employees. Out of the 364 participants, only 12.6% strongly agreed, 12.9% agreed, 2.5% were undecided, 46.4% disagreed, and 25.5% strongly disagreed. The results (Table 6.21) indicate that most respondents would prefer faculty members not to be employed on a full-time basis.

<table>
<thead>
<tr>
<th>A virtual university should appoint teaching members on a full-time basis.</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency %</td>
<td>Frequency %</td>
<td>Frequency %</td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>35 14.0</td>
<td>11 9.6</td>
<td>46 12.6</td>
</tr>
<tr>
<td>Agree</td>
<td>34 13.6</td>
<td>13 11.4</td>
<td>47 12.9</td>
</tr>
<tr>
<td>Undecided</td>
<td>6 2.4</td>
<td>3 2.6</td>
<td>9 2.5</td>
</tr>
<tr>
<td>Disagree</td>
<td>117 46.8</td>
<td>52 45.6</td>
<td>169 46.4</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>58 23.2</td>
<td>35 30.7</td>
<td>93 25.5</td>
</tr>
</tbody>
</table>

Table 6.21: Respondents' views on appointing faculty on a full-time basis

In item five, the purpose was to understand whether teaching members' appointments should be restricted to Saudi citizens. The outcomes (Table 6.22) show that 33.0% (N = 120) strongly agreed, 31.9% agreed, while just 9.1% were undecided, 18.4% disagreed and only 7.7% strongly disagreed. The largest number of respondents agreed that academic staff should be Saudi citizens, which is in accordance with the government initiative to nationalise all employment.

<table>
<thead>
<tr>
<th>Teaching appointments at the virtual university should be restricted to Saudi citizens.</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency %</td>
<td>Frequency %</td>
<td>Frequency %</td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>87 34.8</td>
<td>33 28.9</td>
<td>120 33.0</td>
</tr>
<tr>
<td>Agree</td>
<td>74 29.6</td>
<td>42 36.8</td>
<td>116 31.9</td>
</tr>
<tr>
<td>Undecided</td>
<td>22 8.8</td>
<td>11 9.6</td>
<td>33 9.1</td>
</tr>
<tr>
<td>Disagree</td>
<td>48 19.2</td>
<td>19 16.7</td>
<td>67 18.4</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>19 7.6</td>
<td>9 7.9</td>
<td>28 7.7</td>
</tr>
</tbody>
</table>

Table 6.22: Respondents' views on appointing only Saudi citizens

The last element of this series endeavoured to measure the respondents' agreement on whether a virtual university should appoint teaching members from all over the world. Principally, the greater part of respondents turned down this idea. Table 6.23 illustrates that
39.6% disagreed, 18.4% strongly disagreed, 5.5% were undecided, just 18.7% strongly agreed, and 17.9% agreed.

<table>
<thead>
<tr>
<th>A virtual university should appoint teaching members from all over the world.</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
<td><strong>%</strong></td>
<td><strong>Frequency</strong></td>
<td><strong>%</strong></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>52</td>
<td>20.8</td>
<td>16</td>
</tr>
<tr>
<td>Agree</td>
<td>41</td>
<td>16.4</td>
<td>24</td>
</tr>
<tr>
<td>Undecided</td>
<td>13</td>
<td>5.2</td>
<td>7</td>
</tr>
<tr>
<td>Disagree</td>
<td>99</td>
<td>39.6</td>
<td>45</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>45</td>
<td>18.0</td>
<td>22</td>
</tr>
</tbody>
</table>

Table 6.23: Respondents' views on appointing faculty from all over the world

6.6.6 Student Admissions

In this category, the intention was to find out, from the respondents' view, a way of admitting students at the proposed university. It began by asking participants to respond to the following statement: The proposed virtual university should admit any potential applicant who holds a Saudi Secondary School Certificate or equivalent, regardless of the GPA. The results in Table 6.24 confirmed that more than half of the respondents (59.9%; N = 218) agreed that potential students who held a Saudi Secondary School Certificate or equivalent, regardless of the GPA, should be granted full access to the virtual university. On the other hand, 9.3% were undecided, and 30.8% disagreed. These figures suggest that a substantial number of respondents believed strongly that higher education should be accessible; thus, admitting students at the proposed university should not be limited by whatever rules or regulations are currently in place in traditional universities.
The proposed virtual university should admit any potential applicant who holds a Saudi Secondary School Certificate or equivalent, regardless of the GPA (Grade Point Average). Total

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>44</td>
<td>17.6</td>
<td>21</td>
<td>18.4</td>
<td>65</td>
<td>17.9</td>
</tr>
<tr>
<td>Agree</td>
<td>105</td>
<td>42.0</td>
<td>48</td>
<td>42.1</td>
<td>153</td>
<td>42.0</td>
</tr>
<tr>
<td>Undecided</td>
<td>20</td>
<td>8.0</td>
<td>14</td>
<td>12.3</td>
<td>34</td>
<td>9.3</td>
</tr>
<tr>
<td>Disagree</td>
<td>53</td>
<td>21.2</td>
<td>20</td>
<td>17.5</td>
<td>73</td>
<td>20.1</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>28</td>
<td>11.2</td>
<td>11</td>
<td>9.6</td>
<td>39</td>
<td>10.7</td>
</tr>
</tbody>
</table>

Table 6.24: Respondents' views on admitting students with a Saudi Secondary School Certificate or equivalent, regardless of their GPA

The second portion of this subsection was aimed at measuring respondents' views on whether a virtual university should admit potential students who held a Saudi Secondary School Certificate or equivalent, regardless of the GPA. Table 6.25 shows that a large percentage of respondents, 77.8%, agreed that potential students should go through an admission examination procedure in order to weigh up their background educational capabilities. 8% of the respondents were undecided and 14.3% disagreed. The philosophy behind this admission condition would be to ensure that students have the necessary knowledge and skills pertaining to an Internet-based learning environment in order for them to engage meaningfully in the learning process with their peers and instructors.

Prospective students should be admitted to the virtual university based on their ability to pass a pre-admission examination.

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>73</td>
<td>29.2</td>
<td>35</td>
<td>30.7</td>
<td>108</td>
<td>29.7</td>
</tr>
<tr>
<td>Agree</td>
<td>118</td>
<td>47.2</td>
<td>57</td>
<td>50.0</td>
<td>175</td>
<td>48.1</td>
</tr>
<tr>
<td>Undecided</td>
<td>19</td>
<td>7.6</td>
<td>10</td>
<td>8.8</td>
<td>29</td>
<td>8.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>40</td>
<td>16.0</td>
<td>12</td>
<td>10.5</td>
<td>52</td>
<td>14.3</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 6.25: Respondents' opinions on admitting students after passing a pre-admission examination

The next part of this category was intended to assess respondents' views on whether secondary school graduation date was essential for admitting prospective students. The majority of respondents, 74.2%, completely agreed that students should be admitted at the proposed university regardless of the graduation date. On the other hand, 9.1% were undecided, and 16.8% disagreed. This result (Table 6.26) illustrates another twist in the
Chapter 6

Questionnaire Results: Analysis

desire for change in the current admission rules at Saudi universities; these require students
to attain a recent Secondary School Certificate, as discussed in Chapter 1.

<table>
<thead>
<tr>
<th>A student graduation date is not essential for admitting potential students.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>Group B</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td><strong>%</strong></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>74</td>
</tr>
<tr>
<td>Agree</td>
<td>114</td>
</tr>
<tr>
<td>Undecided</td>
<td>22</td>
</tr>
<tr>
<td>Disagree</td>
<td>32</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>8</td>
</tr>
<tr>
<td>364</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 6.26: Respondents' opinions on admitting students regardless of their graduation date

The final part of this category is concerned with comprehending the participants' views
regarding the possibility of allowing traditional students to transfer their credits towards a
virtual university degree. This idea was accepted (Table 6.27) by 60.7%, while just 19.8%
were undecided, and the remaining 19.5% disagreed with this idea. The idea of allowing
students to transfer credits between the traditional institution and the virtual university is
derived from the fact that both types of institutions would be standardised, accredited, and
recognised on the same basis by the higher education authorities in the Kingdom. All
students affiliated to those institutions would be given equal opportunities to pursue higher
education based on their preferences.

<table>
<thead>
<tr>
<th>Students at traditional Saudi universities can transfer their course credits towards a virtual university degree.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>Group B</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td><strong>%</strong></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>34</td>
</tr>
<tr>
<td>Agree</td>
<td>112</td>
</tr>
<tr>
<td>Undecided</td>
<td>54</td>
</tr>
<tr>
<td>Disagree</td>
<td>33</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>17</td>
</tr>
<tr>
<td>364</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 6.27: Respondents' opinions on transferring course credits
6.7 Costs and Fees

In this portion of the survey, the objective was to obtain the respondents' views on educational equipment, connection expenses and support at the proposed university. It started by asking participants if they agreed that registered students at the virtual university should be provided with free education similar to their counterparts at the traditional universities. A large percentage of respondents (66.8%), as described in Table 6.28, disagreed and suggested that offering education to registered students at the proposed university should not be free. In contrast, 27.5% agreed that education should be free, while 5.8% were undecided.

<table>
<thead>
<tr>
<th>Students registered at the proposed virtual university should be provided with free education</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>22</td>
<td>8.8</td>
<td>15</td>
</tr>
<tr>
<td>Agree</td>
<td>41</td>
<td>16.4</td>
<td>22</td>
</tr>
<tr>
<td>Undecided</td>
<td>12</td>
<td>4.8</td>
<td>9</td>
</tr>
<tr>
<td>Disagree</td>
<td>110</td>
<td>44.0</td>
<td>41</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>65</td>
<td>26.0</td>
<td>27</td>
</tr>
</tbody>
</table>

Table 6.28: Respondents' opinions on free education

The aim of the second portion of this section was to record respondents’ views on the subject of providing free education to registered students with special needs at the proposed university. 19.8% strongly agreed, 37.1% agreed, 6.9% were undecided, 26.1% disagreed and 10.2% strongly disagreed. These statistical results, as provided in Table 6.29, confirm that a large proportion of participants felt that students with special needs should carry on their higher education.

<table>
<thead>
<tr>
<th>Students with special needs and registered at the proposed virtual university should be provided with free education</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>46</td>
<td>18.4</td>
<td>26</td>
</tr>
<tr>
<td>Agree</td>
<td>91</td>
<td>36.4</td>
<td>44</td>
</tr>
<tr>
<td>Undecided</td>
<td>14</td>
<td>5.6</td>
<td>11</td>
</tr>
<tr>
<td>Disagree</td>
<td>74</td>
<td>29.6</td>
<td>21</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>25</td>
<td>10.0</td>
<td>12</td>
</tr>
</tbody>
</table>

Table 6.29: Respondents' views on providing students with special needs with free education

217
In the third part of this section, the intention was to find out if the respondents agreed that registered students at the virtual university should be provided with equipment (software and hardware) without charge. Table 6.30 shows that 75.3% disagreed, and 17.9% agreed with this view, while just 6.9% were undecided. Based on these results, in order for enrolled students to take full advantage of the virtual university, they should purchase their own software and hardware.

<table>
<thead>
<tr>
<th>Students registered at a virtual university should be provided with free equipment (hardware and software).</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency %</td>
<td>Frequency %</td>
<td>Frequency %</td>
<td>Frequency %</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>16</td>
<td>6.4</td>
<td>12</td>
</tr>
<tr>
<td>Agree</td>
<td>27</td>
<td>10.8</td>
<td>10</td>
</tr>
<tr>
<td>Undecided</td>
<td>14</td>
<td>5.6</td>
<td>11</td>
</tr>
<tr>
<td>Disagree</td>
<td>102</td>
<td>40.8</td>
<td>49</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>91</td>
<td>36.4</td>
<td>32</td>
</tr>
</tbody>
</table>

Table 6.30: Participants' viewpoints on providing students with free equipment (hardware and software)

The next question was aimed at finding out whether respondents agreed on providing registered students with special needs with free equipment (software and hardware). Table 6.31 indicates that 65.1% disagreed, whilst 30.2% agreed, and just 4.7% of the entire participants were undecided.

<table>
<thead>
<tr>
<th>Students registered at a virtual university with special needs should be provided with free equipment (hardware and software).</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency %</td>
<td>Frequency %</td>
<td>Frequency %</td>
<td>Frequency %</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>28</td>
<td>11.2</td>
<td>12</td>
</tr>
<tr>
<td>Agree</td>
<td>50</td>
<td>20.0</td>
<td>20</td>
</tr>
<tr>
<td>Undecided</td>
<td>11</td>
<td>4.4</td>
<td>6</td>
</tr>
<tr>
<td>Disagree</td>
<td>129</td>
<td>51.6</td>
<td>63</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>32</td>
<td>12.8</td>
<td>13</td>
</tr>
</tbody>
</table>

Table 6.31: Participants' opinions on providing students with special needs with free equipment (hardware and software)

Respondents were asked if the government should provide financial support such as loans to needy students. 57.9% agreed, 30.2% disagreed, and 11.8% were undecided. Accordingly, as shown in Table 6.32, more than half of the respondents felt that the government should take
the initiative in overcoming the financial difficulties of disadvantaged students who wish to continue their higher education studies.

<table>
<thead>
<tr>
<th>The Saudi government should provide financial assistance such as student loans, to needy students.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A</strong></td>
<td><strong>Group B</strong></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td></td>
</tr>
<tr>
<td>Undecided</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td></td>
</tr>
</tbody>
</table>

364 100

Table 6.32: Respondents’ views regarding whether the Saudi government should provide financial assistance to needy students

Participants were asked to specify their opinions on whether the private sector should be compelled to make available monetary aid to deprived students who were keen to proceed with their higher education studies. Table 6.33 shows that about 18.4% strongly agreed, 26.9% agreed, 17.6% were undecided, 28.6% disagreed and 8.5% strongly disagreed. Despite the fact these results were in favour of the private sector adding to the funding of a virtual university, they indicated that most respondents hoped that the support of deprived potential students at the proposed university should not be undertaken completely by a single entity.

<table>
<thead>
<tr>
<th>The private sector should provide financial assistance, such as student loans, to needy students.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A</strong></td>
<td><strong>Group B</strong></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td></td>
</tr>
<tr>
<td>Undecided</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td></td>
</tr>
</tbody>
</table>

364 100

Table 6.33: Respondents’ views regarding whether the private sector should provide financial assistance to needy students

The last portion of this sequence aimed to detect respondents’ points of view on whether giving financial support to needy students should be maintained by mutual sponsorship on the part of both the private and public sectors. 31.9% strongly agreed, 39.8% agreed, 9.1%
were undecided, 15.1% disagreed, and 4.1% strongly disagreed. (See Table 6.34.) Evidently, the majority of respondents agreed that the financial backing of prospective students should be undertaken by shared responsibility between the government and the private sector. This result adds credence to the type of proposed virtual university model which was chosen by most respondents in the preceding analysis.

<table>
<thead>
<tr>
<th>The government and the private sector collaboratively should provide financial assistance, such as student loans, to needy students.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group A</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>82</td>
</tr>
<tr>
<td>Agree</td>
<td>100</td>
</tr>
<tr>
<td>Undecided</td>
<td>18</td>
</tr>
<tr>
<td>Disagree</td>
<td>40</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 6.34: Respondents’ views concerning whether the Saudi government and the private sector collaboratively should provide financial assistance to needy students

6.8 Degrees, Academic Specialties, Course Development, Study Systems, Study Language, Media Usage, Study Strategies and Assessment Methods

6.8.1 Degrees

In order to determine what types of academic degree should be offered through the proposed university, respondents were asked first to define the importance of providing a Bachelor’s degree. The largest proportion of respondents (86.8%; N = 316) agreed that a virtual university should offer a Bachelor’s degree to enrolled students. Only 4.4% (N = 16) were undecided and the remaining 8.8% (N = 32) disagreed. The Chi-square test was undertaken and the result was insignificant. These statistical results, as described in Table 6.35, suggested that both groups realised the scope of the problem which was explained and discussed in Chapter 1. The Chi-square test was carried out and the result was insignificant.
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<table>
<thead>
<tr>
<th>Degrees at the envisage virtual university</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor’s Degree</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Very Important</td>
<td>142</td>
<td>56.8</td>
<td>75</td>
</tr>
<tr>
<td>Important</td>
<td>77</td>
<td>30.8</td>
<td>22</td>
</tr>
<tr>
<td>Moderately Important</td>
<td>9</td>
<td>3.6</td>
<td>7</td>
</tr>
<tr>
<td>Of Little Importance</td>
<td>14</td>
<td>5.6</td>
<td>6</td>
</tr>
<tr>
<td>Unimportant</td>
<td>8</td>
<td>3.2</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>364</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.35: Participants’ viewpoints regarding Bachelor’s Degree

Only a small proportion (about 28.9%), of the respondents agreed that a virtual university should offer a Master’s degree, but more than half of the participants (around 54.2%), disagreed and 17.0% were undecided. (See Table 6.36.) Even though this degree is considered to be very important, the respondents would not give rushed judgments regarding the capacity of the virtual university unless they were certain of the success of this project in dealing with the primary concern of higher education authorities which is basically to accommodate the growing number of students graduating from secondary schools in the Kingdom. For the purpose of identifying any possible significance in the response of the two groups in relation to this item, the Chi-square test was undertaken, and the result was insignificant.

<table>
<thead>
<tr>
<th>Degrees at the envisaged virtual university</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master’s Degree</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Very Important</td>
<td>43</td>
<td>17.2</td>
<td>18</td>
</tr>
<tr>
<td>Important</td>
<td>29</td>
<td>11.6</td>
<td>15</td>
</tr>
<tr>
<td>Moderately Important</td>
<td>39</td>
<td>15.6</td>
<td>23</td>
</tr>
<tr>
<td>Of Little Importance</td>
<td>89</td>
<td>35.6</td>
<td>35</td>
</tr>
<tr>
<td>Unimportant</td>
<td>50</td>
<td>20.0</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>364</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.36: Participants’ viewpoints regarding Master’s Degrees

Here again, respondents of the survey were invited to specify the importance of offering a Ph.D. by the envisaged university. The results of the analysis, as illustrated in Table 6.37, showed that 61.3% disagreed that a virtual university should provide a Ph.D. programme and, at least at the present time, around 24.1% agreed and 14.6% were undecided. The Chi-square test was performed and there was no significant difference.
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### Degrees at the envisaged virtual university

<table>
<thead>
<tr>
<th>Ph.D. Degree</th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Very Important</td>
<td>26</td>
<td>10.4</td>
<td>12</td>
<td>10.5</td>
<td>38</td>
<td>10.4</td>
</tr>
<tr>
<td>Important</td>
<td>35</td>
<td>14.0</td>
<td>15</td>
<td>13.2</td>
<td>50</td>
<td>13.7</td>
</tr>
<tr>
<td>Moderately Important</td>
<td>39</td>
<td>15.6</td>
<td>14</td>
<td>12.3</td>
<td>53</td>
<td>14.6</td>
</tr>
<tr>
<td>Of Little Importance</td>
<td>60</td>
<td>24.0</td>
<td>28</td>
<td>24.6</td>
<td>88</td>
<td>24.2</td>
</tr>
<tr>
<td>Unimportant</td>
<td>90</td>
<td>36.0</td>
<td>45</td>
<td>39.5</td>
<td>135</td>
<td>37.1</td>
</tr>
</tbody>
</table>

Table 6.37: Participants’ viewpoints regarding Ph.D. Degrees

### 6.8.2 Academic Specialties

In this section, the intention of this question was to find out which academic studies were favoured at the envisaged university from the standpoint of respondents. The section began with Islamic Studies, considered the basis for all higher education in Saudi Arabia, as pointed out in Chapter 2. Table 6.38 indicates that 43.7% viewed this subject as crucially important, 22.3% as important, 13.7% moderately important, 11.0% of little importance, and finally, 9.3% as unimportant.

<table>
<thead>
<tr>
<th>Academic Specialties</th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Very Important</td>
<td>112</td>
<td>44.8</td>
<td>47</td>
<td>41.2</td>
<td>159</td>
<td>43.7</td>
</tr>
<tr>
<td>Important</td>
<td>54</td>
<td>21.6</td>
<td>27</td>
<td>23.7</td>
<td>81</td>
<td>22.3</td>
</tr>
<tr>
<td>Moderately Important</td>
<td>31</td>
<td>12.4</td>
<td>19</td>
<td>16.7</td>
<td>50</td>
<td>13.7</td>
</tr>
<tr>
<td>Of Little Important</td>
<td>30</td>
<td>12.0</td>
<td>10</td>
<td>8.8</td>
<td>40</td>
<td>11.0</td>
</tr>
<tr>
<td>Unimportant</td>
<td>23</td>
<td>9.2</td>
<td>11</td>
<td>9.6</td>
<td>34</td>
<td>9.3</td>
</tr>
</tbody>
</table>

Table 6.38: Participants’ viewpoints regarding Islamic Studies

The next subject to which the participants were asked to respond was Linguistics and Translation. This subject at present is offered by a very limited number of colleges at traditional universities such as KSU which teaches particular languages such as English, French, German, Persian, Spanish, Hebrew, and so on. These languages, except English, are confined to male students. However, the outcomes of the analysis (Table 6.39) revealed that most respondents, (about 81.9%), wanted this topic to be incorporated in the courses of the proposed university. However, 7.7% thought this subject was of little importance, 2.2% as
unimportant and 8.2% felt it was moderately important. It is evident that a large ratio of respondents from both groups shared a common interest in this subject and thought it was extremely important that it was offered by the virtual university in order to fulfil students' ambitions to learn foreign languages and to fill the gap in teaching these subjects to both genders based on equal educational opportunities.

<table>
<thead>
<tr>
<th>Academic Specialties</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Very Important</td>
<td>129</td>
<td>51.6</td>
<td>49</td>
</tr>
<tr>
<td>Important</td>
<td>80</td>
<td>32.0</td>
<td>40</td>
</tr>
<tr>
<td>Moderately Important</td>
<td>20</td>
<td>8.0</td>
<td>10</td>
</tr>
<tr>
<td>Of Little Importance</td>
<td>16</td>
<td>6.4</td>
<td>12</td>
</tr>
<tr>
<td>Unimportant</td>
<td>5</td>
<td>2.0</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 6.39: Participants' views concerning Linguistics & Translation

This question asked respondents to define the importance of including Social Science Studies in the virtual university programme. 32.4% of the participants said it was very important, 38.2% important, 9.6% moderately important, 12.4% of little importance, and 7.4% thought it was unimportant. (See Table 6.40.) In an attempt to locate a likely significance between this item and the responses of the two major groups under examination, the Chi-square test was applied and the result was 9.644 (df4, P = 0.047). Group B represented the highest percentage of agreement pertaining to this part at almost 79%, while Group A represented around 66.8%. At the present time, and under the current higher education system in the Kingdom, female students have fewer opportunities than male students to study courses such as law, politics, management, business and so forth. Hence, they felt positive and encouraged by any attempt to generate a shift in the direction of providing higher education studies to both male and female students.
Respondents were then asked to provide their views regarding the importance of offering Information and Computer Science courses at the proposed university. The greater part of respondents showed (as indicated in Table 6.41) a positive response as 66.8% denoted the importance of offering Information and Computer Science. Only 6% of the respondents rejected this subject, just 12.9% perceived this topic as moderately important, and 14.3% perceived it to be of little importance. The Chi-square result was 9.598 (df4 P = 0.048). Group B represented the highest percentage of respondents (77.2%) who valued the importance of this subject as part of the proposed virtual university curricula. Group A, on the other hand, represented 62% of the total respondents. Under the contemporary higher education system in Saudi Arabia, this subject is provided by a number of colleges at some Saudi universities but it is customized entirely for male students which means that female students are not yet recognised and cannot legally benefit from such an opportunities.

When respondents were requested to give their opinions regarding the importance of offering Applied Science in the virtual university, most (about 25.8%) rated it of little importance, while 41.2% felt it was unimportant, 6.6% thought it was moderately important,
11.5% considered such subjects to be very important, and 14.8% assumed it to be important. (See Table 6.42.)

<table>
<thead>
<tr>
<th>Academic Specialties</th>
<th>Group A</th>
<th>Group B</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applied Sciences</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Mathematics, Physics, Chemistry ...etc)</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Very Important</td>
<td>25</td>
<td>10.0</td>
<td>17</td>
</tr>
<tr>
<td>Important</td>
<td>34</td>
<td>13.6</td>
<td>20</td>
</tr>
<tr>
<td>Moderately Important</td>
<td>15</td>
<td>6.0</td>
<td>9</td>
</tr>
<tr>
<td>Of Little Importance</td>
<td>67</td>
<td>26.8</td>
<td>27</td>
</tr>
<tr>
<td>Unimportant</td>
<td>109</td>
<td>43.6</td>
<td>41</td>
</tr>
</tbody>
</table>

Table 6.42: Respondents’ views regarding Applied Sciences

The last proposed subject that the respondents were asked about was Fine Arts. 60.7% (N = 221) stressed the importance of these subjects, whereas 26.9% considered these subjects unimportant and just 12.4% thought of these subjects as moderately important. (See Table 6.43.) With the purpose of making clear the potential significance of respondents’ feelings towards this subject, the Chi-square test was used and the result was 20.43 (df4, P = 0.000). Group B appreciated this field of study being integrated into the virtual university programme more than Group A. Group B represented about 75.5%, while Group A represented 54%. This analysis pointed out that Group B realised the inequality between genders that exists in the higher education system more than Group A in this field of study.

<table>
<thead>
<tr>
<th>Academic Specialties</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fine Arts</strong> (Architecture, Decoration, Sculpture)</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Very Important</td>
<td>63</td>
<td>25.2</td>
<td>49</td>
</tr>
<tr>
<td>Important</td>
<td>72</td>
<td>28.8</td>
<td>37</td>
</tr>
<tr>
<td>Moderately Important</td>
<td>36</td>
<td>14.4</td>
<td>9</td>
</tr>
<tr>
<td>Of Little Important</td>
<td>65</td>
<td>25.2</td>
<td>11</td>
</tr>
<tr>
<td>Unimportant</td>
<td>16</td>
<td>6.4</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 6.43: Respondents’ views regarding Fine Arts
6.8.3 Development and Production of Internet Courses

This section will focus on the respondents’ viewpoints of the best Internet course producers. It begins by asking them whether they agree that the Internet-based courses should be entirely developed by outside consultants. A low percentage of the respondents agreed with this viewpoint (11.8%). 75.8% rejected this idea completely, and only 12.4% were unable to decide (Table 6.44).

<table>
<thead>
<tr>
<th>Internet-based technology courses should be entirely developed by outside consultants.</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>10</td>
<td>4.0</td>
<td>7</td>
</tr>
<tr>
<td>Agree</td>
<td>16</td>
<td>6.4</td>
<td>10</td>
</tr>
<tr>
<td>Undecided</td>
<td>30</td>
<td>12.0</td>
<td>15</td>
</tr>
<tr>
<td>Disagree</td>
<td>113</td>
<td>45.2</td>
<td>46</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>81</td>
<td>32.4</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>364</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.44: Respondents’ views on whether Internet-based technology courses should be entirely developed by outside consultants

This was another way of examining the respondents’ position as to who would be eligible to develop Internet courses in a virtual university. In this part, participants were called on to define precisely their position as to whether Internet courses should be shaped entirely by teaching members at the university. The statistical results in Table 6.45 revealed that a large proportion of respondents rejected this option. This represented 66.7% while 17.9% positively agreed and 15.4% were undecided. Group A disagreed with this view more than Group B (Group A: 58.4%; Group B: 48.3%).

<table>
<thead>
<tr>
<th>Teaching members at the proposed virtual university should entirely develop Internet-based technology courses.</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>17</td>
<td>6.8</td>
<td>12</td>
</tr>
<tr>
<td>Agree</td>
<td>20</td>
<td>8.0</td>
<td>16</td>
</tr>
<tr>
<td>Undecided</td>
<td>34</td>
<td>13.6</td>
<td>22</td>
</tr>
<tr>
<td>Disagree</td>
<td>110</td>
<td>44.0</td>
<td>28</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>69</td>
<td>27.6</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>364</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.45: Respondents’ views on whether teaching members at the proposed virtual university should entirely develop Internet-based technology courses
In the final part of this section, respondents were asked to classify their opinion with regard to whether Internet-based courses should be developed collaboratively between teaching members at the proposed virtual university and outside consultants. A significant percentage of respondents (86.1%; N = 277) supported this view, while just 18.1% disagreed, and only 5.8% were undecided. (See Table 6.46.) In order to examine the significance of the viewpoints within the groups with respect to this idea, the Chi-square was used and the result was 15.36 (df4, P = 0.004). Group A represented the highest response rate in agreement regarding this section (81.2%) while Group B represented 65%. The result suggested that Group A more knowledgeable of the requirements of Internet courses production and development in terms of educational and technical expertise than Group B.

Internet-based technology courses should be developed collaboratively between teaching members at the proposed virtual university and outside consultants.

<table>
<thead>
<tr>
<th>Internet Course Producer</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>121</td>
<td>48.4%</td>
</tr>
<tr>
<td>Agree</td>
<td>82</td>
<td>32.8%</td>
</tr>
<tr>
<td>Undecided</td>
<td>8</td>
<td>3.2%</td>
</tr>
<tr>
<td>Disagree</td>
<td>25</td>
<td>10.0%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>14</td>
<td>5.6%</td>
</tr>
<tr>
<td></td>
<td>364</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 6.46: Respondents' views on whether Internet-based technology courses should be developed collaboratively

6.8.4 Media Usage

The Internet has a number of features that can be used to satisfy certain objectives in an educational setting. The basic goal of this subsection is to comprehend the respondents' perspectives vis-à-vis the Internet tools that can be utilised effectively in the proposed university. The most prominent and widespread Internet utility is e-mail. Although there was some agreement among respondents as a whole on the importance of this medium in the virtual university, there was also, to a certain extent, variance in the degree of importance that they accorded it. 83.5% stated that using this tool as an educational intermediary was very important, while 16.5% said it was important. (See Table 6.47.) Unquestionably, e-mail is considered to be one of the most widely used asynchronous tools in virtual education.
because of its ability to facilitate communication between students on the one hand and their instructors on the other.

<table>
<thead>
<tr>
<th>Media Usage</th>
<th>E-mail</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Very Important</td>
<td>207</td>
<td>82.8</td>
<td>97</td>
<td>85.1</td>
</tr>
<tr>
<td>Important</td>
<td>43</td>
<td>17.2</td>
<td>17</td>
<td>14.9</td>
</tr>
<tr>
<td>Moderately Important</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Of Little Importance</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unimportant</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 6.47: Respondents' opinions regarding utilising E-mail

Table 6.48 illustrates respondents' opinions concerning the use of FTP as an educational delivery medium. The highest percentages of respondents (65.1%; N = 237) recognised the usefulness of taking advantage of this tool in the virtual university, around 23.1% considered it as moderately important, and no more than 11.8% thought of it as of little importance.

