

**E-learning in the KSA:
A taxonomy of learning methods in Saudi Arabia**

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Abstract

The advent and rapid advancement of the internet and the Information and Communication Technology (ICT) infrastructure as a whole has greatly revolutionised the world. The presence of this advanced technology has facilitated and eased communication and the relay of information. This has provided advantages for students and educators. Although the Saudi Arabian tertiary education system has been greatly transformed over the past couple of years, the most persistent challenge is how to access higher education. There is an urgent need for education delivery methods that take education beyond the traditional confines of campuses. Therefore, institutions of higher learning in Saudi Arabia have begun to explore various education delivery methods to identify the best course delivery methods for students. The introduction of e-learning will possibly increase the access to tertiary training and education. This study therefore investigates different multimodal delivery methods and technologies currently being employed by tertiary education institutions as well as the incorporation of technology into teaching practice to improve educational systems. This research is qualitative in nature and analyses published academic and industry literature. The research uses a qualitative approach in the development of a model and framework of the Saudi educational system. Symbolic Interactionism is used in the analysis of source material for the development of the model and the framework. The relevant data is collected and categorized through the building of a taxonomy. The study relies on a sample of 34 universities (24 government universities, 9 private universities and 1 public research university) and employs symbolic interactionism. There has been growth, and an increase in and subsequent use of information and technological innovations and ICT in the field of higher education in Saudi Arabia. In addition, the study has established that the learning management system (LMS) implemented relied on the type of university as well as the success rate of the program. The study concludes that the taxonomy of Saudi tertiary education system has six main features on which the system is based. These features have influenced the adoption and implementation of e-learning in the education system. The findings also

indicate that there is likely to be faster implementation and adoption of e-learning programs within the science-based courses than the social science and art courses and that should be considered to prevent institutional gender bias. There is also a higher probability of the adoption of e-learning within post-graduate courses, that is, master and doctoral degrees, than by lower level courses, bachelor degrees, certificates, and diplomas.

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Chapter 1: Introduction

Owing to rapid changes in the study methods, traditional print-based learning materials are undergoing a transformation. Learning has moved to online provision of off-campus learning methods which are more interactive, multimodal, and technology-based (Sadler-Smith, 2001). In these settings, technology is being used extensively through multimedia enhancements such as recorded lecture presentations, audio or video elements, diagrams and simulations which are enhanced with audio to make them more interactive, graphics, and quizzes. Information and Communication Technology (ICT) helps by combining several techniques that fit with various learning styles based on the content of knowledge and modal preference (Sankey, Birch, & Gardiner, 2010; Sadler-Smith, 2001). The number of online students has increased tremendously over the past few years, forcing learning institutions to give serious thought to the conversion of learning design that to suit various environments. With regard to these considerations, the challenge has been in bridging traditional and online learning, and in identifying how students should be supplied with learning resources. These challenges have raised basic educational concerns among faculties especially regarding what should be taught and how it should be taught. Consequently, many institutions of higher learning have adopted new approaches and techniques to the delivery and design of learning resources, which should be considered by the board of institution.

This study is an examination of the Saudi academic structure, and its current course delivery methods in the tertiary educational system. The study investigates how ICT can be used to improve educational systems in the KSA by exploiting the opportunities available for course delivery. The technologies currently being used by the institutions of higher learning in Saudi are discussed, including the multimodal delivery systems in teaching practice and how these can be used to improve educational systems.

The aims of this study are:

- i. To model the delivery techniques of courses in the educational systems of the KSA for the purpose of establishing the main characteristics of the academic structure;
- ii. To use published articles in building an e-learning taxonomy and the delivery techniques and technologies involved; and
- iii. To apply the taxonomy to the modelled educational system.

This study is a qualitative analysis of related literature and other published academic materials. For the development of the framework and model, Symbolic Interactionism is used in the analysis of material sources. Symbolic Interactionism is applied as a technique for analysing content. NVivo software is used to code and link ideas and to search and explore the data. Thereafter, taxonomies are built to organize a large set of identifiers' elements or nodes' classifications in a hierarchical order based on their properties which have been gathered from the analysis in order to apply them to the models.

1.1 Thesis Structure

Chapter 1 is the introduction that highlights the purpose and aims of the study, states the problem, the research questions, and the significance of the study. Chapter 2 is the literature review that outlines the background of the study to give the reader a perspective of the study. A comprehensive discussion of the emerging trends in higher education that have pushed the introduction of online learning platforms in the KSA is presented. Chapter 3, research methodology, includes the process of data collection and the tools that are used for data analysis. Chapter 4 examines the theoretical framework and the derived models. Chapter 5 is an interpretation, analysis and discussion of the results. The models used in the data presentation and analysis are discussed. Results of the analysis are then discussed in relation to findings from other studies. Chapter 6 explores the concepts exposed by the findings to present a new theory for this research. Chapter 7 summarizes the study,

identifies the study's limitations, draws conclusions and makes recommendations for future research.

1.2 Purpose of Study

Information and Communication Technology (ICT) is used in institutions of higher learning to inform and improve education systems through teaching practice. There are various types of technologies which are being explored by learning institutions with the aim of increasing opportunities for the delivery of courses to students. This study investigates multimodal delivery techniques and how technology is applied to teaching practice to develop and enhance educational systems. The study involves the tertiary educational system of the KSA.

1.3 Statement of Problem

In the Kingdom of Saudi Arabia (KSA), the population is growing rapidly and the number of students requiring higher education (education at universities and colleges) is increasing. The number of students is more than the number of available classrooms and the availability of instructors is also an issue of concern. Moreover, the government of the KSA requires higher education to be provided to all citizens. Increased use of ICT is a possible solution to these issues and this is investigated in this study.

1.4 Research Questions

Research questions based on the theoretical framework, objectives of the study, and the statement of the problem are stated below:

***RQ1.** What are the course delivery techniques and characteristics of the academic structure of the KSA's education system?*

***RQ2.** Can the delivery techniques be improved using available technologies and/or a suitable model and taxonomy?*

***RQ3.** What is the ideal learning model for the Saudi tertiary educational system?*

1.5 Significance of Study

The Saudi government is facing the challenge of supplying university education to an increasing number of students. Therefore, institutions of higher learning in the KSA are looking for methods which can be used to meet the education needs of students. The findings of this study can be applied by the Saudi tertiary education system and university faculties to identify the points of weakness in the education system and what can be done to improve them. This study helps to identify the setbacks in e-learning and the implementation of distance learning in Saudi higher education institutions. The institutions can review what they are currently doing and look to what they could or should be doing to improve faculty involvement and adoption of e-learning technologies. This is achieved by an investigation of the current status of e-learning, factors affecting it, and available opportunities, all of which have been systematically analysed in the study.

Chapter 2: Background and Literature Review

2.1 Introduction

Globally, higher education is faced with the challenge of providing better education for students with different needs, abilities and in different circumstances. For that reason, education experts and practitioners have made efforts to provide effective learning strategies and developed technological means using ICT. They start with strategies that help educators integrate technology into the classroom. Due to the fact that these approaches have been introduced gradually, a gap has been created between traditional on-campus, face-to-face learning and the new trend of off-campus, online learning known as e-learning. Moreover, any loss of communication between educators and learners due to e-learning has not been addressed in a pedagogic manner. The objectives of this research are; to explore the different kinds of technologies that are fundamental to online learning in the Kingdom of Saudi Arabia (KSA); to find opportunities for online course delivery; to investigate multi-model delivery methods which embrace on-campus, off-campus and blended learning, and finally, to address the incorporation of technology in current teaching practice to model and build a taxonomy of online delivery methods in the tertiary education system within the KSA.

Over the last 10 years, there has been an increased emphasis on exploring different kinds of delivery methods and technologies in order to expand opportunities for course delivery to students across the KSA. The tertiary education system in the KSA is, like all domains of Saudi Arabian public life, based on the complete separation of students and staff by gender. Therefore, educational institutions have to provide separate buildings and staff for their male and female students. This puts a considerable strain on available resources and accommodation. E-learning and distance learning technologies open up a new mode of education delivery for many Saudi educational institutions, which allows students to utilise a learning option which may better suit their learning style. For example, students who are unable to attend traditional classes are now able to learn off-

site, while Saudi women are offered more flexibility and course options while maintaining their own cultural values and traditions.

In Chapter 2, the background of the research is presented. The chapter also includes a review of education in the KSA, a discussion of the types of universities in the KSA and the emerging trends in higher education that have pushed the Saudi tertiary system to explore different delivery methods and technologies such as e-learning and distance learning. Finally, this chapter reviews literature related to the subject matter such as face-to-face learning, online learning, distance learning and blended learning methods.

2.2 Education in the KSA

In Section 2.2, a background description of the education in the KSA and the establishment of the Ministry of Higher Education (MOHE) are presented as well as an overview of university types in the KSA.

2.2.1 Higher education in Saudi Arabia

In 1932, the KSA was established with an educational program that included 12 schools with approximately 700 students. However, after oil was discovered in 1938, this situation changed dramatically. By 1950 there were 365 schools and approximately 42,000 students (Simmons, Simmons & Allah, 1994, as cited in Alamri, 2011). In 1954, the Ministry of Education was established offering education at all levels – although for men only. In 1957, the KSA's first university was established in Riyadh, allowing students to study in their own country rather than being sent overseas to receive a higher education (Alamri, 2011; Jamjoom, 2012). King Saud University was again for men only; however, in 1960, after King Saud had discussed the issue of educating women in Saudi Arabia with many religious scholars, the first school for girls was established in Riyadh (Rawaf & Simmons, 1991). While there are now a large number of schools for both men and women, gender segregation continues.

After King Saud University was established in 1957, six more universities were established in the KSA between 1961 and 1975. The new government universities were established in the major cities of Jeddah, Medinah, Riyadh, Makkah, Al-Hasa and Dhahran. Several campuses of these government universities were then created in a few cities, including Al-Hasa, Abha, Jazan and Qassim (Jamjoom, 2012). As a consequence of this growth, the MOHE was established in 1975 to oversee the execution of educational programmes and policies in tertiary institutions both internally and externally (MOHE, 2011). Part of the MOHE's objectives is to ensure that all the patterns and procedures of these educational systems are adopted according to Islamic systems, traditions and customs (Saudi Arabian Cultural Mission to the USA, 2006). Table 2.1 presents the 24 government universities and their year of establishment. It shows that 16 new government universities have been created since 1999. However, according to Jamjoom (2012), the establishment of King Khalid University was an outcome of two local branches of two universities coming together in 1999 – the southern branches of Imam Mohammed bin Saud Islamic University and King Saud University – rather than the birth of a new institution. New universities established between 2002 and 2010 were also a result of the merger of branches of existing universities (Jamjoom, 2012). This type of merger led to the establishment of universities such as Taif University, Jazan University and Al-Baha University.

The total budget for higher education in the KSA was US\$2.5 billion in 1985 but has increased significantly as the price of the oil has increased and is now US\$40 billion – 46 per cent of the total national budget (US-Saudi Arabian Business Council, 2012). According to Lindsey (2010), the budget for education and training will be US\$200 billion by 2014.

The first private university in the KSA was King Abdulaziz University (KAU) (Jamjoom, 2012). KAU became a government university in 1971 after operating as a private institution since 1967. As a private university KAU was financed by a number of Saudi businesses with minimal support from the Saudi government. However, business finance proved insufficient to maintain the venture and, as a result, the university board requested the KSA government to run the institution as

a government university in 1971 (Batarfy, 2005). Between 1971 and 2000 private universities did not exist in the KSA. However, the possibility was revisited in 1998 with approval from the Council of Ministers that private universities could be re-established (MOHE, 2012b). According to Jamjoom (2012), the delay in re-establishing private universities reflected the Saudi government's concern for the quality of higher education, something it believed had been compromised by private universities in a number of other countries. However, Jamjoom also points out that, "This delay was also perceived negatively as demonstrating a lack of planning and the absence of vision on the part of policymakers" (p. 207).

Table 2.1 Foundation date and location of Saudi government universities (MOHE, 2012a).

Abbreviation	University	Foundation	Location
KSU	King Saud University	1957	Riyadh
IU	Islamic University of Medina	1961	Medinah
KFUPM	King Fahd University for Petroleum and Minerals	1963	Dhahran
KAU	King Abdulaziz University	1967	Jeddah
UAU	Umm Al-Qura University	1967	Makkah
IMAMU	Imam Muhammad bin Saud Islamic University	1974	Riyadh
KFU	King Faisal University	1975	Al-Hasa
KKU	King Khalid University	1999	Abha
Taibah U	Taibah University	2003	Medina
TU	Taif University	2003	Taif
QU	Qassim University	2004	Al-Qassim
UoH	University of Hail	2005	Hail
JU	Jazan University	2005	Jazan
AJU	Al-Jawf University	2005	Sakakah
KSUHS	King Saud bin Abdulaziz University for Health Sciences	2005	Riyadh
BU	Al-Baha University	2006	Al-Baha
UT	University of Tabuk	2006	Tabuk
NU	Najran University	2006	Najran
NBU	Northern Borders University	2007	Arar
PNAU	Princess Nora bint Abdulrahman University	2007	Riyadh
UD	University of Dammam	2009	Dammam
SAU	Salman bin Abdulaziz University	2009	Al Kharj
SU	Shaqra University	2010	Shagra
MU	Al-Majma'ah University	2010	Al-Majma'ah

Two private universities in Riyadh and Jeddah were subsequently opened in 2001, providing a new form of higher education in the KSA. These private universities helped meet the huge demand for higher education, offering high quality education in line with the government universities. Despite the provision of private universities there are still a large number of Saudi students who pursue higher education abroad. Studying abroad is perceived as a sound solution to the problem of over-strained local tertiary institutions; however, it should not be seen as a long-term solution and the Saudi tertiary sector needs to face enlarging its intake capability. Table 2.2 provides a list of private universities in the KSA, their location and foundation date.

Table 2.2 Foundation date and location of Saudi private universities (MOHE, 2013).

Abbreviation	University	Foundation	Location
PSU	Prince Sultan University	2001	Riyadh
EU	Effat University	2001	Jeddah
AOU	Arab Open University	2003	Riyadh
YU	Al Yamamah University	2004	Riyadh
FSU	Fahad Bin Sultan University	2006	Tabuk
PMFU	Prince Mohammad Bin Fahd University	2007	Al Khobar
FU	Alfaisal University	2008	Riyadh
DAU	Dar Al-Uloom University	2009	Riyadh
SEU	Saudi Electronic University	2011	Riyadh

Private universities in the KSA are owned by companies and not-for-profit organisations rather than individuals. The Saudi government waived the restriction on for-profit tertiary institutions after the establishment of private universities. The government offers equal support to both types of tertiary institution and both institutions must meet the requirements stipulated by government regulations. Initially, most private universities were small colleges, with about seven becoming universities, as a condition of becoming an independent university in the KSA is to have three or more colleges (Jamjoom, 2012). The higher education budget allocation in the KSA has increased by more than 200% from around US\$3 billion in 2005 to around US\$9 billion in 2009 (MOHE, 2011). This has assisted the further expansion and development of the higher education system. The establishment of King Abdullah University of Science and Technology (KAUST) in 2010, a public research

university located in Thuwal, was as a result of these government efforts. This university focuses solely on research and post graduate education and uses English as the language of instruction. KAUST offers programmes in computer sciences, life sciences, physical sciences and engineering. This university differs from most private institutions which focus on teaching rather than research (Jamjoom, 2012).

Currently, there are 24 government universities, 9 private universities and 1 public research university having more than 900,000 students in total. In addition to this, there are approximately 120,000 Saudi students and government scholarships studying at higher education institutions around the world (MOHE, 2011).

Figure 2.1 shows how universities are distributed within the KSA. It can be seen that there are more than one university has been built in each different region to permit students to find a local university to enrol in and enable students to find more opportunities for course delivery in the KSA.

In the KSA, admission to elementary and secondary education is offered free of charge to all Saudis and non-Saudi students. However, free admission to higher education institutions, especially to government universities, is for Saudi citizens only, and the students are also given monthly stipends. The admission criteria and requirements are nearly the same for all government universities in the KSA for both male and female students; however, this differs for private universities. While most government institutions are free for all students, private universities charge a high tuition fee. The admission standards also differ between government and private universities: admission to all government universities in the KSA is determined by the applicant's Grade Point Average (GPA), while admission standards in private universities are less rigorous (Jamjoom, 2012). The GPA is a mixture of secondary school grades and the results of a chain of standardised tests.

As a growing country, Saudi Arabia has one of the highest birth rates in the world with over 50 per cent of the population under the age of 20 (Ali, Sait & Al-Tawil, 2003). According to the 2010 Population Census, the population of the KSA was 29,195,895 in that year, with Saudis

comprising 19,838,448 of the total (Central Department of Statistics and Information, 2012). The growing population accounts for the large number of students enrolling in the KSA's universities. According to Ali et al., (2003), the growth rate capacity of these universities "doesn't match the current growth rate in enrolment demand" (p. 393). This means that there is a great demand for other solutions that support educational demands, not only in higher education, but also in public grade schools.

The universities and colleges of the KSA offer Diplomas, Bachelors, Masters and PhD degrees in both science and humanities. The bachelor degree involves four years of study in both the humanities and the social sciences and five to seven years of study in the field of medicine, pharmacy and engineering. English is used as the medium of instruction in the fields of technology and science; however, all other subjects are taught in Arabic (Sedgwick, 2001; Saudi Arabian Cultural Mission to the USA, n.d.).

2.2.2 Types of education in Saudi universities

Sedgwick (2001) and Krieger (2007) argue that there are two types of education in Saudi universities: traditional Islamic education and Western-oriented education. Most public and private universities offer a variety of subjects; however, the Islamic University of Medina and Imam Muhammad bin Saud Islamic University focus more on Islamic law, Islamic sciences, Quranic studies, Arabic language and social sciences (Rugh, 2002). Not all subjects are offered to women; they are able to access limited qualifications in areas such as medicine, nursing, agriculture, nutrition, home economics and education (Hamdan, 2005). According to Abalhassan (2007), government universities are starting to offer more courses to female students, including study in traditionally male areas such as engineering, architecture and law.

2.2.3 National Centre for E-learning and Distance Learning (NCEL)

With an increased allocation of funds from the MOHE to develop the education system, many universities have begun to develop and improve their ICT infrastructure (AlMegren, 2011). The incorporation of technology in the delivery of academic coursework, including an increasing utilization of the Internet, has enabled Saudi universities to offer a convenient and appropriate method for course delivery (Al Saif, 2005; Alkhalaf, Nguyen, Nguyen, & Drew, 2011; Alzahrani & Woollard, 2012). In 2007, the MOHE responded by establishing the National Centre for E-learning and Distance Learning (NCEL). This centre focuses on the many projects that encourage Saudi universities to facilitate educational contiguity through the optimal use of information and communication technology (MOHE, 2011). The NCEL also assists higher education institutions with all the technology and training needed to offer online classes. Consequently, the NCEL has established The Saudi Centre for Support and Counselling (SANEED) to provide educational and academic support, recommendations and assistance to all beneficiaries of e-learning (NCEL, 2012c). The NCEL has also started several projects that aim to enhance e-learning in Saudi universities: for example, Jusur was created to provide learning management features in Arabic for Saudi institutions. Jusur also has a Learning Content Management System (LCMS) which helps to enhance the value of E-learning content delivery by offering a scalable platform to deliver proprietary knowledge to individual learners and researchers (NCEL, 2012a).

Many services are provided by the NCEL to enhance e-learning in Saudi. All these services are available to assist higher education institutions with all technological and training needs. A summary of the services provided by the NCEL is shown in Table 2.3 (NCEL, 2012d).

Table 2.3 Services provided by the NCEL.

Logo	Service Name	Description
	Saudi Digital Library	<ul style="list-style-type: none"> • A pioneer project that aims to: <ul style="list-style-type: none"> ○ Cover the requirements of scientific research ○ Empower competency and build a knowledge-based society ○ Support the digital curricula with sources and resources important to both learner and teacher. ○ Improve and expand awareness levels and facilitate sharing of information. ○ Provide digital books and resources from leading publishing houses
	Jusur	<ul style="list-style-type: none"> • A Learning Management System (LMS) that helps to: <ul style="list-style-type: none"> ○ Register students in the portal ○ Plan and schedule courses ○ Deliver courses ○ Track students' progress and issue reports for their performance ○ Evaluate and test student's through quizzes and examinations
	SANEED	<ul style="list-style-type: none"> • A Centre for support and counselling that provides: <ul style="list-style-type: none"> ○ Educational, academic and advisory support and guidance to all beneficiaries of e-learning ○ Solutions and services to its customers through: <ul style="list-style-type: none"> ▪ live voice connection, email and SMS
	MAKNAZ	<ul style="list-style-type: none"> • an electronic national repository that helps to: <ul style="list-style-type: none"> ○ develop digital content ○ enrich the curricula ○ retrieve, reuse and share learning objects
	Training Programs	<ul style="list-style-type: none"> • A project that aims to: <ul style="list-style-type: none"> ○ Provide training to faculty members and administrators as well as technical staff. ○ Collaborate with local and international experts to present basic programs to more advanced and professional programs for trainers.

2.3 Learning Approaches.

Section 2.3 provides an overview of learning approaches that are currently applied in the KSA in order to introduce and define the main of course delivery methods in the Saudi tertiary educational system.

Generally speaking, there are two main styles of delivery of educational courses, first, on-campus, also known as face-to-face, courses which are delivered by educators in the classroom; the second, the new trend in distance/off-campus or online courses. The latter, does not require learners to attend classes as all courses are delivered and assessed online. Currently, there is also a mix of both types of course delivery, known as blended learning, which includes both on-campus and off-campus courses.

First of all, face-to-face or traditional classroom learning is the traditional learning approach, which has always been popular and will continue to be so as humans learn from humans (Bleimann, 2004). This type of learning allows learners and instructors to directly communicate with each other in physical proximity. It allows the interpretation of and reaction to facial expression as well as the possibility of instant feedback. However, face-to-face course delivery has some limitations in terms of accessibility and availability of electronic technology as well as limitation in time and location (2004)

On the other hand, online learning, also known as e-learning, involves the use of technology to teach and learn from a distance (Ruiz, Mintzer & Leipzig, 2006). There are two basic delivery systems for online education, based on how and when interactions with others occur. The first is synchronous instruction, which requires simultaneous interaction from all students and instructors. This type of delivery system provides learners with *real time* education. The second is asynchronous learning, which does not require students to participate at the same time; rather, they can choose their learning time based on their own schedules. They can communicate with their

peers or their instructors by leaving messages that can be answered later (Alsadoon, 2009; Betts, 1998).

According to Urdan and Weggen (2000), e-learning is defined as a learning model that delivers course content via electronic means such as the Internet, extranet, intranet, broadcast, satellite, audio/video, interactive TV and CD-ROMs. The most popular definition of e-learning is developed by Rosenberg (2001), who states that e-learning refers to the use of internet technologies to deliver a broad array of solutions that enhance knowledge and performance. Roffe (2002) supports Rosenberg's definition and states that e-learning or online learning is as a way for people to communicate and learn electronically. This has only recently emerged as a key source of competitive advantage in information societies. Rosenberg also states that e-learning is based on three fundamental criteria. That is, e-learning is:

1. Networked, making it capable of instant updating, storage/retrieval, distribution and sharing of instruction or information;
2. Delivered to the end-user via a computer using standard internet technology; and
3. Focused on the broadest view of learning so that learning solutions can go beyond the traditional paradigms of training.

According to Ally (2008), different terms have been used to describe online learning, which makes it difficult to develop a standard definition. These terms include e-learning, internet learning, distributed learning, networked learning, web-based learning, virtual learning and distance learning. Terms such as e-learning, technology-based learning and web-based learning are defined and used differently by different organisations and user groups (Roffe, 2002). Khan (1997) defined online instruction as an innovative approach for delivering instruction to distant learners using the Internet as the medium. However, Ally argues that online learning involves more than just presenting or delivering instruction to learners via the web. He explains that the learner and the learning process are more important than the medium that is used for delivering instruction, and therefore these

should be the focus of online learning. Thus, Ally supports Urdan and Weggen' definition and say online learning is:

The use of the Internet to access learning materials; to interact with the content, instructor, and other learners; and to obtain support during the learning process in order to acquire knowledge, to construct personal meaning, and to grow from the learning experience (2008, p. 17).

Another style of course delivery is blended learning. The most common definition of blended learning refers to the integration of online activities and traditional face-to-face class activities (Sharpe, Benfield, Roberts & Francis, 2006; Mayadas & Picciano, 2007).

In the following sections, e-learning, LMS and distance education are clarified and discussed in detail in order to introduce and define blended learning, which is the third style of course delivery in the KSA.

2.3.1 E-learning

Since 2002, the word of e-learning has become an umbrella term that covers web-based instruction, online learning, networked learning, computer-assisted learning and computer-mediated learning (Littlejohn & Pegler, 2007). As identified in the eclipse diagram in Figure 2.2, all of these terms refer to the use of information and communications technologies in learning. E-learning is based on ICT, which is derived from Information Technology (IT) (Hill, 2008).

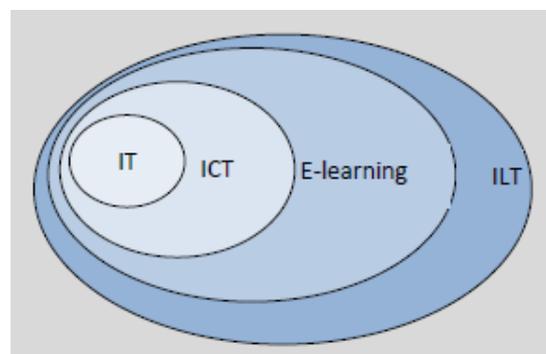


Figure 2.2 Relationship between Information Technology (IT), Information Technology and Communication (ICT), e-learning, and Information and Learning Technologies (ILT) (Powell, Knight & Smith, 2003, p. 4).