<table>
<thead>
<tr>
<th>Media Usage</th>
<th>FTP</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Very Important</td>
<td>62</td>
<td>24.8</td>
<td>18</td>
<td>15.8</td>
</tr>
<tr>
<td>Important</td>
<td>101</td>
<td>40.4</td>
<td>56</td>
<td>49.1</td>
</tr>
<tr>
<td>Moderately Important</td>
<td>58</td>
<td>23.2</td>
<td>26</td>
<td>22.8</td>
</tr>
<tr>
<td>Of Little Importance</td>
<td>29</td>
<td>11.6</td>
<td>14</td>
<td>12.3</td>
</tr>
<tr>
<td>Unimportant</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 6.48: Reveals respondents' opinions regarding utilising FTP

Respondents were then asked to express their judgment on the use of News Groups as a forum for discussion among people of similar interests. As Table 6.49 shows, 65.6% (N = 239) realised the significance of employing this utility in a virtual setting. Almost 12.4% of the total respondents mentioned that this was of moderate importance, and about 14.3% saw its significance as slight. With the purpose of determining a possible significant difference between participants’ views related to this item, the Chi-square test was applied and the result was 27.58 (df4, P = 0.000). This demonstrated that Group A, which represented about 70.4% of the total number of respondents, was more convinced of the importance of utilising this device than Group B which represented only 55.3%. This result
emphasised that, in a culture dominated almost entirely by the male sex, as is the situation in Saudi Arabia, females tend to be diffident and hesitant. In most circumstances, women are reluctant to enter into any public debate with people other than those of their own gender.

<table>
<thead>
<tr>
<th>News Groups</th>
<th>Group A Frequency</th>
<th>Group A %</th>
<th>Group B Frequency</th>
<th>Group B %</th>
<th>Total Frequency</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Important</td>
<td>96</td>
<td>38.4</td>
<td>22</td>
<td>19.3</td>
<td>118</td>
<td>32.4</td>
</tr>
<tr>
<td>Important</td>
<td>80</td>
<td>32.0</td>
<td>41</td>
<td>36.0</td>
<td>121</td>
<td>33.2</td>
</tr>
<tr>
<td>Moderately Important</td>
<td>28</td>
<td>11.2</td>
<td>17</td>
<td>14.9</td>
<td>45</td>
<td>12.4</td>
</tr>
<tr>
<td>Of Little Importance</td>
<td>37</td>
<td>14.8</td>
<td>15</td>
<td>13.2</td>
<td>52</td>
<td>14.3</td>
</tr>
<tr>
<td>Unimportant</td>
<td>9</td>
<td>3.6</td>
<td>19</td>
<td>16.7</td>
<td>28</td>
<td>7.7</td>
</tr>
</tbody>
</table>

Table 6.49: Respondents' opinions regarding utilising News Groups

A list server is another Internet tool and respondents were invited to identify how important it would be to integrate this in the virtual university. Table 6.50 shows that 57.4% (N = 209) noted it was important, 22.0% mentioned it was moderately important, only 9.3% indicated it was of little importance and 11.3% believed it was unimportant. The Chi-square test was implemented to explore the significance between respondents' opinions regarding this tool. The result was 18.09 (df4, P = 0.000). Group A represented about 63.2%, while Group B represented 44.7% of the total number of respondents who agreed on the importance of using this tool in virtual education. Here again, the result showed that women were disinclined to be practically involved with men.

<table>
<thead>
<tr>
<th>List Server</th>
<th>Group A Frequency</th>
<th>Group A %</th>
<th>Group B Frequency</th>
<th>Group B %</th>
<th>Total Frequency</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Important</td>
<td>61</td>
<td>24.4</td>
<td>18</td>
<td>15.8</td>
<td>79</td>
<td>21.7</td>
</tr>
<tr>
<td>Important</td>
<td>97</td>
<td>38.8</td>
<td>33</td>
<td>28.9</td>
<td>130</td>
<td>35.7</td>
</tr>
<tr>
<td>Moderately Important</td>
<td>54</td>
<td>21.6</td>
<td>26</td>
<td>22.8</td>
<td>80</td>
<td>22.0</td>
</tr>
<tr>
<td>Of Little Importance</td>
<td>20</td>
<td>8.0</td>
<td>14</td>
<td>12.3</td>
<td>34</td>
<td>9.3</td>
</tr>
<tr>
<td>Unimportant</td>
<td>18</td>
<td>7.2</td>
<td>23</td>
<td>20.2</td>
<td>41</td>
<td>11.3</td>
</tr>
</tbody>
</table>

Table 6.50: Respondents' opinions regarding utilising List servers

When respondents were asked to decide on the importance of adding a mailing list to the overall educational delivery mechanisms in the virtual university, the highest number of participants (74.4%; N = 271) agreed, as shown in Table 6.51, on the importance of this
device, 7.4% felt it was of moderate importance and 18.1% thought it was of little importance. The Chi-square test was employed and the result was insignificant.

<table>
<thead>
<tr>
<th>Media Usage</th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Mailing Lists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Important</td>
<td>67</td>
<td>26.8</td>
<td>26</td>
<td>22.8</td>
<td>93</td>
</tr>
<tr>
<td>Important</td>
<td>124</td>
<td>49.6</td>
<td>54</td>
<td>47.4</td>
<td>178</td>
</tr>
<tr>
<td>Moderately Important</td>
<td>17</td>
<td>6.8</td>
<td>10</td>
<td>8.8</td>
<td>27</td>
</tr>
<tr>
<td>Of Little Importance</td>
<td>42</td>
<td>16.8</td>
<td>24</td>
<td>21.1</td>
<td>66</td>
</tr>
<tr>
<td>Unimportant</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 6.51: Respondents' opinions regarding utilising Mailing Lists

All respondents positively valued the importance of using Bulletin Boards at the virtual university. Around 42.3% stated that this was very important while 57.7% rated this as important. (See Table 6.52.) The results suggested that respondents recognized the significance of this medium as a means of communication that could be used to post any information concerning students and courses.

<table>
<thead>
<tr>
<th>Bulletin Boards</th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Very Important</td>
<td>107</td>
<td>42.8</td>
<td>47</td>
<td>41.2</td>
<td>154</td>
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<tr>
<td>Important</td>
<td>143</td>
<td>57.2</td>
<td>67</td>
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<td>210</td>
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<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
</tr>
<tr>
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<td>0</td>
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</tr>
</tbody>
</table>

Table 6.52: Respondents' opinions regarding utilising Bulletin Boards

When respondents were asked to evaluate the significance of using IRC as an educational delivery medium, more than two thirds of the total participants (85.4%; N = 311) confirmed that this was important, while 14.6% (N = 53) considered it to be moderately important. These results, as shown in Table 6.53, indicate that the majority of respondents valued this device as a communication channel which would facilitate learning and teaching within a virtual university. Additionally, it would assist in creating a sense of community for individual participants, reducing any feelings of remoteness or loneliness.
Chapter 6

Questionnaire Results: Analysis

<table>
<thead>
<tr>
<th>IRC</th>
<th>Group A Frequency</th>
<th>%</th>
<th>Group B Frequency</th>
<th>%</th>
<th>Total Frequency</th>
<th>%</th>
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</thead>
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<tr>
<td>Very Important</td>
<td>116</td>
<td>46.4</td>
<td>50</td>
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<td>Important</td>
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<td>38.6</td>
<td>145</td>
<td>39.8</td>
</tr>
<tr>
<td>Moderately Important</td>
<td>33</td>
<td>13.2</td>
<td>20</td>
<td>17.5</td>
<td>53</td>
<td>14.6</td>
</tr>
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<td>0</td>
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<tr>
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</tr>
</tbody>
</table>

Table 6.53: Respondents’ opinions regarding utilising IRC

Nearly all the participants agreed on the value of incorporating the WWW in the envisaged university. 78%, as shown in Table 6.54, specified this to be of the highest importance, while 22% felt that it was important. The WWW is one of the most widely used Internet tools in virtual education.

<table>
<thead>
<tr>
<th>The WWW</th>
<th>Group A Frequency</th>
<th>%</th>
<th>Group B Frequency</th>
<th>%</th>
<th>Total Frequency</th>
<th>%</th>
</tr>
</thead>
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<tr>
<td>Very Important</td>
<td>190</td>
<td>76.0</td>
<td>94</td>
<td>82.5</td>
<td>284</td>
<td>78.0</td>
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<tr>
<td>Important</td>
<td>60</td>
<td>24.0</td>
<td>20</td>
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<td>22.0</td>
</tr>
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<td>0</td>
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<tr>
<td>Of Little Importance</td>
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<td>Unimportant</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 6.54: Respondents’ opinions regarding utilising the World Wide Web

Audio conferencing is another popular Internet tool which gained a consensus among the respondents on its importance to be included in the virtual university as a learning delivery device. About 65.1% accepted it as highly important and 34.9% acknowledged it as important. The results (Table 6.55) reveal that respondents understand the necessity of using this medium which is crucial, particularly for learners with sight impairments.
The final Internet utility which the respondents were requested to comment on was video conferencing. Participants’ views regarding this item were varied. More than half indicated that it was important (53%; N = 193). On the other hand, about 35.4% were less inclined to value its importance, and the remaining 11.5% mentioned that it was only moderately important. To determine the possible significance of the participants’ views, the Chi-square test was conducted and the result was 52.71 (df4, P = 0.000). It can be seen from Table 6.56 that Group A represented the largest percentage of respondents (64.8%) who supported the utilisation of video conferencing as a means of educational delivery in the virtual university, whereas no more than 27.2% of Group B did so. This outcome suggests that using video conferencing in the virtual university, at least in the initial stages of its inauguration, may impede women from communal involvement because of cultural reasons.

### Table 6.55: Respondents’ opinions regarding utilising Audio conferencing

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Very Important</td>
<td>160</td>
<td>64.0</td>
<td>77</td>
</tr>
<tr>
<td>Important</td>
<td>90</td>
<td>36.0</td>
<td>37</td>
</tr>
<tr>
<td>Moderately Important</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Of Little Importance</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unimportant</td>
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</tr>
</tbody>
</table>

### Table 6.56: Respondents’ opinions regarding utilising Video conferencing

<table>
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<tr>
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<th>Group A</th>
<th>Group B</th>
<th>Total</th>
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<td></td>
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<tr>
<td>Very Important</td>
<td>75</td>
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<td>Important</td>
<td>87</td>
<td>34.8</td>
<td>19</td>
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<tr>
<td>Moderately Important</td>
<td>28</td>
<td>11.2</td>
<td>14</td>
</tr>
<tr>
<td>Of Little Importance</td>
<td>20</td>
<td>8.0</td>
<td>16</td>
</tr>
<tr>
<td>Unimportant</td>
<td>40</td>
<td>16.0</td>
<td>53</td>
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</tbody>
</table>

### 6.8.5 Study System

The study system in this context means the overall arrangements, rules and regulations that answer such questions as what kind of courses should be studied in a given period of time for each individual, when students should begin and end their studies, and so on.
Respondents in this section were asked to state their preferred study system for the virtual university. 54.9% were in favour of Credit Hours; this has been excluded by higher education decision-makers from Saudi universities for the reasons discussed briefly in Chapter 2. The second most desired study system was Half Yearly or Semesters. 25.5% supported this view, while just 19.5% chose the annual system. The result, as illustrated in Table 6.57, shows that the Credit Hours System was appropriate because of the nature of the university on the one hand and the availability of academic staff on the other, since most of these are employed on a part-time basis.

<table>
<thead>
<tr>
<th>Study System</th>
<th>Group A</th>
<th></th>
<th>Group B</th>
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<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
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<tr>
<td>Semester or Half Yearly System</td>
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<td>28.9</td>
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<td>Credit Hours System</td>
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<td>56.8</td>
<td>58</td>
<td>50.9</td>
<td>200</td>
<td>54.9</td>
</tr>
</tbody>
</table>

Table 6.57: Respondents' viewpoints concerning the most appropriate study system

6.8.6 Study Language

The purpose of this subsection was to ascertain what languages could be used in teaching and learning at the virtual university. At the present time, Arabic and English are the two most commonly used languages in Saudi higher education institutions. Generally, Arabic is used in theoretical subjects such as Humanities and Social Sciences, while English is normally adopted for scientific fields of study such as Medicine, and Agricultural and Applied Sciences. In this regard, respondents were asked to select the most suitable languages which could be used for teaching and learning. The majority of participants (58.8%; N = 214) agreed that both Arabic and English should be utilised, based on the academic specialism. 31.0% saw Arabic as the most appropriate language for study, while 10.2% accepted English as the only teaching and learning tool. (See Table 6.58.)
### Study Language

<table>
<thead>
<tr>
<th>Study Language</th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
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<th></th>
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</thead>
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<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Arabic Language</td>
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<td>28.9</td>
<td>113</td>
<td>31.0</td>
</tr>
<tr>
<td>English Language</td>
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<td>12</td>
<td>10.5</td>
<td>37</td>
<td>10.2</td>
</tr>
<tr>
<td>Combination of both Arabic and English languages (based on the type of subject)</td>
<td>145</td>
<td>58.0</td>
<td>69</td>
<td>60.5</td>
<td>214</td>
<td>58.8</td>
</tr>
</tbody>
</table>

Table 6.58: Respondents' viewpoints concerning the most appropriate study language

#### 6.8.7 Teaching Strategies

Instructors in a virtual learning environment have to adopt certain teaching techniques to be in accordance with students’ learning styles. In practice, some of these approaches are being exploited in an FTF environment, but others are not. However, in order to determine which teaching approaches are more appropriate in an Internet environment, respondents were asked to specify the degree of importance of a number of teaching approaches normally implemented in this kind of educational setting. The first technique is teaching by lecture. 24.7% thought that it is very important, 34.9% believed it is important and should be one of the basic teaching strategies at the proposed university, while only 8.5% considered it to be moderately important, 19.0% of little importance and 12.9% said it was unimportant (Table 6.59). The Chi-square test was applied to explore the potential significance of respondents’ views within the main groups, and the result was 11.787 (df4, P = 0.019). Group B rated a higher percentage of agreement on the importance of this method (67.6%), while Group A rated only 56% (N = 140). In most higher education institutions, whether in colleges for males or females, the instructor (the “sage on the stage”) is regarded as the main source of knowledge and the lecture is the dominant teaching style. This does not typically reflect students’ educational needs or even meet their learning styles. In an online environment, the lecture approach is fundamentally different from FTF. This is called the “expert” lecture and it requires instructors to pay more attention to his/her students’ new learning requirements. Most respondents in Group B seemed in favour of this approach, as opposed to Group A who were more cautious.
The second suggested teaching strategy was the problem-solving approach, despite the fact that this is not a common teaching technique in traditional higher education settings in Saudi Arabia, especially in theoretical studies. 67.6% (see Table 6.60) indicated the importance of this teaching method, 23.4% disagreed about its importance, and just 9.1% thought it to be moderately important. To evaluate the significance of respondents’ opinions regarding this technique, the Chi-square test was used and the result was 10.42 (df4, P = 0.034). Group A represented the highest percentage of respondents who were in favour of this approach (71.2%) while Group B represented 59.6%. These statistical analyses revealed that Group A wanted, more than Group B, to move beyond the old style of teaching which has existed for decades in traditional higher education institutions. The results seem to indicate a desire to move into a more active and interactive learning environment in order to stimulate and motivate students’ thinking on the one hand and to fulfill their learning ambitions on the other. The Chi-square test was also used to define any significance between respondents’ viewpoints and their qualifications with a result of 24.13 (df8, P = 0.002). Respondents who held Ph.D. degrees represented 71.7% who indicated the importance of this view, followed by those who held Masters’ degrees (58.2%) and finally Bachelors’ degrees (45.9%). This result suggested that the higher qualified respondents were more appreciative of this teaching strategy.
The next teaching strategy which respondents were asked to consider was the Individualised Learning Approach. 75.6% noted the importance of exploiting this teaching technique as an educational method in the virtual university, 10.2% mentioned that it was moderately important, 7.4% thought that it was of little importance, and just 6.9% believed it was unimportant. The results of the data analysis (Table 6.61) point out that most respondents preferred a teaching strategy that would fit in with the new learning environment to make the teaching and learning process more attractive and engaging. This approach involves a thorough assessment of students' learning needs and interests which all subject matter and teaching strategies will be built upon. This is considered to be one of the many options available to instructors at the proposed university. As indicated in Chapter 4, the Internet environment, and more specifically the WWW, lends itself to this approach.

In this section, respondents were invited to specify how important it is to utilise the Collaborative Learning Method in the virtual university. The analysis revealed that 59.9% of the participants agreed on the importance of this approach. 16.5% accorded moderate importance to this technique, 13.2% saw it as of little importance, and the remaining 10.4% did not regard it as important. The results in Table 6.62 show that slightly more than half of...
the total respondents valued the significance of this teaching method. The reminder of respondents showed caution in their opinions perhaps because they may prefer straightforward teaching strategies that aim to deal directly with individual learners instead of working collectively.

<table>
<thead>
<tr>
<th>Teaching Strategy</th>
<th>Group A</th>
<th>yers</th>
<th>Group B</th>
<th>%</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Very Important</td>
<td>96</td>
<td>38.4</td>
<td>41</td>
<td>36.0</td>
<td>137</td>
<td>37.6</td>
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<td>19.3</td>
<td>81</td>
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<td>17</td>
<td>14.9</td>
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<tr>
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<td>48</td>
<td>13.2</td>
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<tr>
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<td>11.4</td>
<td>38</td>
<td>10.4</td>
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<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

Table 6.62: Respondents' viewpoints on Collaborative Learning Approaches

Respondents in this section were asked to highlight the importance of incorporating the Programmed Learning Approach as a teaching strategy in the virtual university. Table 6.63 illustrates that 51.1% of the participants indicated the importance of this technique. 18.4% pointed out the moderate importance of this method, 18.1% regarded this approach as of little importance, and almost 12.4% did not recognize its importance at all. This educational approach is parallel in its strategy to the present type of external study, the “Intisab” teaching technique that is available in two major universities in the Kingdom. This was described in Chapter 2. Clearly, however, it is somewhat different in the electronic form which is typically used to help learners acquire a specific level of competence. This approach is most effective in dealing with students with special needs, as well as those of average ability, because it gives them an opportunity to study at their own pace.

<table>
<thead>
<tr>
<th>Teaching Strategy</th>
<th>Group A</th>
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<th>Group B</th>
<th>%</th>
<th>Total</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
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<td>Very Important</td>
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<td>66</td>
<td>18.1</td>
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<td>31.6</td>
<td>120</td>
<td>33.0</td>
</tr>
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<td>44</td>
<td>17.6</td>
<td>23</td>
<td>20.2</td>
<td>67</td>
<td>18.4</td>
</tr>
<tr>
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<td>47</td>
<td>18.8</td>
<td>19</td>
<td>16.7</td>
<td>66</td>
<td>18.1</td>
</tr>
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<td>Unimportant</td>
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<td>12.0</td>
<td>15</td>
<td>13.2</td>
<td>45</td>
<td>12.4</td>
</tr>
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<td>100</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6.63: Participants' opinions on a Programmed Learning Approach
6.8.8 Assessment Methods

This part of the questionnaire aimed to obtain respondents’ views regarding what assessment strategy would be best followed at the proposed university. The majority of the participants sought an effective and well-planned mixture of both summative and formative evaluation techniques. 64.7% favoured this notion. 23.8% preferred summative methods to be predominant, as is currently the case in most colleges in Saudi universities. The smallest group of respondents (11.5%) preferred a formative approach as a way of evaluating students at the envisaged university. These results, as shown in Table 6.64, indicate most respondents’ eagerness to modify the present assessment system, and their wish to apply both assessment techniques in all types of study within the virtual university and for this dual assessment to be the norm. The Chi-square test was performed and it was found to show no significant difference.

<table>
<thead>
<tr>
<th>Assessment Methods</th>
<th>Group A</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Summative Assessment</td>
<td>52</td>
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<td>35</td>
</tr>
<tr>
<td>Formative Assessment</td>
<td>30</td>
<td>12.0</td>
<td>12</td>
</tr>
<tr>
<td>Combination of both Summative and Formative Assessments</td>
<td>168</td>
<td>67.2</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>364</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.64: Respondents’ viewpoints concerning the most appropriate evaluation method

6.9 Obstacles Facing the Establishment of a Virtual University

The chief objective of this section was to outline some of the obstacles in order to test the feasibility, desirability and practicality of establishing a virtual university in the Kingdom. These obstacles were framed as opinions. Respondents were invited to specify to what extent they agreed with each of them. The first obstacle which might be encountered when founding a virtual university is the negative response of the majority of people within the Kingdom towards the Internet; this may limit its accessibility. This factor was commented on by all the participants but the general responses were encouraging because the largest percentage believed the opposite of this. As shown in Table 6.65, 53% (N = 285) disagreed
with the statement that the Internet is ignored by the majority of Saudi society, 8.6% were undecided, and 38.5% agreed with this. In fact, Internet technology will not be accepted if the government and religious scholars do not jointly approve its accessibility to the general public after long and exhaustive deliberation. The results indicate that some people may still refuse to accept this useful technology; this may not be because of social standards or traditional norms but, in essence, because of a lack of understanding and knowledge of its usefulness. Furthermore, a small number of respondents may have been undecided because they might not have access to authentic statistics on the number of Internet users in the Kingdom to support their views on this issue.

### Most people do not yet accept the Internet in Saudi Arabia.

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>53</td>
<td>12.8</td>
<td>19</td>
<td>15.4</td>
<td>72</td>
<td>13.4</td>
</tr>
<tr>
<td>Agree</td>
<td>106</td>
<td>25.5</td>
<td>29</td>
<td>23.6</td>
<td>135</td>
<td>25.1</td>
</tr>
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<td>Undecided</td>
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<td>8.0</td>
<td>13</td>
<td>10.6</td>
<td>46</td>
<td>8.6</td>
</tr>
<tr>
<td>Disagree</td>
<td>173</td>
<td>41.7</td>
<td>41</td>
<td>33.3</td>
<td>214</td>
<td>39.8</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>50</td>
<td>12.0</td>
<td>21</td>
<td>17.1</td>
<td>71</td>
<td>13.2</td>
</tr>
</tbody>
</table>

Table 6.65: Respondents' opinions regarding the Internet in Saudi Arabia

The second potential limitation that may deter the construction of the virtual university is the idea that there is a tendency among higher education policy-makers to limit access to higher education. The greatest percentage (82.5%; N = 444) rejected this notion completely, while just 17.5% agreed (see Table 6.66). The Chi-square test was conducted and the result was 9.185 (df3, P = 0.027). This result revealed that Group A (85.1%; N = 353) believed more than Group B (74%; N = 91) that the new admission rules and regulations which are now in place are intended to dissuade students from continuing their higher education studies. Instead, they are designed to minimise the effect of the increasing pressure on higher education institutions through initiating a reasonable balance between existing capacity and the number of students being accepted.
There is a tendency by higher education policy-makers to limit access to continuing higher education studies. Table 6.66 shows the distribution of respondents' opinions regarding the attitudes of higher education policy-makers towards continuing higher education.

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>35</td>
<td>8.4</td>
<td>15</td>
</tr>
<tr>
<td>Agree</td>
<td>27</td>
<td>6.5</td>
<td>17</td>
</tr>
<tr>
<td>Undecided</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Disagree</td>
<td>151</td>
<td>36.4</td>
<td>37</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>202</td>
<td>48.7</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>538</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.66: Respondents' opinions regarding the attitudes of higher education policy-makers towards continuing higher education.

On the third possible barrier, respondents were requested to state their opinions on whether teaching members at Saudi universities are convinced that the best way to teach their discipline is through face-to-face teaching methods. The results, as provided in Table 6.67, show that more than half of the respondents (58.8%) did not think so, whereas around 41.3% felt that this was so. External study or "Intisab", which can be considered as a type of distance education or remote teaching, has been known in Saudi universities for quite some time. This was explained in Chapter 2. This may reflect respondents' views regarding this concept. In order to determine any possible significance between respondents' opinions in the two groups and this perception, the Chi-square test was used and the result was 10.17 (df3, P = 0.017). Group B showed more agreement regarding this view (51.3%) than Group A (38.3%). This is because respondents in Group B had less experience in teaching via TV circuits which is mostly provided by members of Group A, as indicated in Chapter 2.

<table>
<thead>
<tr>
<th>Teaching members at Saudi universities are convinced that the best way to teach their discipline is through the face-to-face teaching method.</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group A</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>51</td>
</tr>
<tr>
<td>Agree</td>
<td>108</td>
</tr>
<tr>
<td>Undecided</td>
<td>00</td>
</tr>
<tr>
<td>Disagree</td>
<td>170</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>86</td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Table 6.67: Respondents' opinions regarding FTF teaching methods.

Respondents were asked if they thought that learning through Internet-based technologies cannot provide high quality education. Table 6.68 indicates that 63.7% (N = 343) did not
agree with this, while 11.2% were undecided, and only 25.1% agreed that teaching via the Internet and related resources offers lower quality than teaching through FTF. These results validate what was discussed in Chapter 4 about the capability of the Internet and its associated technologies to provide access to high-quality education. This indeed largely explains the rapid growth in the use of these media in a large number of higher educational institutions worldwide. The Chi-square test was carried out and there was no significant difference.

<table>
<thead>
<tr>
<th>There is a belief that learning through Internet-based technologies cannot provide high quality education.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A</strong></td>
<td><strong>Group B</strong></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>22</td>
</tr>
<tr>
<td>Agree</td>
<td>91</td>
</tr>
<tr>
<td>Undecided</td>
<td>47</td>
</tr>
<tr>
<td>Disagree</td>
<td>135</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>120</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>538</td>
</tr>
</tbody>
</table>

Table 6.68: Respondents' opinions regarding the quality of education provided via Internet-based technologies

Respondents were also asked whether they agreed that one of the main reasons that could limit a virtual university in Saudi Arabia is that teaching members in Saudi universities lack relevant skills to facilitate virtual learning. Just 21.5% agreed with this viewpoint, while 5.6% were undecided, and the largest percentage (72.9%; N = 392) disagreed entirely with this view. These results, as shown in Table 6.69, demonstrate that most respondents thought that Internet skills could be acquired through learning and practice. This supported their previous views, in Section Three of this questionnaire, that: "Internet skills should not be used as a precondition for appointing teaching members at the envisaged university".

<table>
<thead>
<tr>
<th>Teaching members lack relevant skills to facilitate learning through the Internet.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A</strong></td>
<td><strong>Group B</strong></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>17</td>
</tr>
<tr>
<td>Agree</td>
<td>67</td>
</tr>
<tr>
<td>Undecided</td>
<td>20</td>
</tr>
<tr>
<td>Disagree</td>
<td>167</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>144</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>538</td>
</tr>
</tbody>
</table>

Table 6.69: Participants' views on Internet skills
Participants were then questioned on whether a lack of English language proficiency might impede the creation of the virtual university in the Kingdom. Table 6.70 shows that 64.5% of the total number of respondents agreed that an inability to master the English language could be an obstacle. About 11.5% were undecided on this question and the rest (24%) disagreed. Most respondents, as indicated earlier, are in favour of accommodating both Arabic and English in the virtual university. This should minimise the potential side-effect of this factor.

<table>
<thead>
<tr>
<th>English language proficiency of Saudi students is lacking.</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>69</td>
<td>16.6</td>
<td>23</td>
</tr>
<tr>
<td>Agree</td>
<td>202</td>
<td>48.7</td>
<td>53</td>
</tr>
<tr>
<td>Undecided</td>
<td>53</td>
<td>12.8</td>
<td>9</td>
</tr>
<tr>
<td>Disagree</td>
<td>78</td>
<td>18.8</td>
<td>34</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>13</td>
<td>3.1</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 6.70: Participants’ views on English language proficiency

Respondents were asked if they thought that the production and development of the Internet courses was too costly. 62.1% did think so, 5.6% were undecided, and 32.4% disagreed. For the purpose of finding a possible significance between the two groups pertaining to their responses, the Chi-square test was used and the result was 8.96 (df4, P = 0.062). Group A represented the highest percentage of agreement in relation to this point of view (63.2%) while Group B represented 58.5%. These results, as shown in Table 6.71, reveal a certain level of concern on the part of a large percentage of respondents in both Group A and Group B on the overall cost of developing and producing Internet courses. This may be a valid concern if the university depends entirely on sophisticated technologies such as animation, video conferencing, complex Web design, and so forth. However, the increasing cost of course design, which might be accrued by using highly advanced technologies such as those noted in Chapter 4, can be reduced in the long run through experience and even turned into profit. However, to avoid escalating expenses of course design, teaching members can rely on basic Internet technologies to produce high quality courses that can accomplish the goals and objectives of the whole learning process.
Internet course production and development is too costly.

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>119</td>
<td>28.7</td>
<td>42</td>
<td>34.1</td>
<td>161</td>
<td>29.9</td>
</tr>
<tr>
<td>Agree</td>
<td>143</td>
<td>34.5</td>
<td>30</td>
<td>24.4</td>
<td>173</td>
<td>32.2</td>
</tr>
<tr>
<td>Undecided</td>
<td>18</td>
<td>4.3</td>
<td>12</td>
<td>9.8</td>
<td>30</td>
<td>5.6</td>
</tr>
<tr>
<td>Disagree</td>
<td>84</td>
<td>20.2</td>
<td>24</td>
<td>19.5</td>
<td>108</td>
<td>20.1</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>51</td>
<td>12.3</td>
<td>15</td>
<td>12.2</td>
<td>66</td>
<td>12.3</td>
</tr>
</tbody>
</table>

Table 6.71: Respondents' opinions on the cost of Internet course production and development

Table 6.72 illustrates that 62.4% (N = 336) thought that a lack of coordination among Saudi universities might obstruct the foundation of the envisaged university in the Kingdom. Just 7.8% were undecided and 29.8% totally disagreed with this idea. The impact of this obstacle has been reduced since most respondents chose the For-profit Virtual University Model which could be formed through a collaborative enterprise between the Saudi government and the private sector. The Chi-square test was employed and the result was insignificant.

Lack of coordination between Saudi universities.

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>89</td>
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<td>21</td>
<td>17.1</td>
<td>110</td>
<td>20.4</td>
</tr>
<tr>
<td>Agree</td>
<td>164</td>
<td>39.5</td>
<td>62</td>
<td>50.4</td>
<td>226</td>
<td>42.0</td>
</tr>
<tr>
<td>Undecided</td>
<td>33</td>
<td>8.0</td>
<td>9</td>
<td>7.3</td>
<td>42</td>
<td>7.8</td>
</tr>
<tr>
<td>Disagree</td>
<td>112</td>
<td>27.0</td>
<td>25</td>
<td>20.3</td>
<td>137</td>
<td>25.5</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>17</td>
<td>4.1</td>
<td>6</td>
<td>4.9</td>
<td>23</td>
<td>4.3</td>
</tr>
</tbody>
</table>

Table 6.72: Respondents' views on coordination between Saudi universities

An attempt was then made to find out whether respondents agreed that the lack of an adequate IT infrastructure within Saudi universities could be an obstacle to the establishment of a virtual university in the Kingdom. 55.0% disagreed, 2.4% were undecided, and around 42.6% agreed. When this opinion was cross-tabulated with respondents' views within the groups, it was discovered that the Chi-square was 136.39 (df4, P = 0.000). The results, as described in Table 6.73, show that Group B represented 88.7% while Group A represented 39.1%. This supported what has been presented in Chapter 3 which noted that girls' education centres are lacking an adequate IT infrastructure. The results also imply a sense of concern from Group A respondents about the availability of an adequate IT infrastructure that supports Internet accessibility within their institutions.

243
Chapter 6 Questionnaire Results: Analysis

Lack of adequate IT infrastructure within Saudi universities to support Internet connectivity.

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>48</td>
<td>11.6</td>
<td>81</td>
<td>65.9</td>
<td>128</td>
<td>23.8</td>
</tr>
<tr>
<td>Agree</td>
<td>73</td>
<td>17.6</td>
<td>28</td>
<td>22.8</td>
<td>101</td>
<td>18.8</td>
</tr>
<tr>
<td>Undecided</td>
<td>9</td>
<td>2.2</td>
<td>4</td>
<td>3.3</td>
<td>13</td>
<td>2.4</td>
</tr>
<tr>
<td>Disagree</td>
<td>128</td>
<td>30.8</td>
<td>7</td>
<td>5.7</td>
<td>135</td>
<td>25.1</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>157</td>
<td>37.8</td>
<td>3</td>
<td>2.4</td>
<td>161</td>
<td>29.9</td>
</tr>
</tbody>
</table>

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>538</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6.73: Participants' views on the availability of an adequate IT infrastructure within Saudi universities

The last question to which participants were asked to respond was whether a lack of manpower could be an impediment to setting up a virtual university in Saudi Arabia. Table 6.74 reveals that most respondents (60.8%; N = 327) disagreed with this idea while 10.2% were undecided. 29% agreed that a lack of professional technical personnel might hold back the creation of the proposed university. Certain studies cited in Chapter 5 have raised the issue of technical manpower as one of the primary limitations which might slow down the development and growth of IT in Saudi Arabia. Indeed, there has always been a heavy reliance on the efforts of foreign workers with IT knowledge and expertise. However, in recent years, Saudi citizens have begin enter this field steadily and in large numbers; these will eventually and gradually replace these expatriate workers.

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>52</td>
<td>12.5</td>
<td>17</td>
<td>13.8</td>
<td>69</td>
<td>12.8</td>
</tr>
<tr>
<td>Agree</td>
<td>63</td>
<td>15.2</td>
<td>24</td>
<td>19.5</td>
<td>87</td>
<td>16.2</td>
</tr>
<tr>
<td>Undecided</td>
<td>41</td>
<td>9.9</td>
<td>14</td>
<td>11.4</td>
<td>55</td>
<td>10.2</td>
</tr>
<tr>
<td>Disagree</td>
<td>137</td>
<td>33.0</td>
<td>45</td>
<td>36.6</td>
<td>182</td>
<td>33.8</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>122</td>
<td>29.4</td>
<td>23</td>
<td>18.7</td>
<td>145</td>
<td>27.0</td>
</tr>
</tbody>
</table>

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>538</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6.74: Respondents' viewpoints on the availability of technical manpower

6.10 Alternative to the Proposed Virtual University

This section of the questionnaire was aimed at those who did not agree with the idea of establishing a virtual university in the Kingdom of Saudi Arabia. It was designed to give them the opportunity to offer informed opinions by providing rational feedback on how to
solve the problem of accommodating the increase in graduates from secondary schools. After extensive and thorough analysis, it was found that their responses were very varied. Some of them, for instance, tried to avoid answering the question directly. Instead, they began deliberately raising other issues; this will be discussed when applying SSM to the study. In general, most respondents who preferred options other than a virtual university grouped their responses into three major categories. This is shown in Table 6.75. The data analysis of their responses divided them into three obvious sections. The first section, which represented 19.0% (N = 33), stated that they would like the private sector to take its responsibility seriously and begin individually, or through collaborative participation with the Saudi government, to construct more traditional colleges and universities in all regions of the Kingdom. The second group, which represented 51.1% (N = 89) were in favour of the MHE, on behalf of the Saudi government, taking full control of higher education, introducing more traditional public colleges and universities throughout the Kingdom. The third group, which represented 29.9% (N = 52) wanted the current universities to increase their capacity to absorb more students now and in the future. The Chi-square test was performed and it was found to be of no significance.

<table>
<thead>
<tr>
<th>Alternative to the proposed virtual university.</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishing traditional private universities</td>
<td>30</td>
<td>3</td>
<td>33</td>
</tr>
<tr>
<td>Frequency</td>
<td>% (18.2)</td>
<td>Frequency</td>
<td>% (33.3)</td>
</tr>
<tr>
<td>Constructing more traditional public universities</td>
<td>87</td>
<td>2</td>
<td>89</td>
</tr>
<tr>
<td>Frequency</td>
<td>% (52.7)</td>
<td>Frequency</td>
<td>% (22.2)</td>
</tr>
<tr>
<td>Increasing the capacity of the existing universities</td>
<td>48</td>
<td>4</td>
<td>52</td>
</tr>
<tr>
<td>Frequency</td>
<td>% (29.1)</td>
<td>Frequency</td>
<td>% (7.7)</td>
</tr>
<tr>
<td>Total</td>
<td>174</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Table 6.75: Respondents' opinions on the available alternatives

6.11 Conclusion

The central purpose of this chapter was to outline the main results which were generated from analysing the data collected through the questionnaire. Two groups participated in responding to the questionnaires. Group A represented male teaching members at KSU,
IMIU and KAU, and Group B represented female teaching members at three centres of girls' education attached to the above-mentioned universities. Their responses were outlined statistically and interpretation has been offered. The questionnaires were divided into six major sections. Each section involves specific questions that answer some of the key research questions stated previously in Chapter 1. The number of questionnaires that was distributed totalled 966 for the main survey. The number of questionnaires returned was 538, which seems satisfactory. The overall responses suggest that the majority of respondents (67.7%) were in favour of establishing a virtual university in the Kingdom of Saudi Arabia in order to alleviate some of the burdens on traditional universities to contain the growing number of students graduated from secondary schools. The Chi-square test revealed that Group B was significantly more supportive than Group A in relation to the concept of establishing a virtual university. Moreover, the Chi-square test which was carried out on the age of respondents showed \( (6.7; \text{df}3, \ P = 0.082) \) that there was no significant difference in their views on supporting the concept of establishing a virtual university.

The result also revealed that Group A had more Ph.D. qualified members (81.2%) than Group B who had 59.3%. Group B, on the other hand, had larger numbers of respondents who hold Masters' and Bachelors' degrees (29.3% and 11.4% respectively) than Group A (15.2% and 3.6%). Furthermore, the analysis indicated that Group B represented the largest percentages of those who used the Internet, (91.1%; \( N = 112 \)), while Group A represented 68.7% (\( N = 285 \)).
References

(Details of publishers are included in the bibliography at the end)

Chapter 7:

Interview Results: Analysis

7.1 Introduction

In order to discover as much data as possible in relation to the main research problem, it was decided, in addition to the data collected from the questionnaires, to conduct interviews with a number of key figures that have a direct connection with the overall subject. The aim was to build up a picture that would assist in developing the rich picture of the issue. The interviews, as explained in detail in Chapter Five, were executed as shown in Table 1.7 with members of the HESC, the Deputy Minister of the MHE for Academic Affairs, the Vice-Rectors of the three universities, Six College Deans, Directors of the Computer Centres at KSU, IMIU and KAU, the Director of the Internet Services Division at KACST, the Manager of Internet Services at STC, and the one selected ISP.

<table>
<thead>
<tr>
<th>TYPES OF INTERVIEWEES</th>
<th>NUMBER OF INTERVIEWEES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members of the Higher Education Supreme Council</td>
<td>3</td>
</tr>
<tr>
<td>Deputy Minister of the Ministry of Higher Education for</td>
<td>1</td>
</tr>
<tr>
<td>Academic Affairs</td>
<td></td>
</tr>
<tr>
<td>The University Vice-Rectors</td>
<td>3</td>
</tr>
<tr>
<td>College Deans</td>
<td>6</td>
</tr>
<tr>
<td>Directors of Computer Centres at KSU, IMIU and KAU</td>
<td>3</td>
</tr>
<tr>
<td>Director of the Internet Service Unit at KACST</td>
<td>1</td>
</tr>
<tr>
<td>Manager of Internet Services at STC</td>
<td>1</td>
</tr>
<tr>
<td>Internet Service Provider</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

Table 7.1: Types and number of interviewees

The purpose of this chapter is to present the data from these interviews and, at the same time, to outline the main issues of concern raised by the interviewees.
7.2 HESC Aspects

7.2.1 Members of the HESC

Three members of the HESC, who also perform the duty of university presidents for KSU, KAU and IMIU, were invited to participate in the interview process in order to answer a number of structured questions. The first question which was asked was intended to discover what the main problems or challenges are that are currently encountered in the universities in Saudi Arabia. The respondents answers were very similar and, in some respects, hardly differed. All of them stated firmly that the issue of accommodating the increasing number of secondary school graduates was one of the primary concerns of higher education policy-makers at present. Indeed, the rapid growth in the number of students graduating from secondary schools has created a considerable challenge to universities to try to absorb them. This was noted in Chapter 1.

The second issue which respondents pointed out was the lack of balance between need and the available specialisations in Saudi universities. This problem has come about as a result of the increasing social demand on universities to admit the large number of students, well beyond the capacity of the existing institutions. This ends by unbalancing the distribution of the students who are accepted between the theoretical and scientific fields. More than two thirds of students are admitted to theoretical specialisations which are actually far removed from the real needs of the work force. The government has insisted that achieving balance between academic studies is vital in responding to the new requirements of the overall national development plans.

The next challenge which was noted by the interviewees was the decline or weaknesses in the input and output of Saudi universities. This problem is linked to the first problem. The universities have accommodated more than their normal capacity, the number of years students spend studying their own field is more than it is supposed to be, and the specialisations of the students who have graduated
from universities do not tie in with the actual needs of the national development plans.

The ongoing need of the private sector for qualified professionals was another issue raised by respondents. The coordination, collaboration and interaction between higher education institutions and private organisations is less than the government’s expectations. This weakens any attempts by either the public or the private sector to absorb the graduates from Saudi universities into the workforce.

The final challenge which respondents identified was continuing education. This sector, which is assumed to be more influential in improving and promoting individual skills, does not receive adequate attention from higher education institutions in general and some universities in particular.

In the second question, respondents were asked to identify the short and long-term plans of the HESC to overcome these problems or challenges. Regarding the issue of the increasing number of secondary school graduates, they believed that the short term plan which is currently underway and which is based on establishing a number of new colleges in a number of cities, such as Riyadh, Jazan and Tabuk, would minimise the potential impact of this problem. There was no intention in the short term to increase enrolments into the existing universities. In the long-term, however, respondents outlined the following possibilities:

- Augmenting the capacity of the existing universities, based on a comprehensive evaluation of the actual needs of the public and private sectors for technical and scientific professionals.

- Enlarging the participation of the private sector in establishing and operating new community colleges, and in funding higher education programmes and projects.

- The Council intends to deal with the other issues as follows:
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- Improve the quality of the input and outputs of the higher education institutions.

- Expand continuing education programmes in order to equip individuals with the essential skills for the workforce market.

- Re-evaluate all graduate programmes in coordination with the private sector, and link all higher education programmes to specific essential goals and objectives of the national plans and the work market.

In response to the three questions that sought to find out from interviewees what resources are available to execute these plans, respondents mentioned that the government commitment to support higher education system is the most important resource currently available. The government should continue its efforts to provide total financial support to all higher education institutions, for the foreseeable future, to allow them to achieve their goals. The vigorous participation of the private sector in sponsoring higher education programmes is another resource which is assumed to be available.

In the fourth question, respondents were asked if they agreed with the prospect of establishing a virtual university via the Internet as an alternative means to accommodate the increasing number of secondary school graduates seeking higher education. They noted that establishing a virtual university could be one of the available options, although not the only one, open to the MHE as well as the private sector which should participate in sponsoring the provision of higher education. They added that some universities, such as IMIU and KAU, had expressed interest and had a strong determination to exploit this medium to support existing external studies ("Intisab") for non-traditional students. Other universities, such as KFUPM, are considering the utilisation of the Internet in delivering on-campus courses, and plan to expand its usage. On the reasons for supporting this idea, responses varied. The president of KSU pointed out that the main reason for supporting this idea related to its basic requirements in terms of infrastructure and financial expense. A university, functioning via the Internet,
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would reach almost every one in every region of the Kingdom. This, of course, could not be achieved through traditional institutions which only benefit those who live nearby. This capacity to accommodate a large number of students who have been denied access to the traditional universities will ease the pressure on traditional universities to admit more students. Moreover, the medium itself is seen as easy to use, accessible and contains a wealth of information. IMIU's president indicated that establishing a virtual university in the Kingdom would provide more higher education opportunities to both sexes. It is also more likely to attract more students who live in rural areas or who could not, for particular reasons, pursue their higher education studies. The president of KAU emphasised that creating a virtual university in the Kingdom would provide opportunities for those who seek to develop their knowledge and capabilities through higher education and would attract a large number of secondary school graduates to pursue their studies to B.Sc. level.

7.3 MHE Aspects

7.3.1 Deputy Minister of the MHE for Academic Affairs

The same issues were discussed with the Deputy Minister of the MHE. The interview began by asking what kind of challenges or obstacles are currently facing higher education and universities in particular. The interviewee stressed that achieving the aims and objectives of the Seventh National Development Plan is the definitive target and primary concern of the Ministry. Some of these challenges are:

- Meeting the present and future demands from the growing number of students looking for university enrolment.
- Meeting the market demand for qualified professionals.
- Bridging the gap between the Ministry and the private sector because of the lack of coordination and collaboration in sharing the available information.
and in cooperative participation in subsidising higher education programmes, research, and so on.

- Improving the quality of the output of higher education institutions.
- Expanding the exploitation of state of the art technology to carry out all higher education institutions' administrative functions.
- Utilizing Information Technology in education.

The respondent was then asked to outline some of the Ministry's short and long-term plans to surmount these issues. The Deputy Minister indicated that these plans were intrinsic in the overall national development plans, and the Ministry, since its creation, had vowed to devote all of its resources to promote the quality and quantity of the higher education system in the Kingdom and to provide access to higher education to all citizens on an equal basis. Its short-term plans are:

- Establishing more scientific and community colleges throughout the Kingdom.
- Expanding post-graduate studies within universities and sending more highly qualified students on scholarships outside the country to receive their higher education studies.
- Directing and maintaining equilibrium by keeping a sharp eye on budget spending.
- Developing more external study programmes (Intisab) within universities and enlarging the capacity of the existing ones to absorb more students.

The main aspects of the long-term plans are:

- Designating the nature of the various activities that should be included as part of the higher education system, such as vocational education after
secondary school, life-long learning and continuing education programmes, research and development activities, and so forth.

- Specifying the roles, aims and objectives of each higher education institution individually but within the higher education system, with the intention of achieving coordinated growth for the system as a whole.

- Discussing all issues in relation to the number of students who must be trained in the various types of higher education institutions to achieve a balance between the output of these institutions and the manpower requirements of the Kingdom.

- Discussing and recommending ways to improve and carry forward the quality of higher education institutions' activities.

- Ensuring that all the required developments and improvements in the higher education system will reinforce and act in accordance with social values and beliefs.

The interviewee further stated: "The government of Saudi Arabia in the era of the Custodian of the Two Holy Mosques, King Fahad Bin Abdulaziz, is placing more emphasis on education in general and on higher education in particular. The MHE budget has been increased almost every year since he took over the monarchy. The Saudi government is generously sponsoring the higher education system. In the 2001 national budget, the government allocated more than 6 billion Saudi Riyals to cover overhead expenses of the higher education system. However, this rapid financial increase means that the government will continue its obligation to press forward in advancing and improving the higher education system in an attempt to remain consistent to its goals and objectives."

After this, the interviewee was invited to provide some thoughts on the concept of establishing a virtual university via Internet-based technology in Saudi Arabia. He commented that the Ministry of Higher Education is attempting vigorously to find a realistic solution to deal with this important problem. Its continuous efforts began
by increasing the capacity of the existing colleges and universities to their maximum level with the purpose of accommodating as many students as possible, and establishing new colleges in some regions of the country. In respect of creating a virtual university via the Internet in the Kingdom, he felt that we should think carefully and analytically and ask ourselves quite a few questions before embarking on this route. These questions include: Do we have sufficient IT infrastructure and expertise in place to carry out this project effectively? Has this type of education been proven to be successful? What sort of experience do other countries have with this type of teaching and learning? And of foremost importance, do we need this type of education at present? If so, what type of education should we offer? Who are the main recipients of this type of study? What sort of measures and regulations should we initiate in order to ensure its quality? Who is going to sponsor this type of education? These questions and others must be answered before any attempt should be made. He further stated, "I do not think at the present time, or even in the nearest future, the Ministry has any plan, willingness or intention to provide this type of education. However, in the interim, the government will not obstruct any venture or any public institution from facilitating and providing this type of education. This can be done through close coordination and consultation with the Ministry to determine its worthiness."

7.4 University Aspects

7.4.1 University Vice-presidents

This section of the interview, as indicated in Chapter 5, was intended to discover respondents’ views on issues which most concerned their institutions. They were initially asked what they might think to be the most important challenges or problems that are currently encountered in their universities. The Vice-President of KSU identified the following issues as the main challenges facing the university at the present time:
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- The increasing number of applicants seeking admission to the university.

- The improvement and promotion of the efficiency of graduates to the high levels and numbers required to meet workforce targets.

- The establishment of a strong and close relationship with all public and private organisations in the Kingdom.

The second question sought to understand the short and long-term plans to contain, manage and control the increasing number of students seeking higher education. The Vice-President mentioned that the university tried to employ all necessary measures to reduce the side effects of this problem through creating more colleges, extending the capacity of the existing colleges to accommodate more students, setting up Diploma programmes, opening more community colleges, expanding post-graduate study programmes and utilising technologies to support and to deliver education.

In order to accomplish all of these plans, the interviewee pointed out that the university is almost entirely, as are all higher education institutions in Saudi Arabia, subsidised by the government. This limits the execution of their plans in accordance with the amount of money allocated to them every year. However, he also commented that the university makes every effort to increase its financial resources by requesting the government to increase its budget, and through research projects, investment, services and donations.

The last question in this series was whether the interviewee agreed with a proposal to establish a virtual university. He said: “Definitely, yes”. The university is now in the process of transferring the whole of the university onto the Internet and it has its own Web site. Currently, the university is undertaking comprehensive studies on projects which are designed to exploit the Internet, as well as other suitable technologies, to expand the reach of its educational programmes.

The same set of questions was put to the Vice-President of IMIU for higher studies and scientific research. When asked what he thought are the major challenges facing
the university nowadays, he replied that the university is facing tremendous challenges which can be summarized as follows:

- The increasing number of students seeking admission to the university beyond its existing capacity.
- The limitation of the available funds.
- The increase in the number of students in classrooms.
- The increase pressure and workload on academic staff as a result of the increasing number of students who lack incentive.
- The concentration on teaching as the primary goal of the teaching staff, which lessens the importance of scientific research.
- The shortage in the number of academic staff to meet the increasing number of student admissions.

The university has proposed a number of solutions to overcome some of these problems including establishing new colleges and departments, extending the working day, improving the external study (Intisab) programmes by utilising technology, balancing teaching loads and research, and searching for financial support to assist in carrying out the university’s major activities.

The respondent was then asked his opinion about what resources are available to accomplish these plans. He pointed out that, at present, the university’s capital resources are not sufficient to carry out some of them. However, the university is discussing the possibility of establishing a fee for higher education programmes in order to provide reasonable funds to cover the cost of some of the future plans.

The final question was intended to find out whether the interviewee agreed with the establishment of a virtual university with the purpose of assisting traditional universities in absorbing the rapid growth of students who graduate from secondary schools. He stated: “In principle, yes” but said that this required an exhaustive
analysis of the actual needs for this kind of learning. Such a venture would need comprehensive preparation, training and regulations in order to ensure its usefulness.

The third interviewee was the Vice-President of KAU for higher studies and scientific research. He was asked similar questions to the previous two respondents. The key challenges that the university is facing today are:

- The increasing demand for university education.
- The completion of the infrastructure of the university.
- The financial support to execute the plans put forward.

According to the respondent, the university plans to:

- Accept students to the full capacity of all departments in the university.
- Start e-education via the Internet (distance learning).
- Initiate an undergraduate parallel degree programme.
- Enhance and improve its continuing and life-long education programmes.

In order to accomplish these plans, the university, as the interviewee revealed, has to rely on the following resources:

- Continuous government funding.
- Higher education funds which have just recently been established by the HESC to provide extra resources to the universities as well as to other higher education institutions.
- Charging fees for education services provided by the university in some programmes.
- Research grants provided from both public and private organisations.
Long-term contracts with the private sector to run specific higher education programmes.

The respondent acknowledged the concept of establishing a virtual university in the Kingdom to accommodate more students and to provide equal educational opportunities.

7.4.2 College Deans

Three members of Group A and the same from Group B were interviewed to determine first the main challenges that are currently facing their colleges. Group A respondents highlighted the following issues as the main obstacles:

- Lack of, or weakness in, IT facilities to support the teaching and learning process.

- Clear failure on the part of top university management to provide sufficient technical manpower to operate and maintain available technologies in order to serve students and academic staff in carrying out the learning process productively.

- Indications of an obvious lack of interest by most of the university academic members in undertaking teaching or in conducting research except for promotion purposes.

- Lack of incentives, recognition or enticement by the university. This has driven many qualified academic staff to move to the private sector and, in the meantime, the university has demonstrated a lack of planning to replace them.

- Increase in the drop-out rate of students leaving universities on the one hand and the increasing number of students seeking continuing higher education studies on the other.
• A failure, shown by a great many students, to take education seriously.

• The limited financial resources of the MHE which is 100% dependent on government funding.

The latter seemed to be one of the most important obstacles which is limiting the expansion of higher education in the Kingdom. The average total cost of a Saudi student at university is estimated at 34, 229 SR (6,600 UK Sterling). This cost is rapidly accelerating and the government, with limited resources that are nearly all dependent on unstable oil revenues, has found itself unable to meet increasing demand. This is a result of the increasing financial burdens on the part of the government because of the increasing cost of the higher education system. The Seventh National Development Plan recommended that the government should provide whatever support was necessary to encourage the private sector actively to participate, alongside the Saudi government, in undertaking some of the responsibility for expanding higher education opportunities within the Kingdom.

Group B, on the other hand, identified the following as the major challenges facing their colleges today:

• Outdated buildings

• Overcrowded lecture rooms

• More students seeking higher education

• Lecturer shortages

• Budget constraints

• Insufficient IT facilities

• Lack of educational opportunities for women which are equivalent to those for men

• Poor communication with male higher education decision-makers
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- Dependency on male top management in deciding their educational fate.

In response to the second question which aimed to understand their colleges' short and long-term plans, Groups A and B shared similar thoughts. They all pointed out that their plans are most of the time disregarded by the university higher authorities. However, two members of Group A, IMIU and KAU, indicated that they plan to increase the capacity of their external study programmes in suitable subjects. All of them plan to back up their colleges with more teaching staff, to request more educational facilities and financial support, and to improve the academic qualifications of both instructors and students. In addition, they intend to carry out continual and frequent modification of the curriculum to fulfil the requirements of the national development plans. Furthermore, they will expand the use of the Internet within their colleges by establishing the necessary IT infrastructure to facilitate access by all teaching staff and students.

One member of Group B, KAU, thought that their plans would remain on paper because, as she said, "We are not autonomous in deciding and carrying out our educational plans". Members of KSU and IMIU stressed the importance of providing more educational facilities, employing more teaching members, opening more educational departments and colleges for women, attaining more independence in deciding their educational affairs, and constructing new buildings.

Question Three sought to identify the resources available to both groups which could be used to accomplish their plans effectively. An IMIU member believed that the financial backing of the government is indispensable in bringing about such a plan. KSU and KAU interviewees added that private organisations should be involved in developing, financing and investing in higher education. All members of Group A agreed that students themselves should contribute to some of the costs of their higher education.

The respondents were then asked to decide whether they agreed with establishing a virtual university in the Kingdom to cope with the growing number of students. Group A and B respondents had different views regarding this issue. In Group A,
members of both KSU and IMIU thought that the project is unnecessary at present because the government has pledged to increase its funding of the higher education system. According to the respondents, the Saudi government still has the capacity to create more colleges, employ more teaching staff and provide adequate facilities for every single higher education institution. They also thought that higher education should only be granted to students who successfully fulfil the admission regulations. Other students who fail to comply with these rules should be transferred to training and vocational programmes. The KAU member agreed with this idea and argued that the advantages of using Internet-based technology in delivering higher education is not exclusive just to those students who have graduated from secondary schools; it will benefit the whole of society if planned, prepared, developed and delivered wisely. If formed, such a system would replace the existing traditional external studies (Intisah) that lack any real sense of interaction. There is an urgent need to utilise IT in higher education because the traditional system cannot reach everyone in every location.

All members of Group B supported this project and hoped that this type of education would increase their chances of gaining more educational opportunities and would also alleviate some of the deficiencies that exist in the traditional institutions in respect to this matter.

7.4.3 Directors of Computer Centres at KSU, IMIU and KAU

In this section of the interview, respondents were asked to what extent they thought that the IT infrastructure and computing services were sufficient to meet the needs of academic members, administration staff and students. The IMIU computer centre director indicated that the IT infrastructure and computing services within the university were incapable of providing comprehensive and effective services to their end-users. KSU and KAU thought that their universities had a reasonable IT infrastructure and computing services in comparison to other universities in the Kingdom.
Interviewees identified numerous challenges facing IT development within their institutions including:

- Budget constraints and lack of professional human resources.
- Lack of coordination and collaboration with each other and with other departments and colleges.
- Rules and regulations that impede the expansion of their services.
- Scarcity in the number of PCs available to academic members and students.
- Lack of adequate Internet access for a large number of male teaching members and the lack of an acceptable IT infrastructure and Internet access in girls' academic centres.
- Vague distinction of responsibilities and a lack of official links between various information service units within the university such as the library, college or department computer labs etc.

The general IT services provided by these centres are almost identical in the following functions:

- Administrative software applications for the university
- Academic software applications for students and teaching members
- Hardware and software installations, maintenance and technical support.

However, they differed in the following:

- Internet services are provided for teaching staff and for students in designated labs in both KAU and KSU. In addition, KSU provides Internet services for library users, while KAU does not. IMIU, on the other hand, does provide this service for male teaching members, but not for students or library users.
Training programmes are offered by the KAU computer centre exclusively for the university's librarians, employees and employers.

In addition, the KAU respondent pointed out that the university also provides training programmes for some government organisations such as school students and the general public in learning about some operational software such as MS-Windows, MS-Dos, MS-Excel and so on.

When respondents were asked who decided their IT policies, KSU and KAU computer centre directors pointed out that their universities initiated a special committee (The University Committee for IT Development) to be in charge of deciding their IT progress and advancement. In IMIU, the IT policy was decided by the Computer Council which was composed of a number of qualified teaching staff from inside and outside the university. Members were appointed by the university rector and were under his direct supervision.

All respondents revealed that they have short and long-term plans which are based on advancing and sustaining the existing IT infrastructure through installing new hardware, software and fibre optic technology to connect every office, department and college with state-of-the-art technology.

Interviewees were asked whether they had ever participated in designing, developing or delivering Internet courses or in facilitating any teaching and learning courses via other kinds of technology within the university. Their responses were negative.

7.7 The KACST View

7.7.1 Director of the ISU at KACST

The Director of the Internet Service Unit at KACST was asked to characterise the key limitations that they currently encountered regarding Internet services in Saudi
Arabia. The interviewee revealed that the provision of Internet services at present was confined by certain obstacles which are slowing down the expansion of these services. They include:

- The high fees charged by STC for leased lines and Internet ports. This hinders most of the ISPs from fast expansion and has caused a few to use unlawful means to obtain Internet connection.

- The dearth of available leased lines to the ISPs which impede them from further expansion of Internet services to smaller cities. Some of the ISPs connected directly into the ATM via the ATM protocol with a capacity of STM-1 (155 Mbps). Therefore, the process of further expansion for them seemed to be relatively uncomplicated. However, this virtue is not prevalent in all ISPs because it depends on the geographical location of the ISPs and the availability of the fibre optic infrastructure to them. Those who cannot access this service in this way needed to be linked through a number of E1s (2Mbps) as they need to use the Frame-Relay protocol but, in fact, further expansion has taken a long time and is fraught with complications. Additionally, the ISU is currently facing certain difficulties in providing an adequate hook-up between some private companies and small businesses with ISPs. The ISU has tried actively to overcome this problem through extending its fibre optic technology network to connect more buildings and, in addition, to use Wireless broad-band access for this.

- KACST is the only national Internet connection point (gateway) in the Kingdom which means that if any of the KACST central machines malfunction for whatever reason, Internet services will accordingly be disrupted. In order to overcome this problem, KACST is now constructing another Internet gateway point in Jeddah to ensure continuity of service.

The Director further added that he is very optimistic about the future of the Internet services in the Kingdom because KACST-ISU is currently implementing a long term plan to provide state-of-the-art technology to enhance the quality of this
service and to build the necessary infrastructure that will make this service accessible from any part of Saudi Arabia in a short period of time.

7.8 The STC View

7.8.1 The View of the Internet Services Manager at STC

The interviewee was asked what the main responsibilities of the Internet service division were at STC. He pointed out that the basic roles of the division are: firstly, participating in identifying the necessary IT infrastructure and related technical requirements for providing effective telecommunications to facilitate Internet services throughout the Kingdom; secondly, hooking up the beneficiaries of the Internet services in terms of individuals, ISPs and government and non-government organisations with KACST-ISU; thirdly, overseeing all types of procedures to designate modem ports and leased lines to the ISPs; and handling related financial issues and providing the required technical and support services. He also indicated that the division plays roles parallel to those offered by the commercial ISPs in term of administering and tendering Internet services to end-users, whether these are individuals, profit or non-profit organisations in Saudi Arabia.

With regard to the question that sought to understand the current status of the Internet infrastructure and future plans, the respondent revealed that, before the introduction of Internet services into the Kingdom, MPOTT and later the STC formulated a short and a long-term strategy with the intention of developing an adequate IT infrastructure that would ultimately simplify the Internet connection. The result was a wide-ranging plan comprised of three main stages, each stage projected to be accomplished within a specific time-span.

The first stage, which dates back to 1996, includes:

- Linking KACST to the Internet to provide the backbone network.
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- Providing dial-up access for up to 5,000 subscribers from various cities and connecting eight universities.
- Connecting the national ATM network with the international network.
- Installing 5000 ports to support more than 75,000 potential subscribers.
- Connecting six major cities in Saudi Arabia with PSTN.
- Connecting the 29 ISPs.
- Providing dial-up access via an overlay network.
- Adding about 100,000 junction trunks to the existing network.
- Inducting 170 junction and access network rings all over the Kingdom. This includes 50 junction network rings with a bandwidth of STM-4 (622 Mbps) and 120 access network rings with an STM-1 bandwidth (155 Mbps).
- Constructing a long-distance network using a backbone of five 2.5 Gbps fibre optic rings enlarged by high capacity digital microwave radio hoops.

The second stage, which began in 1999, comprises:

- Providing Internet connection to more than half of the population of Saudi Arabia, and operating 15,000 ports.
- Providing more than 3 gmbts, 15 EI line connections, leased lines with different speeds (64 Kbps, 128 Kbps, 512 Kbps, 1.024 Mbps, 1.536 Mbps, and 2.048 Mbps) to link private and the remaining unconnected public organisations with the Internet network via KACST-ISU with different speeds.

Stages 1 and 2 have both been accomplished, as the interviewee mentioned, in the last quarter of 2001, while Stage 3 is still in progress and is expected to be accomplished by the end of 2005. This involves providing the necessary IT
infrastructure to facilitate Internet connection to cover every single region in the Kingdom, including installing additional modem ports, creating and developing more telephone lines, supporting the existing IT infrastructure through using Wireless broad-band access and installing more fibre optic cabling and digital transmission. Recently, the STC, alongside the Saudi government, has been preparing to select the appropriate suppliers for the multi-million dollar first phase of its e-government system. This will come in two parallel ways: the Saudi Gateway, which will allow government ministries and departments to talk to each other; and the public access Saudi Public Data Site, which will export data to the Internet for other organisations to access.