In an e-learning environment, the student is usually not present in the classroom but interacts virtually with the instructors and tutors using technology (Warschauer, 1997). In general, e-learning allows learning in situations where both the teacher and the student are separated by time, distance or both (Cook, Ley, Crawford & Warner, 2009). According to Bannan-Ritland (2002), e-learning counters the negative effect of distance on knowledge acquisition. It was also established to provide convenience, to overcome the problem of inadequacy of resources, to diminish overpopulated educational institutions, and to augment traditional teaching methods (Coventry, 2002). Numerous public, private, profit and not-for-profit organisations are now using e-learning throughout all levels of education. The speed at which e-learning is being adopted shows how useful it is perceived to be (Kim & Bonk, 2006).

When teaching online, instructors have the option of using either or both of an asynchronous or synchronous delivery method. Naidu (2006) points out that e-learning incorporates all educational activities that are carried out by individuals or groups working online or offline, synchronously or asynchronously via networked or standalone computers and other electronic devices. Making decisions on how instructors deliver instruction to students impacts on their content's design, as well as their teaching practice.

According to Khan (1997), online instruction is an innovative approach for delivering classroom instruction to a remote audience, using the Web as the medium. There are many benefits to using online instruction as an effective method of learning. This type of learning enables students to learn in a way that is based on their preferences and needs. One of the most important benefits of using online instruction is its flexibility in providing learning at any time. In addition, online instruction helps students who are not able to maintain regular study schedules due to obstacles such as learning disabilities, family or work commitments.

The Indian Management Academy (n.d.) describes online education learning:

Offering online courses gives students more choices in their learning. For instance, a course may not be able to attract enough students at any one location to offer it, but can when students from all those locations are added together. Online courses allow instructors to serve students who live too far away to attend face-to-face courses. The unique nature of the Web, including hypertext and multimedia, offers new ways of presenting course material and allowing students to interact with it that can improve student understanding.

Hansen (n.d.) identifies some disadvantages or factors that could negatively affect the success of distance education:

Online learning will not provide students with personalised attention from the teacher because both teachers and learners interact in a virtual environment. Teachers and students are required to use and interact with the computing environment; some students do not like computers or are afraid of using new technology. Students who need extra time to complete their assignments and projects may struggle because most online activities have a time limit, for example online quizzes and online discussions.

Previously, it was difficult to deploy completely online courses in Saudi Arabia, as there was limited technical support and there was no official LMS available for universities, but with e-learning now becoming more important the MOHE manages and provides all universities with access to an LMS. In addition, teachers can develop online teaching skills by attending workshops and training courses to overcome the barriers mentioned above. Students also need to be aware of the advantages and disadvantages of online instruction and decide whether or not this type of learning is appropriate and effective for them.

2.3.2 Learning management system

The LMS is the fourth generation system in the e-learning field. It has three main features: the retrieval of large amounts of information, the ability to interact via Computer-Mediated Communication (CMC), and the possibilities afforded by fourth generation computing languages.

These characteristics facilitate the creation of new e-learning technologies such as WebCT, Blackboard, Moodle, and Lotus Notes (Garrison & Anderson, 2003).

LMS or Virtual Learning Environment (VLE) or Course Management Systems (CMS) is one of the solutions useful for both students and instructors in e-learning environments (Altun, Gulbahar & Madran, 2008; Chang, 2008; Falvo & Johnson, 2007). The LMS is defined as a Web-based technology that assists in the planning, distribution and evaluation of a specific learning process (Alias & Zainuddin, 2005). Sallum (2008) describes an LMS as a high solution package that allows for the delivery and administration of content and resources to all students and employees. This system contains software applications and features that make learning content easily accessible and manageable. In addition, an LMS helps instructors to provide students with learning material and manage student data.

An LMS or CMS is an integrated tool for the management of the educational processes via the Internet (Brusilovsky, 2004). An LMS is commonly considered as the foundation of any Web-based learning programme because it provides a platform for a learning environment by enabling the delivery of material, it keeps track of learning and testing, provides synchronous and asynchronous communication tools simultaneously, and supports registration processes and study schedules (Cavus & Ibrahim, 2007; Cavus, 2010).

With the development of e-learning systems, LMS has become a reliable means of teaching and training. An LMS is used in most universities around the world for managing courses and learning content. Jones, Morales and Knezek (2005) finds that 90 per cent of universities in the United States offer programmes through LMS. Teaching via an LMS ensures effectiveness in both teaching practice and student learning (Santos, Boticario, Campo & Saneiro, 2007).

Using an LMS or CMS also positively affects the attitude of faculty members towards special-needs students. According to Pollock (2009) the LMS provides knowledge about students with special needs and methods for dealing with them through a variety of teaching strategies.

The Cavus, Uzunboylyu and Ibrahim (2006) study, investigating the effectiveness of using an LMS and collaborative tools in the Web-based teaching of programming languages, indicates that an LMS is more efficient and effective if it is equipped with a collaborative learning tool. Zouhair (2010) evaluates the level of students' satisfaction and corresponding instructors after using the Jusur LMS. From the students' perspective, the Jusur LMS is a helpful tool that enhances their understanding of course content. The instructors say the Jusur LMS is easy to use and provides instructors and students with a single access point to different features. Figure 2.3 shows the Jusur homepage.



Figure 2.3 Home page of the Jusur LMS (Zouhair, 2010).

Similarly, Hussein's (2011) study of the attitudes of Saudi university faculties toward using the Jusur LMS shows that there is a positive attitude toward using it. At the same time, the results indicate that faculty need a training programme to use Jusur LMS effectively since the majority of participants do not have adequate skills to develop online courses.

2.3.3 Distance education

The field of distance education has changed rapidly during the last decade as educational programmes where learners and instructors are separated by place, and usually by time, become the most rapidly growing form of education throughout the world (Gunawardena & Mclsaac, 2004; Tracey & Richey, 2005). As a result of the rapid development of educational technology, many courses are delivered to potential students in various locations to respond to the increasing demand for higher education. This development in technology enables higher education institutions to provide specialised courses to students who are geographically distant, with increasing interaction between students and teachers and among students themselves (Gunawardena & Mclsaac, 2004). With increased infrastructure, the Internet, Web-based education and distance education has spread to across the world. Computer systems and their related functions help students to learn multiple subjects through the use of software programs (Moisseeva, 2011). CMSs such as Blackboard, Web CT, and desire2learn allow universities to increase the number of online courses and online degree programmes (Schlosser & Simonson, 2010). Web-based instruction allows both synchronous and asynchronous interaction, and supports student-student, student-content, and student-instructor communication (Moore & Kearsley, 2005). Internet-based courses also hold the potential to deliver more effective and dynamic course materials (Moisseeva, 2011).

The shift in distance education from correspondence (via traditional mail) to online instruction increases the number of course programmes and degrees due to the seemingly larger number of students willing to continue their education online. For example, in the United States, the number of higher education institutions providing distance education increased from 33 per cent to 44 per cent between 1995 and 1998. The increase in enrolments led to a larger number of online degree programmes from 690 programmes in 1995 to 1,190 programmes in 1997/1998 (Mehrotra, Hollister & McGahey, 2001). During this rapid growth period, two generations of distance media were employed: one-way print, radio, TV and audiocassettes, videotapes and fax, followed by two-

way interactive technology such as interactive video conferencing and Web-based courses (Matthews, 2002).

2.3.4 Blended learning

Blended learning is defined as an approach whereby both face-to-face and online learning are made better by the presence of the other (Garrison & Vaughan, 2008). Graham (2006) defines blended learning as a learning system combining face-to-face instruction with technology-mediated instruction (See Figure 2.4).

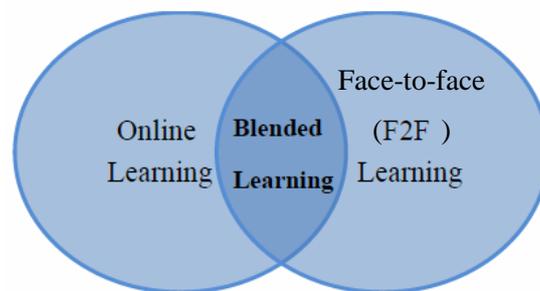


Figure 2.4 A diagram of the blended learning definition (Alebaikan, 2010, p. 5).

Figure 2.4 illustrates how blended learning merges two types of learning to provide a mixed environment. Lynch and Dembo (2004) point out that blended learning, as distributed education, represents an eclectic blend of technologies and modalities to enable both synchronous (real time) and asynchronous (anytime) teacher-learner and learner-learner interactions in a single course or programme. Graham (2009) states that “In higher education, the term 'hybrid learning' was often used prior to the emergence of the term 'blended learning,' and now the two terms are used interchangeably” (2009, p. 375).

Most people recognise that the convergence of classroom and communications technology has the potential to transform higher education for the better (Garrison & Vaughan, 2008). However, Driscoll (2002) reports that blended learning solutions are a great way to introduce an organisation to e-learning. She states that ‘blended learning’ refers to four different concepts and means different things to different people, as it combines:

1. modes of Web-based technology (for example, live virtual classroom, self-paced instruction, collaborative learning, streaming video, audio and text) to accomplish an educational goal;
2. various pedagogical approaches (for example, constructivism, behaviourism and cognitivism) to produce an optimal learning outcome with or without instructional technology;
3. any form of instructional technology (for example, videotape, CD-ROM, Web-based training, film) with face-to-face instructor-led training; and
4. instructional technology with actual job tasks in order to create a harmonious effect on learning and working.

Garrison and Vaughan (2008) note that “the past is the future if we examine the ideals of higher education and recognize the need to critically examine current practices in higher education and the potential of communications technology to support intense, varied, and continuous engagement in the learning process” (p. ix).

Using blended learning can benefit the learner, the staff, and the organisation as it allows organisations to gradually move learners from traditional classrooms to e-learning in small steps making change easier to accept (Driscoll, 2002).

Dziuban, Moskal and Hartman (2005) state that in the recent decades, rapid technological innovation has facilitated a convergence between traditional face-to-face and technology-mediated learning environments. Since blended learning combines the two environments, teacher and learner can take advantage of the strengths of both learning environments (Graham, 2006).

2.4 Online Learning in the Saudi Tertiary Educational System

Section 2.4 provides an overview of online education in the KSA and the emergence of e-learning and distance learning tools. A brief analysis of blended learning will also be presented.

2.4.1 E-learning in Saudi Arabia

Over the last century, educational processes in the KSA have undergone numerous changes. Recently, the education system within the KSA has started to move from printed learning or face-to-face learning to include interactive e-learning, made easier by continuing technological change in the KSA and throughout the world (Alharbi, 2002). Almohaisen (2007) maintains that e-learning will totally transform the teaching process, although the rate at which this will happen is dependent on the perceptions of teachers. He argues that adoption of e-learning technology is inevitable within the KSA, due to judging by its impact observed on educational systems throughout the world. Already, e-learning modes, such as distance learning, are reshaping today's educational systems in the KSA. E-learning offers students new ways of learning while providing teachers with new ways of teaching, and administrators with new ways of organizing the educational system (Abouchedid, & Eid, 2004; Almohaisen, 2007).

There are five reasons why Saudi universities' adoption of e-learning is important. Firstly, a shortage of Saudi faculty members and an increasing number of students. Secondly, maintaining separate male and female colleges has led to a severe shortage of female faculty members, thereby necessitating the adoption of e-learning. According to Al-Sarrani (2010), e-learning is cost effective and allows for a culturally acceptable environment wherein male faculty members are able to teach female students through non face-to-face interaction. Thirdly, the Saudi government is supportive of e-learning in higher education institutions and the formation of the NCEL has greatly promoted e-learning within the country (Al-Kethery, 2006; Chanchary & Samiul, 2011). Fourthly, the widespread use of computers and the internet means that education in the KSA can now be much more easily accessed (Al- Khalifa, 2008), giving opportunity to those who would otherwise have missed out (Almegren, Al-Yafei & Hashem, 2007). Fifthly, the growing number of students, including women, and the desire to use technology to compete internationally make the appeal of distance learning even greater.

Aljabre (2012) suggests that distance learning can resolve many of the issues facing the KSA's higher educational system. While e-learning is beneficial on a national level, there are also great benefits for the individual. Distance learning allows a more flexible schedule and the ability to self-pace. It also increases people's access to higher education, including working professionals and women. Aljabre comments that "Distance learning has all of the components to be a vital element in higher education; however that is, of course, if culture is considered and the most advanced technology is used" (2012, p. 134).

A number of factors mean that better use of distance learning and an effective e-learning program in the KSA is needed. The increase in enrolment at universities, specifically the increase in female students, means that distance learning and e-learning programs are needed in addition to traditional courses at Saudi Arabian universities. A study by Al-Sultan (1993), cited in Altowaijry (2005), shows the number of high school students who have been denied access to higher education. In 1993, 70,000 high school students graduated and 2,000 were unable to proceed to a higher education institute. However, in 2003 more than 200,000 students graduated and over 12,000 students were unable to find a place in higher education. The increase from 2.88 per cent to 6 per cent indicates a widening gap between the number of students graduating from high school and the number of students admitted to institute higher learning. There is a clear need for a solution that allows all students access to higher education.

2.4.2 Distance education in Saudi Arabia

Saudi Arabia is expanding in terms of population, very quickly. According to UNESCO (2010), in 2010 the population of Saudi Arabia was 27,448,000 with an average annual growth of 2.4 per cent. A major concern linked with this rapid growth in the population is the limited capacity of the existing higher education system to provide education to high school students as well as other prospective students (Al-Arfaj, 2001). The KSA's needs for employees are mostly catered for by foreign workers especially those with science majors. Saudi college graduates are only able to meet a fifth of the KSA's employment needs. For example, according to Abdullah (2010), the KSA

requires an average of 60,000 pharmacists each year, out of which only a 100 seats are filled by Saudi students.

Previously the Ministry of Higher Education took to building new colleges and universities in response to this problem. Although to an extent it helped make room for more local students to enrol into higher studies programmes, on a larger scale, this solution was very expensive and impractical, especially in the current global financial situation (Al-Erieni, 1999; Al Saif, 2005; Albalawi, 2007).

Moreover, there are many students who either work during the day or are geographically distant and are thus unable to attend face-to-face courses (Al Saif, 2005); in which case the solution would be the adoption of distance education and e-learning. Abdullah (2010) argues, "... why spend billions on the construction of new universities and proceed with such a time-consuming plan instead of utilizing distance education and the graduates it can produce to fill the shortage of local talent?" (P.5)

Until two years ago, the distance education programmes offered by Saudi institutions were correspondence-based which required the students to receive course materials at home and post assignments to their instructors. However, this form of distance education failed because the process was time consuming and limited the interaction between the student and instructor (Al-Aljabre, 2012). For a long time, this was the only acceptable distance education method formally accredited by the Ministry of Higher Education. However, with the call for a national plan implementing IT based facilities by Abdullah bin Abdulaziz, the Saudi King, in 2005 this trend finally changed across the kingdom. The core of this plan is to implement distance education programmes and integrate online technologies in higher education platforms (Saudi Ministry of Communications and Information Technology, 2005). In addition to this, the national plan also calls for the establishment of a national centre offering consultancy for universities seeking to adopt distance education. The primary mission of this centre is defined as:

... preparing the regulations and policies governing the e-learning process, formulate a unified model for e-learning using standard specifications, develop quality assurance standards for e-learning, issue quality assurance certificates for e-learning systems, and measure the efficiency of various technologies as aids for the e-learning process (Saudi Ministry of Communications and Information Technology, 2005, p.75).

As a result, the NCEL was founded in Riyadh in 2006. The NCEL has several goals:

1. Expand the use of online educational applications for higher studies at institutions;
2. Support distance education and online learning for research;
3. Provide online teaching and study consultancy;
4. Arrange seminars, conferences and workshops related to online learning; and
5. Design and publish online courses (NCEL, 2012b).

With the establishment of its Deanship and Faculty of Distance Education in 2006, King Abdulaziz University (KAU) became the first government university to introduce distance education programmes (Al Saif, 2005; Albalawi, 2007; Alsadoon, 2009). These programmes were offered by two faculties at KAU: the Faculty of Arts and Humanities and the Faculty of Economics and Administration (Abdullah, 2010). According to the Dean of the Distance Learning Faculty at KAU, Dr. Hisham Bardesi, during the academic year 2009-2010 Saudi students joined the KAU online courses with a 200 per cent increase in enrolment (Abdullah, 2010). The oldest university in Saudi Arabia, King Saud University (KSU), also established a Deanship of e-Learning and Distance Education (DED) and adopted distance education in 2008. Its mission is to put the regulations for online learning and distance education in place while supporting faculty members by offering them essential technological support and training (Alsadoon, 2009).

Other government universities have also started to adopt Distance Education (DE) as a method for delivering instruction, on a smaller scale, however. Examples of these universities are those included in this study: King Faisal University (KFU), Imam Mohammed bin Saud Islamic University (IMAMU), Damman University (DU), Jazan University (JU), Al-Jawf University

(AJU), University of Tabuk (UoT) and Najran University (NU). Despite having established dedicated DE units, universities seldom utilise these units and offer full DE courses. Several of these universities lack online education programmes. Research verifies that, a majority of the Saudi universities do not offer online DE courses and also lack systematic integration plans for these types of education methods. This has led to severe criticism of the slow adoption of online instruction by Saudi institutions (Abdullah, 2010).

2.4.2.1 E-learning and distance learning tools in the KSA

The use of online education, specifically distance learning programs, is however starting to take off in the KSA; but there is room for improvement and expansion. It is important to first evaluate the current status of e-learning programs in the KSA. Saudi Electronic University (SEU) is an example of a new model of learning that uses e-learning and distance education. This university was established in 2011 as a new provider of higher education and its certification is equivalent to that of other Saudi universities. Its graduates have the same opportunities as regular Saudi university graduates in terms of future career (Saudi Electronic University, n.d.). Currently, SEU has branches in four cities: Riyadh, Jeddah, Dammam and Al-Medina. Study is in English, and students are required to attend on-campus-classes for 25 per cent of the semester. SEU uses the Blackboard system, a management system which offers functionality and significantly enhanced collaborative learning opportunities (Saudi Electronic University to use Blackboard eLearning solutions, 2012). SEU offers undergraduate programmes, and one Master of Business Administration (MBA) degree (Saudi Electronic University, n.d.).

A few years ago, two universities, King Fahd University of Petroleum and Minerals and King Abdulaziz University, established e-learning centres that helped their faculties to develop interactive web-based supplementary material for traditional courses. KAU was the first Saudi university to employ a virtual learning environment to offer bachelor degrees through an online learning system named *Centra* (Al-Khalifa, 2010; King Abdulaziz University, 2012b). Imam Muhammad Bin Saud University began offering a distance learning programme that delivers

instruction entirely through the Internet in August 2007 (Imam University goes online with distance learning, 2008, June 13). In addition, some universities and institutions have also provided different commercial VLE and LMS applications such as Moodle, Blackboard, Web CT and JUSUR to facilitate learning and teaching online (Al-Khalifa, 2010).

Three major universities in the KSA are presented as examples of institutions using e-learning programmes. The three universities; King Saud University (KSU) in Riyadh, King Abdulaziz University (KAU) in Jeddah, and King Faisal University (KFU) in Al-Hasa, are all leading universities in the Arab region (see Figure 2.5).

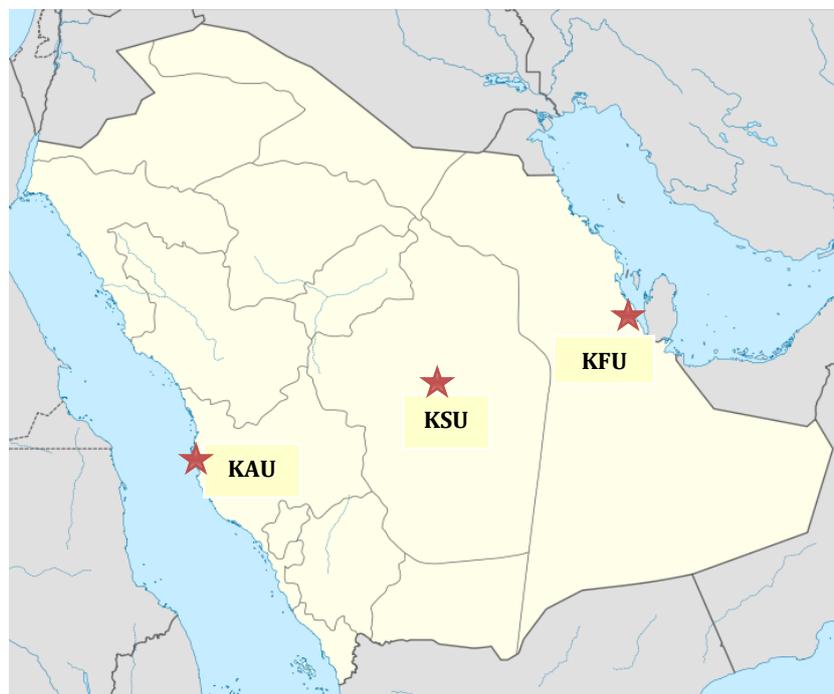


Figure 2.5 Map of KSA showing locations of King Saud University (KSU), King Abdulaziz University (KAU) and King Faisal University (KFU).

All three universities, though stated in different ways, share the same mission of delivering distance learning or e-learning programmes to their students. The mission of the universities' distance learning programs is to utilize, integrate, and train students and faculty with the latest technology in distance learning. Each university has a Deanship of E-learning and Distance Learning, although developed at different times with KAU being the first in 2006, followed by KSU and KFU in 2010 (Al-Khalifa, 2010). As stated on each university's webpage, the Dean of E-learning and Distance

Learning is responsible for providing students with online resource training and access to tools such as virtual classrooms and online lectures and seminars (King Saud University, 2010a; King Abdulaziz University, 2011; King Faisal University, n.d.). In order to ensure that faculty members are able to make full use of distance learning technology, all three universities train faculty members to meet the needs of distance learners. KSU provides a good example of faculty training: in the summer of 2012, it held training sessions in which specific members of the university were given instruction on the management system. Due to the success of the training sessions, the university reported that it would continue the training programme to include all KSU faculty members. To further ensure that the distance learning programme at KSU was making full use of the technology available in the most efficient and effective way, faculty members at the university participated in the 2011 *Blackboard Exemplary Course Program* – a program developed by *Blackboard, Inc.* which trains faculty members in the best practice use of distance learning (King Saud University, 2010b).

King Faisal University has also made strides in the use of distance learning. As listed on the university's website, the e-learning systems that are made available to students are a Blackboard/Web CT LMS, a virtual classroom synchronous system, a class capturing/recording system, an authoring tool and content management systems, and an online exam system (King Faisal University, n.d.). The Blackboard system functions as a LMS through which classes can be held, work can be assessed, and grades can be tracked. Students are able to exchange files, communicate with instructors and classmates through discussion boards, forums, chats, and email. Instructors and students can also utilize authoring tools in multiple formats to present and exchange audio, video, and image files.

The Blackboard system can be used as a distance learning course or act as a companion to traditional courses through the use of the virtual or synchronous classroom. Through this system, students can attend live classes and participate in those classes by using the whiteboard, real-time quizzes, recording and playback capabilities, and application sharing. As a result, students can

experience live classes through real-time synchronous voiceover that does not require a minimum internet connection speed. To provide a more flexible schedule for students using distance learning, the class capturing/recording system can be utilized. This option gives instructors two choices: they can record synchronous classes to be used as an upload that students can review at their leisure; or they can record classes that are not presented synchronously. Students then have more freedom to view the class within the parameters of the course outline.

King Abdulaziz University makes use of several different distance learning components that allow the students to engage in classes and collaborate as if they were in a traditional classroom. Additionally, KAU creates courses on an LMS, with virtual classes (Centra's virtual classroom) for every corresponding face-to-face lecture that can be recorded and accessed by students at any time from any location using an internet connection. Centra enables students to access lesson overviews, tasks, assessments, links to online resources, and downloadable training resources and files (Al-Nuaim, 2012; King Abdulaziz University, 2012b).

Unlike KFU and KSU, KAU plans to introduce a mobile learning system. This system will be compatible with mobile cellular devices or other devices that make use of cellular data or which connect to the internet, such as iPods, iPads, or other tablets or devices (King Abdulaziz University, 2012a). The university recognizes that the technology used by its students is changing, and that teaching must adapt to reach students on their level using the same technology as they do.

The three universities are all leading universities in the KSA and are beginning to earn recognition on a global scale. They are all making use of educational technologies available for distance learning in order to increase student understanding and provide access to resources and training. The technology they use creates a virtual classroom that in many ways mirrors a traditional classroom. However, if universities within the KSA want to continue providing quality education to the growing population, they will not only have to stay current with education technology, they will also have to increase the number of trained instructors to teach distance learning courses (Aljabre, 2012).

2.4.2.2 Challenges of e-learning in the KSA

Despite the numerous advantages of e-learning, there are also challenges. Recent research on e-learning in the KSA has shown that despite the importance and usefulness of e-learning, there is a lack of knowledge and skills (Al-Sarrani, 2010). Also, there is still an issue of poor internet infrastructure, a lack of distance learning education, and a general lack of e-learning support in some parts of the KSA (Al-Wehaibi, Al-Wabil, Alshawi & Alshankity, 2008; Al-Shehri, 2010). Despite this, there are many within universities who are positive about the adoption of e-learning including faculty members, students, and administrators. Despite the lack of adequate research regarding E-learning (Almohaisen, 2007; Al-Sarrani, 2010), this learning style is gaining popularity in most institutions where it is regarded as a 'must have' in this age of information technology (IT). The diverse backgrounds of learners and instructors can pose challenges in the use of e-learning, and e-learning can be perceived differently by stakeholders; however, the overall attitude to e-learning is positive. In a related study, conducted in the KSA by Hussein (2011) on the attitude of faculty members toward e-learning, it is found that most faculty members in Saudi universities have positive perceptions of e-learning, which encourages other members to embrace the use of contemporary technology in teaching. However, there are few faculty members who utilise all of these systems. One reason could be that the universities and institutions do not provide enough training workshops for online learning systems. A few faculty members, who are interested in e-learning and have adequate skills, provide online materials as supplementary resources for their courses (Al-Khalifa, 2009).