When the respondent asked what problems he thought might be encountered in providing Internet services in the Kingdom, he revealed that the major obstacle is time. The STC, as he said, “is attempting energetically to build the most modern and advanced state-of-the-art infrastructure technology to facilitate linkage into the Internet network.” He further noted: “We, in reality, are under severe pressure because of the massive demand from the government, society and of most of the private sector to speed up the process of upgrading the available IT infrastructure or installing and building a new one.”

7.9 The ISP View

7.9.1 ISP

The interviewee was asked to outline the main functions of the ISP. He indicated that the ISP is an intermediary link between KACST-ISU and the STC, facilitating the distribution of Internet services to their customers, designing and hosting Web-pages, advertising on behalf of the customers, and providing consultation in this regard. The ISP also provides subscribers with advice and technical support as requested by them.
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The major challenges the ISP is facing, as the respondent revealed, are censorship and government control over Internet services and access which sometimes causes severe reductions in speed for the end-user. Another problem is that KACST-ISU is the only international gateway. This restricts the expansion of Internet services and has driven some people to obtain Internet services through other ISPs in other countries. Moreover, the high fees charged by the STC for leased lines and Internet ports, and the lack of available leased lines, are further problems. Furthermore, the STC, which controls the linkage point with KACST-ISU and provides Internet services at the same time, hinders some ISPs from providing better Internet services to end-users.

7.10 Conclusion

The interviews were conducted with a number of key figures who have a direct involvement in the overall aims and objectives of this research. It was revealed that all higher education decision-makers in their various positions confirmed that the growing number of students is considered to be one of the most fundamental issues currently facing the higher education system in Saudi Arabia. This is, of course, besides a number of other critical issues which were sometimes shared by all interviewees or those which just pertained to a specific college or particular university. The interviews also revealed that all participants indicated that they have both short and long-term plans and their capacity to execute them depends heavily on the support provided by the government, higher education funds, private participation or any other source of finance. Some of them also expressed concern regarding the future of education for women. The interviews further demonstrated that most of the participants agreed on the concept of establishing a virtual university via the Internet in the Kingdom as a means of accommodating the increasing number of students seeking continuing higher education studies. On the other hand, quite a few of the respondents either firmly opposed the idea or could not express their opinions definitely.
The interviews, which were conducted with a number of computer centre directors at KSU, IMIU and KAU, sought to understand the key limitations that hold up the development and growth of IT within their institutions. It was learned that the progress of IT within their institutions is not comparable; KSU is considered to be the most advanced in terms of available IT infrastructure, KAU is in the process of building state-of-the-art technology, and IMIU is still in the planning process for initiating its IT infrastructure. Nevertheless, they all raised the issue of the lack of female representation in deciding IT policy within their particular institutions. They share common concerns about shortage of money and of technical personnel, the lack of sufficient IT facilities, especially in girls' education, and so forth. Additionally, they all provide several identical services such as administration, library and software applications for students and staff. However, they vary greatly in offering Internet services and training programmes to their internal or external members of their communities. The interviews highlighted that they envisaged a better future for IT development and advancement in their institutions. However, the interviews also revealed that they are not yet involved in facilitating Internet-based courses whether inside or outside their universities.

The interview with the Director of the ISU at KACST, on the other hand, raised some problems about the development of Internet services from his own perspective. These limitations were mostly technical ones. These problems will begin to disappear gradually because KACST-ISU plans to promote and expand Internet services in the Kingdom.

The Manager of the Internet Service at STC indicated that the STC is undertaking a plan to build the most advanced IT infrastructure in order to respond effectively and efficiently to the enormous demand for sufficient Internet access and services. Of course, this will take some time before total completion. This seems to be the major limitation regarding the provision of Internet services in Saudi Arabia today.

The interview with the ISP specified its major functions. Providing Internet services to customers is its key activity. However, there are several other functions which may be common to all the ISPs, such as hosting and designing Web homepages,
advertising and so on. The potential impact of limitations, as the ISP pointed out, may vary from one ISP to another and cannot be generalised.

It can be concluded that establishing a virtual university is likely. This has been supported by most higher education authorities' standpoints and the perceived existing IT infrastructure.
Chapter 8:

Application of Soft Systems Methodology

8.1 Introduction

The previous two chapters, 6 and 7, were designed with the intention of being consistent with the requirements of Stage Two in the SSM approach which emphasises the collection of all the necessary data related to the problem situations in terms of questionnaires and interviews. The questionnaire was designed to generate the appropriate model for a virtual university from the viewpoints of academic teaching members at three major universities (KSU, KAU and IMIU) and their associated academic centres for girls’ education in the Kingdom of Saudi Arabia. It was also designed to identify issues pertaining to the overall project. The interview, on the other hand, attempted to: first, outline the major issues currently facing higher education systems with special emphasis on universities, and to search out respondents’ opinions regarding the creation of a virtual university in the Kingdom; secondly, to examine the existing IT infrastructure and the main challenges of its development within the three major Saudi universities under investigation from the point of view of the directors of the computer centres at these universities; thirdly, to pinpoint the key areas of development in the field of Internet provision and services; and fourth, to present some of the major concerns expressed by one of the ISPs related to the provision of Internet services in the Kingdom. However, in this chapter, the intention is to shed light on these issues through the application of SSM. The first section, 8.2, is the first stage of SSM. It starts by identifying the PSS, the PCS, and their relation to each other. This, beside the information gathered and the issues described in Chapters 1, 2, 3, 6, and 7, contribute to this first stage of Checkland’s SSM. Section 8.3 is the second stage of SSM in which the problem situation is addressed and several issues are generated and briefly analysed from Section 8.3.1 to 8.3.8 inclusive. Stage Three in Section 8.4 states the overall root definition of the proposed virtual university model and outlines the major relevant systems. In Section 8.5, the conceptual model, in relation to each visualised relevant system, is formed. Finally,
Section 8.6 will provide a concise discussion of each relevant system in order to produce an agenda for possible change.

8.2 Stage One: The Problem Defined

It is advisable, at this early stage of the implementation of SSM in such a study, that the analyst clarifies the PSS (Figure 8.1), the PCS (Figure 8.2) and their relation to each other (Figure 8.3). In this instance, the role of the problem solver is to explicate the problem content system in order to employ the SSM and to carry out an appropriate action to bring about improvement to the problem situation or to explain it again. The PSS is not supposed to provide a specific course of action; the analyst’s intention instead is to persuade the client to engage unequivocally with the situation in order to explore his/her perceptions regarding the problem situation. The PCS, meanwhile, includes defining who will be the client that causes the study to take place, and the problem owner, who could be a variety of people, groups and/or organisations that are involved and interested in improving the situation. These need to be precisely described, together with their expectations. This, undoubtedly, will assist the analyst in his/her efforts to bring into being a change that is culturally desirable and systematically viable.

However, despite the fact that the problem has been firmly expressed in the Seventh National Development Plan, as stated in Chapter 1, it is still vague and unstructured and needs more clarification. In this initial stage of the SSM, the researcher is concerned with finding out as much information as possible about the problem situation. This involves participation by all those concerned with the system under examination, and where the mixture of views regarding the problem situation is both assembled and acknowledged. Chapters 1, 2, 3, 6, and 7 lay down the necessary background information pertaining to this stage. The intention here is to increase the analyst’s knowledge or views concerning the problem situation without imposing a premature understanding about the situation or its characterisation as a problem of a particular type with an identified set of actions. The analyst needs to comprehend all elements which are entailed in the system, including those
which have been affected or influenced by the situation under consideration. At this stage, Checkland (1) provides the following recommendation:

"It will not be possible for any problem solver, whether an outsider or part of the problem situation, to simply find out about the situation in a neutral manner. The personality traits, experience, knowledge and interest of our investigator will affect what is noticed and what is taken to be significant. The finding out has to be done seriously but tightly, with this in mind".

In general, this stage aims to determine the channels of formal and informal communication within the system.

Figure 8.1: Problem-solving system (PSS)
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Problem-content System

Problem-owner
- Saudi Arabia's Government

Structure
- Higher Education Supreme Council
- Ministry of Higher Education
- Saudi Universities
- University computer centres
- Information and communication technology providers

Process
- Planning, developing higher education policy, governing its educational affairs, monitoring and directing all its activities
- Executing Higher Education Supreme Council policy concerning higher education studies
- Disseminating knowledge, teaching, educating and training students, supporting and promoting research activities
- Providing and facilitating IT services and conducting training sessions

Climate
- Higher Education System
- Provide higher education studies
- Information system and networking

Figure 8.2: Problem-content system (PCS)
Figure 8.3: Explains the relationship between the Problem Solving System and the Problem Content System
8.3 Stage Two: The Problem Stated

The researcher, in this expression stage, will convert what has been gathered in Stage One (the informal and unstructured picture of the problem situation) into a more systematic and structured form. Checkland noted (2)

"...the most useful guidelines here, in the interest of assembling a picture without, as far as possible, imposing a particular structure on it, has been found to be that the analysis should be done by recording elements of slow to change structure within the situation and elements of continuously changing process, and forming a view of how structure and process relate to each other within the situation being investigated".

One of the tools normally used to carry out this task is the generation of a 'rich picture', which is a pictorial representation of the problem situation. This should disclose the elements of organisational structure, individuals, processes and climate, as well as, in addition, problems and conflicts within the system, roles and their relationship, communication and/or report channels, users, tasks, and internal and external agents affecting the system. Generally, a rich picture should consider all aspects of the general system's environment and its boundaries in terms of formal and informal elements.

The diagram presented in Figure 8.4 makes clear all interested parties who affect or who are affected by the problem under study. These include, for example, higher education system authorities, university higher decision-makers, deans of colleges, computer centre directors, academic staff etc. The main internal actors in the system are represented by human figures, while a crossed sword is used as a symbol of conflicts between some actors in the system. 'Think bubbles' and rectangular callout symbols indicate key problems and some of the expectations of the major actors in the system. Question marks reveal students as being unsure and arrows are used to indicate types of relationships between actors in and outside the systems. Finally, the organisational structure of the universities in the diagram is bordered to stand for the system boundary. The outside environment or the influence of the
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external entities that affect the overall problem situation such as the Saudi government, the HESC, the MHE, KACST, STC, the private sector and so forth are indicated by up-down arrows and represented by a human eye.

According to Elliott and Starkings (3), a rich picture should explicitly highlight issues and conflicts of interest which matter and are of concern in the development of an efficient and effective information system. Certainly, the analysis of the interviews and data collected through questionnaires shed light on a number of issues pertaining to the problem situation. These issues or problems have been identified by individuals. Their views concerning these issues were dependent primarily on the professional role that they perform within or outside the organisation. This means some of the expressed issues may be considered as important from the viewpoints of particular individuals, and may not be regarded as essential by their counterparts. However, both views are legitimate based on each individual's knowledge, appreciation and comprehension of the real world situation of the higher education system in Saudi Arabia.

In the initial phase of this study, it was thought that the only problem currently challenging the higher education system in Saudi Arabia was the escalating number of students graduating from secondary schools and this was what was officially raised by the Seventh National Development Plan, as indicated in Chapter 1. In fact, this was viewed as the most important issue until the decision was made to undertake SSM as a means of investigating and improving the situation. Hence, as a data collection method frequently used in SSM, the questionnaire and interview techniques were applied in this study and carried out on a number of individuals interested in the situation under scrutiny. After the completion of the analysis, the single issue which was believed to be the only problem was conceived as part of a multiple one.

Chapters 6 and 7 highlight the difficulties and problems which currently exist in the higher education system in general and in universities specifically. These had been identified by actors in the system by analysis from various standpoints. Most of these issues are considered to be major ones that affect the performance, processes and operation of every university, college and department in Saudi universities. Their influence extends to include
Saudi society and the overall application of the national development plan. Other problems could be called institutional in that they only pertain to a particular university, college or department. Although the "multi-perceptions" of these problems, expectations and issues are demonstrated in the rich picture, they will not be exhaustively tackled by this study. This is because the key aim of this study is to investigate the feasibility, practicality and desirability of establishing a virtual university. Nonetheless, other issues will be illuminated, analysed and taken into consideration as part of the overall study. For that reason, the main issues that were found to be significant can be categorised and analysed in terms of internal and external perspectives:
What is the best way to contain the proliferation of the number of students seeking higher education?

Saudi Government

How to promote the quality and quantity of the higher education system and at the same time accommodate the growing number of students in universities?

HESC

How to provide continuing education and qualified professionals to improve our higher education system?

MHE

What do we actually plan to do?

Other universities

Our colleges suffer from increasing dropout rates of students, and the failure to take education seriously by some students!!!!

We think we are left behind in the decision-making process!!!!

Our colleges are unable to accommodate the increasing number of applicants seeking continuing higher education studies!!!

We need sufficient funds to improve our educational facilities!!!

We need more teaching members!!!

College Deans

We are unable to accommodate the increasing number of applicants seeking continuing higher education studies!!!

How could we establish an effective relationship with the private sector?

Currently, we lack the capabilities to meet the actual needs of the market workforce in terms of the number of well-trained graduates

We have the responsibility to carry out a long-term plan for IT infrastructure.

KACST

We are on schedule in our IT policy.

STC

How to provide and sell better services?

ISP

How to participate in providing and sponsoring higher education studies?

Private Sector

Students

Indeed, we need urgent solutions! We are being victimised of this system!

We lack adequate IT facilities and technical support!!!

Academic staff

We need more incentives and recognition

We need more teaching members!!!

University library

How can we provide high-quality teaching to all of these students at once???

We do not have Internet access

We are not yet fully automated

We do not have enough resources to provide the necessary IT facilities!!!

Who is the regulator of our IT policy?

What are our actual responsibilities regarding IT services?

Universities' Decision-Makers

We need better infrastructure.

Figure 8.4: Rich picture: holistic view
8.3.1 Internal Perspectives

The internal perspectives represent the viewpoints of a variety of individuals who were affecting or affected by the system within the three Saudi universities under investigation. Some of these issues, which will be discussed, have been also viewed from a number of external perspectives. However, their major concerns will be highlighted collectively and briefly explored in the following paragraphs:

8.3.1.1 The Growing Number of Secondary School Graduates

This is the key theme of this study and has been extensively discussed in Chapter 1. The outcomes of the interviews with numerous decision-makers in the higher education system, which were detailed in Chapter 7, also suggested that this issue was felt to be crucial and affected the entire system. This problem arose originally from the absence of an influential, well-planned, long-term strategy that would take into account all potential future demographic change, a lack of monitoring and control, and of a thoughtful follow-up review of what had been achieved and what was left to accomplish. However, Saudi universities now are facing up to this problem and are making vigorous attempts to find constructive solutions that will aid them in enlarging their capacities in order to absorb up-and-coming students.

8.3.1.2 Lack of Equal Educational Opportunities

The non-existence of equal educational opportunities for the sexes in the higher education system is perceived by female interviewees as one of the key issues that must be addressed and resolved if the government is serious about accomplishing a successful national development plan. They believe that education in general, and higher education in particular, must be equally accessible for both male and female students. The lack of participation by females in all fields and subjects offered by higher education institutions means that a large
percentage of female secondary school graduates are left without any glimmer of hope of participating in further education. In Chapter 2, this issue is highlighted and clearly explained.

8.3.1.3 Lack of Educational Quality

Typically, the quality of teaching and learning in any educational setting is measured by the availability of certain factors. These include knowledge, experience and the enthusiasm for teaching by academic staff, as well as eagerness to learn on the part of students. They also include effective educational facilities (laboratories, technologies, buildings and so on), student support systems (counselling, learning resources and technical assistants), administrative support in terms of incentives, recognition and encouragement for both teaching members and students, educational theory, course design, assessment methods, active involvement in the decision-making process by representatives of the whole educational community, and collaboration between all members of this community. These are some of the major components which come together to construct high-quality education. The fact that most of these elements are lacking in the existing higher education system makes this problem imperative, as has been voiced by several educational authorities.

8.3.1.4 Increased Drop-out Rates and Lack of Interest in Learning by Some Students

The great social pressure and demand on universities to accept students beyond their existing capacity, as indicated in Chapter 1, has resulted in an imbalanced distribution of students between the scientific and theoretical specialisations. The fact that about two thirds of students were admitted to the theoretical faculties comes as a result of the ad hoc admission policy and has resulted in a lack of interest in learning or in giving up education completely on the part of a significant number of students. This is because many of them
had been placed in certain departments or colleges without any consultation, without advice and without being asked which subjects they preferred.

8.3.1.5 Lack of Job Satisfaction

The imbalanced distribution of students, which was mentioned earlier, has caused some departments and colleges to admit students beyond their actual capacity in terms of the number of available academic staff, facilities and financial resources. Indubitably, this results in escalating teaching loads for staff alongside their research and administrative duties yet without additional incentives. Thus, they feel discontented with this significant increase in workload and the multiple nature of the work they undertake that does not pay heed to their actual abilities and aptitudes. This has severely affected their professional contribution and has driven some of them to move either to the public or the private sector for the sake of a better position.

8.3.1.6 Finance and Budgetary Issues

The only source of finance for higher education system is the government which allocates the amount of funding required for the system every year. This direct financial linkage is normally affected by the growth or reduction of the overall national economy. The lack of funds currently experienced by the Saudi universities affects their core activities such as teaching. This makes it necessary for them to locate alternative funding bodies, such as the private sector, to assist them in carrying out some of their traditional tasks.
8.3.7 Lack of Well-Forged Mutual Relationships between Universities and the Private Sector

This issue has become clearly visible in recent years, due to the rapid increase in the number of students who have graduated from higher education institutions but who could not be employed by the government on the one hand, and who do not match the requirements of the private sector on the other. This clear gap has forced higher education policy-makers to rethink the type of relationship and coordination, if any exists, between the higher education system and the private sector, with respect to providing and sponsoring higher education studies; a tied and reciprocal relationship has been called for.

8.3.8 Lack of Adequate IT Facilities

Despite the fact that some universities such as KSU have more advanced IT facilities than others, this problem is of great concern and was expressed by all teaching members within these institutions. This has emerged because of the absence of sufficient funds allocated to IT for purchasing, installation, maintenance and training in these institutions. Consequently, this affects the possible spread of IT which could be exploited for teaching and learning in most departments and colleges.

8.3.9 Inadequate Representation of Female Teaching Members in the Higher Education Decision-Making Processes

This issue was identified explicitly through interviews, specifically by female college deans who believed that they were excluded from decision-making processes concerning higher education strategies. Females have little chance of being represented in many aspects of social life, including education. The lack of adequate representation of women in the upper echelons of the decision-making hierarchy has made the fate of female education uncertain under the current higher education system.
In general terms, these issues seemed to be interrelated. Some of them, such as the lack of job satisfaction, lack of educational quality, lack of equal educational opportunities, lack of adequate representation of females in the higher education decision-making processes and so on, cannot be addressed unless the higher education authorities, on behalf of the Saudi government, take a major initiative towards finding an adequate and sensible solution for each of them. Other issues were found to be beyond the existing capacity of the Saudi government for the time being, including the problem of accommodating the rising number of students who graduate from secondary school, and financial difficulties.

8.3.2 External perspectives

This represents the diverse opinions and views provided by stakeholders within and outside the higher education system. Some of them, such as the Saudi government, HESC and MHE, have total involvement and are considered as an integral part of the overall system, while others, such as KACST, STC, the private sector and the ISP, are actors who have intrinsic relations to the proposed new system. All their points of view are highlighted in the rich picture.

The Saudi government, as noted in Chapter 1, expressed firmly its main concerns regarding higher education systems. It raised the issue of the increasing growth of the number of secondary school graduates and the unbalanced distribution of students in faculties.

Besides those issues raised by the Saudi government in the Seventh National Development plan, HESC pointed out other challenges currently facing higher education, including the weakness of the input and output of Saudi universities and the ongoing need of the private sector for well-qualified professionals.

The MHE outlined several issues pertaining to the entire system. These issues include first, meeting the growing demands on higher education; secondly, meeting the market demand for qualified professionals; thirdly, the lack of coordination and collaboration between the
Ministry and the private sector; and fourth, improving the quality of the output of higher education, and expanding and enhancing the utilisation of IT in higher education.

Outside perspectives are considered essential to a better understanding of the existing Internet infrastructure and services in order to obtain more knowledge of the feasibility and practicality of the proposed project. The key limitations identified by the director of ISU-KACST in relation to the development of Internet services in Saudi Arabia were the high fees charged by STC for leased lines and the Internet port, and the lack of available leased lines to the ISPs. Besides, KACST is the only national Internet connection provider. Time is the key element for the STC in order to complete its massive short and long-term plans. It is under pressure from the government, the private sector and Saudi society to speed up the required IT infrastructure in order to respond effectively and efficiently to their need for Internet services. The major issues raised by the ISP were censorship and government control over Internet services and access. This has slowed down the Internet services in terms of connection speed and potential new customers’ subscriptions. In addition to the high fees charged by the STC for leased lines and the Internet port, the lack of available leased lines is a further problem. Furthermore, the STC, which controls the linkage point with KACST-ISU and provides Internet services at the same time, hinders some ISPs from providing superior Internet services to the end-user.

With reference to the aim of the study, as noted in Chapter 1, and based on the literature review and the data analysis outputs, the researcher will attempt to provide an insight into the situation and suggest what he believes to be legitimate steps that can be taken to improve issues related directly to the problem statement which is the key purpose of this research. Consequently, the system which is proposed in this research, the virtual university model, will be able, if established carefully and systematically, to function effectively and efficiently in executing the following:

- The system will accommodate any number of recent, past and future secondary school graduates because of its vast capacity and wide accessibility.
- The proposed system is cost effective in comparison to the conventional one.
The envisaged system will assure equal distribution of educational opportunities through unlimited access that crosses barriers of space and time.

The system is capable of providing high-standard education through the utilisation of a variety of interactive media that meet the needs of diverse learning styles and by implementing quality assurance procedures.

The proposed system will eradicate, or at least minimise, the drop-out rate of students because it will allow them to study at their own pace, anytime and anywhere.

The system will overcome the lack of IT facilities through a well-established IT infrastructure as a delivery mechanism for instructional materials.

The system will initiate a mutual relationship between the government and the private sector.

It will enhance the possibility of reciprocal decision-making responsibilities between males and females in relation to higher education studies.

It has the potential to promote the job satisfaction of teaching members through its continuous academic support, incentives and recognition.

8.4 Stage 3: Selection of a Root Definition and Naming of Relevant Systems

The rich picture in the preceding stage provides us with a thorough understanding of the problem situation. Thus, this stage is regarded as an imaginative phase in which the primary concern of the analyst is to investigate a variety of innovative approaches, and to look at the existing problem and its surrounding environment from various standpoints. This is seen as a useful tool for clarifying the problem and revealing different perspectives that will
eventually produce systems that are, in essence, relevant to the problem situation. The purpose of these chosen systems is to provide the analyst with a systematic view of the existing situation. However, the key activity here is the formulation of a root definition for the selected relevant systems. The root definition is a concise explanation of what is intended by the selection of this particular relevant system. The primary objective of the root definition is to express the core purpose of some purposeful human activity systems which seem relevant to solving the problem or taking advantage of the opportunity.

In this study, the chief aim is to construct a virtual university model for higher education in Saudi Arabia based on the light of the literature review provided in Chapter 4; therefore, the relevant systems that have been suggested for this model can be outlined as follows:

- Strategic planning
- Content
- Communication technology
- Central support services

According to the above view, the general root definition of a virtual university model can succinctly be suggested as:

An operation jointly owned by the Saudi government and the private sector whose mission is to respond effectively and efficiently to the educational needs of the growing number of secondary school graduates in the Kingdom of Saudi Arabia by providing them with accredited, measurable, on-line, high-quality higher education, comparable in standard to that offered in the traditional universities which will give them equal access to learning, regardless of their gender, social status, physical ability, or geographical location, and to provide the necessary educational support.
The above root definition will be tested against a number of elements known by the mnemonic CATWOE, which is principally used to examine the analysis of root definition sentences or to function as a backbone for developing root definitions. This can be accomplished as follows:

**C = the Clients (customers) of the system (as victims and beneficiaries)**

All stakeholders (Higher Education Supreme Council, Ministry of Higher Education, Saudi universities, students, academic staff, Saudi society, public and private sectors.

**A = the Actors in the system**

Higher Education System

**T = the Transformation process supported by the system**

The lack of an effective and efficient system to accommodate the growing number of graduate secondary school students changing into an effective and efficient system capable of containing the increasing number of students.

**W = the Weltanschauung (Worldview) which makes the transformation process meaningful in context**

A desirable system capable of providing higher education studies for the increasing number of secondary school graduates nationally.

**O = the Owner of the system**

The Saudi government and the private sector.

**E = the Environmental constraints on the system**

The existing information technology infrastructure, technical human resources, funding and the financial situation, cultural and social attitudes, political pressure, rules, regulations and policies of higher education, lack of collaboration and coordination.
8.4.1 Relevant systems for strategic planning

It is imperative to form a strategic planning team in the early phase of the project because the success of any virtual education programme depends on the kind of leadership which is required in order to ensure that the long-term investment needed for the project is available and is effectively deployed. Forming a strategic planning team is the starting point in building the vision and this must consist of representatives of all interested parties such as the Saudi government, the MHE, private entities, and so on. It is assumed this will work collaboratively in order to carry out specific tasks and undertake particular responsibilities that will assist in the fruitful accomplishment of the entire venture.

The root definition suggested for the relevant systems for strategic planning is defined as follows:

A system own by president of the university to envision an optimal virtual university model, including procuring the required funds; establishing efficient procedures for staff recruitment, student admissions and programme provision; taking into account accountability and ownership; developing publicity techniques; and ensuring overall effectiveness.

The primary requirements of the system can be summarised as indicated below:

- Setting up mission statements
- Allocating sufficient funds and all the necessary financial support
- Establishing effective staff recruitment procedures
- Determining student admission requirements
- Deciding the types of courses and programmes to be offered
- Ensuring effective copyright and ownership procedures for course materials
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- Planning and carrying out marketing and advertisement
- Maintaining and monitoring effectiveness

For this proposed relevant system, CATWOE components can be outlined as follows:

C  Students and academic staff
A  Educators, educational experts, corporate executives, local authorities and representatives of the Ministry of Higher Education
T  Lack of entrepreneurial planning transformed into well-thought out business enterprise planning
W  An effective system that will be concerned with every aspect of achieving a sound mechanism in order to create an ideal virtual university model
O  President of the university
E  Higher education policy, the available information technology infrastructure, technical expertise, funding, and possible cultural and social attitudes

8.4.2 Relevant Systems for Content

The components of a relevant system in terms of content in a virtual university comprise a variety of elements including the language of study, teaching methods, evaluation techniques and other materials that the instructor builds in order to create an influential and interactive learning environment whose primary objective is to meet the educational needs of the individual.

For this relevant system, a possible root definition can be summarised as follows:

A system own by academic deans which is devised to provide students with all necessary information regarding course content and teaching techniques, taking into consideration their appropriateness and efficiency.
The key requirements of relevant systems for content can be outlined as below:

- Maintaining course content quality
- Determining the language of study
- Defining effective teaching and learning approaches
- Establishing an efficient assessment mechanism

For this suggested relevant system, CATWOE elements can be determined as below:

C Students and academic staff
A Academic staff and technology facilitators
T An ineffective content system transformed into an effective one
W An efficient system concerned with establishing a well-structured content system
O Academic deans
E The available information technology infrastructure, technical expertise, funding, collaboration and coordination between academic staff, outsourced course producers

8.4.3 Relevant Systems for Communication Technology

In the virtual university, students and instructors are actually at a distance from each other. Therefore, course contents, class activities, information provided by instructors, communication among students and between students and their teachers, and all the essential support services needed for the provision of efficient education must be provided via some sort of telecommunication intermediary. The media which are normally used to carry out these tasks can be asynchronous (not in real time), synchronous (in real time), or a combination of both. The possible delivery mechanisms in a virtual university must be weighed against each other and carefully selected to execute particular functions in order to yield maximum returns.
The root definition recommended for the relevant system for communication technology is as follows:

A system own by KACST and STC to stipulate the most favourable delivery mechanism that will maintain effectiveness in delivering high quality Internet-based courses and ensure equal access opportunities.

The basic requirements for such a system can be characterised as below:

- Specify tools for content delivery
- Define learners’ system requirements
- Maintain learners’ privacy and system security
- Monitor the efficiency of communication technology

The CATWOE elements for this relevant system can be highlighted as below:

C Students and academic staff
A Course producers and technical professionals
T The traditional delivery system changed into a telecommunication delivery mechanism
W A desirable system to carry out wired class activities and other related support services
O KACST and STC
E Policies of the higher education system, available information technology, infrastructure, technical professionals, finance, potential cultural resistance

8.4.4 Relevant Systems Central Support Services

All the previously mentioned relevant systems make up a proportion of those vital parts which comprise a virtual university model. A relevant central support system is employed to
complete the total model. In the virtual university setting, all activities performed, whether by students or instructors, need to be supported by some kind of educational tools. It is important to recognise these activities because their nature specifies the type of support required by the university. There are numerous reasons behind the need to establish a central support system by the virtual university. For example:

- The lack of student-to-tutor and student-to-student face-to-face interaction
- Unfamiliarity with Internet-based technology as a learning environment
- Unfamiliarity with Internet-based technology as a new learning approach
- The lack of suitable and sufficient learning resources
- The feeling of isolation
- Internet connection and access-related technical problems.

In this regard, when establishing a virtual university, these deficiencies should be given priority when designing sustainable and practicable central support services.

The root definition provided for this relevant system can be defined as follows:

A system own by KACST, STC and university to provide both students and instructors collectively with comprehensive and seamless support that enables them to achieve their educational goals productively.

The main requirements of the system can be described as below:

- Facilitating students’ administrative services
- Providing induction and training programmes
- Forming and promoting an online community
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- Running counselling services
- Operating career advisory services
- Providing library services
- Providing technical support services
- Maintaining and monitoring effectiveness

For the relevant central support system, the CATWOE parts can be built up as follows:

C  Students and academic staff
A  Academic staff, university support service units, university managerial units
T  A lack of adequate well-structured central support services changed into well-organised support services
W  A viable system that provides all the required educational support services for students and tutors simultaneously in order to provide an effective learning environment
O  KACST, STC and universities
E  Higher education policies, existing hardware, software, and network accessibility, technical expertise and funding

8.5 Stage 4: Building Conceptual Models of Relevant Systems

At this stage, the root definition that has been created in the previous stage must be explored in more detail. This is frequently described as the most critical part of the SSM process. The analyst here has to develop the minimum set of activities which must be included in the system in order logically to meet the requirements of the selected relevant systems and their associated root definitions. The model does not necessarily have anything to do with the real world situation, as it is derived using deductive logic and is abstract (5). It uses verbs that are arranged in a logical order to express its activities.
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With reference to the overall root definition of the virtual university model which has been stated in Stage Three, the basic set of activities that are implied can be outlined as analysing the educational needs of learners, planning the provision of education, delivering education and providing support, evaluating the outcomes of the education provided and improving its processes. These activities are presented in Figure 8.5 as the first level of the modelling process.