E-learning requires a great deal of infrastructure, involving significant sums of money. In addition, there are other challenges that are specific to students, faculty, and administrators (Alsadoon, 2009). For example, a number of students have neither the knowledge nor the skills required for e-learning, nor do they have the motivation to learn them. This will require an additional time commitment for faculty members, as well as professional support in developing course content and evaluation. Additionally, resistance to organizational change poses a threat to

the use of e-learning methods and is a challenge to administrators (Zhen, Garthwait & Pratt, 2008). In a research study conducted by Al-Sarrani (2010), differences in demographic characteristics are cited as a main cause of resistance to e-learning in the KSA. Younger faculty members are much more open to e-learning than older faculty members.

The advantages of this new style of teaching and technology do not mean that the associated risks should be ignored. These risks should be recognized and acted upon so that people can take advantage of the new e-learning technology. Faculty perceptions are crucial for the implementation of e-learning, and faculty members should show their concern regarding several issues. According to Cardwell-Hampton (2008), e-learning must be adopted as a meaningful option for teaching because of the change in the way educators are now viewed. According to Alajmi (2010), cited in Alenezi (2012), “They no longer are considered distributors of educational content, but as facilitators of learning.” (p. 38)

2.4.3 Overview of the blended learning model in the KSA

As stated earlier, one of the goals of the E-learning Project of the Ministry of Higher Education is to adopt e-learning and blended learning in universities. In 2008, The Director of the NCEL announced that the Ministry was investigating the prospect of reducing class attendance hours for university students after shifting to e-learning. The Director of the Centre stated that with blended learning, students no longer need to achieve 100 per cent class attendance because communication with lecturers is achieved through modern technologies (SAUDI ARABIA: E-learning education shake-up, 2008, 01 June). Thus, the Ministry of Higher Education believes blended learning, combining face-to-face instruction and online instruction, will reduce the amount of time students need to be in class.

The aim of NCEL is “to provide rich multimedia resources to enable lecturers to integrate E-learning and blended learning in a way that fits their course and the university’s needs” (NCEL, 2012b). It is likely that more colleges will offer blended courses utilizing NCEL’s Jusur. In 2007, the College of Application Studies at KSU started using Jusur in a blended learning application.

There have been no pilot studies prior to this first application of blended learning in Saudi public universities, but it is expected that the use of blended learning for teaching and training will continue to grow.

As stated by Alebaikan (2010), blended design instruction reduces 70 per cent face-to-face class time to 30 per cent face-to-face class time, through online instruction announcements, assignment submission, online quizzes, lecture notes and online discussions. KSU believes that online instruction greatly expands the resources and interaction opportunities for female students.

For female students who have family commitments, blended learning offers the flexibility they need. This is also true for employers and employees (both men and women) who are unable to attend weekly face-to-face classes. Where face-to-face interaction is not permissible between female students and male lecturers, online learning allows for increased participation and interaction, thus leading to more effective learning processes (Alebaikan, 2010).

2.5 Conclusion

Chapter 2 presents developments in technology that have provided new opportunities for course delivery to students across the Kingdom of Saudi Arabia. The introduction of online learning to Saudi tertiary educational institutions enables students to utilise a course delivery option which may be better suited to their learning style, allows more students to enrol in courses, and provides women with opportunities to study in areas they have been unable to access previously.

The Saudi education system has demonstrated significant growth over the past few decades. This has required an increase in the number of learning institutions within the KSA. At tertiary level there are now 24 government universities, 9 private universities and one public research university that cater to the needs of over 900,000 students. The e-learning agenda is supported by MOHE through the establishment of the NCEL and the services provided by this national centre. The Jusur LMS is designed to provide higher educational institutions with an Arabic learning management system to manage all teaching and learning processes; registration, scheduling, checking availability of content, tracking the performance of the learner and issuing reports, facilitating communication

as well as providing assessment tests and questionnaires. The NCEL has also numerous other services to enhance the e-learning for Saudi institutions.

Improvement of ICT infrastructure within universities has allowed the development of a system of teaching and learning which makes use of information and communication technology in order to offer e-learning as an option for both education providers and students. E-learning is regarded as a convenient method for expanding traditional teaching methods, while overcoming the problems of inadequate resources and overpopulated educational institutions. Through online interaction, the gender equality of e-learning can solve the previous issue of maintaining separate male and female colleges; which had led to a severe shortage of female faculty members.

An overview is presented of the KSA's e-learning and distance learning tools and management systems, with a description of faculty member training in e-learning provision. This is followed by a discussion of the challenges facing e-learning, including poor internet infrastructure, resistance by some older faculty members and a lack of e-learning support in some areas of the KSA. Despite this, the attitude of both faculty and students towards e-learning is, for the most part, extremely positive.

The chapter concludes with a discussion on blended learning, the integration of online activities and traditional face-to-face class activities. Blended learning decreases the amount of time students need to be in class, allowing them to 'attend' lectures online when necessary and to submit homework and join discussions. Blended learning particularly benefits women, workers and employees and is seen as a useful compromise between full online teaching and learning and traditional classroom-based learning.

In conclusion, this chapter gathers relevant data from academic journals and online sources to analyse the information and to arrive at a more comprehensive understanding and historical reconstruction of the Saudi tertiary education system. The research attempts to shed light on the questions:

1. What are the methods being used for teaching courses in the Saudi educational system?

2. What are the online delivery methods and technologies currently available?

The answers to these questions provide information about the developments that are being undertaken in the Saudi tertiary education system and modes of delivering those courses. Furthermore, detailed information is provided regarding the available e-learning delivery methods and technologies. The information helps to provide answers for the research questions:

***RQ1.** What are the course delivery techniques and characteristics of the academic structure of the KSA's education system?*

***RQ2.** Can the delivery techniques be improved using available technologies and/or a suitable model and taxonomy?*

***RQ3.** What is the ideal learning model for the Saudi tertiary educational system?*

To answer these questions, in Chapter 3 a detailed review of the available information from previous research is required. The data gathered is analysed through the use of interpretative research techniques. All information regarding the research methodology and procedures that are employed to conduct the research is provided. The methodology entails the research design, the instruments used in this research, the available data sources, the data collection techniques and the analytical techniques implemented.

Chapter 3: Research Methodology

3.1 Introduction

In Chapter 3, a detailed description of the research methodology applied in this study is provided and the research methods are defined. Symbolic Interactionism is used in the analysis of source material for the development of the model and its framework.

The research design, research instruments, data sources, data collection techniques and analytical techniques used are also described. A statement of the purpose of the study is provided, followed by the particular research questions that guide the data collection and analysis procedures. The chapter ends with a summary to illustrate the links between the main sections presented as part of the research design for this study.

The information collected for this study is analysed using a combination of NVivo software and thematic analysis in order to investigate the current tertiary educational institutes' adoption of online learning systems as well as to explore the different opportunities for course delivery to students in the KSA. The research also aims at defining the hierarchical taxonomy of Saudi tertiary educational systems.

3.2 Purpose of Study

Saudi tertiary institutions are exploring various kinds of technology to find new methods of course delivery. This study seeks to investigate both multimodal delivery methods and technologies currently explored by tertiary education institutions and the incorporation of technology into teaching practice to improve Saudi tertiary educational systems. Chapter 2 presented two types of learning currently applied in the KSA: face-to-face learning and online instruction. This study focuses on online instruction methods in the KSA in particular, which incorporate e-learning, distance learning and blended learning. To date, no study has modelled or built a taxonomy of

online delivery methods in the KSA. This study attempts to fill this gap, in response to the research question.

3.3 Research Question

The research questions to be investigated in this study are:

***RQ1.** What are the course delivery techniques and characteristics of the academic structure of the KSA's education system?*

***RQ2.** Can the delivery techniques be improved using available technologies and/or a suitable model and taxonomy?*

***RQ3.** What is the ideal learning model for the Saudi tertiary educational system?*

To answer these questions, the research aims to:

- Create models for course delivery required to be applied in the Saudi education system and identify the key characteristics of its academic structure;
- Build a taxonomy of online delivery methods and technologies from published articles; and
- Apply the taxonomy to the education system model.

3.4 Qualitative Methods

This research applies qualitative research methods which have been defined in a variety of ways. In one definition, Strauss and Corbin (1998) identify qualitative research as:

Any type of research that produces findings not arrived at by statistical procedures or other means of quantification. It can refer to research about persons' lives, lived experiences, behaviours, emotions, and feelings as well as about organizational functioning, social movements, and cultural phenomena. (Pp.10-11)

They further elaborate that qualitative research is best used when the methods are complementary to the preferences and personal experiences of the researcher; congruent with the

nature of the research problem; and employed to explore areas about which little is known (Strauss & Corbin, 1998, pp.10-11). In this case there is no previous study that has modelled or built a taxonomy of educational delivery methods in the KSA.

Miles and Huberman (1994) expand Strauss and Corbin's position by indicating that qualitative research is conducted to confirm previous research on a topic; provide more detail about something that is already known; gain a new perspective or a new way of viewing something; and expand the scope of an existing study. With regard to the design of qualitative research, Marshall and Rossman (1999) assert that there is a wide variety of qualitative research genres, each having its own assumptions, methods, procedures, and considerations. They describe qualitative research as naturalistic, interactive, humanistic, emergent, and interpretive.

Based on the definitions above, qualitative methods are regarded as appropriate for this study. However, although qualitative research is characterized by an emergent and flexible design, a basic research plan is necessary to guide this exploration. The following sections detail the research plan by discussing qualitative methods and the procedures used in data collection and data analysis.

3.5 Research Plan

This qualitative study seeks to investigate the multimodal course delivery methods and technologies being explored in the KSA, as well as the incorporation of technology into teaching practice to improve the Saudi tertiary education systems. The study also explores programs that support e-learning methods in the Saudi tertiary education system. The research is a qualitative analysis of published academic journals and scientific literature. The research uses a qualitative approach to develop a model and framework of the Saudi educational system. Symbolic Interactionism is used in the analysis of source material for the development of the model and the framework. The relevant data is collected and categorized through building a taxonomy. The results are then coded using NVivo software in order to analyse and create a model for the Saudi educational system.

3.6 Selection Criteria

McNamee (2002) suggests that the validity of the data being collected has a direct effect on the strength of the qualitative research itself. However, McNamee claims that sample size is a concern and a qualitative project will normally have a lower number of participants, even when a fair cross-section of subjects has to be included.

Qualitative design methods usually include; a case study, providing data which describes the subject of the study; a meta-analysis designed to analyse statistical outcomes of previous research from diverse sources; research analysis of relevant administrative records; a record of focus group discussions which serve to bring together a group of informants, serving the issue under investigation; or unstructured, semi-structured, or structured in-depth interviews (Obaidat, Adass & Abdulhaq, 2002).

Qualitative research can be considered as an independent field of inquiry, as it is focused on studying objects in their natural settings (Woods, 1996). This natural setting allows the interpretation of phenomena in terms of their meanings as related to a set field (Thomas, 2003). Qualitative research examines a situation in which an opportunity is presented and the knowledge production process is reflected on. The multiple methods may be used to provide interpretation and focus on individual cases. Additionally, qualitative research usually includes interviews, the practical components of a case study, a life story, observations, and personal experience. It can also involve descriptions of routines or moments which were problematic, and even meaning of the phenomena in the lives of individuals (Thomas, 2003). Qualitative studies, then, are ultimately concerned with both how participants fit into their environments, and how they make sense of their individual experiences.

3.6.1 Data sources

In this study, data are collected from the following sources:

- *Saudi university websites.* Online databases and Saudi university websites are used as a primary source of data. The most important of these are the websites of various universities in the KSA. An extensive review of articles on the university websites prompt the decision to examine factors affecting the tertiary education system in the KSA, including the variables related to these factors, such as campus types, available programmes and majors and teaching styles. The information from these websites is relevant to the creation of an appropriate framework from which to identify the models and assumptions evident within the sites.
- *Scholarly journals (peer-reviewed).* Scholarly journals are important to this study as they contain reports of both original research and experimentation. Experts review scholarly journals to check their accuracy, originality and, hence, their relevance. Scholarly journals are obtained from online libraries and various libraries in the KSA.
- *Literature review articles.* These articles review and arrange original research about a particular subject of interest. A comprehensive review of secondary literature is performed on the Saudi tertiary education system (termed 'higher education' in Saudi); as well as other official documents that contain relevant information on the subject. These include government documents from government education websites, as well as other academic websites from Saudi higher education, that are relevant to this research context.
- *Theses by Saudi students.* Relevant information from previous research papers by Saudi students in the KSA is gathered to help find supportive data. This process involves visiting the libraries of several universities and requesting permission to use past student research papers as a basis for the study. Collecting and analysing data from different stakeholders at universities, such as students, lecturers, administrative staff and academic employers, facilitated the availability of secondary data.

All data are selected according to their relevance to the research purpose, which is to investigate the multimodal delivery methods and technologies currently being explored by tertiary educational institutions in the KSA.

3.7 Symbolic Interactionism

3.7.1 Introduction

Symbolic Interactionism (SI) is used in this study for the analysis of source material to develop a model and framework relating to the Saudi educational system. SI seeks to explain family functioning and social networks in terms of how humans learn through interactions and symbols. Humans learn and communicate through symbols that are created and/or modified through constant interactive experiences with other humans and the environment (LaRossa & Reitzes, 1993). Symbolic interactionist theory argues that people construct meanings for phenomena based on their interactions with others. The work of Mead (1934) shapes the fundamentals of SI relating to perspective and provides alternative views in terms of understanding human society (Berg, 2004). Blumer (1969) continues Mead's work and the study of SI by developing a methodology for the investigation and interpretation of individuals in social contexts. He states that people from different backgrounds do not always share the same sets of norms, values and beliefs, which means that people from differing backgrounds may have competing and conflicting goals and interests. The development of organised behaviour follows and may be the product of self-interested negotiations or coercion of a weaker party by a more powerful one.

Symbolic Interactionism is concerned with people and the meaning that people find in things. These meanings are then subjected to a process of interpretation within social contexts. The complexity of social situations is reflected in Woods' (1996) account of SI. Woods maintains that he is attracted to Symbolic Interactionism because it provides him with the tools necessary to explore the social interactions that occur in the institutional setting. In this study, SI focuses on the interaction between objects/individuals in a tertiary education context. It then focuses on social

interaction and meanings that result from the process of interpreting these interactions in a tertiary education context. Blumer (1969) and Goffman (1959) outline certain tenets of SI that are used to frame this research. The five tenets used in this microanalysis are as follows:

1. Face-to-face social encounters entail interactions between people.
2. Social interaction is a process that forms human conduct or behaviour.
3. Human subjects are agentive actors in the creation and interpretation of meaning.
4. The objects of analysis can be indicated, pointed to or referred to.
5. Actions are interlinked.

SI emphasises real-life events, such as the practice of teaching (Rosenberg & Turner, 1990). Within the context of this study, the nature of tertiary education objects, such as universities and students, is rich in symbols that are useful for exploring the identity of universities, including delivery method, LMS product, qualification and gender-based campuses, which lends itself to the principles of social interactionism. Blumer (1969) describes ‘things’ as physical objects (such as a classroom, office space or a textbook), other humans (such as an officemate, a husband or wife), categories of humans (such as friends, students and management), institutions (such as government and universities), guiding ideals (such as university policies, individual independence and approaches to teaching) and the activities of others (such as requests from colleagues or demands from management).

Interpreting the work of Mead (1934), Blumer (1969) develops a set of three premises that characterise the fundamentals of SI. The first premise addresses the nature of meaning that humans give to things that are defined socially. Secondly is the principle of language that provides the tools or symbols to negotiate meaning. The last principle is thought which can be interpreted symbols in different ways and assume different points of view. These principles have helped to draw a theoretical framework that will be widely discussed in Chapter 4.

The research methodology according to Blumer (1969) set of three premises covers the underlying principles and guide through the entire studying and observing of the full process concerning the obdurate character of the concerned empirical world.

The methodology of Symbolic Interactionism concerns the entire scientific process and is not centred towards any specific or initial areas. Also every area or part of scientific research quest is required to fit the empirical world's obdurate character. Also according to Blumer (1969) the empirical world always provides the decisive answers to every question posed. Blumer (1969) aggressively attacks the lone quantitative social sciences approach only and relies upon digging in deep into more careful study. Symbolic Interactionism analyses the two basic fundamentals of the empirical world namely exploration and inspection.

Exploration or depiction of empirical world basically refers to the exploratory value of studies which initiates as a broad starting focus and is sharpened through the way as research or inquiry proceeds. This exploration is not limited to particular technique sets however places emphasis on seeking participants that are well informed and knowledgeable in the study area. This empirical material paves way for the development of images and concepts with the goal of developing a comprehensive picture of the study area. Descriptive information relating to the area of study provides answers to any theoretical questions, however formulating a theoretical schema may not be a necessary priori.

The inspection or analysis part of Symbolic interactionism refers to the casting of empirical world's examination into a theoretical form. No conventional protocol should be present however as it will only limit the analysis of empirical data. Inspection of Symbolic interactionism is defined as

“an intensive focused examination of the empirical content of whatever analytical elements are used for purposes of analysis, and the same kind of examination of the empirical nature of the relations between such elements.” (Blumer, 1969, p.43)

Blumer (1969) further defines the procedure of Symbolic Interactionism as examining the analytical elements of the research from diverse perspectives including creative, flexible and imaginative.

Operationalising the data is never the answer to a research according to Blumer.

3.8 Data Analysis

There is great diversity in qualitative research types, methods, disciplinary orientation and findings (Creswell, 2003). Qualitative research has many traditions. These include cultural ethnography, institutional ethnography (Bryman, 2006), analyses for historical comparison, case studies, focus groups, interviews (in-depth), participant and non-participant observation and hybrid approaches, which include a whole or a part of multiple types of study. Based on the many different kinds of methods, study designs and theoretical traditions, numerous experts (Patton, 2005) conclude that approaches to qualitative research cannot and should not be uniform. This research concentrates on strategies that enable the analysis of qualitative data. This is especially applicable in terms of theory, themes and taxonomy.

Taxonomy can be described as a system that is designed to classify multifaceted and complex phenomena according to a common set of conceptual dimensions and domains (Patton, 2002). Taxonomies help to produce clarity in defining and comparing diverse and complex interventions. The recurring themes are concepts that unify the subject under inquiry (Bradley, Curry & Devers, 2007). A theme is a fundamental concept that characterises particular experiences of individual participants according to the more general insights that are clearly seen from the entire data set. Theory is defined as a set of non-specific propositions that may help to explain, predict and interpret the phenomena of interest (Devers & Frankel, 2000). Theory helps make sense of different variables and potential causal links, allowing an understanding of the context in which a phenomenon happens and providing a possible framework for the purpose of guiding future research. Data required in this study were collected and categorised through the building of a taxonomy. The results were then coded in NVivo software to analyse and model the Saudi education system.

3.9 Data Analysis Techniques

3.9.1 Coding

After data have been evaluated and key experiences ascertained, coding can then be employed to organise the data. Codes are labels (Creswell, 2003) or tags that may be assigned to parts or whole documents to help catalogue particular concepts, while keeping them within the contexts in which they appear. The process of coding includes development, application and finalisation of the structure of the code. Various experts maintain that the process of coding is best done by a single researcher (Hussey & Hussey, 2003). They argue that this principle is important when conducting a study in which the researcher has close relationships with the participants of the research. In such cases, the researcher is considered an instrument—data collection and analysis are inextricably connected to the researcher. Other researchers are not able to achieve the same results due to differing paradigms or traditions. However, it is considered important that the researcher discloses his or her biases and philosophical methodologies. Conversely, other experts (Basit, 2003) recommend a team of researchers with differing backgrounds for the purpose of coding. This helps improve the breadth and depth of the analysis being conducted and of any subsequent findings. Cross-training is recommended for these teams. This research is undertaken by one researcher using NVivo as the software to help code the relevant data.

3.9.1.1 What is NVivo?

NVivo provides a variety of tools for manipulating data records, browsing, coding, annotating and gaining access to data records quickly and accurately (Richards, 1999). According to Richards (1999), NVivo has tools for ‘recording and linking ideas in many ways, and for searching and exploring the patterns of data and ideas. It is designed to remove rigid divisions between “data” and “interpretation,” should that be the researcher’s goal’ (p. 4). NVivo then offers many ways of connecting the parts of a project, allowing the integration of reflection and recorded data. As the researcher links, codes, shapes and models data, NVivo helps in the management and synthesis of

ideas. It offers various tools for finding new understandings and theories about the data and for the construction and testing of answers to research questions. NVivo ‘combines the coding of rich data with familiar ways of editing and revising rich text’ (Richards, 1999, p. 1) and is easier to introduce to students than other packages. The software can be learned during the actual research process, rather than in lengthy preparatory training phases

3.9.1.2 How NVivo works

To accomplish the research tasks necessary with NVivo, the researcher must create a project. The project will contain the data, ideas and links between the various components. A project can either be simple or complex, depending on the researcher’s wishes. Within a project, data can be managed within three systems: documents, nodes and attributes. The various actions that can be performed bring these three systems together and, in doing so, give values to attributes, linking, coding and shaping the documents and nodes in sets. The documents, nodes or attribute values can be searched, with the user specifying the scope of the search. This work begins from the Launch Pad, which is a pop-up window that serves as NVivo’s control centre and provides easy access for the user for creating and opening projects (Richards, 1999).

The software allows the researcher to import material in the form of documents or videos or pictures in addition to the option of creating new documents within the software. These documents are rich text records that can be browsed, explored, changed, coded or linked with the help of the Project Pad. If one wants to mark some passages to be reviewed later, the function of visual coding is available. For example, all the material pertinent to one topic can be marked in one colour in order to be reviewed later. A node on the other hand, serves as a folder or a container is comprised coded material or categories. These folders or nodes may contain concepts, information on people, places, methods, ideas or any other sub-category of the project. A node can accommodate any amount of coded material and has no space limit. In the Node Explorer or the list of nodes, one can conveniently drag and drop nodes up or down in the list in order to reorganize them and change their sequence as the project develops. Some nodes are created by the researcher; while others are

automatically created (Richards, 2002).

3.9.1.3 How NVivo used in this research

The information collected as a part of this study is analysed using a combination of NVivo and thematic analysis in order to investigate the current tertiary educational institutes' adoption of online learning systems. It is also aimed at defining the hierarchical taxonomy of the Saudi universities. NVivo is a commercial software product which allows researchers to organise and analyse unstructured data, helping individuals to concentrate on systematically working through information ensuring that connections are made which might otherwise have been missed (Bazeley & Jackson, 2013). The advantage of this software package is that it is able to handle data in any form including Word documents, PDFs, spreadsheets, audio and visual files and information from the Internet. The tools within it allow one to identify trends which might not be immediately obvious by searching all the data for an exact word or phrase in order to provide an area of focus or enable one to quickly test a theory. Data can also be displayed using a variety of visual images such as mind maps and charts (Bazeley & Jackson, 2013).

The software has been used in this research to code all the collected data – which is translated from Arabic to English. The preliminary set of nodes are established prior to analysis, based on the theoretical framework, the research aim and research questions, and the key factors that are drawn from a review of the literature.

Moreover, notes are briefly written referring to the most important data or text. Then, data is categorized according to five different dimensions or nodes as it is named in Nvivo; mainly university type (private, public and state universities), gender-basis of campus (male or female), delivery methods (face-to-face, e-learning and blended learning) and both pre-requisite and gained qualifications and available courses (see Figure 3.1).

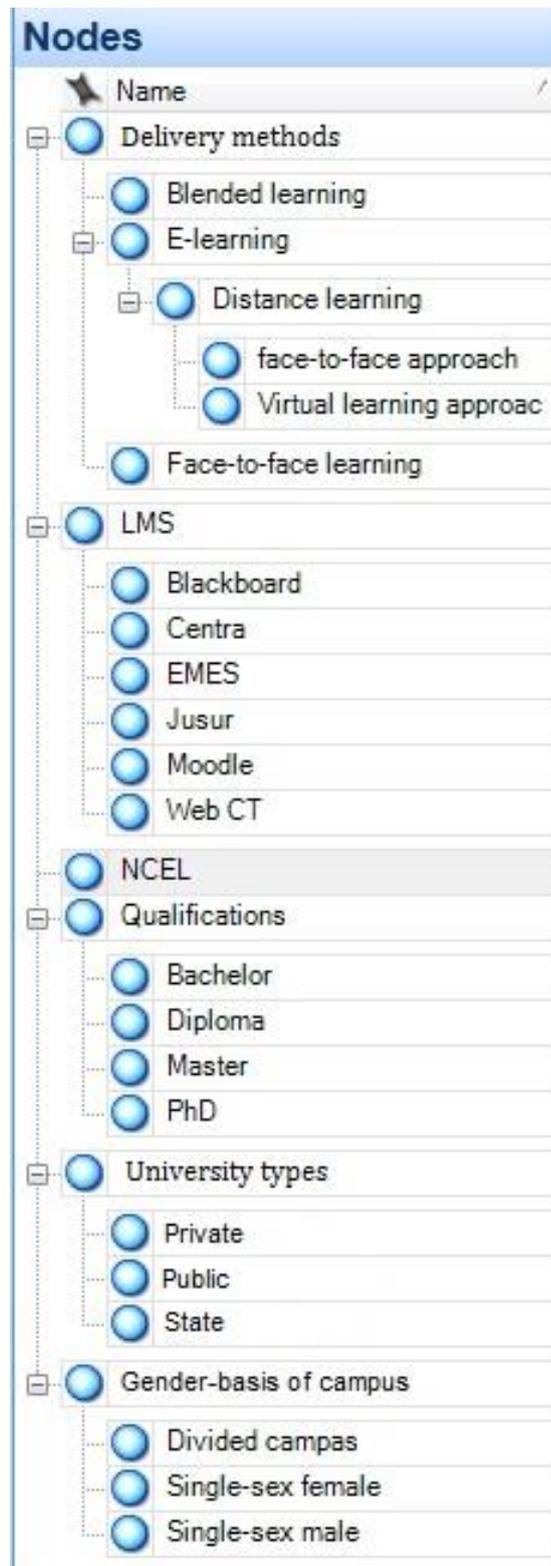


Figure 3.1 The main nodes to organise the data.

The reason for selecting this software is that all of the data which is collected and put into the system will be able to be used, which is not always the case when this process is undertaken

manually. The use of this software enabled the researcher to code various themes which occur across the various data streams.

Computers and software are tools that can be used to assist in the process. According to Patton (2002), they are able to significantly help in the manual performance of the analysis. They can speed up the process of “locating coded themes, grouping data together in categories, and comparing passages in transcripts or incidents from field notes” (2002, p. 442). However, it is up to the researcher to decide which themes have emerged, what name should be attached to each theme, and the meanings that are extracted.

Coding is essential in qualitative analysis (Fielding, 1994; Kelle, 1997; Patton, 2002). First, the researcher identifies major themes and the sections of text in which those themes reside. Each of the identified regions is marked with a relevant code (Kelle, 1997). In the software, these codes are stored along with the location, or address, of the appropriate passage of text so that the researcher can locate all the information associated with a certain topic. Text retrieving software packages allow the user to recover data based on keywords that appear in the text. They locate these keywords, even when they are in combination with other words, and can search one or more files. These packages can mark the text many times, separate the marked text into a new file, count the number of occurrences of the keywords, display the keywords in their context, and organize the retrieved pieces of text in a given format. These software packages are very fast and efficient (Fielding, 1994). Code-and-retrieve software packages help the researcher separate text into segments, attach codes to those segments of text, and then find and display all text segments with a given code or some combination of codes.

According to Merriam (2009), the use of computer software in qualitative research is becoming more popular because the computer has the capacity for ‘organizing massive amounts of data, as well as facilitating communication among members of a research team’ (p. 166). However, before the data can be analysed, it must be prepared. This process involves typing notes,

transcribing interviews and entering other data from which the researcher will be working (Merriam, 2009). In most cases, a standard word processor is the best tool to use in creating clean records from which to work. Data that is prepared in this way can be used in conjunction with other programs to assist in the analysis phase. Once the data has been entered, it must be divided into meaningful segments that are easy to locate. Programs that are specifically developed with qualitative research in mind are most useful in this situation. By using these types of programs, the researcher can search for, sort, retrieve and rearrange data segments (Merriam, 2009).

3.9.2 Taxonomy

Taxonomy is also used to organise a large set of items into a hierarchical order. This order is based on their characteristics and properties. ‘Taxa’ is the term given to every unit in a classification (Ramesh, 2012). The upper levels of the taxonomical framework contain elements that are more generalised and contain common features. As the framework descends, each individual element is further separated into its individual characteristics and can be easily differentiated. Taxonomy provides both organisation of and access to all the elements that represent its constituent parts.

Creating a taxonomy of an education system is an idea that was first proposed by Bloom (1956) in the early 1950s. According to Bloom (1956), there is an immediate need to cut down on labour intensive stages of test development by facilitating the exchange of items among institutions of higher education. Bloom (1956) argues that he could facilitate this by developing a well-defined framework on which related items measuring similar objectives would be classified. To create a taxonomy for the Saudi education system, the following methodology is used. The first step is to develop a taxonomy to categorise the education system. This taxonomy is then translated into a dependency diagram of the education system. By organising the available knowledge into a taxonomic classification, easy and efficient storage of information is realised and the information used efficiently. Another benefit of taxonomy is that it provides a convenient framework for the collection, analysis, evaluation and presentation of information and knowledge in the system. As

such, a taxonomy is a comprehensive solution to the problem of providing structure to an unstructured problem or domain.

When investigating previously created taxonomies in education, it is important to have a full understanding of the term itself. According to Simpson (1961), there is often confusion between the meanings of 'classification' and 'taxonomy'. While the terms are sometimes used interchangeably, there is a clear distinction between the two when literally defined. Simpson (1961) distinguishes between the two using the following definitions:

Classification is the ordering of phenomena into groups (or sets) on the basis of their relationships, that is, of association by contiguity, similarity or both. Taxonomy is the theoretical study of classification, including its bases, principles, procedures, and rules. (p. 11)

According to Derr (1973), developing a taxonomy implies providing a hierarchical classification of classes or categories, whereas simply classifying categories without hierarchy results in a simple collection of phenomena. Bloom, Engelhart, Furst, Hill and Krathwohl (1956) provide an even more detailed explanation of the difference between taxonomy and classification when they state that 'taxonomies...have certain structural rules which exceed in complexity the rules of a classification system. While a classification scheme may have many arbitrary elements, a taxonomy scheme may not' (p. 17). They also maintain it is important that the taxonomy is constructed so that the order of the terms corresponds to some real order among the phenomena represented by the terms, stating:

a classification scheme may be validated by reference to the criteria of communicability, usefulness, and suggestiveness; while a taxonomy must be validated by demonstrating its consistency with the theoretical views in research findings of the field it attempts to order. (Bloom et al., 1956, p. 17)

According to Creswell (2003), qualitative methods offer a sophisticated method for specifying complexity, instead of simply enumerating dichotomous characterisations of interventions (i.e.,

treatment versus control), which is common in research with a quantitative approach. In addition, using a taxonomy or common language to distil complex interventions into their most important parts is similar to comparing alternative interventions and facilitating clear communication.

It is important to understand how the move from the finalisation of code structure to the generation and reporting of taxonomy is made. If the code types above are used, the taxonomical structure will mirror the conceptual codes and sub-codes closely. While conceptual codes define important domains that are used to characterise phenomena, sub-codes are used to define the common dimensions shared by those domains. Each dimension may contain additional sub-dimensions depending on the complexity of the inquiry. It must be remembered that taxonomies identify dimensions and domains that are broad in nature. For example, in his study of a hospital improvement system, Bryman (2006) states that the relevant taxonomy defines the six domains that comprise the hospital quality improvement efforts, which are organisational goals, leadership of clinicians, administrative support, initiatives for performance improvements, use of data and factors of context. The domain of organisational goals contains four dimensions: specificity, challenge, sacredness of goals and content. For every dimension and domain, the abstract concept is represented by the code but not a specific statement pertaining to the concept. For instance, the domain might be called 'nursing leadership' but not 'here can be found a strong nursing leadership'. The important difference is that taxonomies are used to describe a set of discrete domains or axes that can characterise multifaceted phenomena.

In his study, Patton (2005) begins by highlighting the significant processes of taxonomy in other disciplines, especially in social sciences and sciences. He notes that taxonomies may be especially useful to these areas of knowledge and study because they allow practitioners and researchers to comprehend and analyse domains that are complex in nature. Therefore, taxonomy provides a means of classification that significantly enables many forms of pedagogy and research, as they are a crucial mechanism for the organisation of knowledge (Devers & Frankel, 2000).

Taxonomies represent a conceptual knowledge form in contrast to a descriptive knowledge or prescriptive knowledge form.

3.9.2.1 Classifications of Taxonomies

Taxonomies refer to classification systems that are based on a certain organisational scheme. For example, a set of well-defined terms that are organised from concrete to abstract and from simple to complex presents a framework of different categories that might be used to classify the tertiary education system in the KSA. There are various recognisable education schemes and objectives that depict the goal towards which the Saudi education system is directed. There are different tools that can be used to derive a taxonomy for the education system. One example is the provision of a common language regarding education goals, which helps to bridge grade levels and subject matter; determining the congruence of classroom assessments, activities and goals and providing a panorama of the various education goals on which the limited depth and breadth of any given educational curriculum might be compared.

3.10 Conclusion

There are various procedures used in data collection, based on the type of study in questions. This study is based on a qualitative approach and the literature that examines such an approach has been discussed. In chapter 3 is discussed how the data will be analysed, the various sources of data collection and the methodology involved in an analysis of the different sources of data. The research methodology employed is practical and achievable for the study.

The concept of Symbolic Interactionism is significant to this study. This concept is important in the study of social contexts and the interpretation of social theories. Diversity in social norms, values, traditions, backgrounds, goals and interests introduces some level of complexity within social contexts, groups and interactions of individuals. SI challenges the mechanistic world view and the dualistic assumptions found in classical realism by focusing on people, societies, social interactions, objects, human actions and the relationships between them. The meaning that

humans give to things is defined from a social perspective, which is generated through communication. This meaning, from a psychological perspective, can be influenced by factors such as attitudes and unconscious or conscious motives; however, from a social perspective, it can be influenced by social pressures, social position and cultural prescriptions. SI is significant in this study as it deals with people, the meaning people give things and the interpretation of these meanings within social contexts. It helps to explore the mysteries of social interaction that occur in institutional settings, in this case universities in the KSA.

As this is a qualitative study, the selection criteria involve data related to the subject and a meta-analysis of the qualitative findings from previous studies from different sources. The latest literature on Saudi universities is chosen for review, as this provides reliable information. For data collection, academic articles from Saudi university websites are used in addition to scholarly peer-reviewed journals, literature reviews from articles related to the subject and an analysis of previous theses by Saudi students. The data analysis involves a diversity of methods, which consider cultural ethnography, institutional ethnography, partial listing and analyses for historical comparison and hybrid approaches, which include whole or parts of multiple studies from the past. Taxonomy, the generation of common themes and theory, is a significant method used in the analysis of the data. Coding is one technique used in data analysis, and NVivo is used to facilitate the classification of similar ideas and themes for easier data analysis.

In Chapter 4 the framework and the derived models of course delivery in Saudi tertiary institutions are presented, as well as define the multimodal delivery methods and technologies on which to build taxonomy of online delivery methods in the KSA.

Chapter 4: Study Framework and Derived Models

4.1 Introduction

For the purpose of this research, qualitative data analysis is deemed to be the most appropriate approach for analysing the emerging themes in the current education system in Saudi universities. Based on an interpretative philosophy, the data is analysed through explanation and interpretation of published academic and scholarly literature. As Wellington (2000) notes, it is beneficial to analyse data early in the research cycle so it can direct and influence any further data collection. He also notes that there is no single correct method of data analysis; rather there are several options from which to choose.

Every method has a set of general guidelines that indicate how to conduct it systematically and reflectively. Data analysis requires organisation, categorisation and interpretation of the data. It starts with reducing the data by coding it and sorting it into categories and themes.

To identify themes within the data, this study uses thematic analysis which can be used within different theoretical frameworks. This allows the theoretical framework of this study, which is interpretivist, to be used as the foundation for the analysis process. The objectives of this research allow the researcher to allow the literature to speak for itself. Themes are not predetermined but, rather, emerge from the data with the help of qualitative analysis, thus, they are data-driven. However, Wellington (2000) states that "the emergence of categories from data depends entirely on the researcher" (p. 142).

According to Ryan and Bernard (2003), the theme identification process is hardly ever described in literature. Researchers and methodologists have outlined some techniques used for the identification of themes, and two are chosen for this research: the word-frequency-based technique and the scrutiny-based technique. The word-frequency-based technique is used to categorise the literature at an early stage of the analysis. During the process of gathering literature for the purpose of data collection, memos and annotations are made that later help identify the themes, as they

emerge from the literature gathered in NVivo. Several articles, journals and papers for this study are translated from Arabic to English. Braun and Clarke (2006) state that themes capture important issues in relation to the research questions and these themes do not necessarily have to be based on quantifiable measures.

The main reason for the use of computer-assisted data analysis software is the significant amount of data gathered. According to Ozkan (2004), large and varied data requires the use of software to increase the speed and flexibility of data retrieval, coding and linking. Barry (1998) points out that computer-assisted qualitative data analysis software is helpful in several ways: it assists in automation and, thus, speeds up the process of coding; it provides a formal writing structure; and it has the facility to store annotations and memos to develop the analysis and support more conceptual and theoretical approaches towards the data. NVivo is selected to analyse the data for these reasons. It is a multifunctional software program used for the development, management and support of qualitative data analysis research. The literature gathered, including several official university websites, is translated into English by the author to be imported as raw data into NVivo. The software is never considered as a substitute for the reflective position of the researcher. Ritchie and Spencer (2003) argue that "there is strong advice that these [software programs] should be seen only as analysis support to aid the process of analysis and not as a replacement for the intellectual role that is required of the researcher" (p. 217).

Although a number of themes emerged from the data, the research may not have identified all themes present in the data. While undertaking a task of this nature, it would naturally be expected that the research should cover all themes emerging from the literature; however, reality often runs counter to this. Several limitations and restrictions prevent all themes in the literature from being analysed and several themes were dropped in order to focus on a limited number of aspects of Saudi educational institutions, that is, the emerging of e-learning trends.

Ryan and Bernard (2003) point out the limitations and challenges of collecting primary data "In addition to avoiding sensitive issues or assuming the investigator already knows about the topic,

people may not trust the interviewer or may not wish to speak when others are present, or may not understand the investigator’s questions” (p. 93). It may also be that people do not realize the crucial impact of these topics on the research. Therefore, the researcher decided against primary data collection techniques and adopted secondary sources for data collection. Literature is used in this study to discover elements that are pertinent to e-learning in several Saudi universities and to cross-check the institutions with the help of comparative assessment. For example, a comparison of different universities reveals that they have adopted different LMSs. During the analysis, it is found that some of the data required further investigation, of which Chapter 5 provides an overview.

4.2 Theoretical Framework

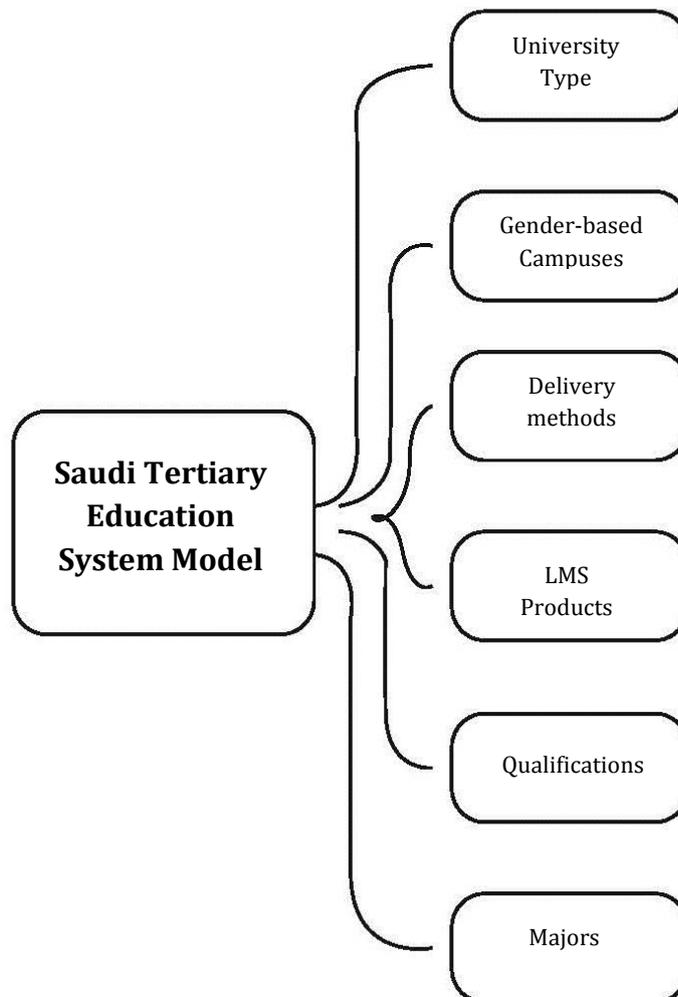


Figure 4.1 Theoretical framework for Saudi tertiary education system model (A. Litchfield, personal communication, August 28, 2013).

4.2.1 Explanation of framework

In this theoretical framework, a model is presented that can be used by Saudi officials to improve their tertiary education system. The model shows that there are six distinct characteristic features of the Saudi tertiary education system. These features are important as they will impact heavily on the implementation and overall success rate of any education programme introduced (Smith, 2001). These features are university type, gender-based campuses, delivery methods, LMS products, available qualifications and available majors:

1. University type:

- *government*: A government university is created, managed and owned by the central government; and
- *private*: These universities operate autonomously without any direct interference by the State, but are owned by both companies and not-for-profit organisations rather than individuals; and
- *public research*: A university that is predominantly funded by means of national or regional government in contrast to the private university, but it focuses on conducting researches and catalyses the diversification of the economy through economic and technological development.

2. Gender-based campuses: All three types of universities in the KSA cater for students according to gender. The universities either teach only male or only female students, divide the campus into two parts (one for male students and one for female students), or allow coeducation, where male and female students can sit together in a single class.

3. Delivery methods: This explains the teaching method at universities. There are three main types of delivery method:

- *face-to-face learning*: This is the traditional way of teaching, in a classroom and is also known as the brick and mortar system;

- *e-learning*: This is a new method of teaching, where the students are logged onto the Web from home and the teacher uses PowerPoint slides or special applications or software to teach them; and
- *blended learning*: The blended learning approach combines the previous two learning methods and forms an integrated instructional approach.

4. LMS products: This covers the technology used in the classroom and online to teach the students, including the use of Blackboard, Moodle, Jusun, Web CT or EMES/Centra

5. Available qualifications: This covers the qualifications or degrees the universities offer:

- diplomas,
- bachelor's degrees,
- master's degrees, and
- doctorates.

6. Available majors: This refers to the major (specialisation) that the student selects when signing up to a qualification.

4.3 Developed Models

The developed model is generated using NVivo to set out and review the ideas about the topic. It also illustrates the research question in pictorial form. Models can also be used in the design stage of a project, as a means of exploring the conceptual space being worked in. It helps to show the relationships or patterns that are expected to be found in the data, based on prior experience or preliminary reading. This is particularly important for understanding the KSA education system as well as the features of the tertiary institutions and their level of online learning implementation.

NVivo provides a visual representation of how the project items are related. This is of particular interest as this, may affect the implementation and performance of online learning in the KSA tertiary institutions.

The software helps identify existing and emerging pattern theories and explanations about the Saudi tertiary education system model. Through seeing these trends, the researcher will be able

to understand and predict the acceptability and adoption of online learning programs. NVivo software also provides a tool to present a detailed record of themes and stages of the project.

4.3.1 The Final model

The final model presents a very complex picture based on the Saudi tertiary education system with the universities that are present in the KSA as a whole (Figure 4.2). It shows how each university links with the above-mentioned features of the Saudi tertiary education system model (Figure 4.1). The relationship is depicted by first linking the university to a type (e.g., private or public) and then to gender, delivery methods, learning management methods, qualifications and major options, respectively.

As mentioned, this figure is difficult to read and follow, so the model is explained as sub-models in the next section.

4.4 Saudi Tertiary Education System Model

Figure 4.3 depicts the basic model of the Saudi tertiary education system showing the variables that play an important role in the system. The model presents an outline of the project and its expectations and initial ideas which include exploring the learning methods and technologies presently utilized by tertiary education institutions in the KSA and the inclusion of information technology in teaching practice to improve educational systems. Subsequent models help to explain and show links between these items in this project.

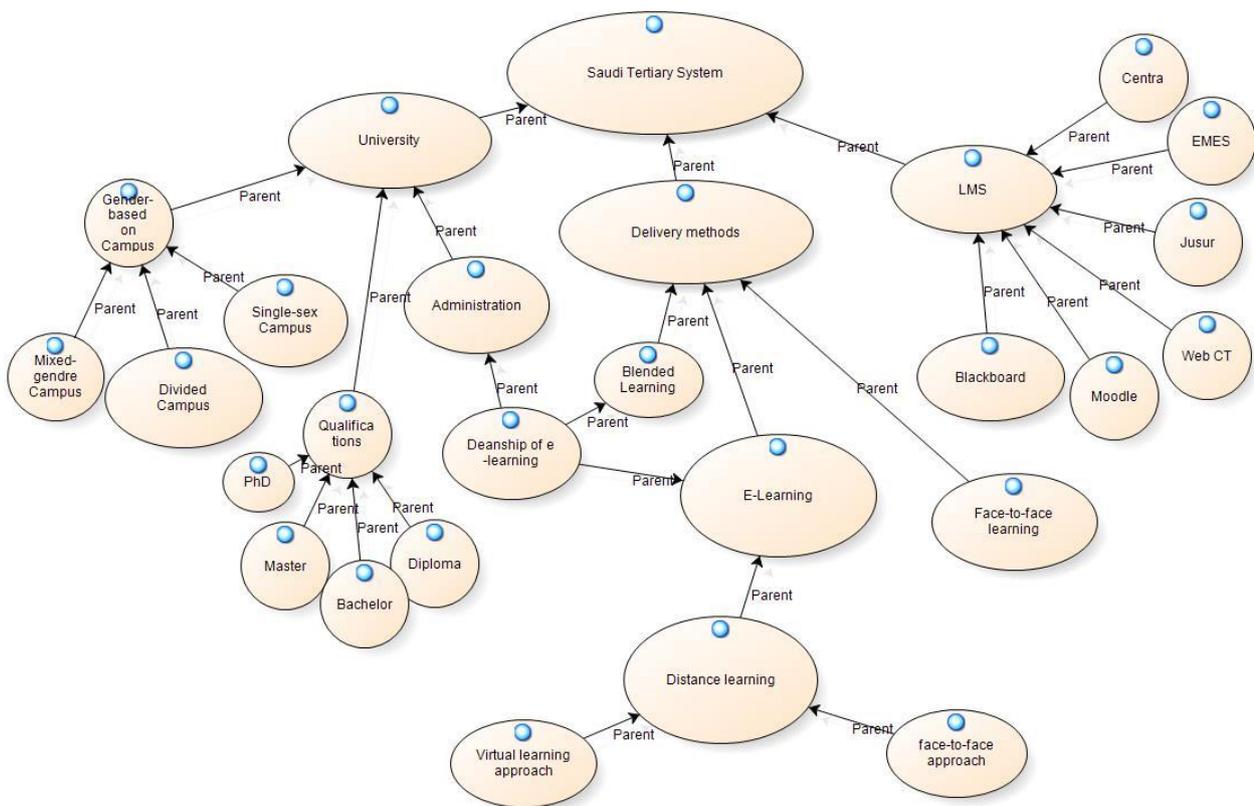


Figure 4.3 Saudi Tertiary Education Systems: Main model.

The main model represents the whole taxonomy of the Saudi tertiary education system model. It shows how the Saudi education system is divided and sub-divided into a number of components and how these sub-components are interrelated. For example, the universities have gender-based campuses that are either male, female, divided or mixed campuses in which students are taught using face-to-face, e-learning or blended learning approaches through Blackboard, Moodle, Jusur,

Web CT or EMES/Centra and, through this technology, the students attain their various qualifications by selecting from a wide range of majors.

4.4.1 University type

In the KSA, university type falls into three categories: government, private or public research. This classification has been considered a major predictor of success. For example, private universities have higher tuition fees charged and are associated with the higher socio-economic standing of its student population, and have flexible curricula and guidelines. Public research or government education is considered education for the masses, and is more aligned with the cultural identity of the country. This classification also determines the investment into a given educational programme, which in this case of its performance and success rate.

4.4.1.1 Private universities

This represents the universities that are heavily funded through high student fees. In the KSA, private universities have female only or divided campuses. They offer diplomas, bachelors and master's degrees. The delivery methods that are used in teaching and training the students include e-learning and blended learning, and the main LMSs used are Blackboard and Moodle.

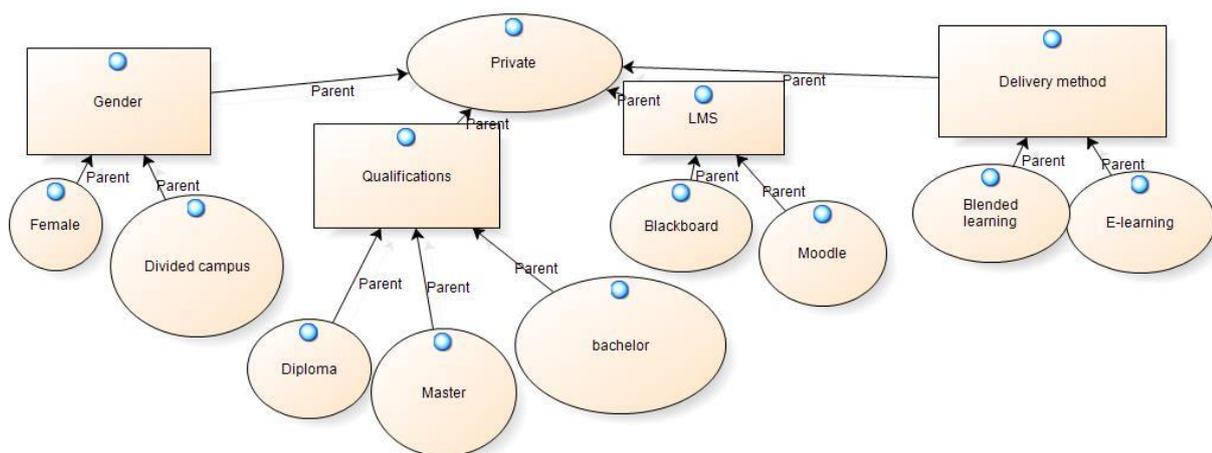


Figure 4.4 Private university education systems in the KSA.