Once this basic set of activities has been identified, it is crucial to consider other activities which are rationally implied by them. These activities, as mentioned in Stage Three, are distinguished in terms of four interlinking relevant systems. Each relevant system will be conceptually presented in Figures 8.6 to 8.9 respectively. Finally, the overall conceptual model, which basically comprises these interconnected relevant systems, will be examined using formal system model components.
Figure 8.6: Conceptual model – relevant systems for strategic planning
Figure 8.7: Conceptual model – relevant systems for content
Figure 8.8: Conceptual model-relevant systems for communication technology
Figure 8.9: Conceptual model – relevant systems for central support services

- Providing technical support
- Providing library services
- Operating career advisory services
- Running counselling services
- Facilitating students’ administrative services
- Providing training programme
- Forming and promoting an online community
- Take control action
- Monitor activities
- Define measure of performance: efficiency and effectiveness
8.6 Stage 5: Comparing Conceptual Models with the Real World

This stage involves a comparison between what is and what might be. In other words, it is a comparison between the data collected from the questionnaires and the interviews which were presented in the rich picture (Stage Two), and the proposed conceptual model (Stage Four). In practice, there are a variety of ways of carrying out this comparison, as discussed in Chapter 5. However, the most structured way of making comparisons can be undertaken by raising a set of rational questions to be answered on the basis of an adequate awareness of the real world situation. These questions are drawn from the process of examining each part of the conceptual model including activities and the structure of the real world situation. For example, a question such as "Does this particular activity happen in a real world situation?" may be asked to ascertain whether or not an activity in the model exists in the real world.

The key factor in this comparison is to initiate a debate in relation to the problem situation; this is supposed to point out what possible change might be appropriate and feasible in the system under investigation. This will lead to an agenda of possible change which is the ultimate output of this stage. The agenda is concerned with highlighting what activities are present, missing, problematic or questionable in the system. Based on the structure of the comparison previously described, the following tables demonstrate how such an agenda can be generated at the end of this stage. In order to undertake this process, an agenda in the form of a table will be constructed for each relevant system. This consists of four main divisions as follows:

- Activities in the conceptual model (Stage Four). This will name the chosen relevant systems and list related activities.

- Activities present in the real world situation (Stage Two). The purpose here is to know to what extent these activities exist in the real world.

- Comments. This part will allow the analyst to identify any possible variances between the conceptual model and the real world situation that will eventually assist in executing desirable change.
Activities included in the agenda. The aim of this is firmly to indicate whether this particular activity will be included in the agenda or not.
### Conceptual Model-Relevant Systems for Strategic Planning

<table>
<thead>
<tr>
<th>Activities In Conceptual Model (Stage 4)</th>
<th>Present In The Real World Situation? (Stage 2)</th>
<th>Comments On Real World Situation</th>
<th>Include On Agenda?</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Setting up mission statements</td>
<td>Partially</td>
<td>The mission statement of Saudi universities stresses the importance of providing higher education opportunities to every citizen equally as long as he/she meets the requirements of the institution. They all share the same basic objectives set by the HESC but they differ in providing higher education opportunities to both genders equally.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Allocating sufficient funds and all the necessary financial support</td>
<td>Partially</td>
<td>The Saudi government financially supports the entire higher education system. It provides necessary funds and the required financial support whenever it is needed. But, in recent years, and due to the economic situation, the government has begun to realise how important it is to seek out certain collaborative partnerships with the private sector to participate in subsidising and undertaking some of the responsibility for higher education provision.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Establishing effective staff recruitment procedures</td>
<td>Partially</td>
<td>In order for a person to be employed as a teaching member within any Saudi university, he/she has to meet certain standards including acquiring a distinction in a higher education degree (PhD, Masters, Bachelor), and offering a good reference. It should be mentioned that those who have been employed with a Masters or Bachelors qualification must pursue their PhD to take full advantage of the academic staff position in terms of promotion, housing accommodation and other distinctive academic facilities.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Determining student admission requirements</td>
<td>Partially</td>
<td>Students’ admission policy at Saudi universities has changed over time. It began with an open policy which gave every applicant a chance of being accepted after obtaining a secondary school certificate. However, this policy has been modified to be more selective in nature to include only those who are capable of meeting specific requirements set by the university.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Deciding the types of courses and programmes to be offered</td>
<td>Partially</td>
<td>All Saudi universities, including colleges and departments, have a study agenda which specifies types of courses or programmes to be offered and which are designed to achieve particular goals or objectives in relation to their subject interest. But not all of them provide identical courses and programmes to both genders equally.</td>
<td>Yes</td>
</tr>
<tr>
<td>---</td>
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<td>---</td>
<td>---</td>
</tr>
<tr>
<td>- Ensuring effective copyright and ownership procedures for course materials.</td>
<td>Partially</td>
<td>The issue of copyright is regarded as one of the most critical issues that must be resolved before undertaking any new education initiative. Although governments worldwide have attempted vigorously to enforce copyright and ownership laws within their nations, it is still a major issue that remains ineffectively implemented in many nations, particularly in developing countries including Saudi Arabia. However, Saudi universities do not yet have complete, well-planned and effective procedures in this respect.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Planning and carrying out marketing and advertising</td>
<td>No</td>
<td>All Saudi universities are non-profit-making government organisations which do not have an entrepreneurial outlook.</td>
<td>Yes</td>
</tr>
<tr>
<td>Activities</td>
<td>Present In The Real World Situation? (Stage 2)</td>
<td>Comments</td>
<td>Include On Agenda?</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>- Maintaining course content quality</td>
<td>No</td>
<td>There is a documented regulation regarding what should be done to maintain the quality of the course content, but the implementation of these rules rests in the hands of individuals who may or may not follow these standards.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Determining language of course delivery</td>
<td>Yes</td>
<td>Arabic and English are the most commonly used languages for teaching and learning within Saudi universities. The theoretical subjects usually utilise the Arabic language in their teaching and learning process, whereas English is more popular in scientific fields.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Defining effective teaching and learning approaches</td>
<td>Partially</td>
<td>The lecture technique is the most widely used approach within Saudi universities, in addition to the problem-solving method which is most often used in a number of scientific fields. This may be partially applied in the Internet-based learning environment. However, based on the literature review, constructivism is thought to be the most desirable approach because, according to this method, the roles of instructor and learners are changed. Learners must adopt a more “self-administered” learning approach in order to be deemed true partners in the whole learning process. They will be entrusted with their own learning progression with minimum supervision from an instructor. On the part of instructors, they are no longer the ‘sage on the stage’. Their new tasks are more to do with counselling. They have to provide educational advice and interact with learners whenever they are needed to ensure their students’ learning and understanding without unnecessary interference.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Establishing an efficient assessment mechanism</td>
<td>Partially</td>
<td>All Saudi universities recognise the value of evaluating the overall learning performance of students. Both summative and formative assessment techniques are used as a means of measuring students’ progress and outcomes throughout the learning process. The quality of these assessment mechanisms are hard to measure.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
- **Conceptual Model-Relevant Systems for Communication Technology**

<table>
<thead>
<tr>
<th>Activities In Conceptual Model (Stage 4)</th>
<th>Present In The Real World Situation? (Stage 2)</th>
<th>Comments On Real World Situation</th>
<th>Include On Agenda?</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Specifying tools for content delivery</td>
<td>No</td>
<td>Saudi universities are providers of traditional courses and programmes.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Defining learners’ system requirements</td>
<td>No</td>
<td>Irrelevant to the real world situation.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Maintaining learners’ privacy and system security</td>
<td>No</td>
<td>Irrelevant to the real world situation.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Monitoring efficiency of communication technology</td>
<td>Partially</td>
<td>Despite the fact that all three universities visited for interview had some kind of IT monitoring system, they did not have a unified technical professional team who could execute this duty adequately in all colleges and departments within each university.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### Conceptual Model-Relevant Systems for Central Support Services

<table>
<thead>
<tr>
<th>Activities In Conceptual Model (Stage 4)</th>
<th>Present In The Real World Situation? (Stage 2)</th>
<th>Comments On Real World Situation</th>
<th>Include On Agenda?</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Facilitating students' administrative services</td>
<td>No</td>
<td>Generally, all Saudi universities provide students with some type of administrative support services.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Providing training programmes</td>
<td>No</td>
<td>This activity is not carried out at all.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Forming and promoting online communities</td>
<td>No</td>
<td>This does not exist in the real world situation.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Running counselling services</td>
<td>No</td>
<td>This activity has not been implemented.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Operating career advisory services</td>
<td>No</td>
<td>This activity is not carried out at all.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Providing library services</td>
<td>Partially</td>
<td>The most common services provided by Saudi university libraries are lending non-reference materials, offering assistance from reference</td>
<td>Yes</td>
</tr>
<tr>
<td>Service</td>
<td>Provided</td>
<td>Description</td>
<td>Result</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Providing technical support services</td>
<td>No</td>
<td>All computer centres which were visited for interview claim to provide technical support services for their clientele while, in reality and through personal observation, this service is not adequately planned and effectively disseminated.</td>
<td>Yes</td>
</tr>
<tr>
<td>Maintaining and monitoring effectiveness</td>
<td>No</td>
<td>Lack of maintaining and monitoring adequate and efficient support services is observed within the three Saudi universities visited.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
8.7 Conclusion

This chapter is a practical application of Stages One, Two, Three, Four and Five of SSM. Its main purpose is to examine data generated from the questionnaires and interviews. The chapter started with Stage One in which the analyst concludes that the problem situation is messy and not clearly defined, as discussed in Chapters 1, 2, 3, 6, and 7. Stage Two offers a systematic and conceptual starting point in organising and expressing the problem situation in the form of a rich picture. A number of issues were drawn out and were structurally defined. These issues help the analyst in formulating a general root definition for the whole model of the proposed virtual university and in identifying four other relevant systems, as described in Stage Three. The relevant systems that emerged were strategic planning, communication technology, content and central support. For each relevant system, a root definition was produced and its elements were checked via CATWOE analysis. In Stage Four, a conceptual model for each of the relevant systems was developed. The insights gathered from the ‘system’ view were then presented and systematically weighed against the existing reality in Stage Five in order to generate an agenda for possible change that is systematically feasible and culturally desirable. This agenda will be discussed in detail in the next chapter.
References

(Details of publishers are included in the bibliography at the end)


Chapter 9: 

Change and Action

9.1 Introduction

The previous chapter showed that there were numerous issues that are currently challenging the higher education system in Saudi Arabia. These issues have been precisely expressed and clearly defined. This, in turn, led to the proposal for the virtual university model. This consists of several relevant systems accompanying the identification of their root definitions in order to overcome some of the obvious deficiencies which exist in the system under analysis. Then, the conceptual model for each of these relevant systems has been depicted and compared with reality; this has eventually produced an agenda for possible change. The aim of this chapter, therefore, is to offer in more detail the process of applying Stages 6 and 7 of SSM which will complement the preceding stages in dealing with the problem under investigation. This will be discussed in Sections 9.2 and 9.3. Moreover, Section 9.4 will demonstrate how the four relevant systems which were outlined in Chapter 8 relate to each other through their integration in a single diagram and it will also include the main characteristics of the formal systems which have been used to examine the validity of the conceptual model of the total system. Finally, Section 9.5 will provide a general conclusion of the chapter.

However, it is first crucial to emphasise that the type of improvement which is being suggested is generated primarily from the literature review, the existing virtual university models, specifically Jones International Virtual University (http://jiu-web-a.jonesinternational.edu/eprise/main/1IU/home.html) and the University of Phoenix Online (http://www.uopdegreesonline.com), data analysis and the researchers’ knowledge about the subject. Second, the discussion will not include any economic or technical considerations.
9.2 Stage 6: Defining Feasible and Desirable Change

It is assumed that the agenda will be debated at this stage with the actors working in the system, along with the clients, the problem-owner(s) and the problem-solver, as identified earlier in Stage 1 of the SSM. This debate (Tables 9.1, 9.2, 9.3, and 9.4) is intended to generate ideas of possible change that are regarded as systematically desirable and culturally feasible. ‘Systematically desirable’ means that the suggested changes must harmonise with how the system aims to function, while ‘culturally feasible’ relates to discovering exactly whether or not such change is clearly recognised and does not contradict the actors’ potential (1). If both criteria are met, change becomes rationally attainable and should be put into action. The outcome of this stage is an agreed set of changes, or an agreement not to change. However, another way of carrying out this stage is through direct analysis of what had been agreed on in the agenda, derived out of Chapter 8. For this study, it was determined that both will be undertaken in order to identify appropriate change that is systematically desirable and culturally viable.

<table>
<thead>
<tr>
<th>Relevant Systems for Strategic Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activities</strong></td>
</tr>
<tr>
<td>Setting up mission statement.</td>
</tr>
<tr>
<td>Allocating sufficient funds and all the necessary financial support.</td>
</tr>
<tr>
<td>Establishing effective staff recruitment procedures.</td>
</tr>
<tr>
<td>Determining student admission requirements.</td>
</tr>
<tr>
<td>Deciding the types of courses and programmes to be offered.</td>
</tr>
<tr>
<td>Ensuring effective copyright and ownership procedures for course materials.</td>
</tr>
<tr>
<td>Planning and carrying out marketing and advertisement.</td>
</tr>
<tr>
<td>Maintaining and monitoring effectiveness.</td>
</tr>
</tbody>
</table>

Table 9.1: The outcomes of the debate concerning relevant systems for strategic planning
### Relevant Systems for Content

<table>
<thead>
<tr>
<th>Activities</th>
<th>Systematically Desirable</th>
<th>Culturally Feasible</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Maintaining course content quality.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Determining courses’ study language.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Defining effective teaching and learning approaches.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Establishing an efficient assessment mechanism.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 9.2: The main debate results regarding relevant systems for content

### Relevant Systems for Communication Technology

<table>
<thead>
<tr>
<th>Activities</th>
<th>Systematically Desirable</th>
<th>Culturally Feasible</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Specifying tools for content delivery.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Defining learners’ system requirements.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Maintaining learners’ privacy and system security.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Monitoring efficiency of communication technology.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 9.3: The major debate findings pertaining to relevant systems for communication technology

### Relevant Systems for Central Support Services

<table>
<thead>
<tr>
<th>Activities</th>
<th>Systematically Desirable</th>
<th>Culturally Feasible</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Facilitating students’ administrative services.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Providing training programmes.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Forming and promoting online communities.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Running counselling services.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Operating career advisory services.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Providing library services.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Providing technical support services.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Maintaining and monitoring effectiveness.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 9.4: The debate outputs in relation to relevant systems for central support services
9.2.1 Relevant Systems for Strategic Planning

9.2.1.1 Setting up Mission Statement

In the construction of any new project, whether public or private, profit or non-profit, small or large, a mission statement has to be set up which expresses the underlying beliefs, values or philosophy which essentially capture the nature of organisation. The rationale behind formulating a mission statement by any institution is to differentiate clearly between this institution and others in term of goals, objectives, function, activities and so forth. It can be used as a tool for the organisation both internally and externally. At the internal level, a well-formulated mission statement will ensure the systematic definition of its goals and objectives. Externally, a mission statement gives an organisation the opportunity to expose and transmit its ideology to the outside world and to such people as politicians, the general public and other institutions (2). In this respect, the proposed Saudi virtual university is not exceptional; it has to formulate a reflective mission statement that conveys and will disseminate unambiguously its basic philosophy to the minds of the potential target audience. To achieve this, the following mission statement of the envisaged Saudi Virtual University is proposed as below:

The Saudi Virtual University is assumed to be a joint venture, created by the Saudi government and the private sector as a for-profit single-mode higher education institution which aims to advance and disseminate knowledge via Internet-based technology in an attempt to extend equal provision of higher education studies to the largest possible segment of the population. It will function across barriers of space and time to promote and improve the quality of education through efficient staff recruitment and by offering wide-ranging and effective course production; it will coordinate and collaborate with other institutions, determine the standards in the overall university system and award undergraduate degrees that are credible to both government and the private sector.
Chapter 9  
Change and Action

The following are the main goals and objectives of the Saudi Virtual University:

- To promote the values, beliefs and culture of Saudi Arabian society;
- To contribute to research for the cultural, economic and social progress of Saudi society;
- To serve as a vehicle for the diffusion of Saudi Arabian culture;
- To provide high-quality cost-effective undergraduate higher education in diverse subjects via Internet-based technology;
- To provide equal higher education opportunities to prospective students;
- To facilitate students' admission through suitable and flexible methods;
- To encourage good relations, collaboration and agreement with other institutions of common interest;
- To establish adequate quality assurance systems.

9.2.1.2 Allocating Sufficient Funds and all the Necessary Financial Support

Indisputably, in order to create the For-profit Virtual University, procuring the required funds and financial support is one of the most critical issues; this must be addressed in the first phase. As a starting point for the virtual university to decide what funding is necessary to carry out its mission appropriately and efficiently, a viability study is required. This will allow an approximate projection of the financial support needed to create and sustain the project. To facilitate the process of budgeting, to identify the commitment to expenditure as it occurs and in advance of the formal resolution of the budget, the proposed university needs to develop a financial model that will identify the costs of its projected activities and programmes. However, there are a number of obvious cost factors which must be borne in mind when setting the budget for this project.

- Capital and recurrent cost: capital costs take account of building the necessary IT infrastructure including the purchase and acquisition of equipment (hardware and software), and buildings to house the administrative and technical personnel.
Recurrent costs, on the other hand, refer to all funds that are needed continuously (for salaries, revising and maintenance).

- Management costs: the management costs will cover the on-going management procedures for course development, presentation, review and evaluation.
- Course production and delivery costs.
- Clerical and staff development costs.
- Student cost per year.
- Contingency costs.

The Saudi government and the private sector in cooperation, as suggested by the majority of respondents and unequivocally supported by higher authorities in the higher education system, will be the main source of long-term funding for this project. This partnership will enhance the type of courses and programmes planned to be offered and will provide the necessary support and expertise.

Other common sources of finance for the virtual university include:

- Charging fees for delivered courses or programmes. This can be applied to all students except those who are disadvantaged and who cannot afford education because of an inability to support themselves financially.
- Receiving grants or endowments from outside partners who have been convinced of the value and worthiness of the courses and programmes offered by the virtual university.
- Increasing the number of students in each class. This, of course, depends heavily on the kind of technology being used. However, increasing the number of students in this way should not affect the overall quality of teaching and learning.
- Minimising the overall cost of delivering courses. A virtual university should decide what, when and how many courses should be offered within a given time frame. Also, it should determine the type of technology that should be used to deliver each course. These elements have to be considered analytically in order to deliver high-quality education with the least possible expenditure.
Additional funding approaches may develop at a later stage, such as carrying out special training programmes, providing specific courses for particular individuals or groups, conducting workshops and seminars on a specific topic or subject, and offering continuing education programmes.

9.2.1.3 Establishing Effective Staff Recruitment Procedures

Unlike a traditional institution in which teaching members direct course instruction, lead the lessons, determine students' responses and the pace of the class, it will be assumed that faculty working in an Internet-based learning environment will be qualified to fulfil a number of roles at the same time. They will function as course tutors, facilitators, mentors and consultants for learning. These changing roles make the process of selecting qualified teaching members in a virtual learning environment a complex and labour-intensive process which must be thoroughly planned in advance by the university. In view of this, the questionnaires suggest that staffing at the proposed Saudi Virtual University should fulfil the following:

- Obtaining Internet skills and prior experience in teaching in higher education are important prerequisites for teaching members at the proposed virtual university.
- A virtual university should appoint part-time teaching members.
- Teaching appointments at the virtual university should be restricted to Saudi citizens.

There are certain criteria which faculty must meet. These include:

- Prospective faculty have to comprehend the nature and philosophy of virtual education. Members must possess theoretical knowledge and professional experience in the subject of his/her interest.
- Prospective staff should possess specialist knowledge to enable them to work as instructional designers, providers of advice and learning, monitors of students, facilitators of the learning process, course managers and academic mentors.
- Faculty must show enthusiasm and an interest in working with students at a distance.
- Staff have to be capable of organising instructional materials consistent with the delivery mechanism, of providing the necessary instructional and psychological support whenever needed by learners, and of carrying out adequate evaluation procedures.
- Faculty have to cultivate certain skills in developing and distributing Internet-based materials in addition to facilitating, managing and supporting an Internet-based learning environment.

Those who meet these requirements and who are then accepted as members of the academic teaching staff must participate in a process to determine the quality of their former academic knowledge and professional experience in working with students in a virtual learning environment.

9.2.1.4 Determining Student Admission Requirements

The central theme of the proposed Saudi Virtual University is to incorporate into higher education those who have not been able to join the existing university system. Thus, establishing and implementing a practical, efficient, flexible and suitable admission policy in this new institution is important in order to promote wider access for potential learners.

Hence, the admission policy or requirements which are suggested by most respondents in the questionnaires can be outlined as below:

- The proposed virtual university should admit any potential applicant who holds a Saudi Secondary School Certificate or equivalent, regardless of the GPA. The purpose of the university, as stated earlier, is to expand and extend higher education opportunities to every potential learner anytime and anywhere.
- Prospective students should be admitted to the virtual university based on their ability to pass a pre-admission examination. This selection process will be aimed at measuring learners’ capacity to work in the Internet-based learning environment. If a student fails to comply with this condition, he/she will be recommended to join a basic training course to qualify him/her to work in a virtual environment.
A student graduation date is not essential for admitting potential students. This requirement will enable recently graduated students, as well as adult workers, to pursue higher education.

Generally speaking, it is virtually an open admission policy that the Saudi Virtual University will implement. This is deliberately suggested in response to the current urgent need and massive demand of the great number of potential students who have graduated from secondary schools and are eager to pursue higher education. It is expected to ease educational access and facilitate student recruitment procedures.

9.2.1.5 Deciding the Types of Courses and Programmes to be offered

In principal, every educational course can be presented and taught via Internet-based technology as long as the institution is willing to invest a great deal of money in developing and producing a variety of well-designed courses. Unquestionably, some of these courses require highly interactive technology (animation, simulation and visualisation) in order to fulfil the needs of learners. Others will require lower interactivity using static Web and email technologies. In both cases, the quality of the course or programme depends on a number of factors including content and presentation, delivery mechanisms, teaching approach, the knowledge, skills and experience of the tutor, support services, and students' willingness to learn. The selection of the type of courses and programmes to be offered by the Saudi Virtual University should be derived from the actual needs of Saudi society. It is assumed that these needs will comply with their learning requirements on the one hand, and be in accordance with the goals and objectives of the national development plan on the other. In the initial development phase of the Saudi Virtual University, the survey which has been conducted with teaching members at the three main universities in the Kingdom revealed that the majority of respondents were in favour of the university offering undergraduate programmes in the following subjects: Islamic Studies, Linguistics & Translation, Social Sciences (Sociology, Politics, Economics, Law and Media), Information and Computer Sciences, Fine Arts (Architecture, Decoration and Sculpture).
Obviously, these results come only from a primary analysis; more systematic market research must be carried out to determine the actual academic and professional needs of the target audience and other stakeholders.

9.2.1.6 Ensuring Effective Copyright and Ownership Procedures for Course Materials

The type of course materials in a virtual university are identical to those in traditional institutions but in a digital format. Materials may come in the form of books, syllabi, lectures, notes, overhead transparencies and so forth, in addition to other tools such as Web pages, multimedia (video, audio, CD-ROM), and educational software. Faculty, institutions and educational software developers will have to invest a huge amount of time, money and energy to provide the necessary equipment and expertise to produce and develop any of these course materials in their electronic shape to be adopted as supplementary sources for teaching and learning. However, once the information contained in these materials becomes available electronically, it is almost impossible to prevent any individual or institution from acquiring, downloading, transmitting and transforming all or a portion of these materials. Thus, these materials and their ownership must be protected from such infringement whether by individuals or organisations. This is the purpose of copyright law. For a virtual university it is vital to address clearly and unambiguously the issues of copyright, ownership and the fair use of electronic materials. This can be achieved by devising a new policy if there is none, or revising an existing policy used by other institutions and then implementing these measures and procedures. It is assumed that these policies will specify the property rights of the author or producers of Internet course materials to avoid any potential dispute over materials with other individuals or institutions. The policy has to define and answer adequately a number of issues including, but not restricted to, the following: What exactly is meant by copyright or intellectual property and the ownership of such work? Who holds the copyright of course materials? What are the rights concerning course materials which are developed by academic staff? How will faculty be compensated for developing courses for online delivery? Who will monitor or control the copyright and ownership policies adopted by such an institution? What are the limitations of fair use of electronic sources? These and
any future issues must be considered in order to ensure that intellectual integrity is respected, revenue is shared and possible conflict of interest among individuals or institutions is prevented. Furthermore, these policies must be published by the virtual university so that they are clearly understood internally, by both faculty and students, and externally, by other individuals and institutions.

9.2.1.7 Planning and Carrying out Marketing and Advertisement

As the virtual university is for-profit, it is imperative to set up a thorough and wide-ranging marketing and advertising plan. This must reach as many prospective learners as possible. The aim of this planning phase is to bring to the attention of potential learners that this new institution is offering competitive and outstanding virtual education programmes and courses. In developing such a plan, the institution needs to acquire a highly qualified professional marketing team. Initially, the team has to conduct market research the first objective of which is to become acquainted with the target audience in order to determine who will be potential learners. Secondly, the team must stipulate the form of media and language to be used which will be most influential in conveying the advertisement message to the outside world. Once these components have been outlined and analysed, the advertising team should build its marketing strategies on these findings. The team can place information on the website of the proposed university. This will ease any possible future modifications or promotion regarding courses or programmes. The website should be linked with other sites, encourage interaction, be visually appealing, customisable and easy to navigate, have a friendly search engine, and be rich in content. E-mail, newsgroups and electronic bulletin boards can be developed for advertising purposes. Television and radio programmes are excellent transmission media that will enable the advertising team to grasp the attention of a wider audience concerning announcements on imminent events related to courses and programmes, the types of innovative technology which are used to deliver courses, and reports on progress made by the institution in the area of satisfying the needs of its learners and in serving society as a whole.
In fact, there are various ways for the envisaged university to publicise its programmes, courses and key activities: for example, by seminars, printed publications, interviews and so forth.

9.2.1.8 Maintaining and Monitoring Effectiveness

The proposed university should prepare a comprehensive and systematic evaluation system that continuously measures every detail of academic input, performance, processes and outcome. The primary objective of this system is to maintain the provision of a high standard of education on the one hand, and to know precisely how to maintain this quality to meet the needs of both Saudi society as whole and of prospective learners. The output of this assessment mechanism will generate information that will assist decision-makers to ensure continuous improvements to the entire university system. The Saudi Virtual University can maintain and monitor its operational effectiveness by implementing a variety of assessment techniques. These will run in conjunction with the university input and output which will be described below:

- **Assessment of students**: This can be achieved through a number of approaches. First, student registration assessment is a technique which can be executed during the course of students’ registration and graduation processes. The registration assessment is intended to comprehend, from students’ points of view, why they prefer to be part of this institution. It asks why they want to be registered on this particular course or programme; what sort of instructional approaches they like most in learning and what special services, needs or assistance (financial or physical) they require. It also seeks to discover what they aim to achieve after completion of their studies; how effective the overall registration process is and what difficulties are associated with it; and finally, how they heard about the university. The graduation assessment should allow students who have graduated to share their opinions on a variety of issues, such as how they perceive the quality of courses, programmes and associated support offered to them by the university through their learning study...
years; what features, if any, distinguish the virtual university from other traditional institutions in terms of instructional methods and the effectiveness of support services; whether the knowledge that they have gained has met their educational or professional goals; what negative or positive perceptions they have of studying at the virtual university; and based on this, would they recommend studying at the university to others. Instructor-student assessment places the responsibility of measuring student performance throughout the courses in the hands of the course instructor. He/she has to evaluate and grade students according to their progress and accomplishments. (This method will be discussed in more detail in the relevant systems for content section). Monitoring student performance (the number of assignments, research projects and papers normally completed by the student, plus the average grade received) throughout his/her period of study, together with annual reports provided by instructors to students for each course are alternative tools for monitoring progress.

- **Assessment of faculty**: As in the case of students, faculty members should be required, when they apply for a teaching position at the proposed university, to identify their academic and professional goals, previous experience, skills and other qualifications. A student-instructor assessment is another technique normally organised by the institution to be undertaken by students who have completed a particular course. The aim of this technique is to allow students to provide their instructors with some feedback related to the overall course production, content, delivery mechanisms, support and management. The information provided by students about their perception of the course and its instructor undoubtedly helps faculty and decision-makers in the institution to bring about constant improvement. Moreover, the institution has a responsibility to monitor teaching performance (teaching style, knowledge and skills' improvement) to identify any possible problems with the intention of taking appropriate action on this matter.

- **Assessment of courses and programmes**: Course and programme assessment refers to the overall quality of education. Students and faculty should be encouraged by the institution continuously to engage in evaluating the kind of instructional
delivery media being used. The criteria include: How effective is this medium in conveying knowledge and concepts? How much time do students spend in understanding what has been disseminated through this particular type of delivery mechanism and do they encounter any difficulties regarding this? How simple and straightforward is this medium for use by both student and instructor?

Furthermore, measuring the quality of the university should coincide with the following issues: How can the quality of the programme output be measured by the outside world? Is the institution recognised by other higher education agencies? Is the awarded certificate acceptable professionally to other public or private organisations for employment and promotion? Does the institution meet the higher education standards in order to be accredited by local or international professionally endorsed associations? Do other higher education institutions accept the transfer of graduate students from this virtual university? Is the university affiliated to any national or international higher education league?

These questions give the institution a chance to analyse itself critically. The intention is to improve the quality of learning and teaching so that the university can meet its objectives. Additionally, students may be requested to provide their views regarding the programmes being presented, whether there is any need to improve their quality, and whether these programmes have satisfied their educational and professional needs. They need to be asked if they would recommend or suggest other programmes which are not part of the virtual university’s curricula that should be established.

In addition, the bench-marking technique can be used by the proposed virtual university as another form of monitoring and maintaining effectiveness to measure and improve educational activities and services.
9.2.2 Relevant Systems for Content

9.2.2.1 Maintaining Course Quality

Ensuring the provision of high-quality education must be given the highest priority in the short and long-term agenda of the university. Undoubtedly, this necessitates investing considerable amounts of finance, time, technical expertise, commitment and dedication by the faculty and the institution. The virtual university must have quality standards for content development and production. Careful planning is essential for the institution to design superior Internet courses that meet instructional objectives. Because of the distance between students and instructors, the content must be designed in a way that will clarify ideas, provoke learners’ thinking, encourage individual and/or group involvement and active participation, provide unambiguous instructions, and meet the educational characteristics and attitudes of the learners. In practical terms, Internet-based technology, with its vast capacity, gives the course designer an opportunity to develop and produce high standard courses which in essence could meet diverse learning needs of both individuals and groups. There are some integral features which can be used by course content designers as guidelines in Internet-based course development with the aim of generating optimal course content design. These can be summarised as follows:

- **Learning theory**: The online course designer should be able to accommodate and adopt a variety of learning styles that meet the diverse needs of distance learners.

- **The goal(s) and objective(s) of the course**: These must be given a high-priority and are inherent in each step of designing Internet-based courses. They include the characteristics of the target individual and/or group, as well as the aims, needs and interests of learners, and the anticipated outcomes of the course.

- **The introduction and orientation to the course**: The aim of this process is to familiarise distance learners who come from different backgrounds with the online environment and to offer advice on the best way of solving any problems that they may encounter.
- **The course study guide:** The online study guide is designed to give distance learners advance knowledge of the main activities of the course, such as course topics, assignments, papers, projects, evaluation procedures, class timetable and so on that they may be undertaking during the course.

- **The content of the course:** In an online class, the content of the course comes in a variety of formats including case studies, problem-solving exercises, questions to be answered, issues for discussion, topics for analysis and so on. Generally, the content contains the body of information which the instructor is going to convey to learners at their own pace. The transmission of this message must be accompanied with exhaustive illustrations and explanations.

- **Course publicity:** This is a way of informing distance learners about immediate change whether it is related to the online course or to do with any other related matters.

- **Online course support:** The online course should provide distance learners with some kind of support such as a list of the addresses of information resources, advice and counselling, technical assistance and so on in order to facilitate their learning experience.

- **Interactivity and feedback:** The online course designer should promote learner interaction with peers and the instructor, as well as allowing him/her to ask questions, discuss ideas and concepts, and gain instantaneous feedback from the course tutor.

- **Collaboration:** This is an invitation to learners on the same course to work together collaboratively on a certain project or task in order to share thoughts and provide group insight.

- **The management of the online course:** Effective management of Internet-based courses is imperative to ensure order. To achieve this, many software packages are now available for educators.
An evaluation of the online course: This can be seen from two dimensions: first, an evaluation of the progress of the learner by examining his/her comprehension of the knowledge provided on the course and secondly, assessing the overall strengths and weaknesses of the online course for future improvement.

Broadly speaking, Internet courses should be carefully designed to ensure the direct engagement and total involvement of the learner in the virtual learning environment.

9.2.2.2 Determining the Study Language of Courses

It is essential for the proposed university to determine the language of instructional materials that will be used by the institution for passing on teaching and learning processes. The final decision must be derived from the needs of the learners, the course content requirements, the teaching strategy and whether or not the university plans to extend its educational reach to other cultural contexts. However, in reference to the questionnaire analysis in relation to this topic, it was noted that the largest percentage of respondents agreed that both Arabic and English should be used in the courses and programmes offered by the university.

Due to a lack of proficiency in English, it is recommended that most theoretical study be taught entirely in Arabic; this is assumed to be generally acceptable and encouraged particularly in Islamic Studies and social science subjects. However, English is best suited to teaching and learning in scientific fields. In both cases, words for instructional materials and presentation should be planned and selected carefully to avoid misunderstanding or confusion.

9.2.2.3 Defining Effective Teaching and Learning Approaches

Providing education via Internet-based technology must be rooted in specific learning models. Although there are numerous teaching and learning strategies, there is no single approach that can be adapted as a panacea for all instructional problems, whether in a face-
to-face or a virtual learning environment. Each technique has its own advantages and limitations which will affect the learning situation and may possibly achieve the opposite of its usual application. However, selecting the most appropriate teaching strategy relies heavily on the ability of the instructor or course designer to identify accurately the learning style of the student and the most appropriate delivery medium before embarking on the design process. To determine the best learning approach entails an exhaustive learner-needs analysis by the course tutor in collaboration with technical personnel to plan an effective course design that will respond to the learner's needs and will eventually generate the desired learning outcomes. This operation should be supported by the institution in terms of financial incentives and professional recognition for the course designer.

From the inception of the proposed Saudi virtual university, it will be desirable to announce some of the learning strategies which will be incorporated in the design of the course content. The decision to specify these kinds of learning approaches will be determined by the faculty members who have had prior teaching experience and will have been exposed to the most effective teaching methods applicable to the largest segment of students. When the survey respondents were asked about the main learning approach which should be customised by the proposed university in the course content design, the results showed that the majority of respondents favoured the following learning methods:

- Lecture Approach
- Problem-Solving Approach
- Individualised Learning Approach
- Cooperative Learning Approach
- Programmed Learning Approach

It is worth noting that the selection of these approaches is not intended to be complete nor specifically tailored for every individual learner because the final decision regarding this matter should be carefully weighed against the actual requirements of the individual learner who will be the recipient and the one to benefit from the learning process.
9.2.2.4 Establishing an Efficient Assessment Mechanism

Assessment and evaluation in any educational environment, whether FTF or virtual, must test the knowledge and understanding gained by the learner. It is the idea of who learns, what they learn, how they learn, and why they learn which will ensure whether or not students have assimilated the desired knowledge provided by the course instructor. Generally, assessment methods should track students' course participation, their engagement in discussion, project accomplishment, their involvement in activities and their final achievement. For this reason, the university needs to consider various assessment mechanisms in the initial stages as a guideline for faculty to evaluate the whole learning performance of students. In this respect, when questionnaire respondents were asked what kind of evaluation methods they thought were most appropriate to be implemented by the proposed Saudi Virtual University, the largest percentage indicated that they were in favour of a combination of both formative and summative assessment approaches. The assessment approaches should be practical, easy to follow and highly secure. Summative evaluation can be completed via the Internet using assessments such as on-line standard tests and multiple-choice format tests. Other summative techniques, for example, group projects and short papers can also be submitted online in the form of e-mail, or standard Web. In this instance, the CGI scripts can be used to gather information relevant to students' learning assessments. It allows this information to be compared with established criteria stored in the database files to assign test grades and/or provide students with feedback in relation to the course being taught. Formative assessment can be accomplished in diverse ways including questionnaires, interviews, focus groups, observation and so forth.

In brief, the evaluation procedures, whether formative or summative, must be thoroughly planned and well-suited to the course's instructional design, content and objectives.
9.2.3 Relevant Systems of Communication Technology

9.2.3.1 Specifying Tools for Content Delivery

Internet-based technology embodies a range of technological options that can be used independently or in conjunction with others with the purpose of delivering instructional materials in the proposed university. They play a key role in the delivery of teaching and learning to non-traditional students at a distance. However, the appropriateness of selecting any of these media in virtual education must be derived from answering the following questions:

- What are the actual educational needs of the target learners?
- What are the requirements of the course content to be delivered?
- What types of constraint exist in the medium itself?
- What kind of technical support is available?
- What sort of IT infrastructure exists?
- What funds are available to support such a tool?
- What kind of skills are required by both students and tutors to perform specific tasks in relation to these media?

In addition, several considerations should be taken into account in selecting an instructional delivery medium for delivering virtual education. These include the ease of use, flexibility, versatility, accessibility, interactivity, confidentiality, availability and practicality of the media. The survey analysis indicated that most respondents preferred E-mail, FTP, Newsgroups, List Servers, Mailing Lists, Bulletin Boards, IRC, The WWW, Audio conferencing and Video conferencing. Each one of the above-mentioned delivery mechanisms can be exploited to achieve one or more educational objective or task.

The importance of setting up careful planning before selecting any particular Internet medium for virtual course delivery should be emphasised. The developer or producer of Internet course materials should be able to evaluate these media based on their potential strengths and weaknesses in order to determine exactly the suitability and the reliability of any of the selected tools.
### 9.2.3.2 Defining Learners’ System Requirements

The proposed university has to classify the main characteristics of the learners’ system requirements and the types of equipment required by remote students actively to engage in the learning process and to achieve successfully the aims and objectives of the virtual learning environment. It is fundamental for the university to determine in the early stages of its development the minimum level of IT equipment prospective students are required to obtain. This is in spite of the fact that different courses or programmes may require different types of software or hardware. As a general rule, however, it is generally recommended that the following technology is acquired by students.

**MINIMUM HARDWARE REQUIREMENTS**

- Pentium Processor with at least 500 MHZ or faster
- 128 MB of RAM
- 15” Inch SVGA Monitor
- 65K Modem

**MINIMUM SOFTWARE REQUIREMENTS**

- Microsoft World 98
- Netscape Communicator 4.51
- Internet Explorer 4.01
- Web camera

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Table 9.5: Minimum system requirements

These requirements will enable access to all text-based information, chat areas, newsgroups, audio-conferencing and video-conferencing. Furthermore, depending on the type of course being offered, students may need to obtain additional software. Hence, the university should facilitate the free download of the following software:

- I-Chat ([www.ichat.com](http://www.ichat.com))
- Adobe Acrobat Reader ([www.adobe.com](http://www.adobe.com))
- RealPlayer G2 ([www.real.com](http://www.real.com))

The findings of the questionnaires show that most respondents believe that students at the proposed university should undertake responsibility for acquiring the necessary equipment. Students who cannot afford to provide themselves with the required IT should be helped by the university to obtain such equipment.
9.2.3.3 Maintaining Learners’ Privacy and System Security

Learners’ privacy and system security are considered as interrelated issues which must not be overlooked. These issues are related to both the individual learner and the institution. The main concern comes from a potential hacker who may be able to gain access to confidential information stored on the system. Protecting student privacy and the institution’s network system is critical in virtual education programmes to ensure confidentiality and overall security. There are a number of techniques that can be used to ensure the total privacy of learners’ email. These include the public and private encryption programmes. They have become increasingly important and now many electronic mail programmes automatically encrypt their messages. Another commonly security approach is a firewall which is a highly secure computer that acts as a link between the Internet and the institution’s network. The most noticeable advantage of the firewall is that it limits outside access and restricts internal access to external services. Other security applications which are available for the proposed university to take advantage of include password, voice recognition, call-back, challenge-response system, SmartDisk, Kevlar smart card and so on.

9.2.3.4 Monitoring the Efficiency of Communication Technology

It is fundamental for the envisaged university to understand its major activities and the type of equipment being used in order to identify any potential barrier that may hinder the free flow of academic services to its beneficiaries. This should be undertaken by a professional technical team who should set up a comprehensive plan to monitor and sustain the efficiency of the system and to ensure the provision of back-up methods in case of sudden technical problems. Moreover, the team should meet regularly to discuss issues in relation to the system’s overall performance such as accessibility, ease of use, flexibility, reliability, functionality, interoperability of the system and to suggest upgrading, changing or improving any of its components. The team will have to handle properly and promptly any possible malfunction or prevent downtimes of the system. Additionally, it will be responsible for providing regular maintenance of the system’s hardware and software.
9.2.4 Relevant Systems for Central Support Services

9.2.4.1 Facilitating Students' Administrative Services

Learners at the proposed Saudi Virtual University will require academic support services that will assist both the institution and the students in facilitating the overall learning environment. These services should be developed and planned thoroughly in order to provide students with 24 hours/7 days a week free and direct access to the information they need. The following paragraph will explain briefly each mandatory service:

**Course catalogue:** courses and programmes need to be organised and listed with their general overview descriptions. The information, provided through the online catalogue for each course, should be designed objectively to allow students to select the courses that meet their needs.

**Student enrolment:** For students to be part of an Internet-based course or programme it is compulsory to fill in an online enrolment application in order to be officially registered. This application may contain information about learners' personal and demographic details, contact addresses and telephone numbers, course or programme to be studied, background information about their educational history and so on.

**Scheduling:** The system should enable students at the university to know what courses are available and their time-tabling because they may need to consult their academic advisors. Thus, the system should be designed to provide students with updated lists of courses that are being planned by the institution as well as their scheduling.

**Payment methods:** In an Internet-based learning environment, learners need a secure payment mechanism into which they can pay their course fees online through, for example, credit or debit cards; they need to obtain related billing information simultaneously.

**Financial aid:** Some students, whether normal students or students with special needs, may come across particular financial difficulties prior to or during their studies. Therefore, this
system should be designed to provide them with an efficient and secure system to allow them the chance to apply for financial assistance.

**Scholarship:** This system should give students equal opportunities to obtain current information concerning scholarship availability and all their requirements.

**Students' academic records:** The system should give learners an opportunity to view frequently and securely their academic records, such as grades, to obtain a transcript copy or to transfer credits.

**Bookshop:** The system should allow students to purchase books online through a virtual bookstore or any online publishing house.

There are several Web-enabled administrative systems which combine all or most of these services. The proposed university may select any of them or simply invent its own academic support system that meets its own needs and requirements. In either circumstance, the system design must be freely accessible to any authorised individual and, at the same time, be flexible to allow the updating of information easily.

### 9.2.4.2 Providing Training Programmes

Tutors, as well as students, require training programmes. These training sessions must be systematically organised and precisely controlled. They must be based on educational and professional needs and goals with the purpose of enhancing and promoting skills, attitudes and overall performance in the institution. For instructors' training activities, the university should plan these at two major levels, each level satisfying particular needs and objectives which will be in accordance with the institution's goals as a whole. These levels can be described as follows:

**Pre-appointment-training:** In this kind of training, it is essential for an Internet-based course tutor to maintain and master certain types of IT skills including, for example:
• Ability to access and post messages via E-mail, bulletin boards, newsgroups and list servers.
• Ability to download files, transfer protocol, install software, and use search engines.
• Ability to participate in newsgroup discussions.
• Ability to use various Internet-based tools and be familiar with each one. They must also be able to understand their strengths, capabilities and limitations within teaching and learning frameworks.
• Ability to present, modify, facilitate and transmit online courses to distance learners.
• Ability to make use of particular Internet facilities to promote and improve interaction and a sense of community among students and their peers and between students and their tutors.
• Ability to exploit tools that assist in evaluating learners and provide them with feedback.
• Ability to develop, or at least participate in, Internet-based course design and production.
• Ability to evaluate and determine the quality of instructional delivery mechanisms.
• Ability to be aware of some of the basic applications of multimedia techniques relating to their presentation methods, sound files, graphic applications, video animations, file compression and streaming media.

**Continuing training support:** At this level of staff development, the intention is to give instructors a chance to acquire particular types of training that meet the objectives of specific courses or programmes of study. They may need to be trained on operating particular equipment that requires a comprehensive understanding of how to make a course delivery mechanism more effective and how to communicate with students positively, improving their active participation. Moreover, faculty members need training programmes more frequently to retain their existing skills and to acquire additional expertise in relation to IT in general and the Internet-based environment in particular.

When these training sessions are planned, developed and delivered, they must be generated primarily from two main sources: the needs of the job and the individual, and group
preferences and interests. The university must take into account these factors and allocate the necessary funds, time and support in order to maximise their effectiveness.

Distance learners need to obtain specific kinds of Internet skills, such as navigation through the Internet network, logging on and off the network, posting and sending e-mail messages, uploading and downloading files and software, using various Internet technology tools, and participating in online discussions. These skills can be gained by students' own efforts prior to their enrolment on the Internet-based programmes or as part of the orientation course which should be planned, developed and provided by the university to all students as part of the overall programme.

9.2.4.3 Forming and Promoting an Online Community

Due to the distance between faculty and learners, it is important for the proposed university not to underestimate the potential psychological side-effects of this kind of isolation and to provide support to encourage students to interact and collaborate with each other at every possible opportunity with the aim of developing and maintaining a rich learning environment. This type of social interaction can be initiated through the utilisation of email, online bulletin boards, video conferencing, interactive Web pages or chat modes and so on.

In order for the virtual university to build an online community, it must consider the advantages and limitations of each mode of Internet-based technology to design a system that efficiently and effectively accomplishes this goal. Accordingly, creating a virtual students' union, for instance, will allow distance students to carry out virtual meetings with their fellow learners and to interact with each other synchronously via chat rooms and video conferencing. This can also take place asynchronously through online discussion groups; these can be established as another technique to enhance interactivity between distance students to discuss specific or general topics and issues. A virtual café can be created to give distance learners and teaching members an opportunity for private and/or general conversation in relation to subjects of particular interest.
9.2.4.4 Running Counselling Services

As in a traditional institution, any counselling services provided to students should be highly valued by the university. Students most often referring themselves to counselling services seek assistance or guidance in relation to issues related to difficulties in selecting the appropriate course that will fulfil their learning needs, problems encountered through course study or examination, and lack of human interaction and feelings of isolation. This is in addition to possible problems which may face learners with special needs, including older students and those with disabilities. The proposed virtual university must provide, organise and plan this service thoughtfully to promote the active engagement of students in the course or programme, as well as assisting them in the progress of their studies. Thus, this new institution has to employ initially two full-time qualified staff to carry out this function; they will retain certain characteristics which will include:

- A specialised degree in sociology or psychology and previous work experience in this respect.
- Ability to communicate openly and easily with students, whether individually or in groups.
- Ability to eliminate distance with students to encourage them to express themselves deeply and freely in terms of their concerns, expectations, perceptions, views and so forth.
- Ability to listen carefully and analytically.
- Ability to treat requests for counselling services equitably.
- Ability to respond to learner counselling requests instantly.
- Ability to provide clear guidance and practical advice.

The envisaged university has to design a website dedicated entirely to students’ counselling services. The site should contain up-to-date information pertaining to issues of concern to students. This information should be specific, well-developed and tailored to the students’ personal needs. It has to advance their social and learning skills in a constructive way. Furthermore, the website should facilitate interaction and provide learners with email addresses and Web Links to connect them with others.
9.2.4.5 Operating Career Advisory Services

The proposed Saudi Virtual University should provide prospective graduates with the necessary information concerning employment opportunities and particular jobs that are being accorded high precedence. In addition, it should provide other information and guidance about the postgraduate education and training programmes available to them. Students may want to obtain up-to-date information about organisations that provide placement programmes for prospective graduates, funds for further higher education studies, or other alternatives that will assist students in taking a suitable course of action. This kind of support service complements what the individual learner had identified previously in the registration assessment as his/her professional and/or academic goals. Hence, the university has to appoint two or three part-time specialist advisers. This team has to undertake the responsibility of both planning and carrying out careers service programmes at the proposed university. Their main duties will include:

- Conducting extensive and exhaustive interviews with students in the final year of their study to describe as accurately as possible their careers goals;
- Analysing all types of data generated through the interview process and using these data in providing students with unambiguous careers advice;
- Contacting both public and private organisations to locate particular occupational opportunities which may be available for potential graduates;
- Providing careers education.

It is imperative for the careers advisory team to produce a comprehensive report about the main findings from analysing interviews in relation to graduate students’ objectives. It is assumed that this report will be submitted to the top-management of the proposed university for review and action; this can then be used as an operational guide and an overseeing device for both the programme and the institution.
9.2.4.6 Providing Library Services

The proposed Saudi Virtual University must recognise the information needs of its students and faculty members and provide every means to meet these needs. It has to make arrangements and plans to provide them with economical, easy and flexible access to consult, research and retrieve a variety of resources (reference books, journals, books, CD-ROMs, databases and so on). However, because of the unavailability of any Saudi university on the Internet so far, it is preferable that the proposed university starts by:

- Embarking on building a resource centre with an online catalogue which will be based on course notes, slides, faculty articles and so on.
- Providing students and the faculty with direct access to KACST databases in order to search and obtain full text and citation information.
- Founding an agreement with a number of online journal brokers to allow students and the faculty to access, search and acquire full text articles for moderate charges.
- Establishing an agreement with a number of traditional university libraries such as KSU, KAU and KFUPM to supplement the proposed university with the required materials through document delivery services.
- Locating relevant articles published on the Web and guiding students and the faculty to their links.

The university should employ professional librarians who are able to collect, organise and disseminate information effectively. Students, as well as faculty members, can request information via Email or by filling in a Web-based reference form to request materials.

9.2.4.7 Providing Technical Support Services

Providing technical support services is crucial for the overall success of the proposed university in its online educational provision. Students and the faculty will utilise Internet-based technology in their learning and teaching processes. Because they have to access a variety of Internet resources, including instructional courses, they will need to be
knowledgeable about how to access and navigate the Internet, install software and so forth. This can be accomplished via well organised programmes. However, there are other technical problems related to the capacity of the network itself and which are beyond the capacity of these individuals to resolve. For example: the server is down, frequent interruptions, long downloading, wait time, the bandwidth availability, network disconnection and so on. For these reasons, technical support services become essential and have to be planned and maintained efficiently in order to avoid any potential system turbulence or failure. Several steps can be taken to ensure that the technology will not become an impediment in the students’ and the faculty’s virtual learning environment. These include:

- Providing routine server maintenance for courses delivered on the Web and using e-mail, a low-cost video-conferencing system or any other client server mode.
- Establishing an online helpdesk to provide students and the faculty with the necessary technical services whenever they are needed.
- A list of frequently asked questions (FAQ) should be available for common technical questions.

9.2.4.8 Maintaining and Monitoring Effectiveness

Due to the physical separation of the student from his/her instructor, support services become an integral tool that have to be effectively maintained and monitored. The responsibility of this resides in the hands of all members of the academic community. A comments analysis approach is seen as a vital technique in evaluating the extent to which support services have been adequately maintained. Students, as well as faculty members, should have the opportunity to assess freely the kind of services provided by the institution. Their negative or positive comments on particular services can be sent via e-mail to the top-management who should take these comments seriously and make whatever arrangements are necessary.
9.3 Stage 7: Taking Action

The chief aim of this study, as noted in Chapter 1, was to investigate the feasibility, practicality and desirability of establishing a virtual university in Saudi Arabia. Bearing this in mind, the proposed virtual university model has been based entirely on the survey results, the literature review, the existing virtual university models and the researcher's knowledge of the subject. It has been systematically discussed, and its main characteristics debated and agreed upon as indicated in the introduction of this chapter. At this stage, appropriate action should be taken in order to move the project from its theoretical phase into a practical, operational stage. This will certainly require a number of changes. Some of these changes pertain to what the ideal organisational structure should be and this will be discussed in this chapter. Other changes relate to how this proposed project should be implemented and this will be part of the next chapter. Accordingly, the kind of change which seems to be appropriate and in accordance with the data analysis outputs of the problem situation are concerned with organisational structure, policy and attitudes. These will be discussed in the following three sub-sections.

9.3.1 Organisational Structure

This is a completely new model in terms of its organisational structure. This new organisational structure should promote and facilitate the use and development of virtual education in all academic areas. Hence, the survey results, as pointed out in Chapter 6, suggested that more than half of the respondents prefer a for-profit single-mode virtual university model. The proposed model is not constrained by geographical location because there are no classrooms, laboratories, student union and dormitory buildings in the physical and traditional sense. Instead, it utilises Internet-based technology as a means of communication, reaching students anytime and anywhere. However, it has to have a location and building for its administration. The administrative office should be established and situated in Riyadh, as indicated by most respondents, because the MHE, KACST, STC, the headquarters of large private companies, and the major ISPs which, it is assumed, would
provide support to the proposed university are situated there. This administrative office will be operated, as depicted in Figure 9.1, by the University President, who will be appointed through the Board of Trustees and who will oversee all administrative, financial and educational affairs, as well as executing overall university policies, and report directly to the Board of Trustees. The Board of Trustees has to appoint the Strategic Planning Board which will consist of the Manager of Curriculum Development and Production, the Manager of Finance, the Manager of Marketing, the Manager of Public Relations, the Manager of Recruitment, the Manager of Educational Support Services, the Manager of Quality Assurance and Accreditation, and other staff members working under these directorates. The main function of the Strategic Planning Board is to formulate policies and business strategies for the university; it reports directly to the University’s President. This, as explained in Chapters 8 and 9, will include:

- Setting up mission statements;
- Allocating sufficient funds and all the necessary financial support;
- Establishing effective staff recruitment procedures;
- Determining student admission requirements;
- Deciding the types of courses and programmes to be offered;
- Ensuring effective copyright and ownership procedures for course materials;
- Planning and carrying out marketing and advertisement;
- Maintaining effectiveness.
Figure 9.1: Organisation and administration structure of the proposed Saudi Virtual University

Telecommunications via the Internet
Each directorate has specific tasks and will be assigned specific responsibilities, as described below:

**Directorate of Curriculum Development and Production:** the major activities of this directorate are:

- Planning, scheduling and determining which courses should be designed, produced and delivered in a particular academic year;
- Designing, monitoring, delivering and managing Internet-based courses;
- Working in cooperation with outside educational software developers.

**Directorate of Finance:** this directorate will undertake the responsibility of preparing the university budget and all other related clerical activities.

**Directorate of Marketing:** the directorate of Marketing has to set up marketing and advertising strategies, seek adequate funds to execute these tactics and carry out these plans.

**Directorate of Public Relations:** the university has to maintain and strengthen its relations with the general public in Saudi society; this will facilitate its mission and assist in accomplishing its academic goals and objectives in the long term. In order to achieve this, the Public Relations directorate has to carry out annual market research with the aim of understanding the public's educational needs; the university must then try to satisfy these needs.

**Directorate of Recruitment:** this directorate has the responsibility of formulating effective staff selection and training procedures. Additionally, it has to determine faculty workload and tenures, salaries, incentives and other related matters.

**Directorate of Educational Support Services:** providing educational support to both students and faculty members in virtual education is one of the most crucial areas on which the success of the entire programme depends. Therefore, this directorate has to plan, maintain and provide efficient and effective educational support services.
Directorate of Quality Assurance and Accreditation Directorate: this directorate has to set the required policies that ensure that the quality of the courses and programmes is maintained and standardised. It also has to set up clear and ambiguous copyright and ownership rules, and a fair-use policy for Internet-based course materials. Moreover, the directorate has to ensure the application of overall national accreditation policies to the courses and programmes of the university.

The University President, the Strategic Planning Board and managers of the various directorates will be governed by a board of trustees which will consist of a mixture of educators, educational experts, corporate executives, local authorities and a representative of the MHE. It has to oversee all educational, administrative and financial activities of the proposed university. The board of trustees will report directly to the MHE which has total supervision of this institution on behalf of the Saudi government and the private sector.

9.3.2 Policy

The proposed university requires specific policies that will provide a sustainable basis for all its activities in relation to its educational objectives. These policies must be formed and carried out in order to maintain its credibility, adequacy and efficiency. These can be summarised as below:

a) The largest segment of the survey population was in favour of faculty members at the virtual university being appointed on a part-time basis. This kind of appointment status is entirely new to the educational employment system in Saudi Arabia and therefore this requires new employment rules and regulations. Other policies concerning workloads, promotion and the roles of faculty members should be created.

b) The proposed university has to establish an admissions policy for new students which will ultimately provide equal educational opportunities to all.
c) The university has to set up a policy regarding the schedule of its academic year. It was suggested by most of the survey respondents that each year should consist of three academic semesters.

d) Policies concerning copyright and ownership must be established.

e) The proposed university has to establish a reasonable policy pertaining to its marketing and advertisement strategies.

f) The university should set up a clear policy concerning its sources of funding and other financial matters.

g) Policies regarding the quality of courses and programmes must be created.

h) The proposed university should formulate clear policies regarding its relations to other academic institutions, and to both public and private organisations.

i) The university must form policies regarding the types of courses and programmes to be offered, course development and production procedures, course assessment, and the degrees and certification to be awarded.

j) The virtual university has to establish clear policies regarding scholarships, financial aid and related matters.

k) The university must establish policies to maintain a system to ensure individual security, integrity and confidentiality.

l) A policy regarding overall quality assurance must be shaped.
9.3.3 Attitudes

To achieve effective implementation of the proposed university and to ensure mutual interaction with the people involved, whether they are decision-makers, teaching members or staff, the university has to convince them of its value and benefits. This can be achieved through first, providing them with education and training programmes to promote and improve their knowledge and understanding of the project; secondly, allowing them to participate actively in accomplishing the aims and objectives of the proposed university, and finally, providing them with incentives, rewards and promotion.

9.4 Conceptual Model of the Total System

The four sub-systems of strategic planning, communication technology, content and central support services, which were explained in Chapter 8 and in this chapter, are interlinked to give an idea of the overall conceptual model of the proposed virtual university model. The model, with its diverse activities which are depicted in Figure 9.2, is a representation of how the ideal virtual university model should be constructed.
Figure 9.2: Conceptual model of the total system

A virtual university is a feasible, practical and desirable strategy for improving the higher education system.
The conceptual model of the total system will be checked, as indicated in Chapter 8, by using a formal systems model to assure its validity. This formal systems model, as summarised in Figure 9.3, is intended to check and assess that the conceptual model of the total system contains the following elements:

1. The formal system (S) has an on-going purpose or mission. In a soft system, this may be something that cannot be accomplished because it requires continuing pursuit. It also may not need to be characterised because it is more obvious and describable in terms of goals and objectives.
2. The formal system (S) has certain measures which can be used to monitor, assist and evaluate its precise performance in relation to its goals and objectives.
3. The formal system (S) has a decision-making function. This process will enable the system to take possible regulatory action in the light of elements 1 and 2 to ensure an adequate level of performance.
4. The formal system (S) is a combination of a number of components which are themselves systems and which contain all the features of a system.
5. The formal system (S) has components which interact with each other and demonstrate some kind of connectivity. The logical dependency of activities in the conceptual models is an example of this type of interaction and connectivity between components.
6. The formal system (S) is part of the wider system and/or environment in which it operates.
7. The formal system (S) has a boundary that separates it from its environment based upon the power to take action.
8. The formal system (S) has resources which are at the disposal of the decision-making process. This is represented by the concept of the actor in the CATWOE.
9. The formal system (S) has continued stability and quick recovery features, particularly at times of disturbance.
10. The formal system (S) is assumed to be observed by outsiders (Weltanschauung) who show interest in the system (4,5).
9.5 Conclusion

In this chapter the outcomes of the agenda, which derived from Chapter 8, are debated in order to understand whether such changes are viable and suitable within both educationally and culturally. This change necessitates obtaining sufficient human resource to realise the main activities of the proposed relevant systems. It must be noted that this change necessitates the technology and central support services. The chapter should be established under the overall umbrella of the private sector. Thus, for each relevant system, the university should consist of a number of assigned specific responsibilities. A Board of Trustees and a University President must be established in order to manage and oversee the intention. Overall support from the university has to develop institutional practices, which facilitate, support and ensure the various administrative and educational activities. People involved should be considered and created carefully through promoting their awareness in relation to the value of the proposed project.

In conclusion, the four relevant systems, strategic planning, vision, mission, and control, technology and central support services, have been identified in order to bring to light their functions and relationships to each other within the main model. This model has been checked through the formal system model.

Figure 9.3: Formal system model (6)
9.5 Conclusion

In this chapter the outcomes of the agenda which derived from Chapter 8 are debated in order to understand whether such changes are systematically feasible and culturally desirable. It was found that the required change is viable and acceptable both systematically and culturally. This change necessitates obtaining sufficient and thorough knowledge of the main activities of the proposed relevant systems which were highlighted in Chapter 8. Thus, the main activities of the relevant systems for strategic planning, content, communication technology and central support services were discussed in detail.

The chapter also explained how such change might be undertaken. This was presented in terms of organisational structure, policy and attitudes. It suggests that the new organisation should be established through mutual partnership between the Saudi government and the private sector. Thus, for effective and efficient functioning, the proposed university should consist of a number of directorates in which each one has been assigned specific responsibilities that must be carried out. In addition to these directorates, a Board of Trustees and a University President’s position should be created in order to manage and oversee the institution. Overall supervision should be given to the MHE. Additionally, the university has to develop institutional policies which facilitate, support and execute its various administrative and educational activities. People’s attitudes should be considered and treated carefully through promoting their awareness in relation to the value of the proposed project.

In conclusion, the four relevant systems, strategic planning, content, communication technology and central support services have been integrated and interlinked in order to bring to light their functions and relationships to each other within the total model. This model has been checked through the formal systems model.
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(Details of publishers are included in the bibliography at the end.)

5. Checkland, Peter. ref. 1, p. 173.
10.1 Introduction

At this point, it is assumed that the proposed virtual university model has been completed after being debated to gain insight as to whether this model is systematically desirable and culturally feasible. The appropriate action that related to the organisational structure, policy and attitudes has been discussed, as explained, comprehensively and systematically, in Chapter 9.

After a brief introduction in Section 10.1, this chapter proceeds, in Section 10.2, to recapitulate the main points that have been discussed in this research. Section 10.3 aims to point out the outcomes of the hypotheses which were stated in Chapter 1. Section 10.4 points out the major conclusions that have been drawn from the study. Section 10.5 examines the contribution of this research, while Section 10.6 focuses on the most suitable approaches that can be used in order to carry out the proposed project successfully. This will come in the form of legitimate and pragmatic recommendations. Finally the chapter will finish, in Section 10.7, by suggesting further research in this field.