4.4.1.2 Government universities

These universities are primarily funded by the central government and they have separate campuses for male and female students, as well as divided campuses. Government universities offer diplomas, bachelor's, master's and doctorate degrees. The delivery methods used in teaching and training the students include face-to-face learning and e-learning. However, some government universities in the KSA now also use the blended learning style. The LMS used depends on the vision of the university. If the university wants to apply electronic and online material, then it uses one or more type of LMS: Blackboard, Moodle, Jusun, Web CT and EMES/Centra.

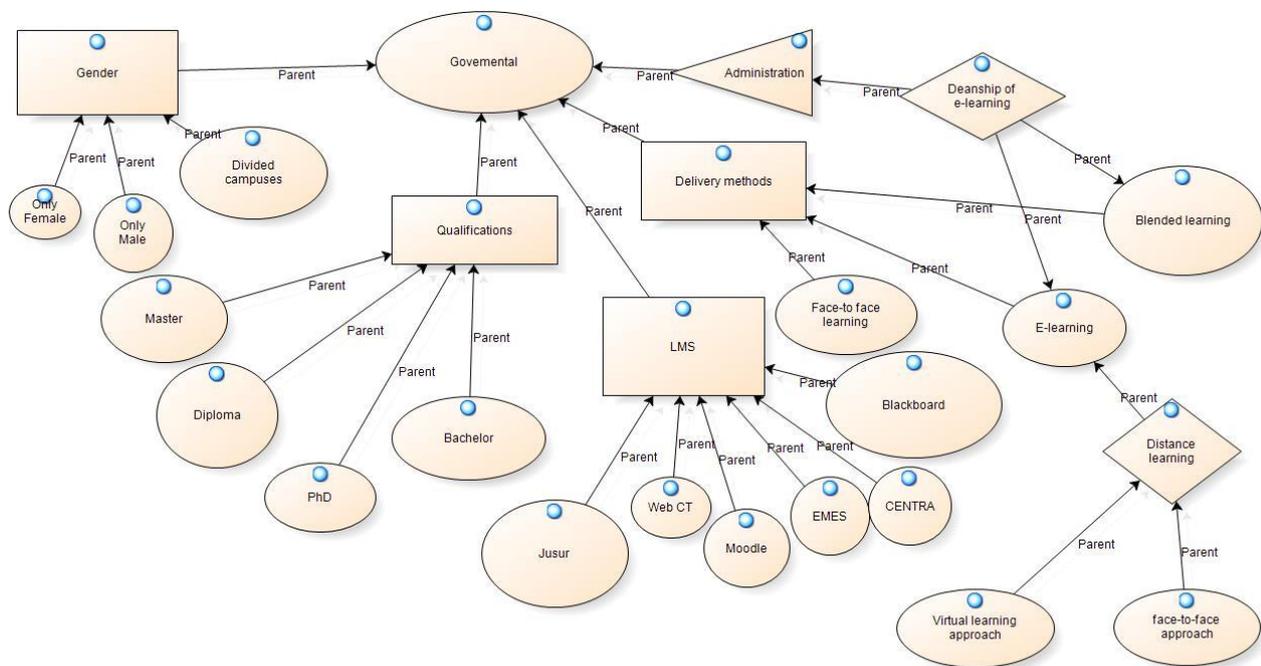


Figure 4.5 Government university education systems in the KSA.

4.4.1.3 Public Research university

In the KSA, there is only one public research institution, which was founded and is operated by the Saudi state government, and has a simple structure. It has a mixed gender campus and the teaching style is traditional, mainly face-to-face learning. It offers post graduate qualifications such as master's and doctoral degrees. This type of university integrates research and education, leveraging

the interconnectedness of science and engineering, and works to catalyse the diversification of the Saudi economy through economic and technological development.

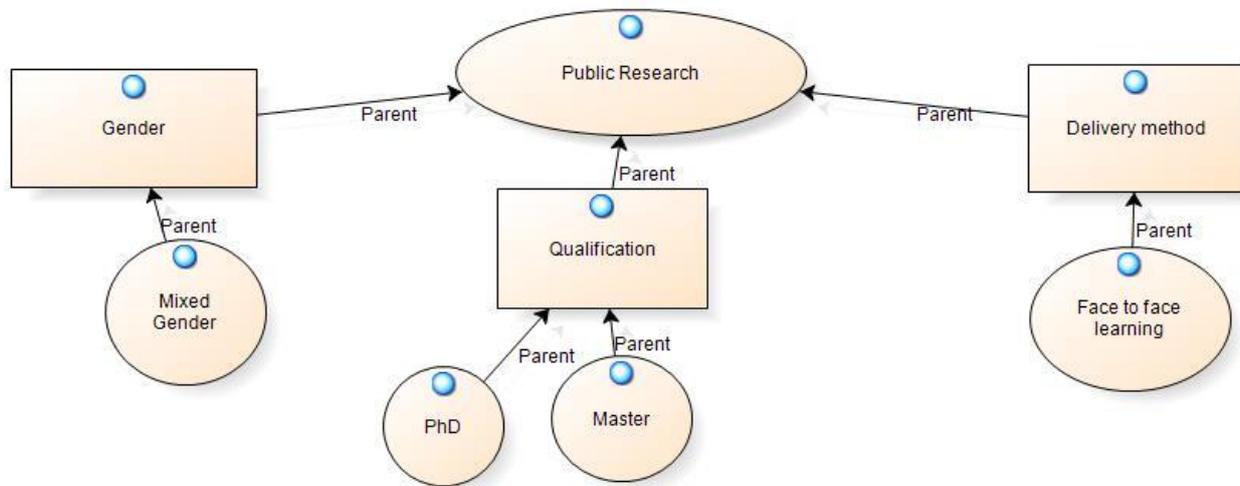


Figure 4.6 Public research university in the KSA.

4.4.2 Gender-based campuses

In the theoretical framework of the Saudi tertiary education system model (Figure 4.1), the second feature is the gender-based campus. The Saudi government now views all levels of education as the key to developing and enhancing the skills and abilities of the people; education expenditure was high in 2003 with more than one quarter of the national budget spent on the development of educational infrastructure (Hamdan, 2005). The Saudi government has increased the number of universities from just eight universities in 2000 to 34 universities in 2011. These steps have helped to improve the education sector's ability to meet the growing needs and demands of the country's female population. Campuses accommodating both genders have increased the opportunities to continue studying at many universities from 2000 up till now.

Private universities have female and divided campuses, government universities have male, female and divided campuses and only the public research university has a mixed-gender campus (Figure 4.7). This difference between campuses is due to women in the KSA being restricted by cultural and religious beliefs, which state that a woman should be taught in an appropriate place

(feminine environment) as well as she should be accompanied by a male *Mehram* (a close or direct blood relative) when leaving the home (Al-Kahtani, Ryan & Jefferson, 2006; Baker, Al-Gahtani & Hubona, 2010; Al-Munajjed, 2010). This law limited female students' ability to find opportunities that enable them to attain higher education, which led to exclusive education setups for women in both private and government colleges and universities (Jamjoom, 2012). Some universities provided education to women in dedicated centres, while others have exclusive campuses dedicated to female education.

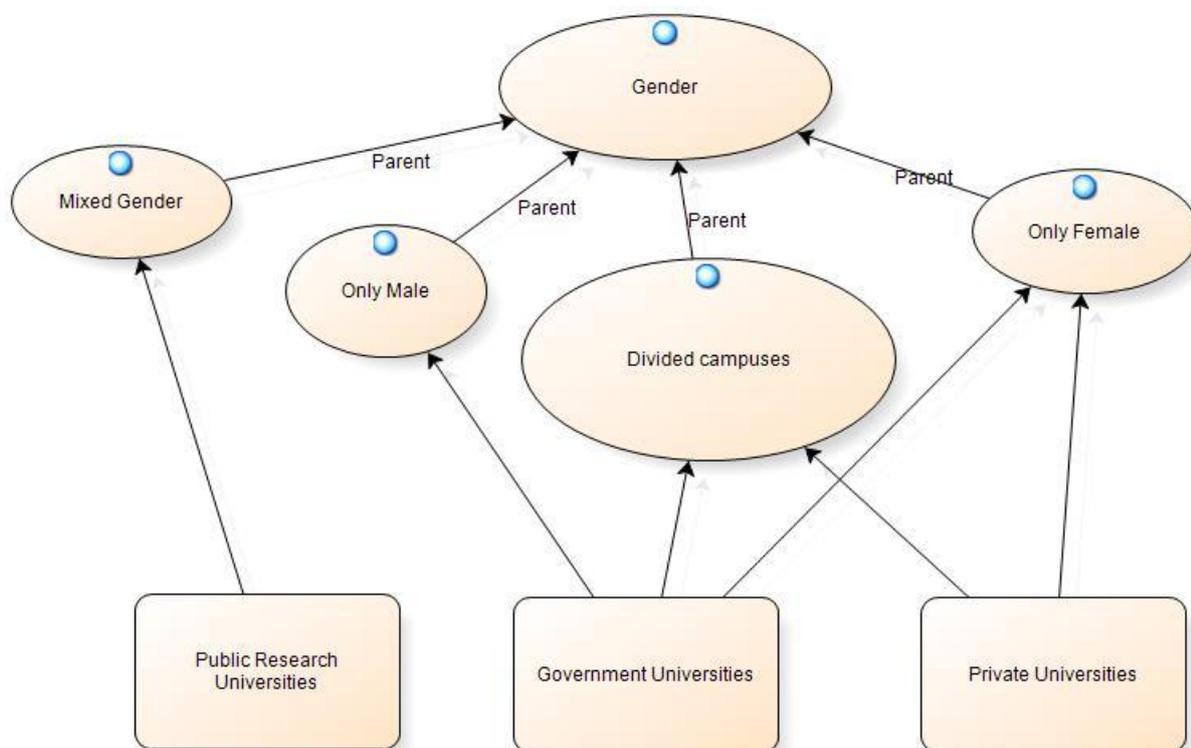


Figure 4.7 Graphical representation of the gender-based system

4.4.3 Delivery methods

The major types of teaching approaches used in the universities are: face-to-face learning, e-learning and blended learning. Face-to-face learning is the traditional way of teaching in which a classroom environment is maintained, e-learning involves teaching students via the use of the Web and blended learning involves a mixture of both styles.

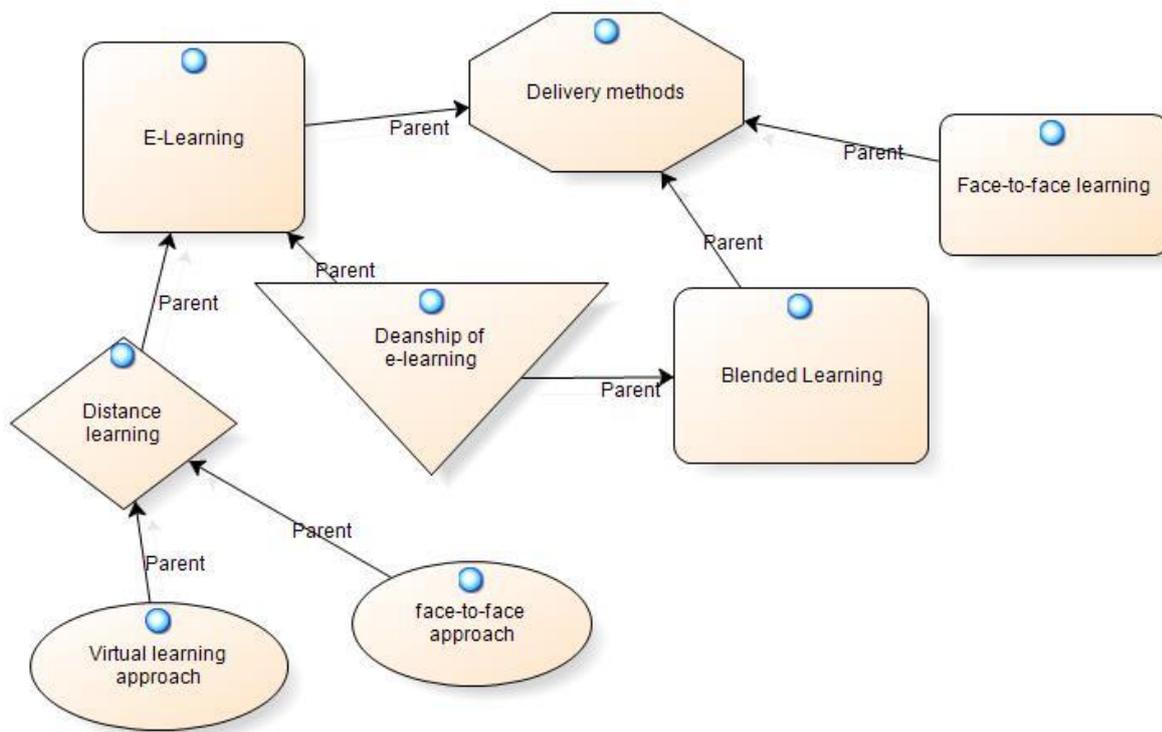


Figure 4.8 Delivery methods employed at universities in the KSA.

A face-to-face delivery method is the conventional teaching method in the KSA. The courses taught require regular meeting of the students and teachers in classrooms and utilizes on-campus learning facilities. This type of approach requires a high level of human resources in terms of teachers in order to meet the rising number of students and high investment in terms of learning materials. With a rapidly growing population, half of which is below 20 years of age, this type of delivery method becomes inefficient and there is therefore a need to have a more cost-effective and efficient learning approach (Habib & Islam, 2011).

E-learning offers a solution to the problems associated with the face-to-face delivery method. E-learning involves the use of the internet and any other electronic media to convey the information from teachers to students. The students can learn in the comfort of their homes (distance learning) and utilize web-based learning materials and there is, therefore, minimal contact (face-to-face approach, which requires 25 per cent student attendance for all courses) or no teacher-student contacts (virtual learning approach).

The blended learning style is a combination of the previous two approaches. This becomes more effective for students who are not comfortable studying and understanding learning materials on the internet as they can meet teachers in person. This also helps enhance the teacher-student relationships (Al-Shahrani & Ward, 2013).

Both e-learning and blended learning delivery methods in the KSA tertiary education system are supported by a deanship for e-learning, which is established to manage LMSs and promote incorporated access to online resources by students and lecturers (Al-Khalifa, 2010).

4.4.4 LMS products

The LMS provides a virtual environment in which students may be taught. It supports the critical functions of online instruction and course administration. It is assumed already to have an important role in Saudi higher education. The LMS products used include, Blackboard, Moodle, Jusur, Web CT and EMES/Centra. Figure 4.9 shows the types of LMSs are offered in Saudi universities. Each type of Saudi university may use one or more LMS products or technology to support the critical functions of online instruction and course administration. Many types of LMS are used, some of them are commercial products like Blackboard, and others are open-source, including Moodle and Web CT. Jusur LMS is designed to support Arabic contents and is managed and controlled by NCEL, whereas EMES and Centra are owned by a single government university and offer the platform for a web-based learning environment.

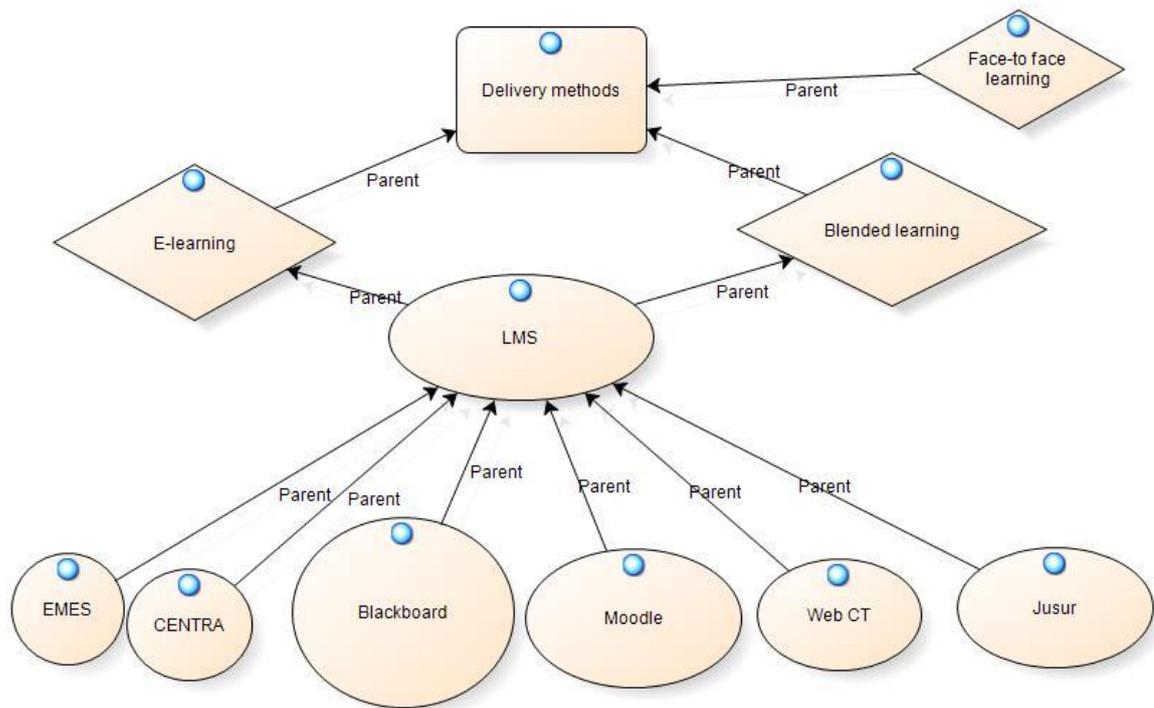


Figure 4.9 LMS products in Saudi Arabian universities.

4.4.5. Qualifications

The focus of this research is tertiary level education. Figure 4.10 shows the available qualifications in Saudi public research, private and government universities.

The four qualification levels are diploma, bachelor, master and doctorate degrees.

- Diploma—a diploma is a deed or certificate that is awarded by an institution to provide evidence of the recipient’s successful completion of a specific course of study. This type of degree takes one to two years to complete.
- Bachelor’s degree—a bachelor’s degree is awarded when a student completes all units of a particular major, including any electives. This type of degree usually takes up to five years to complete.

- Master’s degree—a master’s degree can only be earned after completion of a bachelor’s degree. It is awarded after the successful completion of one to two years of post-graduate study.
- Doctorate is the highest level of academic achievement. It entails recognition that the candidate has achieved a level equal to that of the faculty within a university. Doctorate degree usually take up to four years to complete

Diplomas, bachelors and masters degrees can be awarded through e-learning, blended learning and face-to-face learning, while doctoral degree which must be acquired through face-to-face learning.

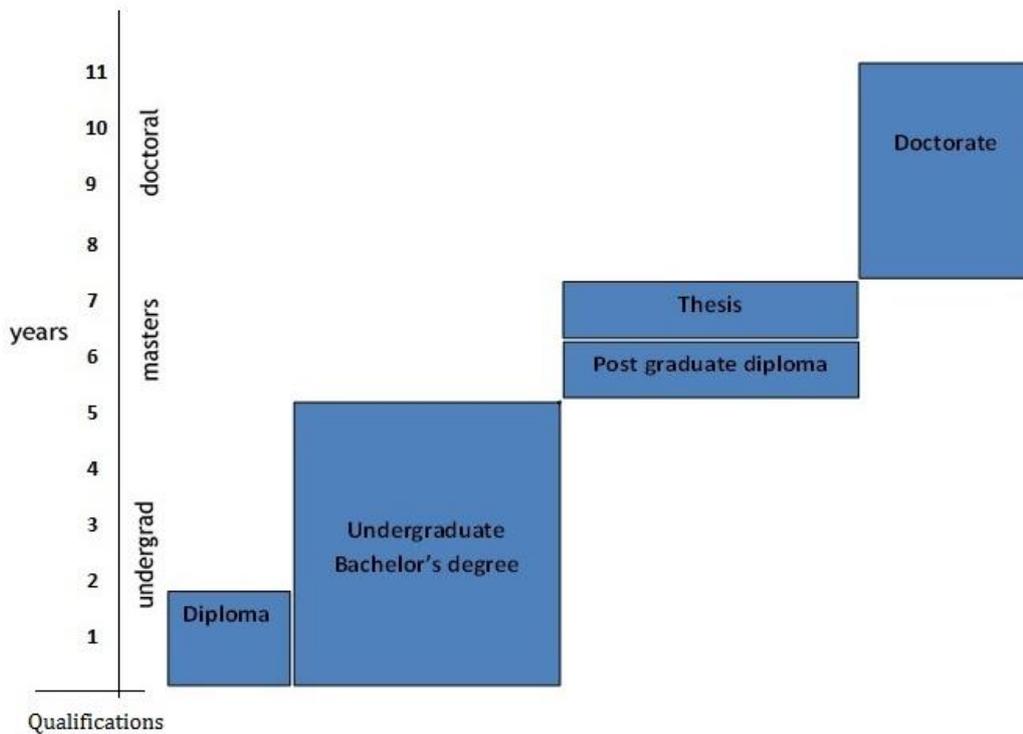


Figure 4.10 Qualifications available in Saudi universities (A. Litchfield, personal communication, August 15, 2013).

4.4.6 Majors:

Selecting majors, when studying at Saudi universities, depends on the seat availability at each university’s campus as well as the accessibility to a particular field in light of cultural and

traditional concerns (Al-Nuaim, 2012). Gender segregation along with physical and technical interaction, especially for females, are among these cultural and traditional issues. Some majors in Saudi Arabian universities are available to one gender only. For example, most of the applied engineering specializations such as electrical, civil, chemical and computer engineering are not offered to female students. Figure 4.11 illustrates some of the available majors at selected Saudi universities. PSU (private university), KKU (government university) and KAUST (public research university) are chosen to be examples of available majors at Saudi universities. It can be seen that undergraduate majors like business and information systems at both private and government universities are available to both genders, whereas master's programmes in some areas such as history and geography are offered to male students only. In contrast, special subjects like home economy and kindergarten teaching, interior design are offered to female students only, whereas many engineering programmes are only available to male students.

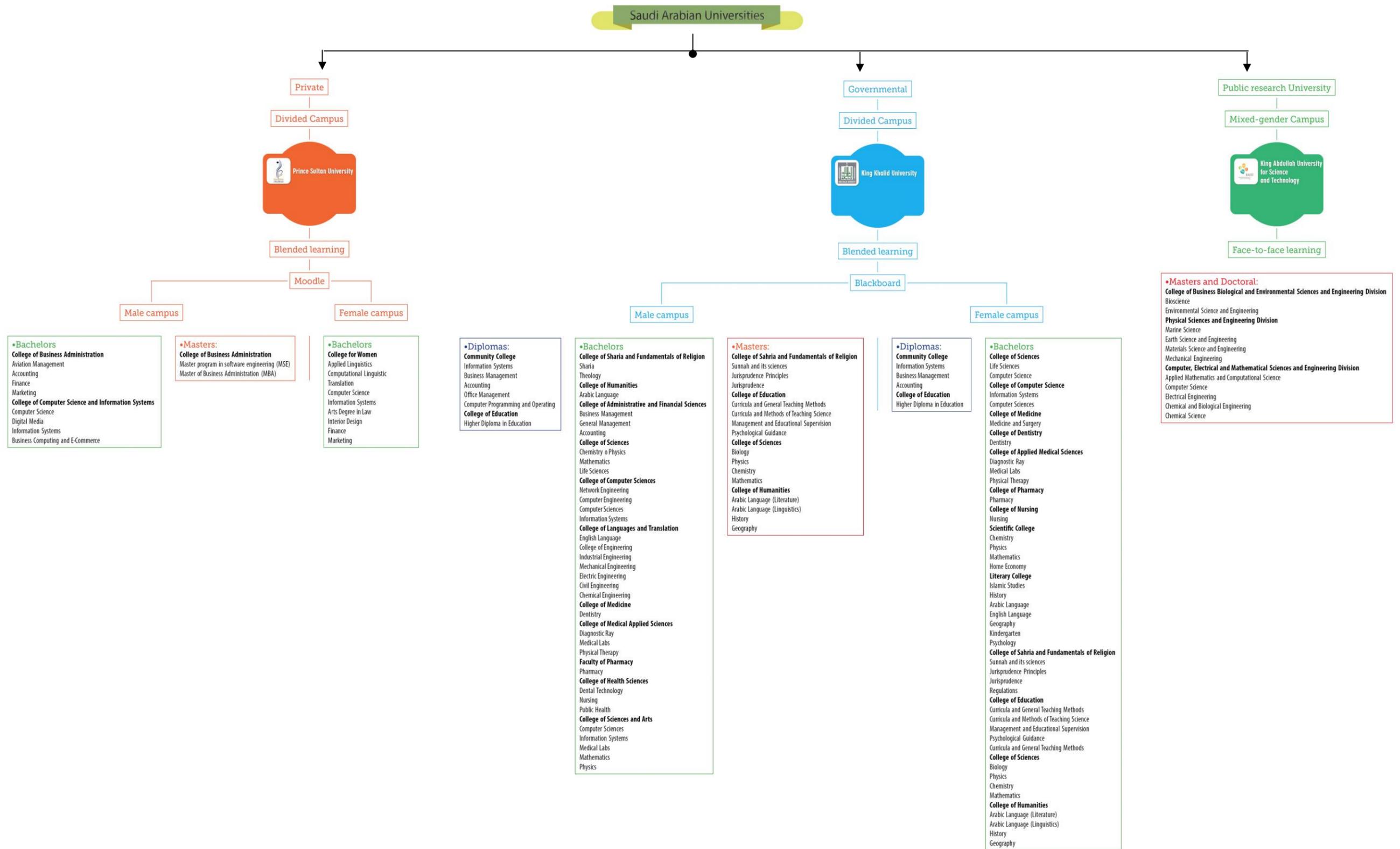


Figure 4.11 Majors available at selected Saudi universities.