10.2 Research Overview

The primary aim of this research, as stated in Chapter 1, was to investigate the feasibility, practicality and desirability of establishing a virtual university in Saudi Arabia. Therefore, several objectives have been established with the purpose of gaining a thorough understanding of a variety of aspects concerning these issues. These, as stated in Chapter 1, are:
1. To analyse the essence of the socio-cultural foundations of Saudi Arabia with particular emphasis on those related to information and communication technology.

To fulfil this first objective, Chapter 1 discussed the socio-cultural foundation with particular emphasis on that which relates to information and communication technology, has been explored in order to identify its fundamental principles with particular emphasis on technology innovation and transfer. It was found that Saudi culture basically stems from Islam which in essence does not contradict or oppose technology such as the Internet as long as it will be exploited for the benefit of the whole of society.

2. To investigate the traditional higher education system in Saudi Arabia.

This can be achieved by:

a) Analysing the organisational structure of the higher education system and its fundamental roles.

b) Summarising the basic objectives of higher education in general and the National Development Plans pertaining to higher education in particular.

c) Evaluating the various types of study system available at higher education institutions.

d) Investigating the major aspects of the eight conventional universities that currently exist in Saudi Arabia, together with their academic centres for girls' education.

The existing higher education system was described in Chapter 2, including its organisational structure and objectives, its study types, and the eight Saudi universities and their branches, in order to comprehend the main characteristics of the entire system under analysis. It was revealed that some efforts have been made by certain institutions, such as IMIU in Riyadh and KAU in Jeddah, to assist in
conquering the problem of increasing demand on higher education by prospective students by means of extending their educational reach to people in other urban and rural locations through traditional methods (Intisab). It also showed that higher education opportunities were not equally distributed between the genders. In addition, the number of Saudi universities and their associated branches are not in balance with the geographical distribution of the population.

3. To investigate the information technology infrastructure and the development of the Internet in the Kingdom of Saudi Arabia. This can be accomplishing through:

a) Examining government initiatives and policies regarding the development and implementation of information and communication technology via KACST.

b) Exploring the key components of the national information and communication technology infrastructure currently existing in Saudi Arabia which were initiated by MPOTT and later STC.

c) Scrutinising the existing ICT infrastructure that is currently available in Saudi university computer centres and libraries.

d) Presenting the progress and growth of the Internet in general and the extent to which Internet technology is employed in Saudi Arabia in particular.

Meeting and achieving objective 3 required examining the information technology infrastructure and the development of the Internet in the Kingdom of Saudi Arabia. In Chapter 3, it was revealed that KACST and STC are playing a major role in the development and progress of Information Technology. They have built a number of networks and have established state of the art technologies in order to facilitate communication and the free flow of information nationally and internationally. Undoubtedly, this has been associated with a number of challenges. These include:
Insufficient policies, regulations and guidelines set by the government to ensure the even exploitation of IT in all government agencies.

- Computer illiteracy, particularly within top management.
- The lack of a skilled IT workforce.
- The lack of IT systems in Arabic.
- Insufficient technical support.
- Inadequate top-management support.

In respect to Saudi universities, it was found that there were obvious variations in the development and growth of IT within Saudi universities. It was noted that KSU, KAU and KFUPM were more advanced in terms of IT availability than the remaining universities. This was because of the amount of funds allocated and the administrative support provided for the advancement of IT at these institutions. Furthermore, the development and growth of Internet services in Saudi Arabia is progressing rapidly and gaining more and more acceptance within Saudi society. This has been validated by the dramatic increase in the number of Internet users.

4. To provide extensive analysis of the chief benefits and the major drawbacks of using Internet-based technology in virtual education.

The literature pertaining to the advantages and limitations of using Internet-based technology in distance education and the virtual university model were surveyed to accomplish objectives 4 and 5 of this study. The outcomes, as pointed out in Chapter 4, suggested that the Internet and from both theoretical and practical viewpoints is considered an excellent delivery mechanism which can be used to deliver distance courses and programmes to assist higher education institutions that have been constrained by physical infrastructure to accommodate the increasing number of students. Some of the advantages are inherent in the technologies themselves, such as flexibility, multiple platforms, multi-media capabilities, accessibility and ease of use, lower cost and so on. Other advantages evolve from the kind of instructional techniques that are incorporated in Internet course design. These include the promotion of active participation, an increase in the quality of
virtual education and a decrease in learners' sense of isolation through interaction and collaboration. Additionally, the literature highlights several issues that might affect the implementation of Internet-based technology in virtual education. These issues could be pedagogical, technological, cultural, ethical or cross-cultural. On the other hand, the literature, with regard to a virtual university model, indicates that these models are still in their infancy; they therefore require more research and investigation.

5. To identify current models of virtual universities which deliver higher education courses and programmes by using the Internet and related technologies from other countries and using these to suggest a virtual university model for continuing higher education studies in Saudi Arabia.

The selection of the type of research methodology that suits this study was determined after comprehensive analysis, as specified in Chapter 5, of diverse IS research methodologies. SSM was selected and questionnaires and interviews were chosen as means of data collection. The major findings of the questionnaires (see Chapter 6) indicated that the largest percentage of respondents were in favour of establishing a virtual university in Saudi Arabia and they have contributed to the construction of the model. The interviews reported in Chapter 7 identified several issues and concerns in relation to the higher education system that is provided the authorities. They noted a variety of concerns such as the lack of equal educational opportunities, a lack of educational quality, increased drop-out rates and a lack of interest in learning by some students, a lack of well-forged and mutual relationships between universities and the private sector, and so forth. They also outlined numerous technical and administrative problems encountered by KACST, STC and ISPs.

The use of SSM (Mode 1) allowed the researcher to examine the situation from various angles. The finding of the questionnaires and interviews showed that the higher education system is surrounded by multi-dimensional problems which were expressed by diverse individuals within the system. Some of these issues, as noted
in Chapter 8, were beyond the scope of this study. Others have been identified and presented in the rich picture in Stage Two of SSM. A system that could tackle these problems was proposed. It consisted of four relevant systems (strategic planning, content, communication technology and central support services). A root definition has been produced for each system in addition to the overall root definition of the total system. A conceptual model for each relevant system was created and a comparison of these conceptual models and the real world situations was executed. The comparison showed that there were certain differences between the formal and the proposed system.

The functionality and the activities intrinsic in each relevant system were extensively discussed as demonstrated in Chapter 9. The required changes that are systematically feasible and culturally desirable have been built based on the findings of Chapters 1, 3, 4, 6, and 7.

10.4 Conclusions

The principal conclusions to be drawn from this research are as follows:

1. A virtual university is feasible in Saudi Arabia. This conclusion comes as a result of the literature review in relation to the virtual university model in Section 4.3 of Chapter 4 which concludes that the virtual university is a global phenomenon and has begun to gain acceptance in most nations of the world today. Some of the current examples are Phoenix, Joins International Virtual Universities, and Western Governors University in the United States as well as the Open University and Clyde Virtual University in the United Kingdom. Further examples include South Africa Telecom in South Africa and Deakin University in Australia.

The data analysis suggested that establishing a virtual university in Saudi Arabia is crucial, and is urgently needed in order to cope with the limitations of the existing
higher education system. Accordingly, the proposed project is considered to be one of the most favourable alternative solutions currently available to the higher education system. This idea was supported by the positive views of the majority of teaching members at the three major universities under investigation, as pointed out in Chapter 6, in addition to a number of higher education authorities within HESC, and MHE, as noted in Chapter 7.

2. This study conducted a comprehensive literature review of the existing virtual university models and their main characteristics. The outcomes of this review indicated that there are generally six main types of existing virtual university models, as indicated in Chapter 4. These are:

a) For-profit Consortium virtual university model
b) Joint Venture virtual university model
c) Non-profit Aggregated virtual university model
d) Dual-Mode virtual university model
e) For-Profit Single-Mode virtual university model
f) Non-Profit Single-Mode virtual university model

However, none of these models, according to the definitions provided for each of them in Chapter 4, was ideal for the Saudi situation. This is despite the fact that the proposed model, which seemed to be the most appropriate and could effectively and efficiently suit the requirements of the higher education system in its current situation, imitates the concept of the For-profit Single-mode virtual university model. The proposed model is a collaborative enterprise which, it is assumed, will be funded by the Saudi government and the private sector and will be supervised and overseen by the MHE, as noted in Part III of Chapter 6. It will consist of four interrelated relevant systems among which are: strategic planning, content,
communication technology and central support services. Certainly, this proposed model could be adopted and generalised after slight modification.

3. The study provided an extensive review of the existing literature regarding the development of IT infrastructure and the growth of the Internet network in Saudi Arabia. The chapter concludes that there is an adequate IT infrastructure which could be used to initiate the proposed virtual university.

4. The study revealed numerous issues and problems that currently exist in higher education which are beyond the scope of this study and, at present, cannot be addressed by the creation of a virtual university. These issues include:

- The lack of balance between need and the available specialisations in Saudi universities.
- A decline or weaknesses in the input and output of Saudi universities.
- Outdated buildings.
- A lack of interest by most of the university academic members in undertaking teaching responsibilities or in conducting scientific research except for promotion purposes.
- Clear negligence on the part of the university top-management to provide sufficient technical manpower to operate and maintain available technologies in order to serve students, and academic staff in carrying out the learning process productively.
10.5 Research Contributions

The major contributions of this research can be summarised as follows:

1. This research presents, in context, a detailed review of the literature related to using Internet-based technology in distance education. The intention was to contribute to a better understanding of the potential opportunities and challenges of using this medium as an educational delivery mechanism.

2. One of the major strengths of this study derives from its research methodology. Checkland’s SSM was applied in order to provide a holistic view, an analysis and, finally, to suggest possible improvements in relation to the problem under investigation. This has shown that such a methodology can bring a significant value to the overall study outcomes. This study is the first application of SSM to the planning of establishing a virtual university in Saudi Arabia.

3. This study provides a detailed and structured approach to establish a virtual university model based on respondents’ points of view, a literature review, the researchers’ knowledge and existing virtual university models such as Phoenix and Joins International Virtual Universities.

4. To the best of the researcher’s knowledge, this is the first study of its kind that suggests establishing a virtual university via Internet-based technology to non-traditional students in Saudi Arabia. Therefore, the ensuing information may be used as a foundation for the future construction of the proposed university by both the government and/or the private sector.

10.6 Recommendations

Based on these conclusions, it is recommended that a virtual university be established in Saudi Arabia, as a partial solution to the Kingdom’s problems in
making adequate higher education provision. In order to achieve this, it is recommended that:

1. The government and the private sector should consider this proposed virtual university model as a constructive solution to the current problems facing the higher education system in general and universities in particular. They should re-evaluate its effectiveness, its potential benefits, and act in accordance to implement it, taking into account the knowledge, success and experience of other countries.

2. The MHE, which should act on behalf of the Saudi government and the private sector, as discussed in Chapter 9, should have supervision of the proposed university.

3. The MHE should establish all necessary legislation, rules and regulations which will encourage support and facilitate the establishment of a virtual university via Internet-based technology.

4. The MHE should establish all necessary legislation, rules and regulations that will ensure the provision of equal education opportunities for both genders.

5. Certain changes should be undertaken in order to make this proposed project practicable. It first requires a new organisational structure, as discussed in Chapter 9. This organisational structure will comprise the University President; the Board of Trustees consisting of a mixture of educators, educational experts, corporate executives, local authorities and representatives of the MHE; and the Strategic Planning Board that will consist of the Manager of Curriculum Development and Production, the Manager of Finance, the Manager of Marketing, the Manager of Public Relations, the Manager of Recruitment, the Manager of Educational Support Services, the Manager of Quality Assurance and Accreditation, and other staff members working under these
directorates. The MHE is assumed to have total supervision of this institution on behalf of the Saudi government and the private sector. Secondly, specific policies need to be established to maintain the effectiveness of the proposed university, as noted in Chapter 9. Finally, people’s attitudes need to be accustomed to this new project in order to ensure the common interest, involvement and participation of all stakeholders. This can be achieved, as explained in Chapter 9, through education, training, active participation and incentives.

6. The proposed university will be governed by a Board of Trustees which will be composed of a mixture of educators, educational experts, corporate executives, local authorities and representatives of the MHE in order to oversee all educational, administrative and financial activities of the proposed university.

7. The Board of Trustees will appoint a President for the university who will manage all administrative, financial and educational affairs, as well as executing overall university policies.

8. The Board of Trustees will also appoint members of the Strategic Planning Board which will consist of the Manager of Curriculum Development and Production, the Manager of Finance, the Manager of Marketing, the Manager of Public Relations, the Manager of Recruitment, the Manager of Educational Support Services, the Manager of Quality Assurance and Accreditation, and other staff members working under these directorates. The main function of the Strategic Planning Board is to formulate policies and business strategies for the proposed university.

9. The Board of Trustees should recognise the potential needs and requirements of academic staff working in the virtual university. The Board should provide them with the necessary IT skills, rewards,
promotion prospects and incentives to encourage them to work satisfactorily in this new environment.

10. The MHE should undertake a comprehensive national plan to attract, motivate and encourage students to participate in this type of education.

11. The MHE should facilitate active female involvement and participation in the decision-making processes which affect their educational affairs.

12. The university should work cooperatively and collaboratively at an international level with other educational and non-educational organisations to resolve issues related to educational standards, quality assurance, copyright, certification, and cultural values.

13. The implementation of the proposed university requires very significant investment in terms of financial and human resources, and IT infrastructure in order to maintain its operation. Therefore, the government and the private sector must work cooperatively to provide the necessary funds which will sustain the institution’s financial stability both in its initial phase and on a yearly basis. They must also focus on qualifying specialist faculty members through regular training in order to work in this new environment, as well as establishing an adequate telecommunication infrastructure and data-processing system which must be updated and upgraded whenever necessary.

14. The government and private sector companies, particularly those in technological fields, should jointly increase their investment to facilitate the spread of IT within Saudi society by introducing instalment plans and loan initiatives for ordinary people.

15. The government should encourage the higher education system to engage in interaction and mutual relationships with the private sector to
propose national education and training plans that will meet the needs of individuals, society at large and the national development plans.

10.7 Further Research

The area of virtual university modelling is relatively new and further research is needed. The main issues which are of interest for further exploration and investigation are:

- To study the underlying philosophy for the variations of the existing virtual university model in terms of its organisational and administrative structure.

- To study the implications of the organisational and administrative structure on the overall success of specific types of virtual university model.

- To examine how the organisational structure of a virtual university differs from the organisational structure of a traditional one.

- To conduct a comparative study in order to investigate the common factors that lead to the success of one particular virtual university model over another.

- To examine the influence of particular cultures on the implementation of specific kinds of virtual university model.

- To examine the effect of the implementation of a virtual university model on a particular culture.

- To research the effect of particular types of virtual university model on the quality of educational products being delivered.

- To study the advantages and limitations of each virtual university model.
Chapter 10  
Overview, Conclusions and Recommendations

- To investigate the influence of certain type (s) of technology on the success of the virtual university model.

- To study the main ways in which the current virtual university models can be standardised.
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APPENDICES
Appendix A

Formal letter requesting questionnaire participation

Dear Teaching member

My name is Mansour Al-Shchri. I have a full scholarship from King Saud University. Currently, I am a Ph.D research student in the Department of Information Science at Loughborough University. This survey questionnaire has been designed to investigate the feasibility, practicality and desirability of establishing a virtual university based on the Internet and related technologies to facilitate continuing higher education studies as an alternative solution to cope with the proliferation of potential higher education students.

It is important to note that the concept of a virtual university via the Internet and associated technologies has existed for quite some time. Such universities have been established in many countries and they have proved to be a remarkable success. For example, Phoenix Virtual University, California Virtual University, Indiana Virtual University, Clyde Virtual University, Jones International Virtual University and so on. Thus, your opinions and thoughts regarding this are highly valuable. The researcher's aim is that the outcomes of this study will generate appropriate recommendations that will assist in proposing a virtual university model.

I am requesting your help in allocating a few minutes of your valuable time to complete the attached questionnaire as fully as possible and to hand it back to your department secretary after completing it. I would inform you that all the data you provide will remain confidential and will be used for research purposes only. If you are interested in the findings of this questionnaire, I will be happy to provide you with a copy of the main conclusions.

Thank you for your co-operation.

Yours sincerely,

Mansour Ali Al-Shchri

Notes:

In this survey questionnaire, the respondents will be asked to apply the term 'Virtual University'. This is a new form of higher education organisational structure which is assumed to be similar in its basic functions such as teaching, administration, support and research to its counterpart, the conventional institution, although it offers courses and instructional programmes through the Internet and associated technologies to allow prospective learners to have the opportunity to learn at their own pace, space and place.
ابحاثة عن التعرف على آراء أعضاء هيئة التدريس في بعض الجامعات السعودية حول مدى إمكانية إنشاء "جامعة افتراضية" من خلال شبكة (الإنترنت) 

بسم الله الرحمن الرحيم
حفظه الله تعالى
سعادة الأخ الكريم / عضو هيئة التدريس
السلام عليكم ورحمة الله وبركاتكم... وبعد

أفيد ساعدكم بأنى أقوم بإعداد دراسة علمية للحصول على درجة الدكتوراه من المملكة المتحدة في موضوع "دراسة إمكانية إنشاء "جامعة افتراضية" VIRTUAL UNIVERSITY.

وذلك من منطلق طرح بحثي قائم على مشكلة تزايد أعداد الطلاب والمطالبات إثراء في وخاصة التعليم العالي، وعموم تترافع الأفراد أكثر منهم في الوضع الحالي للجامعات من ناحية، ومحاولة توظيف إمكانات التقنيات الحديثة في ذلك، وخاصة شبكة الإنترنت، من ناحية أخرى. وقد صممت هذه الاستبانة للتعرف على آراءكم ومفاهيمكم حول هذا الموضوع وذلك بحبكم وموقفكم الوفيق.

وقد نجد الإشارة إلى أن فكرة "الجامعات الافتراضية" المبنية على استخدام شبكة الإنترنت قد خرجت إلى حيز التنفيذ، ثم بالفعل إنشاء جامعات الافتراضية في أماكن متعددة من العالم وأوجرهن جافا واضحا ومعلوما ومن ثم الأأملة على ذلك ما قامت به "جامعة فيتكس" جامعة كاليفورنيا، جامعة النيلية، جامعة كليفلاند، جامعة جوهر الدولية، وغيرهم من الجامعات المعروفة.

ومع هذا النظام، فإن أمل من ساعدكم أنكم تساهم باستبانة في تعبئة هذه الاستبانة، التي تعد الأداة الأساسية لجمع بيانات هذه الدراسة، ومن ثم إعدادها في سكرتارية فسمكم، وكم في عمليم التقدير ورناكم.

وأود في النهاية أن أطمئنكم بأن جميع البيانات التي تتضمنها هذه الاستبانة سوف تتخذ بسرية كاملة، ولن نستخدم إلا لأغراض هذا البحث. كما يمكنكم أن إياكم غيركم في التعرف على نتائج الدراسة حين انتهائها بإذن الله، الحصول على نسخة منها، وذلك بالتقدم بإفادتك بريدكم الإلكتروني أو البريد العادي.

شكرًا ومقدرا حسن تعاونكم، وسلام عليكم ورحمة الله وبركاتكم.

الباحث
نصر بن علي الشهري

ملحوظة هامة:

في هذه الاستبانة، سوف يستخدم الباحث مصطلح "VIRTUAL UNIVERSITY" للدلالة علي شكل جديد مستحدث من الجامعات، التي إذا كانت لا تختلف في وظائفها التقليدية، كالتعليم، والبحث العلمي، ودورة المجتمع وخدمة قضايا، عن نظامها الجامعات التقليدية، فهي تختلف... فلا شك... في بنية التنظيم، والإدارة، وفي رسائلها العلمية التي تعمد على شبكة الإنترنت.
**Appendix A**

**Part I: BACKGROUND:**
Please tick (✓) in the appropriate box

<table>
<thead>
<tr>
<th>1. Gender</th>
<th>2. Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Male</td>
<td>1. Less than 30</td>
</tr>
<tr>
<td>2. Female</td>
<td>2. 30-39 years</td>
</tr>
<tr>
<td></td>
<td>3. 40-49 years</td>
</tr>
<tr>
<td></td>
<td>4. 50 years and over</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Highest academic qualification</th>
<th>4. To what extent do you use the Internet?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ph.D. Degree</td>
<td>1. I use the Internet</td>
</tr>
<tr>
<td>2. Master's Degree</td>
<td>2. I do not use the Internet.</td>
</tr>
<tr>
<td>3. Bachelor's Degree</td>
<td></td>
</tr>
<tr>
<td>4. Other (specify)</td>
<td></td>
</tr>
</tbody>
</table>

**PART II: PERCEPTIONS AND OPINIONS REGARDING THE ESTABLISHMENT OF A VIRTUAL UNIVERSITY IN SAUDI ARABIA:**

5. Do you agree with the concept of establishing a virtual university in the Kingdom of Saudi Arabia? (Please tick (✓) in the appropriate box).

<table>
<thead>
<tr>
<th>Yes</th>
<th>If you answer (Yes) please answer Questions 9-22 and 24 (optional).</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>If you answer (No) please answer Questions 22-24.</td>
</tr>
</tbody>
</table>
Appendix A

Questionnaires

6. Some opinions likely to support the establishment of a virtual university in Saudi Arabia are outlined below. (Please tick (√) in the box provided to indicate your response to each of the following statements.)

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1. Extend higher education opportunities to every potential applicant whether male or female.</td>
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<td>2. Provide female students with equal opportunities to males in studying equivalent courses.</td>
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<tr>
<td>3. Allow learners to learn, and to work interactively and collaboratively.</td>
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<tr>
<td>4. Provide students with the required knowledge in IT at their own pace and learning ability.</td>
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<tr>
<td>5. Allow students who have dropped out of Saudi universities to proceed with their studies at the proposed virtual university.</td>
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<tr>
<td>6. Assist the existing Saudi universities, which lack adequate resources and facilities, in coping with the rapid growth of students seeking higher education degrees.</td>
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<tr>
<td>7. Minimise government expenditure on higher education.</td>
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<tr>
<td>8. Other (specify)</td>
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</tbody>
</table>

PART III: ORGANISATIONAL STRUCTURE, FUNDING-BODY, STAFF APPOINTMENTS AND STUDENT ADMISSIONS SYSTEMS; ORGANISATIONAL STRUCTURE:

7. From your point of view which of the following models is appropriate in constructing the proposed virtual university in Saudi Arabia? (Please tick (√) in the appropriate box.)

<table>
<thead>
<tr>
<th>Model</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. For-profit Consortium Virtual University Model</td>
<td></td>
</tr>
<tr>
<td>2. Joint Venture Virtual University Model</td>
<td></td>
</tr>
<tr>
<td>3. Non-profit Aggregated Virtual University.</td>
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<tr>
<td>4. Non-Profit Dual-Mode Virtual University Model.</td>
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<tr>
<td>5. For-profit Single-Mode Virtual University Model.</td>
<td></td>
</tr>
</tbody>
</table>
### SUPERVISION

8. From your point of view, the proposed virtual university should be under the direct supervision of one of the following agencies. (Please tick (✓) in the appropriate box).

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. Ministry of Higher Education</td>
<td></td>
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<tr>
<td>2. Private organisation</td>
<td></td>
</tr>
<tr>
<td>4. Other (specify)</td>
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</tbody>
</table>

### HEADQUARTER LOCATION

9. From your perspective, the virtual university's headquarters should be in one of the following cities. (Please tick (✓) in the appropriate box).

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Riyadh</td>
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<td>Jeddah</td>
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<tr>
<td>Dammam</td>
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<tr>
<td>Other (specify)</td>
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</tbody>
</table>

### FUNDING

10. In your opinion, setting up a virtual university in Saudi Arabia should be fully funded and this should be achieved by one of the following agencies. (Please tick (✓) in the appropriate box).

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1. Public Sector</td>
<td></td>
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<tr>
<td>2. Private Sector</td>
<td></td>
</tr>
<tr>
<td>3. Cooperative enterprise between government and the private sector.</td>
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<tr>
<td>4. Other (specify)</td>
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</tbody>
</table>
**ACADEMIC STAFF APPOINTMENTS**

11. Some opinions regarding staff appointment procedures at the proposed virtual university. (Please tick (✓) in the appropriate box).

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</thead>
<tbody>
<tr>
<td>1. A virtual university should appoint just teaching members who hold a Ph.D. degree.</td>
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<tr>
<td>2. Obtaining Internet skills is an important prerequisite condition for appointing teaching members at the proposed virtual university.</td>
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<tr>
<td>3. A virtual university should appoint teaching members as part-time staff.</td>
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<tr>
<td>4. A virtual university should appoint teaching members on a full-time basis.</td>
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<tr>
<td>5. Teaching appointments at a virtual university should be restricted to Saudi citizens.</td>
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<tr>
<td>6. A virtual university should appoint teaching members from all over the world.</td>
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<tr>
<td>7. Other (specify)</td>
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**STUDENT ADMISSION**

12. Some opinions regarding student admission system. (Please tick (✓) in the appropriate box).

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</thead>
<tbody>
<tr>
<td>1. The proposed virtual university should admit any potential applicant who holds a Saudi Secondary School Certificate or equivalent regardless of the GPA (Grade Point Average).</td>
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<tr>
<td>2. Prospective students should be admitted at the virtual university based on their ability satisfactorily to complete a pre-set competency examination.</td>
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<tr>
<td>3. The secondary school graduation date is not essential for admitting potential students at the virtual university.</td>
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<tr>
<td>4. Students at traditional universities can transfer their credits towards a virtual university degree.</td>
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<tr>
<td>5. Other (specify)</td>
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</table>
### PART IV: Cost and Fees:

13. Some opinions regarding student tuition and fees. (Please tick (√) in the appropriate box).

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</thead>
<tbody>
<tr>
<td>1. Students registered at the proposed virtual university should be provided with free education.</td>
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<tr>
<td>2. Students registered at the proposed virtual university with special needs should be provided with free education.</td>
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<tr>
<td>3. Students registered at a virtual university should be provided with free equipment (hardware and software).</td>
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<tr>
<td>4. Students registered at a virtual university with special needs should be provided with free equipment (hardware and software).</td>
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<tr>
<td>5. The government should provide financial assistance such as student loans to needy students.</td>
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<tr>
<td>6. The private sector should provide financial assistance, such as student loans, to needy students.</td>
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<tr>
<td>7. The government and the private sector collaboratively should provide financial assistance, such as student loans, to needy students.</td>
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<tr>
<td>6. Other (specify)</td>
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</tbody>
</table>

### PART V: DEGREES, ACADEMIC SPECIALITIES, COURSE DEVELOPMENT, STUDY LANGUAGE, MEDIA USAGE, TEACHING STRATEGIES, ASSESSMENT METHODS:

#### DEGREES AND ACADEMIC SPECIALITIES:

14. In your opinion, to what extent is it important for the proposed virtual university to offer any of the following degrees. (Please tick (√) in the appropriate box).

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</thead>
<tbody>
<tr>
<td>1. Bachelor's Degree</td>
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<tr>
<td>2. Master's Degree</td>
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<tr>
<td>3. Ph.D. Degree</td>
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<tr>
<td>4. Other (specify)</td>
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</tbody>
</table>
15. In your opinion, to what extent is it important for the proposed virtual university to offer any of the following academic specialities (Please tick (✓) in the appropriate box).

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>1. Islamic Studies</td>
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<tr>
<td>2. Linguistics &amp; Translation</td>
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<tr>
<td>3. Social Sciences (Sociology, Politics, Law, Management, Business, Media... etc)</td>
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<tr>
<td>4. Information and Computer Sciences</td>
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<tr>
<td>5. Applied Sciences (Mathematics, Physics, Chemistry ... etc)</td>
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<tr>
<td>6. Fine Arts (Architecture, Decoration, Sculpture ... etc)</td>
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<tr>
<td>7. Other (specify)</td>
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</table>

**COURSE DEVELOPMENT:**

16. Please indicate your opinion regarding every statement from the following concerning the development and production of Internet courses. (Please tick (✓) in the appropriate box).

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. Internet-based technology courses should be entirely developed by outside consultants.</td>
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<tr>
<td>2. Teaching members at the proposed virtual university should entirely develop Internet-based technology courses.</td>
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<tr>
<td>3. Internet-based technology courses should be developed collaboratively between teaching members at the proposed virtual university and outside consultants.</td>
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</tr>
<tr>
<td>4. Other (specify)</td>
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</tbody>
</table>
**MEDIA USAGE:**

17. From your viewpoint, to what degree is it important to use any of the following Internet-based technologies as a delivery medium at the proposed virtual university? (Please tick (√) in the appropriate box).

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1. E-mail</td>
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<tr>
<td>2. FTP (File Transfer Protocol)</td>
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<td>3. News groups</td>
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<tr>
<td>4. List Servers</td>
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<td>5. Mailing Lists</td>
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<td>7. IRC (Internet Relay Chat)</td>
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<td>8. The World Wide Web</td>
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<td>9. Audio Conferencing</td>
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<tr>
<td>10. Video Conferencing</td>
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<tr>
<td>11. Other (specify)</td>
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</table>

**STUDY SYSTEM:**

18. In your view, which of the following study systems should be adopted by the proposed virtual university? (Please tick (√) in the appropriate box).

<table>
<thead>
<tr>
<th>Study System</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. Yearly Study System</td>
<td></td>
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<tr>
<td>2. Semester or Half Yearly Study System</td>
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<tr>
<td>3. Hours Study System</td>
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<tr>
<td>4. Other (specify)</td>
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</tbody>
</table>

**STUDY LANGUAGES:**

19. In your view, which of the following study languages should be adopted by the proposed virtual university? (Please tick (√) in the appropriate box).

<table>
<thead>
<tr>
<th>Language</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. Arabic Language</td>
<td></td>
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<tr>
<td>2. English Language</td>
<td></td>
</tr>
<tr>
<td>3. Arabic and English Languages (according to the type of speciality)</td>
<td></td>
</tr>
<tr>
<td>4. Other (specify)</td>
<td></td>
</tr>
</tbody>
</table>
**STUDY STRATEGIES:**
20. In your opinion, to what extent is it important to implement any of the following teaching strategies at the proposed virtual university (Please tick (√) in the appropriate box).

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1. Lecture Approach</td>
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<tr>
<td>2. Problem-Solving Approach</td>
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<td>3. Individualised Learning Approach</td>
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<tr>
<td>4. Collaborative Learning Approach</td>
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</tr>
<tr>
<td>5. Programmed Learning Approach</td>
<td></td>
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<tr>
<td>6. Other (specify)</td>
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</tbody>
</table>

**EVALUATION METHODS:**
21. Evaluation methods adopted by the proposed virtual university should follow one of the following: (Please tick (√) in the appropriate box).

<table>
<thead>
<tr>
<th>Evaluation method</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Summative Assessment</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2. Formative Assessment</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3. Combination of Summative and Formative Assessment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Other (specify)</td>
<td></td>
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</tr>
</tbody>
</table>

**OBSTACLES FACING THE ESTABLISHMENT OF A VIRTUAL UNIVERSITY:**
22. Some opinions regarding the main obstacles that may potentially hinder the establishment of a virtual university in the Kingdom of Saudi Arabia. (Please tick (√) in the appropriate box).

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. Most people do not yet accept the Internet in Saudi Arabia.</td>
<td></td>
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<tr>
<td>2. There is a tendency by higher education policy makers to limit or confine continuing higher education studies.</td>
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<tr>
<td>3. Teaching members are convinced that the best way to teach their discipline is through the face-to-face teaching method.</td>
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<tr>
<td>4. There is a belief that learning through Internet-based technologies cannot provide high quality education.</td>
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<tr>
<td>5. Teaching members are lacking relevant skills to facilitate learning through the Internet.</td>
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<tr>
<td>6. English language proficiency is lacking in students.</td>
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<tr>
<td>7. Internet course production and development is too costly.</td>
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<tr>
<td>8. Lack of coordination between Saudi universities</td>
<td></td>
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<tr>
<td>9. Lack of adequate IT infrastructure within Saudi universities to support Internet connection.</td>
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<tr>
<td>10. Lack of technical manpower</td>
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<tr>
<td>11. Other (specify)</td>
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</tr>
</tbody>
</table>
23. In your opinion, what other suitable alternatives might be available for Saudi higher education policy-makers to contain the increasing number of students seeking continuing higher education studies in the Kingdom of Saudi Arabia?


24. Please write down any suggestions or comments you may wish to add.


Thank you very much for your co-operation

Mansour Ali Al-Shehri
Department of Library and Information Science
College of Art
King Saud University
Riyadh 11151
P.O. Box 2456
الجزء الأول: البيانات الأساسية:
 فضلاً ضع إشارة (✓) في الخلاة المناسبة.

<table>
<thead>
<tr>
<th>رقم</th>
<th>الجنس</th>
<th>العمر</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ذكر</td>
<td>2.</td>
</tr>
<tr>
<td>2.</td>
<td>أثلي</td>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
<td>من 40-49 سنة</td>
<td>5.</td>
</tr>
<tr>
<td>5.</td>
<td>من 50-60 سنة</td>
<td>6.</td>
</tr>
<tr>
<td>6.</td>
<td>أكبر</td>
<td>7.</td>
</tr>
</tbody>
</table>

الجزء الثاني: روي حول إمكانية إنشاء "الجامعة الأفريدية" في المملكة العربية السعودية:
 في الخلاة المناسبة.

1. لا يوجد فكرة إنشاء "الجامعة الأفريدية" من خلال شبكة الإنترنت في المملكة العربية السعودية.
2. لا يوجد فكرة إنشاء "الجامعة الأفريدية" من خلال شبكة الإنترنت في المملكة العربية السعودية.

فيما يلي بعض الأراء حول أبرز الأسباب التي يمكن أن تدعم فكرة إنشاء "الجامعة الأفريدية" من خلال شبكة الإنترنت في المملكة العربية السعودية. يرجى ضع إشارة (✓) في الخلاة المناسبة للرد:

<table>
<thead>
<tr>
<th>رقم</th>
<th>الفكرة</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>متقدم</td>
</tr>
<tr>
<td>2.</td>
<td>منح الطلاب فرصة متكافئة مع الطالب لدراسة نفس التخصصات.</td>
</tr>
<tr>
<td>3.</td>
<td>تاحة الفرص للطفل وطالبة للدراسة الجامعية المشتركة.</td>
</tr>
<tr>
<td>4.</td>
<td>تزويج الفالب والطالبات بالمعرفة في مجال المعلومات التقنية.</td>
</tr>
<tr>
<td>5.</td>
<td>تسهيل الوصول إلى الأدبيات والجامعات الأفريدية من خلال شبكة الإنترنت عبر هذه المكتبة المفتوحة.</td>
</tr>
<tr>
<td>6.</td>
<td>تطوير الفالب والطالبات الذين لا يمكنهم من مواصلة دراستهم بالجامعات السعودية من خلال الدراسة عبر هذه المكتبة المفتوحة.</td>
</tr>
<tr>
<td>7.</td>
<td>تعريف قدرة الفالب والطالبة المالية عن الحياة الأفريدية والتعليم المستمر في هذه الفترة.</td>
</tr>
<tr>
<td>8.</td>
<td>أخيرًا (اختياري)</td>
</tr>
</tbody>
</table>

(جديد)
الجودة الثالث: الهيكل التنظيمي، نظام تعيين أعضاء هيئة التدريس، قبول الطلاب "الجامعة الأفراضية" المقترحة:

القسم الأول: الهيكل التنظيمي:

1. شركة خاصة تقوم بإنشاء جامعة ربحية أفراضية
2. جامعات خاصة أو حكومية تتعاون فيما بينها وتقوم بإنشاء جامعة أفراضية
3. جامعات خاصة أو حكومية تتعاون فيما بينها حيث تقوم بإنشاء جامعة أفراضية غير ربحية
4. جامعات خاصة أو حكومية تقوم بالإضافة إلى مبادئ الأقليدية بإنشاء جامعة أفراضية غير ربحية
5. جامعة أفراضية ربحية تندي من قبل القطاع الخاص
6. جامعة أفراضية غير ربحية تندي من قبل القطاع العام أو الخاص
7. أخرى (حدد)

الجودة الثانية: نظام تمويل إنشاء "الجامعة الأفراضية" المقترحة:

1. التخطيط الحكومي
2. القطاع الخاص
3. مساهمة تمويلية مشتركة بين القطاع الحكومي والقطاع الأهلي
4. أخرى (حدد)

من وجهة نظرك، يمكن أن تكون "الجامعة الأفراضية" المقترحة تحت الأشراف المباشر لإحدى الجهات التالية: فضلاً ضع إشارة (✓) في الخانة المناسبة:

1. وزارة التعليم العالي
2. مؤسسة أهلية
3. إدارة مشتركة بين وزارة التعليم العالي ومؤسسة أهلية خاصة (فضلاً حدد)
4. أخرى (حدد)

من وجهة نظرك، يمكن أن تكون الإدارة العليا "الجامعة الأفراضية" في أحد الأماكن الرئيسية التالية: فضلاً ضع إشارة (✓) في الخانة المناسبة:

1. الرياض
2. جدة
3. الدمام
4. أخرى (حدد)
القسم الثالث: تعين أعضاء هيئة التدريس في "الجامعة الأفتراضية":

فيما يلي بعض الأراء حول نظام تعين أعضاء هيئة التدريس في "الجامعة الأفتراضية"؛ فضلاً ضع إشارة (✓) في الخانة المناسبة.

<table>
<thead>
<tr>
<th>الممارسة</th>
<th>المقابلة يجب أن توافق</th>
<th>مرفق</th>
<th>غير موافق</th>
<th>موافق بشهادة</th>
<th>موافق بشهادة</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. &quot;الجامعة الأفتراضية&quot; المقررة يجب أن توافق بتعيين أعضاء هيئة التدريس الحاصلين على شهادة الدكتوراه فقط.</td>
<td></td>
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<tr>
<td>2. مهارات التعامل مع الإنترنت وخبرة التعليمية في المجال الجامعي يتيح برنامج شهادات أساسية للتدريب في &quot;الجامعة الأفتراضية&quot; المقررة.</td>
<td></td>
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<tr>
<td>3. &quot;الجامعة الأفتراضية&quot; المقررة يجب أن توافق بتعيين أعضاء هيئة التدريس للعمل كمتعلمين جزئياً.</td>
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<tr>
<td>4. &quot;الجامعة الأفتراضية&quot; المقررة يجب أن توافق بتعيين أعضاء هيئة التدريس للعمل كمتعلمين كلياً.</td>
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<tr>
<td>5. &quot;الجامعة الأفتراضية&quot; المقررة يجب أن توافق بتعيين أعضاء هيئة التدريس من السعوديين فقط.</td>
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<tr>
<td>7. أخرى (حدد)</td>
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</tr>
</tbody>
</table>

القسم الرابع: نظام قبول الطلاب في "الجامعة الأفتراضية":

فيما يلي بعض الأراء حول نظام قبول الطلاب والطالبات في "الجامعة الأفتراضية" المقررة. فضلاً ضع إشارة (✓) في الخانة المناسبة.

<table>
<thead>
<tr>
<th>الممارسة</th>
<th>المقابلة يجب أن توافق كل المتقدمين والحاصلين على الشهادة الثانوية السعودية أو ما يعادلها بغض النظر عن المعدل الدراسي للدبلوم.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. يجب أن تقبل كل المتقدمين والحاصلين على الشهادة الثانوية السعودية أو ما يعادلها بغض النظر عن المعدل الدراسي للدبلوم.</td>
<td></td>
</tr>
<tr>
<td>2. بحاجة أن يتم تقبل الطلاب والطالبات المتقدين للانضمام إلى جامعة &quot;الجامعة الأفتراضية&quot; بعد إجتياز اختبار للقدرات بناءً على تاريخ تخرج الطلاب والطالبات من الثانوية العامة ليس شرطًا لقبولهم في &quot;الجامعة الأفتراضية&quot; المقررة.</td>
<td></td>
</tr>
<tr>
<td>3. يمكن للطلاب والطالبات المتقدمين للجامعات السعودية التحول إلى &quot;الجامعة الأفتراضية&quot; المقررة والعكس صحيح.</td>
<td></td>
</tr>
<tr>
<td>4. أخرى (حدد)</td>
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</tbody>
</table>
الجزء الرابع: الرسوم الدراسية، وتكافؤ الأجهزة والأقسام:

- يجب توفير التعليم المجاني للطلبة والطالبات الملتحقين بالجامعة الأكاديمية.
- يجب توفير التعليم المجاني للطلبة والطالبات الملتحقين بالجامعة الأكاديمية من نوع الدراسات الخاصة.
- يجب توفير الأجهزة والبرامج المجانية للطلبة والطالبات الملتحقين بالجامعة الأكاديمية.
- يجب توفير الأجهزة والبرامج المجانية للطلبة والطالبات الملتحقين بالجامعة الأكاديمية من نوع الدراسات الخاصة.
- الحكومة يجب أن تقدم مساعدة مالية مثل برامج فروض الطلبة للطلبة والطالبات الملتحقين.
- يجب أن تكون الحكمة في فرض الضرائب المتعارضة.
- يجب أن تكون الحكمة في فرض الضرائب المتعارضة.
- آخرًا (عدد)

الجزء الخامس: الدراجات العلمية، التخصصات الأكاديمية، تصميم المقررات، اللغة المستخدمة، الوسائل التعليمية، طرق التدريس والاختبارات:

القسم الأول: الدراجات العلمية:

- درجة البكالوريوس.
- درجة البكالوريوس.
- درجة الدكتوراه.

القسم الثاني: التخصصات الأكاديمية:

- دراسات الإسلامية.
- اللغة والترجمة.
- العلوم الإنسانية (اجتماع، سياسة، تجارة، قانون، أعلام)
- علوم الحساب والرياضيات.
- العلوم الاجتماعية (الإنسانية، رياضيات، كيمياء...).
- اللغة العربية (الغرام، الرسوم والقرآن، النحو...).

في Reset، أي من التخصصات العلمية التالية يجب أن تقدمها "الجامعة الأكاديمية" المفتوحة. فضلاً وضع إشارة (✓).
القسم الثالث: تصنيف المقررات:
16. قم بالتساير على أي إحدى المقررات وال занودة المطابقة للجامعة الأهلية "وذلك بوضع إشارة (✓) في الخانة المناسبة.

<table>
<thead>
<tr>
<th>العبارة</th>
<th>1 موافق</th>
<th>2 متيرد</th>
<th>3 غير مخالف</th>
<th>4 لا يوافق بشدة</th>
</tr>
</thead>
<tbody>
<tr>
<td>يجب تصنيف مقررات الدراسة (نقطة والمحتوى) في &quot;الجامعة الأهلية&quot; المقررة عن طريق مصمم خارج البرامج التعليمية.</td>
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<tr>
<td>يجب أن يقوم بإعطاء هيئة التدريس &quot;بالجامعة الأهلية&quot; المقررة تصميم وتبني مقررات الدراسة (نقطة والمحتوى).</td>
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<tr>
<td>يجب أن يكون اختصار هيئة التدريس &quot;بالجامعة الأهلية&quot; المقررة منصبا خارج البرامج التعليمية في تقييم مقررات الدراسة.</td>
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</tbody>
</table>

القسم الرابع: استعمال الوسائط التعليمية:
17. قم بالتساير على أي إحدى المقررات والوسائط التعليمية المقابلة للمقررة "بالجامعة الأهلية". فضلًا ضع إشارة (✓) في الخانة المناسبة.

<table>
<thead>
<tr>
<th>الوسيلة التعليمية</th>
<th>1 مهم جداً</th>
<th>2 مهم</th>
<th>3 متوسط الاهمة</th>
<th>4 أقل أهمية</th>
<th>5 غير مهم</th>
</tr>
</thead>
<tbody>
<tr>
<td>القرد الإلكتروني</td>
<td></td>
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</tr>
<tr>
<td>نظام تقرير المناقصات</td>
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<tr>
<td>مجموعة الأبحاث</td>
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<tr>
<td>قائمة المواد</td>
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<tr>
<td>قائمة المواد</td>
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<tr>
<td>فتح الرسائل</td>
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<tr>
<td>لجنة الامور</td>
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<tr>
<td>شبكة الإنترنت</td>
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</tr>
<tr>
<td>حضور (الحوادث بالاستماع)</td>
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<tr>
<td>مذكرة (المؤتمر) بالاسلام</td>
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<tr>
<td>مذكرة (المؤتمر) بالفيديو</td>
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<td></td>
</tr>
<tr>
<td>آخرى (حدد)</td>
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</tbody>
</table>

القسم الخامس: نظام الدراسة:
18. قم بالتساير على أي من النظم الدراسية المقابلة للمقترحة "بالجامعة الأهلية". فضلًا ضع إشارة (✓) في الخانة المناسبة.

<table>
<thead>
<tr>
<th>النظم الدراسية السنوي</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>آخرى (حدد)</th>
</tr>
</thead>
<tbody>
<tr>
<td>النظام الدراسى الفصلى</td>
<td></td>
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<tr>
<td>النظام الدراسى raster</td>
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</tbody>
</table>

القسم السادس: لغة التدريس:
19. قم بالتساير على أي من اللغات المقاترة على مقصد أساس للتدريس في "الجامعة الأهلية" المقررة. فضلًا ضع إشارة (✓) في الخانة المناسبة.

<table>
<thead>
<tr>
<th>اللغة العربية</th>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>آخرى (حدد)</th>
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<td>اللغة الإنجليزية</td>
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<td>اللغة العربية واللغة الإنجليزية (حسب التخصص)</td>
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<td>آخرى (حدد)</td>
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استنادًا للتعريف على أراء أعضاء هيئة التدريس في بعض الجامعات السعودية حول مدى إمكانية إنشاء "جامعة الأقتراضية" من خلال شبكة الإنترنت:

القسم السابع: أساليب التقويم الدراسي:

في رأي أي من طرق التدريس التالية يجب أن تُتَبَاع فيها في "الجامعة الأقتراضية" المفترضة: فضلاً تحت شارة (5) في الخانة المناسبة.

<table>
<thead>
<tr>
<th>الطريقة لتدريس</th>
<th>1. طريقة المحاطات</th>
<th>2. طريقة حل المشكلة</th>
<th>3. طريقة التعليم الذاتي</th>
<th>4. التعليم التعاوني</th>
<th>5. التعليم المبرمج</th>
<th>6. أخرى (حدد)</th>
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</table>

فيما يلي بعض الأراء حول عدد من الأسباب التي يمكن أن تؤدي إنشاء "الجامعة الأقتراضية" من خلال شبكة "الإنترنت" في المملكة العربية السعودية:

| الوجه السادس: الصعوبات وتحديات تواجه إنشاء "الجامعة الأقتراضية" المفترضة في المملكة العربية السعودية | 1. إن كثيراً من الناس لا يرون فكرة الانتاج على شبكة الإنترنت في المملكة العربية السعودية |
|                                                                                                                      | 2. الشروط المتغيرة من إعدادات التدريس في الجامعات السعودية بتأثير سلبي على التدريس في أسلوب منهجية التدريس بين الطلاب والآباء |
|                                                                                                                      | 3. العوارض من إعدادات التدريس في الجامعات السعودية بتأثير سلبي على التدريس بين الطلاب والآباء |
|                                                                                                                      | 4. كثير من إعدادات التدريس في الجامعات السعودية بتأثير سلبي على التدريس بين الطلاب والآباء |
|                                                                                                                      | 5. عدم أو ضعف الرقابة الجمركية بين الطلاب |
|                                                                                                                      | 6. إلقاء تكاليف التدريس ونظام القرارات التدريسية بتأثير سلبي على الإنترنت |
|                                                                                                                      | 7. التفتيش عبر الإنترنت، التدريس والعمل المشترك بين الجامعات السعودية |
|                                                                                                                      | 8. ضعف البنية التحتية التكنولوجية للشبكة الإنترنت في المملكة العربية السعودية |
|                                                                                                                      | 9. قلة توفر الثقة التكنولوجية العاملة والمدرية |
|                                                                                                                      | 10. أخرى (حدد) |
استنادًا إلى التعرف على أراء أعضاء هيئة التدريس في بعض الجامعات السعودية حول مدى إمكانية إنشاء "جامعة الافتراضية" من خلال شبكة (الإنترنت)

23. في رأيك ما هو الدليل المناسب عن "الجامعة الافتراضية" لاستيعاب الأعداد المتزايدة من الطلاب الراغبين في مواصلة التعليم العالي الجامعي في المملكة العربية السعودية؟

24. من فضلك اذكر في الأسئلة أية تطبيقات أو ملاحظات تود إضافتها.

شكرًا لك على تعاونك، وتفضله بقبول فائق تقديري وعظيم إمتتناني

منصور بن علي الشهري
قسم علوم المكتبات والمعلومات-كلية الآداب-جامعة الملك سعود
 ص. ب. (2456)
 الرياض 11451
Dear Sir

My name is Mansour Al-Shchri. I have a full scholarship from King Saud University. Currently, I am a research student in the Department of Information Science at Loughborough University. For the past few years, there has been a remarkable growth in the use of Internet-based technologies as an instructional delivery mechanism in a great number of higher education institutions in many developing and non-developed countries. The implementation of these technologies has proved to be successful in providing educational opportunities to on/off campus learners. Therefore, I am interested in examining the potentiality of adapting these novel technologies in some higher education institutions in the Kingdom of Saudi Arabia through the prospect of establishing a virtual university for continuing higher education. The outcome of this study will shed the light on the most effective strategies which can be followed to reap the benefits of this promising educational phenomenon.

Your opinions and insights on this matter are crucially important to the completion of this study. Data collected from individual respondents will be kept confidential. If you are interested in the survey findings, I will be pleased to send you a copy of the study as soon as this project has been accomplished.

I would be very grateful if you would allow me to interview you for half an hour. I will contact your secretary to arrange an interview time based on your convenience.

I sincerely appreciate your co-operation and your willingness to give up your time to participate in achieving the aim of this interview.

Thank you and kind regards.

Yours respectfully,

Mansour Ali Al-Shchri
Research Student
Information Science
Loughborough University
Loughborough
LE11 5YL.
United Kingdom
Interview Questions

Members of Higher Education Supreme Council

Name: 
Age: 
Gender: 
Qualification: 
Position: 
Responsibility: 

Type of Interview: Structured Interview

Objectives:
The purpose of this interview is to understand the following issues:

- Problems that are currently being encountered in higher education institutions in Saudi Arabia.
- Short and long-term plans to contain the increasing numbers of students seeking continuing higher education and the available resources to support the accomplishment of such plans.
- Perceptions and views regarding the prospect of establishing a virtual university, and what difficulties may hinder this.

Questions:

1. What are the major challenges that the higher education system, particularly universities, is facing today?

2. What short and long-term plans does the higher education system have to overcome these challenges?

3. What kind of resources (financial, facilities, staff, etc) will be available to support the execution of these plans?

4. Do you agree with the prospect of establishing a virtual university based on the Internet in order to contain the increasing number of students seeking higher education studies and why?
Ministry of Higher Education

Deputy Minister of Higher Education for Academic Affairs

Name:
Age:
Gender:
Qualification:
Position:
Responsibility:

Type of Interview: Structured Interview

Objectives:

The purpose of this interview is to understand the following issues:

- Problems that are currently being encountered in higher education institutions in Saudi Arabia.
- Short and long-term plans to contain the increasing numbers of students seeking continuing higher education and the available resources to support the accomplishment of such plans.
- Perceptions and views regarding the prospect of establishing a virtual university, and what difficulties may hinder this.

Questions:

1. What are the major challenges that the higher education system, particularly universities, is facing today?

2. What are the ministry's short and long-term plans to surmount these challenges and what kinds of resources are available to execute these plans?

3. Do you agree with the prospect of establishing a virtual university based on the Internet in order to contain the increasing number of students seeking higher education studies and why?
Appendix B-1

Interview Questions

University Vice-Presidents
Name:
Age:
Gender:
Qualification:
Position:
Responsibility:

Type of Interview: Structured Interview

Objectives:

The purpose of this interview is to understand the following issues:

- Problems that are currently being encountered in universities.
- Short and long-term plans to contain the increasing numbers of students seeking continuing higher education and the available resources to support the accomplishment of such plans.
- Perceptions and views regarding the prospect of establishing a virtual university, and what difficulties may hinder this.

Questions:

1. What major challenges are facing your university today?

2. What are your university's short and long-term plans to manage and control the increasing number of students seeking continuing higher education studies and what kind of resources will be available to support the execution of these plans?

3. Do you agree with the prospect of establishing a virtual university based on the Internet in order to contain the increasing number of students seeking higher education studies and why?
1.2 College Deans:
Name:
Age:
Gender:
Qualification:
Position:
Responsibility:

Type of Interview: Structured Interview
Objectives:

The purpose of this interview is to understand the following issues:

- Problems that are currently being encountered in higher education institutions in Saudi Arabia.

- Short and long-term plans to contain the increasing numbers of students seeking continuing higher education and the available resources to support the accomplishment of such plans.

- Perceptions and views regarding the prospect of establishing a virtual university, and what difficulties may hinder this.

Questions:

1. What major challenges are your college facing today?

2. What are your college's short and long-term plans to manage and control the increasing number of students seeking continuing higher education studies?

3. What kind of resources will be available to support the execution of these plans?

4. Do you agree with the prospect of establishing a virtual university based on the Internet in order to contain the increasing number of students seeking higher education studies and why?
1.5 Directors of University Computer Centres

Name:
Age:
Gender:
Qualification:
Position:
Responsibility:

Type of Interview: Structured Interview

Objectives:

The objective of this interview is to appreciate the following elements:
- Functions, policy and structure.
- IT infrastructure and services.
- Internet connection.
- Problems and future plans.

Questions:

1. To what extent do you think that your IT infrastructure and computing services are sufficient to meet the needs of academic members, administration staff and students?

2. Who decides on IT policy at the centre?

3. What are the short and long-term plans of the Computer Centre Department?

4. Does the centre ever participate in delivering online courses? What are the difficulties regarding their delivery?

(Due to the lack of literature, the following questions have been developed to elicit information regarding IT infrastructure at KSU, IMIU, and KAU.)

1. What are the main roles and responsibilities of the Computer Centre Department?
2. How is the centre structured?

3. Is there any relation between the IT centre and other divisions within the university?

4. What IT infrastructure, including networks, is now available on campus?

5. What types of services do you provide for IT users on the campus?

6. Do you have an Internet connection, and who is the major Internet Service Provider?

7. Do all teaching members have Internet access?

8. Do students have access to the Internet?

9. Do you provide any training or technical support for literate and illiterate Internet users?

10. What problems are associated with providing Internet connections on campus, and how do you prepare to overcome them?
Appendix B-1

Director of the Internet Services Division at KACST

Name: 
Age: 
Gender: 
Qualification: 
Position: 
Responsibility: 

Type of Interview: Structured Interview

Objectives:

The aim of this interview is to comprehend the following:

- Responsibilities.
- Internet policy.
- IT infrastructure.
- Future plan and problems.

Questions:

1. What difficulties are associated with the provision of Internet services?

2. What are the main tasks of the Internet Service Division at KACST?

3. What kind of policy do you have regarding Internet access, and how is this policy decided?

4. What type of IT infrastructure, including networks, is now available?

5. How do you obtain the Internet connection?

6. What is the division’s short and long-term plans regarding Internet connection and exploitation?
Appendix B-1

Internet Services' Manager at STC (Saudi Telecommunication Company)

Name:
Age:
Gender:
Qualification:
Position:
Responsibility:

Type of Interview: Structured Interview

Objectives:
This interview intends to point out:
- Responsibilities.
- IT infrastructure and policy.
- Future plan and problems.

Questions:

1. What are the main functions of the STC regarding Internet services?

2. What IT infrastructures have you established to facilitate Internet access in the Kingdom and what are the future plans of the Internet services?

(Due to the lack of literature, the following questions have been developed to elicit information in relation to Internet services.)

1. What policy regarding Internet services is now available and how is this policy decided?

2. Is an Internet service available in every part of the country?

3. What obstacles could you identify that are associated with providing Internet services?

4. What are the future plans of the Internet services?
ISP (Internet Service Provider)

Name:
Age:
Gender:
Qualification:
Position:
Responsibility:

1. What are the main functions of the ISP?

2. What major challenges currently face the ISP?


آمل الإجابة.

مع تحياتي وتقديري،
السلام

مدير عام
سليمان بن عبد اللطيف الصيف

P.O. Box: 2454 Riyadh 11451 Tel.: 4678125 Fax.: 4678126
سعادة الدكتور وكيل الجامعة للدراسات العليا والبحث العلمي
حفظه الله

السلام عليكم ورحمة الله وبركاته ... وبعد ،

يرفقه خطاب سعادة الدكتور رئيس قسم المكتبات والمعلومات رقم 10/5/0/10 بتاريخ 29/7/1422 هـ، المتعلق بالطلب المقدم من مبتعث القسم السيد / منصور بن علي الشهري، الذي يطلب فيه رغبته بالسماح له بتوزيع الاستمارات الخاصة بموضوع بحثه، (مرفق نسخة من الاستمارة).

أمل التكرم بالإطلاع وإكمال ما بقزم، ويرفقه كامل المعاملة.

وتقبلوا خالص التحية والتقدير ...”

أبو بكر

عميد كلية الآداب

د. رشود بن حمد الخريف

22/8/1425

خالد

4675389 Fax:46782828

P.O.Box 2456 Riyadh 11451
.chompal مصلحة الأحوال المدنية

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك سعود
الإدارة العامة
شؤون هيئة التحرير والموظفين

إلى من يهمه الأمر

تفيد الإدارة العامة لشؤون هيئة التدريس والموظفين بجامعة الملك سعود بأن
المبتكر منصور بن علي الشهري هو أحد مبرمجي الجامعة لدراسة الدكتوراه بجامعة لفترة في
بريطانيا ويقوم حالياً بحثية علمية إلى المملكة بجمع المعلومات المطلقة لدراسة
جداول إنشاء جامعة افتراضية من خلال شبكة الإنترنت).

وقد أعطي له هذا التعرف بناءً على طلبه بتقديمها إلى كلية الجامعة.

والله الموفق

مدير عام
شؤون هيئة التدريس والموظفين

سلمان بن عبد اللطيف السيف
الملكة العربية السعودية
وزارة التعليم العالي
جامعة الرياض
الإدارة العامة
لشؤون هيئة التحرير والموظفين

إلى من يهمه الأمر

تقرير الإدارة العامة لشؤون هيئة التدريس والموظفين بجامعة الملك سعود بأن
المتحدث/ منصور بن علي الشهري هو أحد موظفي الجامعة للدراسة الدكتوراه بجامعة لفهره في
بريطانيا ويقوم حالياً برحلة علمية إلى المملكة لجمع المعلومات المتعلقة برسالته التي عنوانها (دراسة
جدوى إنشاء جامعة إفراطية من خلال شبكة الإنترنت).
وقد أعطي له هذا التعرف بناءً على طلبه لنقدمه إلى مركز الدراسات الجامعية للبنات.

والله الموفق

مدير عام
شؤون هيئة التدريس والموظفين
سليمان بن عبد الله الطيف السيف

P.O. Box: 2454 Riyadh 11451 Tel.: 4678125 Fax.: 4678126 ص.ب.ب ٢٤٥٤ الرياض ١١٤٥١ تلفون: ١١٤٥١١٤٥٥٦٣٤٨١٢٣٤٨١٢٦، ٤٨١٢٣٤٨١٢٦
حفظه الله

سعادة مدير إعداد بكلية

السلام عليكم ورحمة الله

يرغب الاستاذ/ متصرف بن علي الشهري من قسم الكتب والمعلومات بكلية الآداب بجامعة الملك سعود بالرياض توزيع الاستبانة الخاصة بالبحث الذي يقوم به حالياً للحصول على درجة الدكتوراه في مجال تخصصه، ومن مناطق التواصل العلمي بين الجامعات السعودية.

ارجو التكرم.. فضلاً.. بتسهيل مهمته في توزيع الاستبانة على أعضاء هيئة التدريس بمساعدته في تعيين حقوقها لفرض البحث العلمي.

وتقبلوا خالص التحيات وتقدمي.

مدير مكتب وكيل الجامعة
للدراسات العليا والبحث العلمي

عبد الله بن حمدان العامري

E-Mail: KAUVPGSR @ KAU. EDU. SA
فضيلة عميد كلية الدعوة والإعلام
السلام عليكم ورحمة الله وبركاته

فوقاق تقدم إلى الجامعة الباحث/ منصور بن علي الشهري ، طالبًا السماح له بتوزيع الاستبيان المتعلقة بموضوع بحثه ليل درجة الدكتوراه بعنوان "مدى إمكانية إنشاء جامعة شبکية من خلال شبكة الإنترنت في المملكة العربية السعودية" على بعض أعضاء هيئة التدريس في الجامعة والموافقة وكيل الجامعة للدراسات العليا والبحث العلمي على ذلك.

فأمس الاطلاع فضيلتهم والتوجيه والسماح له بتوزيعها على بعض أعضاء هيئة التدريس لدينا.

فأنت شفاهك ذو وكيع
والسلام عليكم ورحمة الله وبركاته

عميد الدراسات العليا

أ.د. زيد بن عبد الكريم الزيد

الجامعة الإسلامية

graduate@imamu.edu.sa
السماح له بتوزيع الاستبانة المتعلقة بموضوع بحثه لنيل درجة الدكتوراه بعدوان "مدى إمكانية إنشاء جامعات شبكية من خلال شبكة الإنترنت في المملكة العربية السعودية" على بعض أعضاء هيئة التدريس في الجامعة. ولموافقة وكيل الجامعة للدراسات العليا والبحث العلمي على ذلك آمل اطلاع فضيلتكم والتوجيه بالسماح له بتوزيعها على بعض أعضاء هيئة التدريس لديكم.

والألمغب خفظكم وعينكم
والسلام عليكم ورحمة الله وبركاته

عميد الدراسات العليا
أ.د.ありがとう بن عبد الكريم الزيد

graduate@imamu.edu.sa
فضيلة عميد كلية اللغة العربية
السلام عليكم ورحمة الله وبركاته
فقد تقدم إلى الجامعة الباحث/ منصور بن علي الشهري، طالبًا السماح له بتوقيع الاستبانا المتعلقة بموضوع بحثه ليلد درجة الدكتوراه بهدف إنشاء جامعة شبكية من خلال شبكة الإنترنت في المملكة العربية السعودية على بعض أعضاء هيئة التدريس في الجامعة.
ولموافقة وكيل الجامعة للدراسات العليا والبحث العلمي على ذلك آمل اطلاع فضيلتكم والتوجيه بالسماح له بتوقيعها على بعض أعضاء هيئة التدريس لديكم.
والله خلفحكم ويرزقكم السلام عليكم ورحمة الله وبركاته

القيد.
عميد الدراسات العليا
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