4.5 Taxonomies

Taxonomy is used in this research to organise a large set of characteristics and properties into a hierarchical order. The following figure (see Figure 4.12) is an example of the taxonomy for Saudi universities to show types of course delivery methods and the LMSs they employ.

Appendix A shows hierarchical taxonomies of all Saudi universities. The hierarchical taxonomies present and clarify Saudi universities according to their *type* (private, government and public research), *gender-based campuses*, *delivery methods*, *LMS products*, *qualifications* and *majors*.

An infographic is designed to effectively express a complex set of information related to the current model of the Saudi tertiary education system. An infographic is a graphical representation of data collected to represent complex information in an easy and clear manner. It is used to improve cognition, while using graphics enables patterns and trends to be seen. An infographic is designed in this project to represent complex data efficiently and to build a taxonomy and organise a large set of items into a hierarchical order (see Figure 4.13). The infographic represents and symbolizes each university according to its characteristics as well as locating each university on a map of Saudi Arabia. The delivery methods at each university have been summarised on the left hand side.

The infographic shows the 34 Saudi Arabian universities, characterised and organised into a diagram which helps in discussion and interpretation of them in the next chapter.

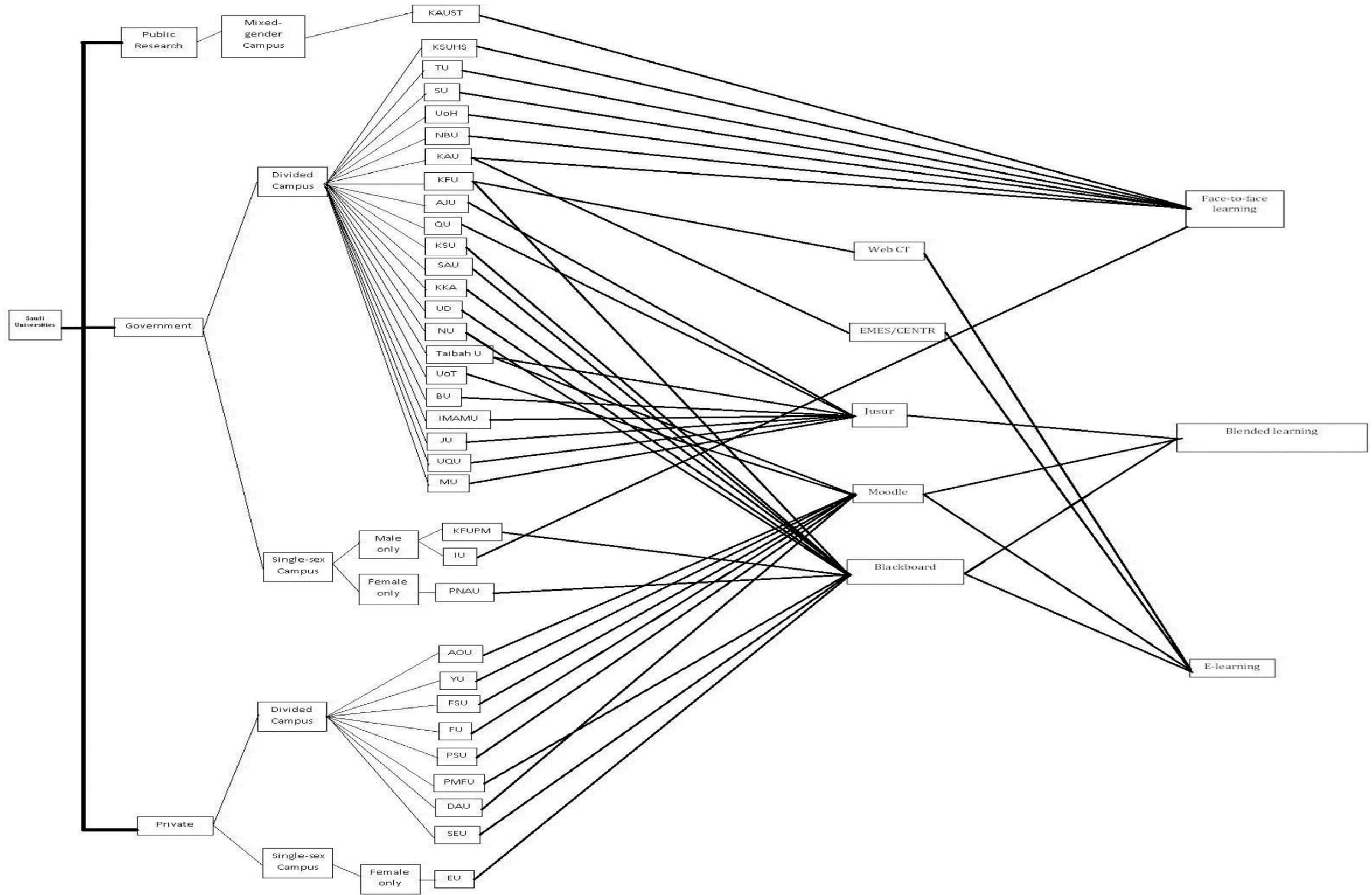


Figure 4.12 A hierarchical taxonomy for the Saudi universities according to their type, gender-based campuses, LMSs utilization and course delivery methods respectively.

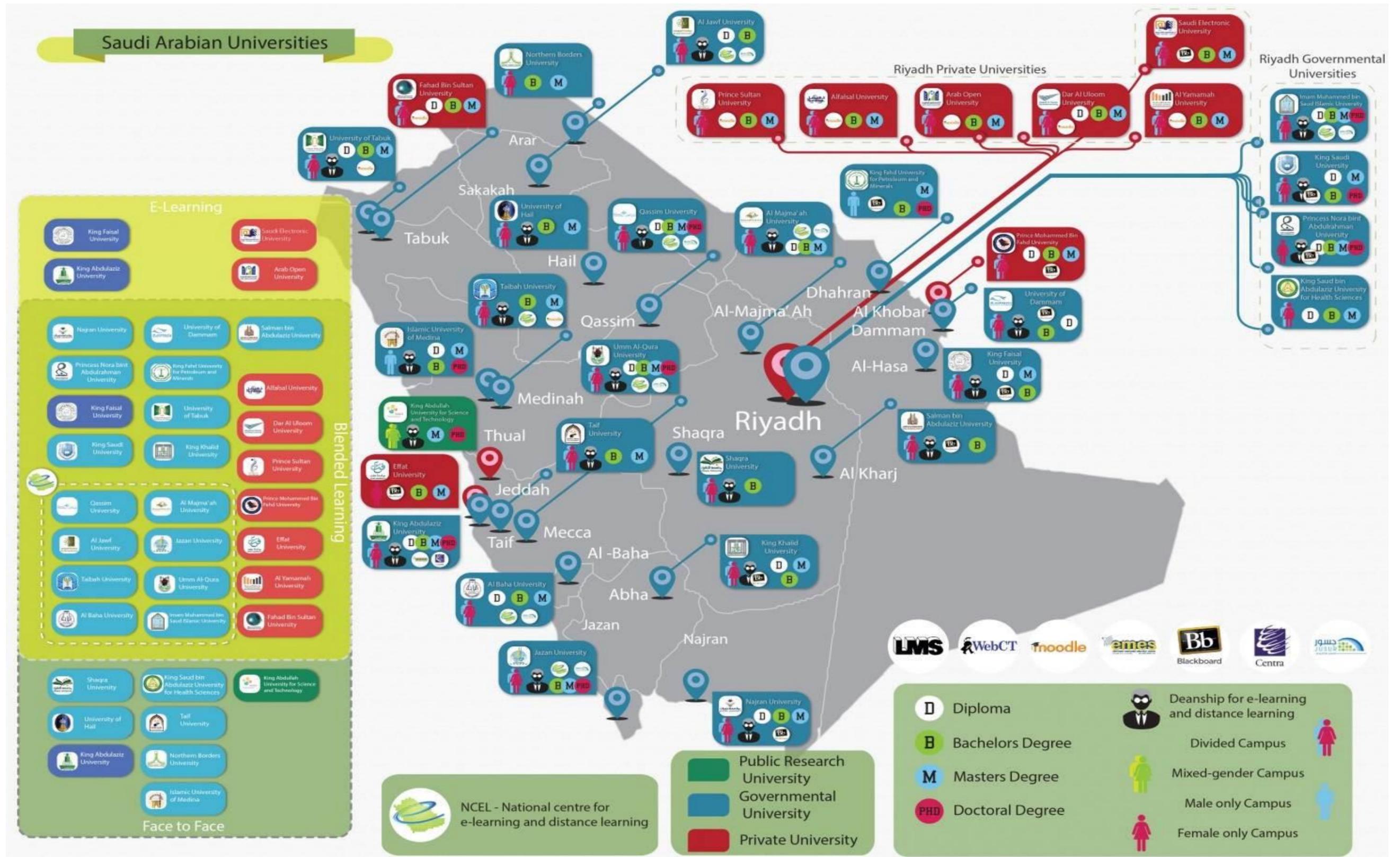


Figure 4.13 Infographic for the Saudi tertiary educational system.

4.6 Conclusion

A theoretical framework that will work as a guideline for this project has been presented. The model defines how the Saudi tertiary education system is structured and identifies the features that need to be developed to improve the education system as a whole. The aim of this study is to create models for course delivery in the Saudi education system and identify features of the academic structure.

The framework shows that the Saudi tertiary education system has six main features on which the system is based. These features will influence the adoption and implementation of any new programs in the education system and are therefore important to analyse and interpret. The main model of the Saudi tertiary education system has been developed using NVivo, a software program used in the application of qualitative techniques. An infographic (Figure 4.13) is designed to effectively express a complex set of information related to the current model of the Saudi tertiary education system. The infographic relies on a taxonomy that organises this large set of items into a hierarchical order. The means of applying a taxonomy to the proposed model of the education system is also put forward.

An exploration of the results gathered from the models, infographic and taxonomies is presented in Chapter 5. The six main features on which the tertiary education system is based are individually explained, as is their effect on the system; university type, gender, delivery methods, LMS products, qualifications and course majors. The next chapter will also discuss the implementation of e-learning within the different features of the KSA education system.

Chapter 5: Research Findings and Discussion

5.1 Introduction

The theoretical framework and model of the current Saudi tertiary education system are presented and discussed in Chapter 4. The framework shows that the Saudi tertiary education system has six characteristics on which the system is based. In this chapter, the results are interpreted and discussed to present an analysis of the components of delivery methods in the Saudi tertiary education system.

Each section in Chapter 5 discusses and investigates particular patterns in the findings of Saudi tertiary educational system framework and provides selected examples and illustrations from the taxonomies and infographic created. Section 5.2 analyses data relating to the different types of universities in the KSA. Section 5.3 discusses the gender-based nature of tertiary education in the KSA and examines e-learning programmes in relation to gender-based learning. In Section 5.4 the different delivery methods used by both government and private universities in the KSA are discussed, along with the role of NCEL in terms of implementing and supporting e-learning. A number of different LMSs are available to universities within the KSA. Section 5.5 introduces the different LMSs used by Saudi tertiary institutions and comments on the influence of cost. In Section 5.6 the range of qualification options offered by universities in the KSA are presented. A global economy requires an educated work-force and this section also discusses how global requirements impact the level of learning in the KSA. Section 5.7 presents subject majors available at both private and public universities – majors that are generally gender restricted and might be unavailable at all qualification levels. Section 5.8 concludes the chapter by summarising the main findings and determining to what extent ICT is used in higher education in the KSA.

The purpose of the data analysis and interpretation is to transform the collected data into sound evidence regarding the advancement of course delivery in Saudi universities and its performance and success rate. The analysis will help answer the questions:

***RQ2.** Can the delivery techniques be improved using available technologies and/or a suitable model and taxonomy?*

***RQ3.** What is the ideal learning model for the Saudi tertiary educational system?*

Three steps are involved in processing the data: organization, description, and interpretation.

Wellington (2000) argues that, in the case of qualitative data, interpretation becomes more difficult for two reasons. The first is that, for qualitative data, it is important to group similar responses into categories and identify the common patterns that will help derive meaning, from what are considered diffuse or unrelated responses. Secondly, it is particularly important to try to gain the maximum value from the collected data.

5.2 Types of Universities

This section discusses data relating to the different types of universities in the KSA and their implementation of e-learning programmes. The type of university influences the implementation and success rate of an e-learning programme. Private universities are likely to have a higher success rates and more effective implementation of the programme as compared to government universities. This is due to smaller student populations and a higher rate of technological investment needed to meet student demands at private universities. Technological investment by private universities also enhances their reputation and allows them to compete with the others for enrolments. Due to the high tuition fees, private universities can afford more prestigious environments which are marked by up-to-date facilities and new buildings, when compared with government universities. Government universities have a high rate of student enrolment as they are free of charge and also grant monthly financial stipends. Therefore, the implementation of e-learning at government universities might be hampered by the high student numbers. However, in the KSA, many government universities are striving to implement e-learning as the programme provides an efficient and economical method of solving the problem of a growing enrolment rate that outstrips the growth rate of the universities' physical resources.

Another factor that influences the implementation of e-learning in private universities is the internal scholarship programme. Seven years after the institution of private higher education, the MOHE established the internal scholarship programme that permits students to be admitted to private universities, with the expectation that they study market oriented subjects. This programme offers two kinds of scholarships: full scholarships for secondary school graduates with excellent and very good accumulated GPAs, and partial scholarships for secondary school graduates with “good” accumulated GPAs (Al-Dali & Al-Rayes, 2009). Internal scholarships are available to students who have already been enrolled, as well as to those to want to be enrolled in private institutions. However, there is a requirement that newly applying students must have passed the standard examination needed to enter government universities. The private universities usually do not have such requirements and regulations and very few even have this type of assessment for admission (Jamjoom, 2012).

Table 5.1 presents a compact version of the data gathered and provides general information on the Saudi tertiary education system. It first divides the universities by type: government universities are shown in blue; private universities are orange; a public research university is green. The table shows a total of 34 universities: 24 governmental, nine private and one public research. Of these, one government university and one private university provide a female only campus, and two government universities provide a male only campus. The public research university has a mixed gender campus. The remaining 29 universities provide for both genders in divided campuses.

Table 5.1 University Features.

University	Campus				Deanship for E-learning		NCEL#		LMS	Qualification			
	Female	Male	Divided	Mixed-gender	Yes	No	Yes	No		Diploma	Bachelor	Master	PhD
KSU			✓		✓				Blackboard	✓	✓	✓	✓
IU		✓			✓				Blackboard	✓	✓	✓	✓
KFUPM		✓			✓				Blackboard	✓	✓	✓	✓
KAU			✓		✓				EMES/ CENTRA	✓	✓	✓	✓
UAU			✓		✓			✓	Jusur	✓	✓	✓	✓
IMAMU			✓		✓			✓	Jusur	✓	✓	✓	✓
KFU			✓		✓			✓	Blackboard/ Web CT	✓	✓	✓	✓
KKU			✓		✓			✓	Blackboard	✓	✓	✓	✓
Taibah U			✓		✓			✓	Moodle	✓	✓	✓	✓
TU			✓		✓			✓		✓	✓	✓	✓
QU			✓		✓			✓	Jusur	✓	✓	✓	✓
UoH			✓		✓			✓		✓	✓	✓	✓
JU			✓		✓			✓	Jusur	✓	✓	✓	✓
AJU			✓		✓			✓	Jusur	✓	✓	✓	✓
KSUHS			✓		✓			✓		✓	✓	✓	✓
BU			✓		✓			✓	Jusur	✓	✓	✓	✓
UT			✓		✓			✓	Moodle	✓	✓	✓	✓
NU			✓		✓			✓	Blackboard	✓	✓	✓	✓
NBU			✓		✓			✓		✓	✓	✓	✓
PNAU	✓		✓		✓			✓	Blackboard	✓	✓	✓	✓
UD			✓		✓			✓	Blackboard	✓	✓	✓	✓
SAU			✓		✓			✓	Blackboard	✓	✓	✓	✓
SU			✓		✓			✓		✓	✓	✓	✓
MU			✓		✓			✓	Jusur	✓	✓	✓	✓
SEU			✓		✓			✓	Blackboard	✓	✓	✓	✓
PSU			✓		✓			✓	Moodle	✓	✓	✓	✓
EU	✓		✓		✓			✓	Blackboard	✓	✓	✓	✓
AOU			✓		✓			✓	Moodle	✓	✓	✓	✓
YU			✓		✓			✓	Moodle	✓	✓	✓	✓
FSU			✓		✓			✓	Moodle	✓	✓	✓	✓
PMFU			✓		✓			✓	Blackboard	✓	✓	✓	✓
FU			✓		✓			✓	Moodle	✓	✓	✓	✓
DAU			✓		✓			✓	Moodle	✓	✓	✓	✓
KAUST			✓	✓	✓			✓		✓	✓	✓	✓

Note: # (National Centre for E-learning and Distance Learning support)

Blue = government university, orange = private university and green = public research university.

5.3 Gender-based Campuses

This section discusses the different gender focuses amongst universities in the KSA, with a description of the social, cultural and religious factors that influence gender-based tertiary education. It also examines to what extent e-learning is gender-based in Saudi universities.

The KSA has always had single-sex education at all levels, from primary to tertiary. Single-sex education refers to the segregation of males and females in schools by either having different buildings for each or by dividing classrooms. This limits interaction between genders during school hours. Co-education is the opposite of single-sex education. In co-education, students of both genders study in the same classrooms and abide by similar rules. The reason behind the schools having single-sex education is to teach each gender differently for social, cultural and religious reasons.

The KSA is influenced by social factors, and cultural and religious norms. These are interlinked, while separated by easily identifiable boundaries and Saudi Arabian characteristics. Society is influenced by culture, culture is influenced by religion, and religion is strictly practised by society. In the KSA, gender roles are derived from the *Sharia* (Islamic law) and tribal culture. The law is generally unwritten, which allows judges to make decisions in favour of tribal culture. However, a famous Saudi saying “It’s the culture, not the religion”, illustrates the way law is practised. Saudis do not see religion as the main obstruction to the expansion of women’s rights, but rather see it being the culture. Under the Sharia law, women should have a male guardian (*Mehram*), in the form of a father, brother or husband. That guardian is responsible for taking care of the woman and has rights over the woman, in all parts of civic life.

Of the total of 34 universities, one government university (PNAU) and one private university (EU) have female-only campuses, and two government universities (IU and KFUPM) have male-only campuses and the public research university (KAUST) has mixed gender campuses. The remaining 29 universities include 22 government universities and seven private universities

which have gender-divided campuses. The majority of the universities offer divided programmes where the campuses are divided into two sections.

The e-learning approaches employed in both male and female only universities are more or less the same. A comparison of KFUPM which is male-only, and the female-only university, PNAU (Table 5.1), shows that they both have the Blackboard LMS and an e-learning deanship, but neither has support from the National Centre for E-learning and Distance Learning (NCEL).

5.3.1 Challenges of Gender in Higher Education

Many universities in the KSA are gender-segregated, offering specific subjects to a specific gender thus limiting the type of courses the students can pursue. Since there is limited capacity in government institutions, the admission requirements are stricter than in private institutions. This also controls the students' focus in various courses and many applicants do not end up in their desired areas of specialization. Lower demand majors such as humanities are taken up mainly by students who do not excel, but are satisfactory students. Students without a background in scientific disciplines, especially the Islamic and social studies tracked students can only enrol in vocational undergraduate schools or in humanities colleges. This is also determined by their secondary school GPAs, the scores of an aptitude exam, as well as programme availability. Graduates specializing in humanities, art sciences and education have flooded the Saudi job market, with 41.6 per cent of government university graduates holding degrees in education, humanities and art studies (MOHE, 2011, p. 129).

In the KSA, the involvement of women in the labour market is minimal and limited and this can partly be attributed to the limitation in the subjects available to them (Ramady, 2005; Al-Munajjed, 2010; Jamjoom, 2012). The student-gender segregation in most public universities means that many subjects are not offered to women, and therefore there is limited opportunity in the type of subjects which they can apply for. This inconsistency between subjects available to women and the accessibility of jobs in the labour market is increased in instances where female students have,

for example, the choice of studying towards a business degree but will have no opportunity to work in this field.

Private institutions are, however, introducing various practices that support gender equity, including new study subjects that suit female students and that will assist them in stepping into a wider spectrum of careers. For example, Effat University initially concentrates on market-oriented courses, offering subjects such as business, electrical and computer engineering, entrepreneurship, early childhood development, and information management. These practices are executed with a lot of caution and are first tested for social-cultural acceptability. It is unclear how the new practices and broad social changes are related: whether private institutions are responding to already existing social changes, or private institutions are primarily leading these social changes is yet to be understood. However, it is clear that the private institutions are spearheading efforts to attaining gender equity by offering female students wider admission to higher education and new professions in the job market. Private universities are also more market-oriented in their degree programmes and course work.

While private universities focus on future employment, the quality and quantity of graduates from government institutions do not always match market needs (Al-Mubaraki, 2011; Jamjoom, 2012). The government institutions have failed to offer subjects which are required in the labour market and for the growth and development of the national economy and adjusted admission quota to those needs. There is a higher admission quota for humanities and social science enrolments than science disciplines in government universities as they do not need as much space and expensive equipment and resources (2012). Business administration is regarded as an important subject in the labour market and while it is offered in most private institutions within specific colleges, it is not available at government institutions. Students in private institutions can specialize in finance, banking, marketing, human resources, hospitality, tourism, quality management and project management (2012).

Statistics show that the literacy level of women in the KSA is lower than men. The estimated level of literacy in 2003 was 78.8%, with 84.7% for males and 70.8% for females. This is despite the fact that students are paid to join schools and institutes (Jamjoom, 2012). In the KSA, women are restricted by religious and cultural requirements, such as the need to be accompanied by a male *Mehram* (a close or direct blood relative) when leaving the house (Al-Munajjed, 2010). Such requirements often limit females' access to higher education. It is this lack of opportunity that has motivated the establishment of exclusive education set-ups for females by various colleges and universities (Baker et al., 2010). As well as dedicated centres females are also able to study on divided campuses.

There is a need for further measures to ensure that the education system is made more accessible to female students. The implementation of new technologies such as e-learning could have a substantial impact, transforming the way in which higher education is accessed in the KSA. The model below illustrates how the e-learning method can assist females who seek higher education in the KSA. Figure 5.1 depicts the social and religious barriers that are faced by Saudi women, Saudi women's use of the internet and internet services, and Saudi women's use of e-learning.

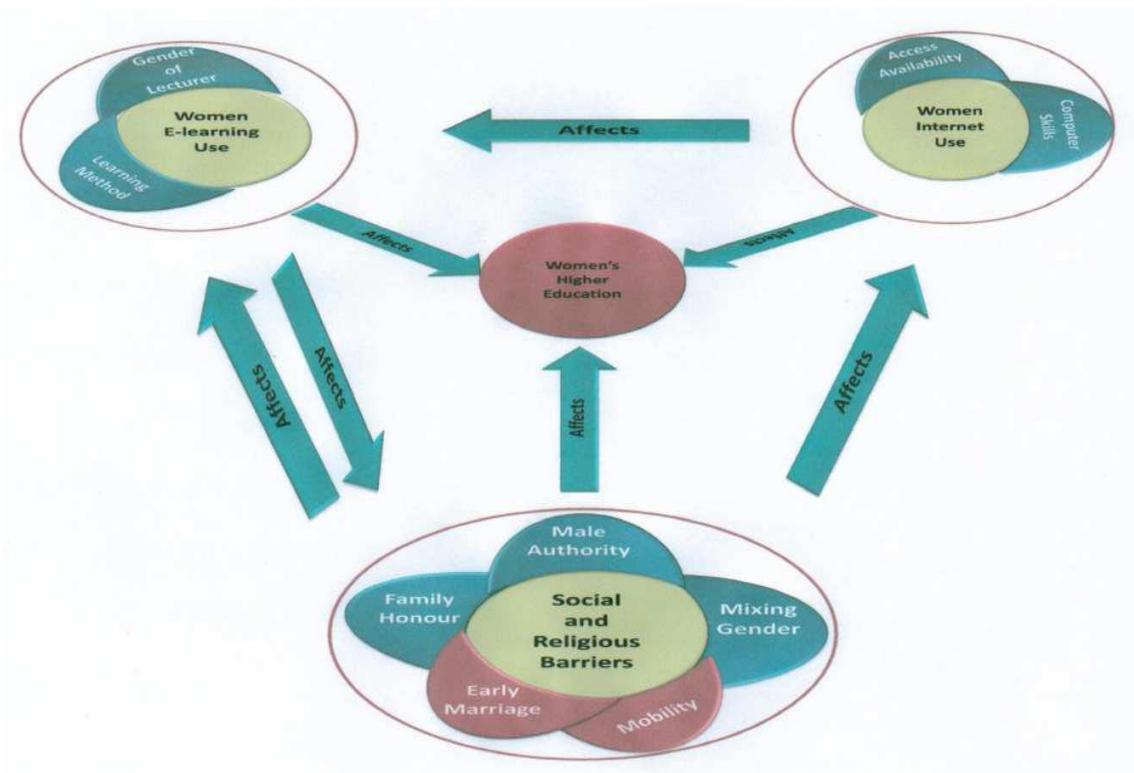


Figure 5.1 Primary model of higher education opportunities for women in the KSA, taking into account social and religious beliefs (Alhareth, McBride, Prior, Leigh & Flick, 2011).

5.4 Delivery Methods

In this section the delivery methods used by both government and private universities in the KSA are discussed, with attention given to student gender. The role of the NCEL in implementing and supporting e-learning is also discussed.

Seven government universities (SU, UoH, KAU, and KSUHS, TU, NBU and IU) and one public university (KAUST) continue to use only face-to-face teaching methods. Of these, only the Islamic University of Medina has a male-only campus.

Altogether four universities, two government universities (KFU and KAU) and two private universities (SEU and AOU), use an e-learning method for teaching their students. Therefore, 17 government universities and seven private universities use the blended learning method to teach students. Among these, KFUPM has a male-only campus and the PNAU has a female-only campus. The remaining universities in this group have divided campuses.

It cannot simply be said that government universities still follow traditional face-to-face teaching methods, as many have converted to e-learning or blended learning methods. Most private universities also use the blended learning method for teaching. Examples of government universities that still teach using the face-to-face learning method are SU and NBU. SEU and AOU are both private universities that use the e-learning method to teach students but require 25 per cent of their students to attend face-to-face classes every month. In contrast, KFU and KAU are both government universities that use the e-learning method and require 80 per cent attendance through virtual classes. NU and the UD are both government universities that use the blended learning method.

Blended learning has removed a number of concerns that were faced by a number of Saudi universities. The gender segregated culture of the KSA helps in the implementation and utilization of blended learning as there is a shortage of female instructors at many Saudi universities (Al-Fahad, 2009; Alebaikan, 2012). Blended learning and its products are now being adopted by 24 Saudi Arabian universities. MOHE and NCEL have launched an Award for E-learning Excellence in order to encourage Saudi universities to develop their delivery methods and to motivate the individual faculties to be creative and productive with their use of e-learning (Alebaikan, 2012).

However, blended learning requires expert support and standardised policies. Moreover, teachers who are new to this model need training to adapt and use it to its maximum potential. Systems analysts need to specialize in this model to gain expertise and to make courses easy for everyone to use. The significance of this model continues to rise and should assist students to become self-reliant, systematic and analytical.

In order to achieve this, the NCEL endeavours to deliver rich multimedia resources to assist faculty members in improving and integrating blended learning so that it fits their courses and the university's needs. Figure 5.2 shows that NCEL maintains and facilitates eight government universities; (UAU, IMAM U, QU, BU, JU, MU, Taibah U and AJU). All these universities apply

blended learning as a method for course delivery and seven of them use the Jusun LMS, while Taibah University uses the Moodle LMS. Figure 5.2 is an excerpt from Figure 4.13, p. 77.

5.4.1 Blending with Purpose

Picciano (2009) describes the blending with purpose model which proposes that technology and learning styles should work together when an instructor is building an approach for the class. Learning style and the use of technology should all be considered important tools for learning (see Figure 5.3). The blending of these is what makes a course a successful source for learning for many different individuals. According to Picciano (2009), the blending with purpose model presents six objectives to enable success in the teaching process: resourceful content; asking the right question; communicating positively; group work; evaluation and assessment of student progress; and reflection.



Figure 5.2 Delivery methods in Saudi universities

1. Resourceful content should always be available to the teacher. This content should be accessible in the classrooms whenever it is needed, as it allows the teacher to keep students updated on topic details at all times. Devices should be widely available that can be installed in the classroom and run LMS software. This software helps to aid student learning by presenting not only text and pictures but also video and presentations.

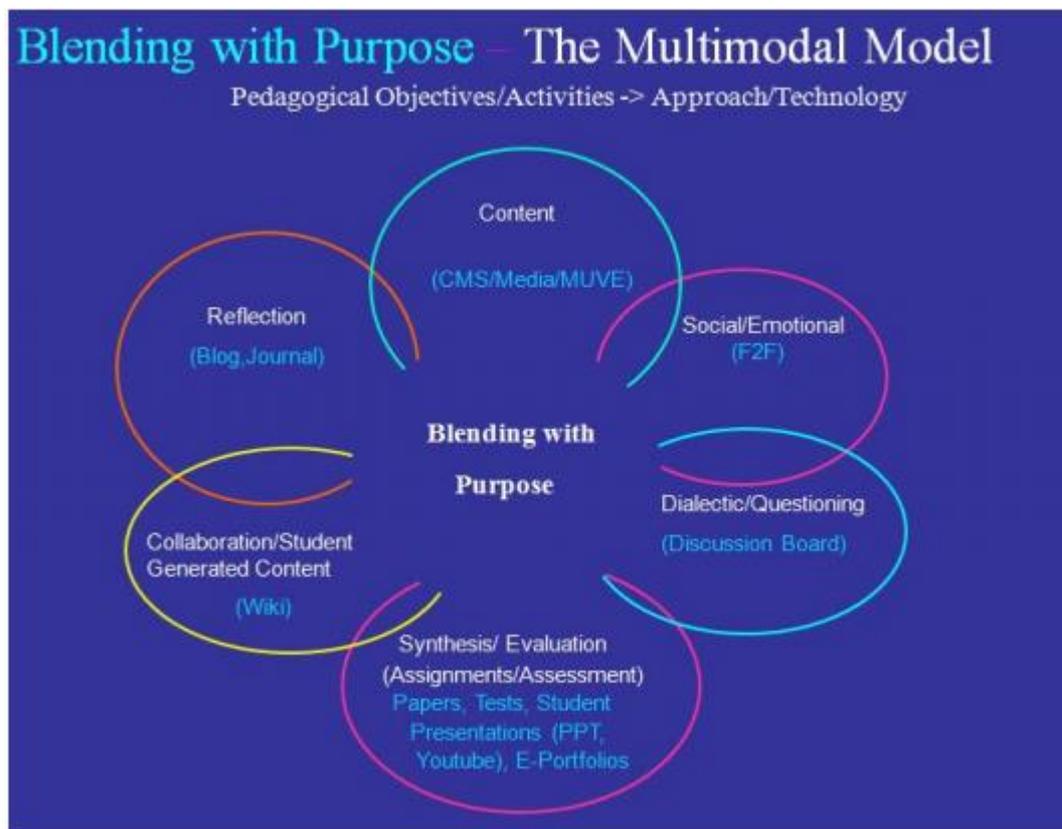


Figure 5.3 Blending with Purpose: The Multimodal Model (Picciano, 2009, p. 11)

2. The 'asking the right question' method should also be used in the classroom. This is a good way to narrow the conversation and let the students think critically. When students raise points during such questioning sessions, it helps them to understand and clarify concepts. An electronic board for discussion is the best approach in such situations. It helps organise answers and develop a healthy discussion.
3. Teachers should communicate positively with students to build good relationships between students and teacher. When the student has an emotional connection between himself or

herself and the teacher, he or she becomes comfortable and confident enough to raise queries whenever required. Students always require advice from professional teaching staff, regardless of whether they are at an elementary or an advanced level. This is possible with an online videoconferencing facility; however, it is not as good as face-to-face interaction. Hence, a combination of both creates a rational environment for effective learning.

4. Group work should always be encouraged in the classroom to help students in areas where they might be struggling. This is a way of improving relationships between students, thereby making it easier for them to communicate and solve problems when the teacher is unavailable. Group work also encourages new ideas that help to enhance students' knowledge on a particular subject. Blogs are another method for answering questions that students may want to ask. This helps them obtain answers instantly from fellow students or from the teacher without having to wait for the next class.
5. Evaluating and assessing student progress should be an important part for teaching. Being able to test students with electronic quizzes and assignments will assist teachers in achieving this effectively. Such technology makes it easier for teachers to check student performance and help them improve in the relevant areas. Teachers can also use blog discussions to review student progress because they can analyse where knowledge is lacking.
6. Reflection should be an important aspect of learning. This is a personal activity that can also be shared with others to clarify any ambiguity. It is a very productive way of improving student participation with each other and with the teacher. It strengthens concepts in the students' minds and allows them to grow in terms of intellect and creativity (Picciano, 2009).

A number of other objectives could be discussed and developed to improve this model. However, it is important that all points discussed above are well integrated for the model to be effective. Blending is about creating new opportunities for learning and creating an easier and more effective learning system for students who find it difficult to cope in or have access to the traditional

classroom. Students can find it difficult to grasp new concepts and this problem can be solved with an effective model. The model can be modified according to the teacher's requirements (Picciano, 2009).

The six objectives of the model should be blended together in a manner that appears as seamless as possible for the students. The blend must be a mixture of various learning methods to create a new learning method that complements the culture and tradition of the Saudi education system, instead of cutting and pasting the same traditional combination of teaching and learning methods (Alebaikan, 2010). Of course, it is not possible for every course to employ all activities and approaches included in the blended model. For example, not every course needs to conduct group work or rely exclusively on the rational premises. The academic goals of a course should be driving the activities and, therefore, the approaches. As well as examining each course, the instructional designers and faculty members must also examine the whole academic programme so that they can determine which system works best with each course to provide cohesion in the overall objectives of the education system.

5.5 LMS Utilization in the KSA

A number of different Learning Management Systems (LMSs) are available to universities within the KSA. This section introduces these LMSs and discusses their utilization by the various tertiary institutions, as well as the financial implications involved.

Table 5.2 provides a list of universities with their respective LMS systems. The table shows that Jusur, Moodle and Blackboard are the most commonly used LMSs in Saudi universities.

Table 5.2 Universities with their respective LMSs

University	Blackboard	Moodle	EMES/Centra	Jusur	Web CT
Private Universities					
Effat University	√				
Arab Open University		√			
Fahad Bin Sultan University		√			

University	Blackboard	Moodle	EMES/Centra	Jusur	Web CT
Saudi Electronic University	√				
Alfaisal University		√			
Dar Al-Uloom University		√			
Prince Sultan University		√			
Al-Yamamah University		√			
Prince Mohammed bin Fahd University	√				
Government Universities					
King Faisal University	√				
King Khalid University	√				
King Saud University	√				
Najran University	√				
Princess Nora bint Abdulrahman University	√				
University of Dammam	√				
Salman bin Abdulaziz University	√				
King Abdulaziz University			√		
Al-Jawf University				√	
Al-Majma'ah University				√	
Imam Muhammad bin Saud Islamic University				√	
Al-Baha University				√	
Jazan University				√	
Qassim University				√	
Umm Al-Qura University				√	
University of Tabuk		√			
Taibah University		√			√
King Fahd University for Petroleum & Minerals	√				√

Some of the government-owned universities (8/24) have implemented the Blackboard LMS, while the majority of the private universities (6/9) have implemented the Moodle LMS. There are seven government universities using the Jusur LMS as the NCEL has encouraged them to offer electronic venues by providing them with all the technology and training needed for utilizing its own LMS.

The difference in the kind of LMS implemented by universities based on the type can be understood as a strategy, especially by private universities, to cut costs and maximize profits, as Moodle is cheaper than Blackboard. Private universities may also want to develop courses that suit their own specific outcomes. Moodle is open source, provided free, and is able to be run on many operating systems, while the use of Blackboard is constrained by the annual license fee. According to Khan

(2012), Moodle has grown quickly within the higher-education marketplace and recently, it has been recognised in the small-to-medium business marketplace as well. Many private universities adopted Moodle as it is open-source and can be used in the business marketplace. Universities will use all these systems more and more because of the increase of technology used in education.

As Moodle and Blackboard are the LMSs most implemented in Saudi universities, apart from the Jusur LMS which is introduced and discussed earlier in Chapter 2, Table 5.3 has a brief comparison between Moodle and Blackboard:

Table 5.3 A comparison between Moodle and Blackboard.

	Moodle	Blackboard
Customization	Open-source	Not open-source
Charge	Free	Cost
Technical support	Can be weak	Reliable
Code	Can be customized and changed	Unchanged
Tools	Wiki module	Whiteboard
Sharing in real time	No	Yes
Assessment scale	Yes	No
Mail	External	External or internal
Discussion forum	Has three	Only one
Database supporting	MySQL and Oracle	Oracle

5.6 Available Qualifications

As the world economy changes, there is a greater emphasis on the type of qualification needed to ensure graduates are competitive in the global work-place. This section discusses the different qualifications available to students in the KSA and comments on the requirements of the new global economy.

Undergraduate courses in the KSA include higher diplomas and bachelor's degrees offered at university level. All such courses involve key research activities and help to develop an employable professional. After completing a bachelor's degree, a student may progress to postgraduate study, at masters or PhD level. Postgraduate degrees allow students to specialize in a field and gain additional expertise.

A diploma is referred to as a certificate (not a degree) and is an academic honour in the KSA. It allows students to study in their chosen field at a certain level, being higher than the secondary school level but below the level of a bachelor's degree. This vocational training certifies a person to work at a technical level in their field of interest. After completing a diploma, which normally involves one or two years of study, a person can enrol in a bachelor's degree.

The purpose of a bachelor's degree is to prepare a student to become a professional in a chosen field. It is the most common level of tertiary education, as most people can be successfully employed with this degree. A master's degree allows students to give expert analysis on professional applications, as well as providing them with the proficiency to address complex problems in their field. A doctorate is the highest level of expertise that can be achieved by an individual in a particular field. This takes the student to the level of scholar, the views of whom are acknowledged worldwide. A doctoral graduate can teach at university level in his or her field and achieve the level of professor. To become a PhD graduate, the student needs to complete original research on a topic. Table 5.3 presents the qualification types that each university offers.

Table 5.3 shows that only seven government universities offer all four qualifications. While all private universities offer bachelor and master's degrees, none offer doctorates. These are offered by ten government universities and the public university. Overall, 18 universities offer diplomas: 3 private and 15 government. It may be easier to implement e-learning programmes for higher level qualifications, that is, master's degrees and doctorates, as compared to lower levels; certificates and bachelor's degrees. This is due to the level of research required at each level. Master's degrees and doctorates require in-depth research of up-to-date information on specific subjects which can be done effectively through the use of the Internet resources. The diploma level is rather general and requires minimal research.

While lower level qualifications have proved adequate in terms of employment opportunities in the past, today global competition for jobs means that in the KSA a higher level of qualification is needed. Students need to work harder in their fields to become experts because of the lack of job

opportunities in the market and this is when they need to undertake further study and gain higher skills. To address this, in 2005, King Abdullah bin Abdulaziz issued a royal decree to establish a scholarship programme to provide greater opportunities for Saudi citizens to study abroad. The objective of the scholarship programme is to meet the needs of the KSA in relation to the development of a professional and academic workforce that can be internationally competitive (Alhazmi & Nyland, 2012). It is also intended to contribute to the international exchange of scientific, educational and cultural experience (MOHE, 2011), since the KSA government has determined to develop reciprocal relations with other cultures in order to participate in the globalization process. Around 130,000 Saudis receive these scholarships each year and to some extent the programme can be viewed as a human export–import bank that seeks to quietly fund the improvement of Saudi society. The scholarship programme has supplemented the considerable private financing of overseas education to give the KSA the highest per capita share of students studying abroad in the world (Clary & Karlin, 2011).

The establishment of an external scholarship programme, the King Abdullah Scholarship Programme (KASP), has developed trust in private institutions. This programme has helped to ease the financial weight on students, principally Saudi students who otherwise would not be able to enter government or private universities, and study overseas (Jamjoom, 2012). The KASP offers financial support for undergraduate and postgraduate programmes at well-known universities around the world, in the U.S., the U.K., Canada, Australia, China, India, New Zealand, Singapore, South Korea, Malaysia, German, Spain, and Italy. The major focus of the programme is on various courses required to satisfy the demands of the labour market (Al-Ohali & Al-Aqili, 2009; Al-Mousa, 2009). The goal of the programme is to develop “...scientific, cultural and educational expertise with a variety of countries around the world ... to develop qualified professional people in the work environment ... to promote and develop the level of professionalism of Saudi nationals” (Al-Mousa, 2009, p. 720).

Table 5.4 Types of qualification offered by Saudi universities.

University	Qualification			
	Diploma	Bachelor	Master	PhD
KSU	✓	✓	✓	✓
IU	✓	✓	✓	✓
KFUPM		✓	✓	✓
KAU	✓	✓	✓	✓
UAU	✓	✓	✓	✓
IMAMU	✓	✓	✓	✓
KFU	✓	✓	✓	✓
KKU	✓	✓	✓	
Taibah U		✓	✓	
TU		✓	✓	
QU	✓	✓	✓	✓
UoH		✓	✓	
JU		✓	✓	✓
AJU	✓	✓		
KSUHS		✓	✓	
BU	✓	✓	✓	
UT	✓	✓	✓	
NU	✓	✓	✓	
NBU		✓	✓	
PNAU	✓	✓	✓	✓
UD	✓	✓		
SAU		✓		
SU		✓		
MU	✓	✓	✓	
SEU		✓	✓	
PSU		✓	✓	
EU		✓	✓	
AOU		✓	✓	
YU		✓	✓	
FSU	✓	✓	✓	
PMFU	✓	✓	✓	
FU		✓	✓	
DAU	✓	✓	✓	
KAUST			✓	✓
Total	18	33	30	11

5.7 Available Majors

Majors are specialisations in a particular field. The student is required to select the majors in which he or she wants to specialise at the bachelor level. The next section describes some examples of the majors available in government and private universities in the KSA as well as the gender restrictions that are involved.

5.7.1 Government Universities

At government universities some majors have restricted entry criteria based on gender. For example, King Saud University (KSU) has divided campuses where only male students studying on bachelor programmes are offered Political Science majors in law and political sciences, or majors in physical education. Similarly, in the master's programmes, majors offered exclusively to male students are law and political sciences, tourism and archaeology, zoology, geology, food and agriculture, petroleum engineering, civil engineering, agricultural sciences, architecture and planning, and urban planning. None of these majors are offered to female students. Figure 5.4 illustrates a hierarchical taxonomy of the subject majors offered to students at KSU.

Other examples of universities with subject gender restrictions are King Abdulaziz University (KAU) and Taif University (TU). At bachelor's level, KAU's Faculty of Engineering offers marine sciences, meteorology, environment and arid land agriculture, tourism and maritime study majors to male students only. Female campuses do not offer these courses; instead, females are offered home economics in addition to food and nutrition, clothing and textiles, interior design. Likewise, TU offers male students computer engineering, civil engineering, mechanical engineering and electrical engineering majors, while female students are offered home economics, nutrition and food sciences, textile and clothing, housing and familial studies. Generally speaking, science-based majors are offered to male students, while female students are offered social-based courses. This influences the implementation of e-learning in these institutions on the basis of gender. As a result of this, female students are more likely to adopt e-learning programmes, as a requirement of their majors than male students as social-based courses require some rigours research than science-based courses.

5.7.2 Private Universities

At private female-only university campuses, particularly at Effat University (EU) where Blackboard is the LMS and the blended learning method is used, there are specific majors that are not offered to

females at other private universities. For example, majors include architecture, electrical and computer engineering, and entrepreneurship at the bachelor level. Figure 5.5 illustrates a hierarchical taxonomy of the subject majors offered to students for EU.

At private universities with divided campuses, particularly at Prince Sultan University where Moodle is the LMS and the blended learning method is used, female students studying on bachelor's programme are offered applied linguistics, computational linguistics, translation, computer science, information systems, arts, law, interior design, finance and marketing majors.

At most of the private universities, male students are offered master’s degrees that are not available to female students. For example, at AOU, where the e-learning method is used, male students are offered a Master of Software Engineering (MSE) and a Master of Business Administration (MBA). Few master’s degree majors are available at the private universities.

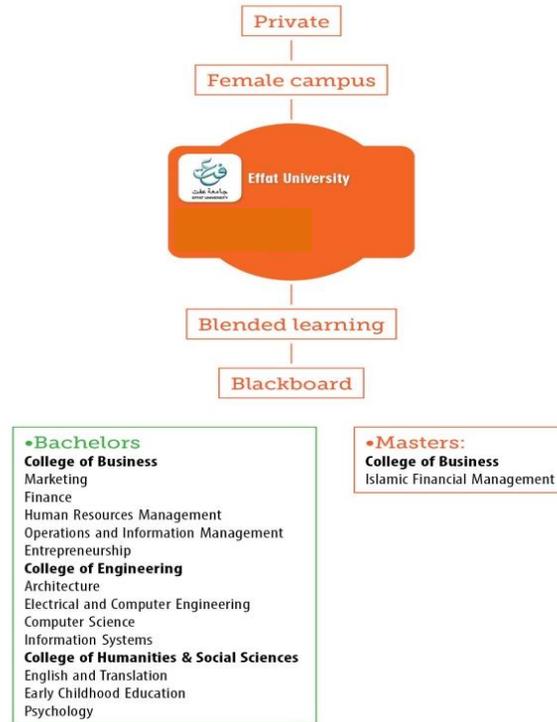


Figure 5.5 A hierarchical taxonomy of subject majors offered at Effat University

5.7.3 Public Research University

There is only one university of this type, King Abdullah University for Science and Technology (KAUST), is a mixed campus university. No particular gender-focused majors are offered at this university. Figure 5.6 presents the hierarchical taxonomy of the subject majors available.



Figure 5.6 A hierarchical taxonomy of subject majors offered at King Abdullah University for Science and Technology.

Appendix A shows the hierarchical taxonomy of all Saudi universities.

5.8 E-learning Systems in KSA’s Universities

Several public and private institutions of higher learning are making efforts towards the implementation of e-learning in their curricula. E-learning is increasingly being viewed as a tool to enhance the learning experiences of students. Some Saudi institutions of higher learning that are ambitiously providing distant learning facilities for their students are King Saud University (Riyadh), the Prince Mohammed bin Fahd University (Alkhobar), Effat College (Jeddah), King Abdulaziz University (Jeddah), King Fahd University for Petroleum and Minerals (Dhahran), and the Arab Open University (Riyadh). The Deanship of E-Learning, formerly known as the Television Broadcasting

Centre, has also helped promote e-learning. Most of the government universities that apply online course delivery methods as part of a blended learning approach or virtual learning approach, also have a deanship for e-learning and distance learning. Figure 5.7 is an excerpt from Figure 4.5, p. 66 and shows that there is a deanship supporting all online course delivery methods (e-learning and blended learning) at government universities.

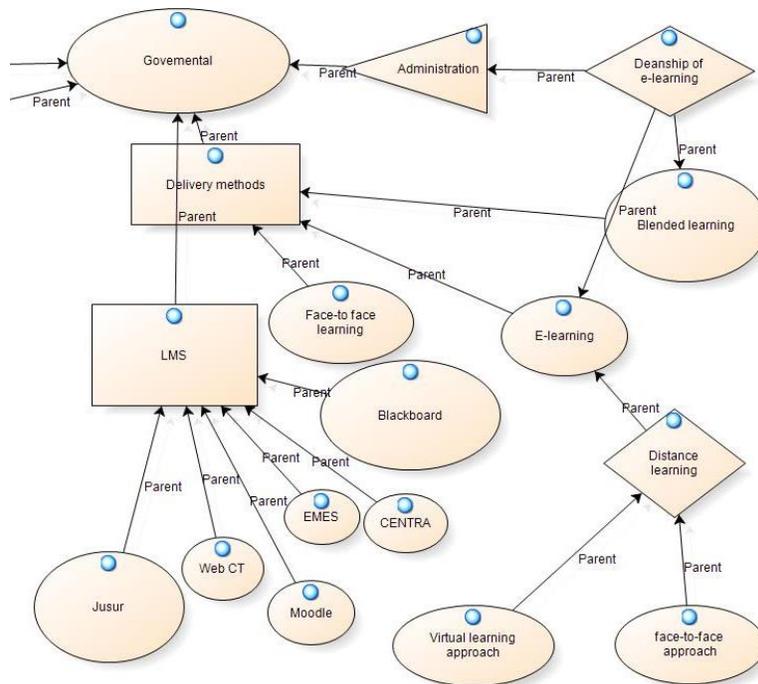


Figure 5.7 Deanship support for online learning at government universities.

E-learning offers functions through which students in the KSA and abroad can share and exchange educational materials and files, and interacts closely with lecturers and other students through discussion boards, forums, chat, and email (Elango & Gudep, 2010). This section examines four universities which have implemented e-learning strategies, showing how these programmes have brought about differences in terms of teaching methods and information delivery, as well as helping to solve various problems faced by the education system. Some recommendations are made.

5.8.1 King Abdulaziz University

King Abdulaziz University (KAU) has, over the years, offered traditional face-to-face programmes but is now determined to offer a viable alternative in the form of an e-learning programme, the first in Saudi Arabia (Al-Nuaim, 2012). The success of this programme lies in its ability to adapt to current socio-cultural practices, so students of the Saudi primary and secondary education system who are not effective in independent learning or research are still able to learn effectively (2012).

KAU's programme is rigorous in development and quality control so that students can be more active on asynchronous technologies, with virtual classes for each face-to-face teaching hour. The programme also has synchronous components, in which the LMS introduces learning to students in their own homes and is designed to integrate with other universities. The virtual class system, named Centra, allows students and teachers to communicate synchronously via audio, video, whiteboard, application sharing, instant voting, text chat and other functions, as if they were face-to-face in a traditional classroom. All teacher activities and interactions with students are supervised through the EMES LMS and Centra.

Teachers and departments at this university have detailed performance reports and on-going assessments of teacher interaction with students. Due to the different delivery methods, it is difficult to make accurate comparisons between e-learning and face-to-face learning models. Implementation of e-learning at this university has increased the accessibility of computers and the Internet and other online interactive platforms. It has also led to advancement in information and communication technologies at the university, which has resulted in improvements in how learning materials are acquired, stored, utilized and presented (Al-Khalifa, 2008; Al-Nuaim, 2012). Figure 5.8 shows a hierarchical taxonomy for King Abdulaziz University.

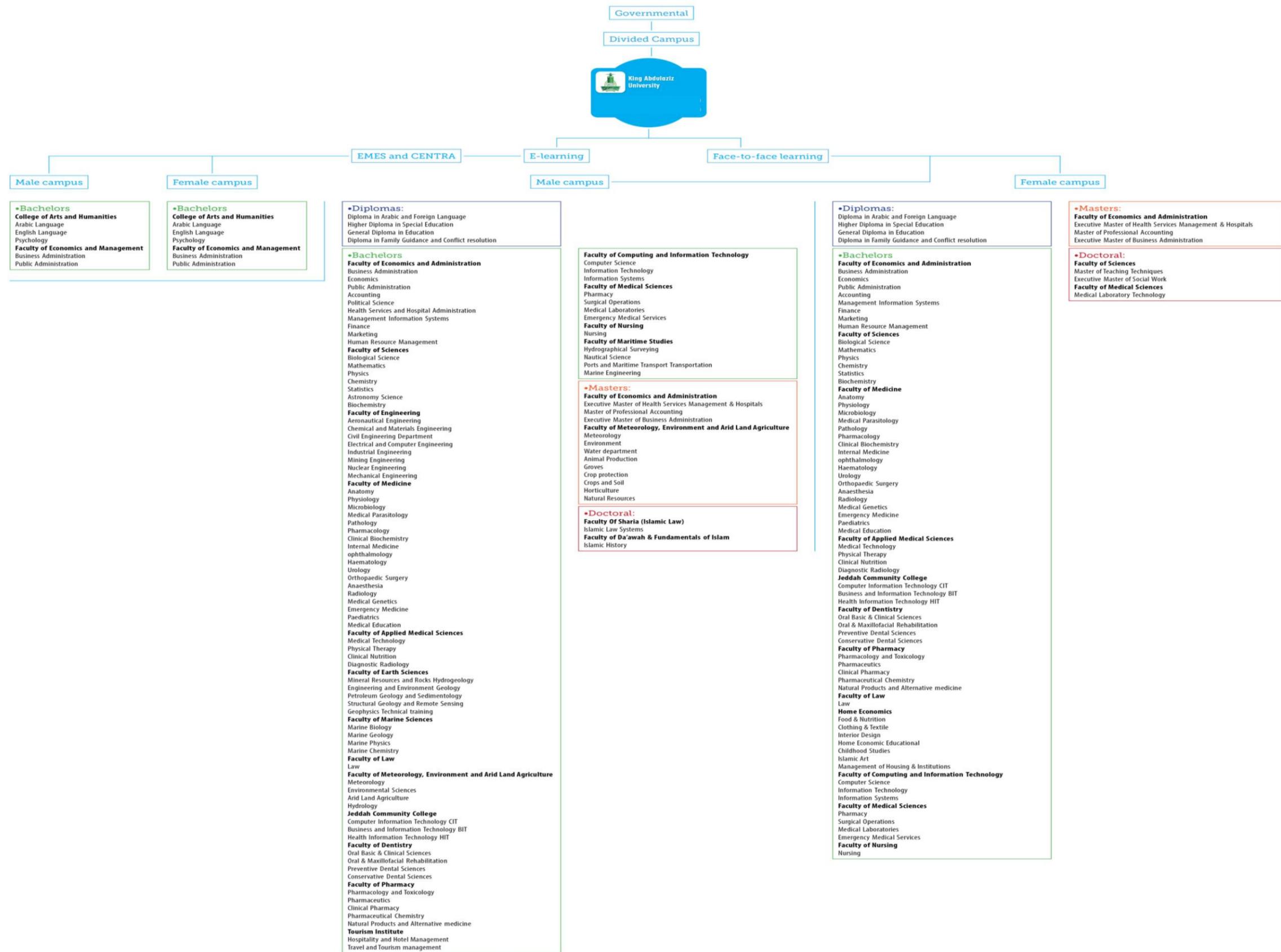


Figure 5.8 A hierarchical taxonomy for King Abdulaziz University.

5.8.2 King Faisal University

Founded in 1975, King Faisal University (KFU) is one of the oldest institutions of higher education in the KSA. The e-learning unit at KFU was established in 2008, followed by the establishment of e-learning centres. E-learning was implemented at this institution not only to augment students' learning but also to enhance information and communication technology, develop teaching methods and to improve relations between students and teachers (Al-Khalifa, 2008; Almegren, Al-Yafei & Hashem, 2007).

KFU has a system of divided campuses that necessitates either the duplication of teaching staff or a method of conveying learning materials between the male and female campuses. This has been achieved efficiently through the use of e-learning. The university makes use of the Blackboard and Web CT LMSs and has also equipped its lecture rooms with interactive white boards, data shows, e-podiums, Polycom video conferencing solutions, and multimedia centres. The LMS offers a virtual classroom, a synchronous system, a content management system and an online-based examination system (Almohaisen, 2007; Mirza, 2007).

The university has a Deanship of e-learning (DeL), established in 2010, that is responsible for continuously enhancing, monitoring, updating and utilising e-learning and technological innovations. The DeL also carries out research in order to model the e-learning programmes as pillars of excellence in the KFU education system. The institution boasts an efficient implementation of digital distance learning via microwave, satellite, and wireless networks.

The introduction of e-learning at this university has helped students use online study materials, meaning that they need less help. The implementation of e-learning has also helped students living in rural areas who are unable to travel to urban campuses. The long-term outcome is a larger number of educated people. Moreover, more people can now access higher education. Figure 5.9 shows a hierarchical taxonomy for King Faisal University.

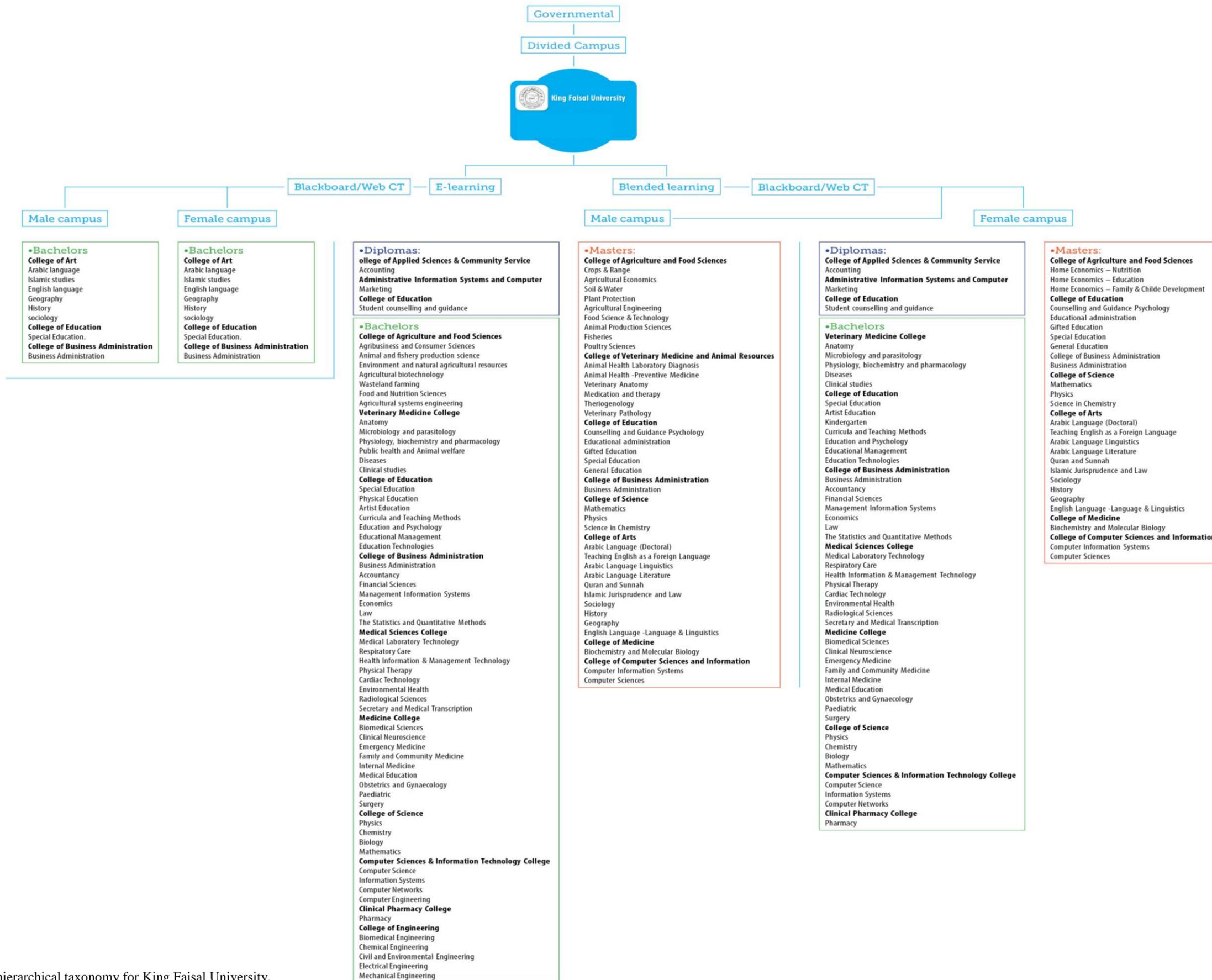


Figure 5.9 A hierarchical taxonomy for King Faisal University.

5.8.3 Arab Open University

The Arab Open University (AOU) was founded in 2003 in Riyadh, and it takes an open education stance. To ensure quality education, the AOU has partnered with the Open University of the United Kingdom (UKOU) and other international institutions including UNESCO, as well as national institutions such as the MOHE (Mirza, 2007).

A system of open education is defined as programmes that allow people to learn without traditional constraints related to location, entry qualification and timetabling (Tuomi, 2006). The purpose of the AOU is to attract a large number of students who cannot attend traditional universities because of work, age, financial issues or other reasons (Galanxhi-Janaqi & Nah, 2004). *Open* in this context also means free from restrictions or limitations imposed by regular colleges, including delivery methods in time, space and content. However, the amount of interaction between learners and educators plays an important role in the effectiveness of a course (Almohaisen, 2007). De Moraes, Paz, Matuzawa and Fiuza (2003) argue that a lack of interaction remains a major obstacle to the success of open education. To increase this interaction and reduce the gap between distance learning and regular learning, the AOU requires that students attend weekly classes. While for some this does not reflect a totally open system, this level of face-to-face participation is relatively low compared to regular schools. For example, modules that require 48 hours of attendance at regular universities are reduced to 12 hours of contact at the AOU.

In a further effort to overcome the issue of the lack of direct contact, the AOU uses Moodle. Moodle is an open source CMS that is used by educational institutions and even individual teachers to add web capability to their courses. A LMS is Internet based, with a software that “allows the teachers to manage the distribution of materials, tasks, and other aspects of instructions for their courses” (Abu-Shawar, Al-Sadi, Hourani, & Amman, 2006, p. 23). Students and teachers can access the system from anywhere with an Internet connection. Moodle offers many learning tools and activities such as forums,

chat, contests, surveys, the gathering collecting and reviewing to assignments and classes (Rovai & Barnum, 2007).

AOU uses Moodle to facilitate the interaction between all stakeholders. In addition, Moodle is easy to learn and use, and is very popular with a large user community and many development organizations. Moodle is flexible. It supports multi-language delivery, customization (web pages, profiles) and separate education groups. Figure 5.10 shows a hierarchical taxonomy for AOU.

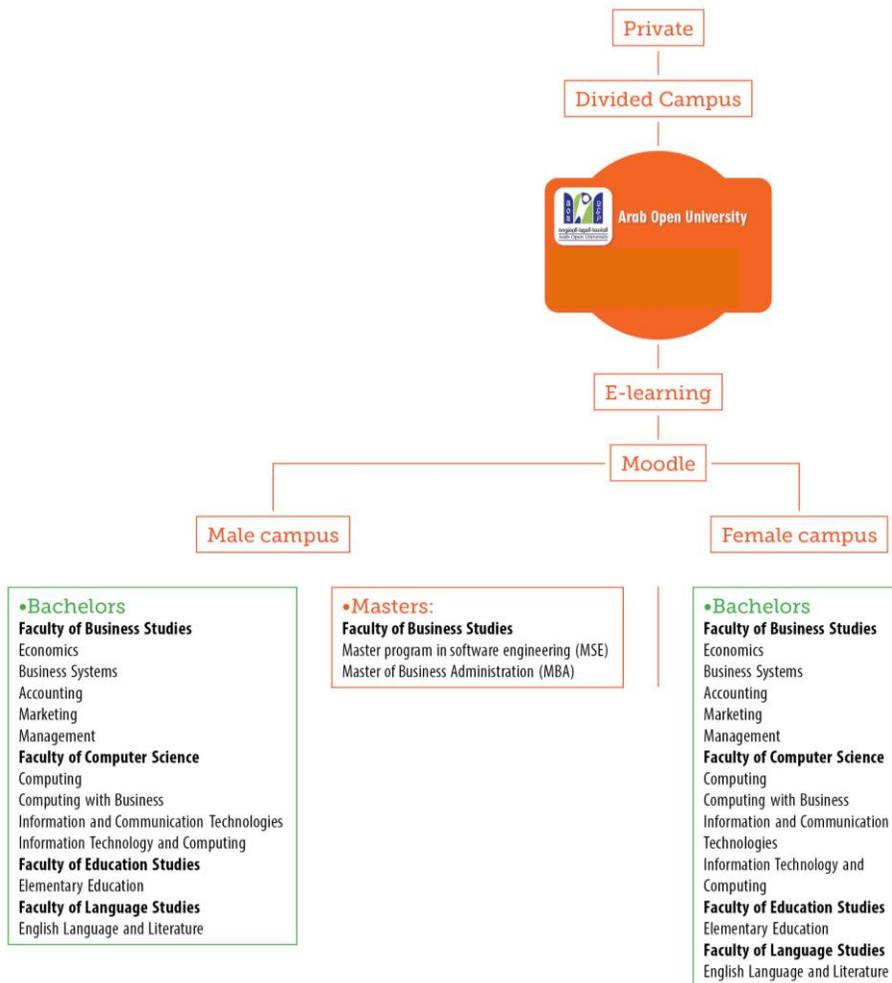


Figure 5.10 A hierarchical taxonomy for Arab Open University.

5.8.4 Saudi Electronic University

The Saudi Electronic University (SEU) is the first e-university in the KSA. It has chosen Blackboard as a strategic partner to sustain the eLearning environment (Islam, 2012). SEU found Blackboard delivered advanced features and many more opportunities for collaborative learning when compared to competing providers. Official Information Technology (IT) consultant at SEU believes that Blackboard solutions are easier to implement and manage educational process (Saudi Electronic University, 2012). Also, it is supported by the user community and is a well-organized and established company (Chen & Hu, 2012).

The MOHE in the KSA recognizes that distance learning is critical to the future success and quality of the expansion of the Saudi education system. Through the development of the SEU, the MOHE continues to work with existing universities to successfully centralize distance learning study programmes into a single organization. The target of SEU was to enrol 6000 students in the initial stages in 2011.

SEU uses a variety of Blackboard solutions. Officials of the university argue that LMS Blackboard learning best suits the long term goals for the institution because it supports a diverse set of students. Through the use of platform-learning, web conferencing solutions and a mobile panel, the SEU is able to offer a wide range of online, traditional and blended courses for students who are challenged by geography or require flexibility in their study hours. The programme has a variety of configurations including the integration of web-based expertise and lecture courses, and the growth of novel online courses carried out completely through distance learning.

The university has adopted the Blackboard Mobile Learn solution to provide students and faculty members with access to courses from their mobile devices (Hilmi, Pawanchik & Mustapha, 2011). Blackboard Collaborate is a web conferencing and online collaboration platform that allows students and teachers more opportunities to interact. The Blackboard Connect platform increases the effectiveness of notification alerts (Hilmi et al., 2011).

The introduction of e-learning at the SEU offers students the capacity to learn with minimal face-to-face meetings and sometimes none at all. E-learning offers a platform for the exchange of learning materials and ideas between students in the KSA and those outside its borders and therefore there is a sharing of knowledge which is vital to achieving a successful education system (Almohaisen, 2007). Figure 5.11 shows a hierarchical taxonomy for Saudi Electronic University.

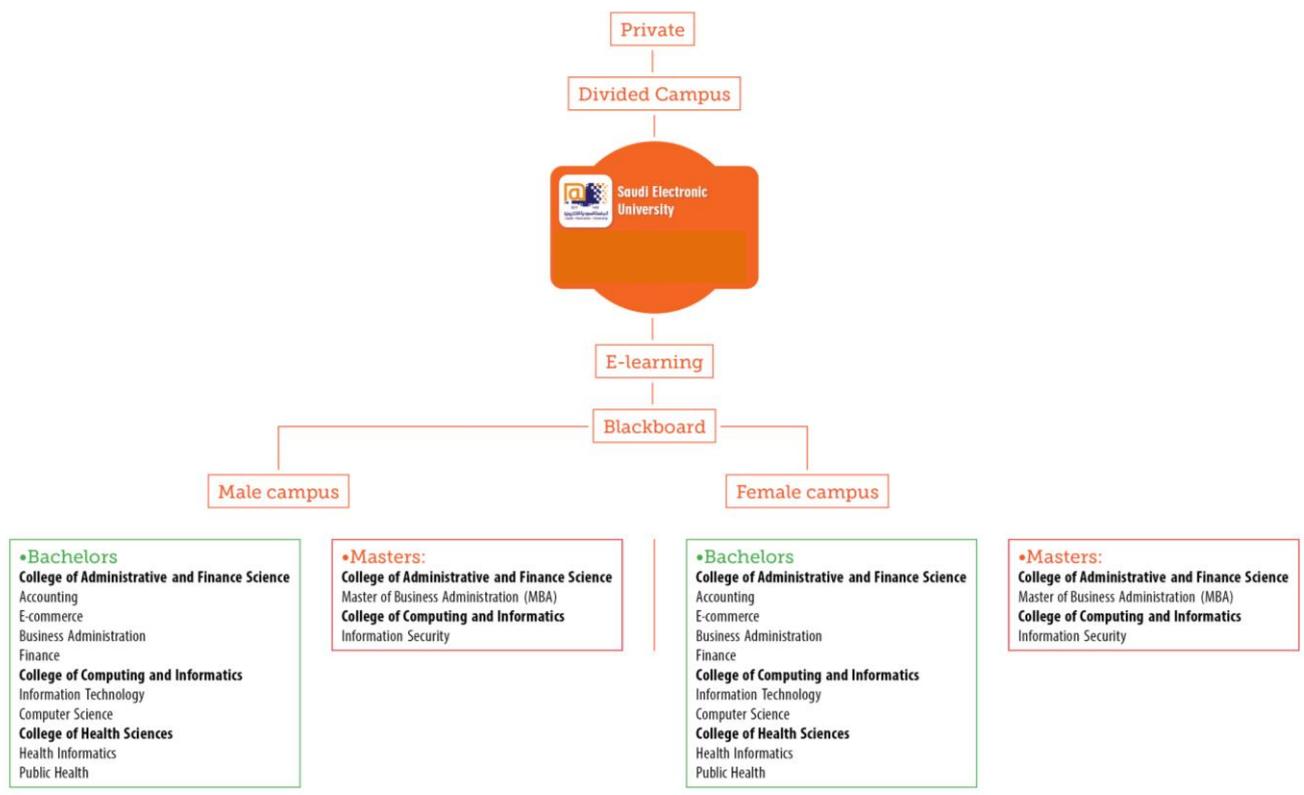


Figure 5.11 A hierarchical taxonomy for Saudi Electronic University.

5.8.5 Theory based on findings

This study implies that the tertiary education system in the KSA faces many challenges. For example, there is a need for cooperation between the government and public and private stakeholders in the education sector in order to offer perceptible opportunities for both genders, women in particular. This movement may herald socio-political changes in the KSA that will see not only more widely educated women, but will also increase the talent pool within the KSA, one day allowing both men and women to compete in a global job market. E-learning, as a delivery method, will also expand opportunities for Saudi students, allowing greater access to education and

more subject choice. The institutions of higher learning in the KSA are developing an interest in the incorporation of online learning in their programmes.

5.8.6 Recommendations

The KSA must look into its education policies and adjust them to meet the needs of online learning. Students should be able to study for online degrees at any university across the globe. The modern world is a globalised community and the importance of being open-minded and accepting international learning standards cannot be disputed. By acknowledging degrees from other international universities, the KSA will expand its knowledge base and open doors to resources from the global learning framework. Collaborative learning networks will be widened and the country will be supported towards the creation of world-class Learning Object Repositories (LORs). These are online databases which can be accessed to acquire a wide collection of learning objects systematically organised and classified (Tzikopoulos, Manouselis & Vuorikari, 2009).

At the same time, LORs and other course materials from learning institutions which are currently available online should be customised or tailored to suit the needs of local students in order to augment their learning experience. A gateway should also be created through LORs to enhance innovation among students. If these requirements are met, they will serve to enhance the implementation of e-learning in the KSA and reduce the challenges faced by students who use the online education platforms in a setting like the KSA. The challenges faced by distance students in the KSA should be identified, acknowledged and addressed along with the creation of LORs. This strategy will ensure that learners take part in education more actively and it will enhance information sharing of, knowledge building and extensive learning at both the local and global levels. Education is a universal right that does not belong to any culture or specific individual. As such, international learning networks should ensure that the learning process is culturally enhanced and offers a learning environment which is diversified and enables improved learning, leading to an enriched knowledge base and better information. Currently, LORs are a significant component of knowledge growth and are facilitating advancements in the learning community network. However,

there is room for improvement in Saudi Arabia in terms of the development of LORs. Compared to LORs in other developed countries, Saudi must incorporate the strengths of the current high-calibre LOR strategy to help the country adjust to the fast-changing global e-learning platform. Before implementation, creation, maintenance and management, LORs must be comprehensive and include all targets, evaluation activities, subjects, content of the syllabus, and online learning approaches. These transformations must involve a balance between a wide range of network resources, education reforms, a user network, and the central government and administration.

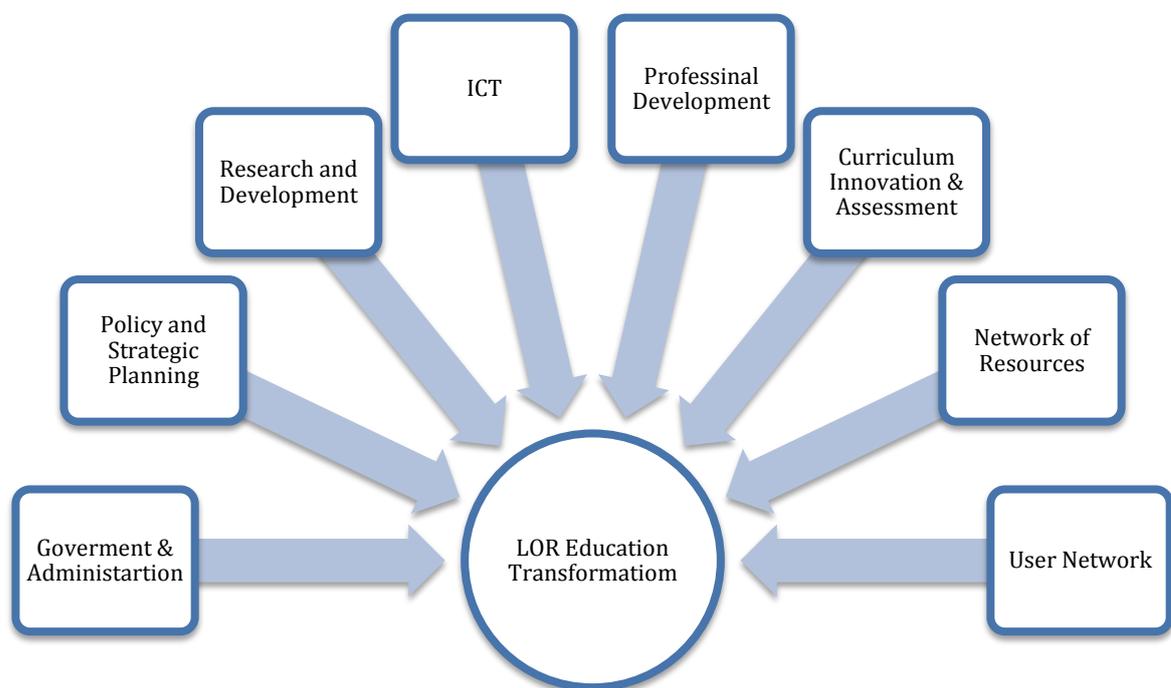


Figure 5.12 Relationship affecting LOR Education Transformations (AlMegren & Yassin, 2013, p. 126).

For there to be a university in the KSA that deals essentially in distance learning, two important issues must be addressed. First, the NCEL, as the body that regulates e-learning, must make best use of the LOR platform to create a relationship between the tertiary education institutions of the KSA, both public and private. Second, the NCEL must ensure that its LOR platform is maximised and abides by the e-learning standards. All public and private universities employing e-learning could be hosted under the one roof of the e-university, which is managed by the NCEL. Learning could then be improved across the country by students, academics, researchers and tutors all making use

of a national LOR framework. This concept is being achieved through the Saudi Electronic University (SEU) which, to date, (2013) has admitted more than 7,000 students into its three faculties: Health Sciences, Administrative and Financial Sciences, and Computing and Informatics. Saudi Arabia could create a learning system which maximises its resources and uses modern technology to tackle financial constraints. The population of students in tertiary education institutions is predicted to grow greatly in the near future, and the country may not be able to accommodate that population of students. Therefore, Saudi Arabia needs to invest in a web-based learning programme which guarantees speed, convenience, flexibility and interaction as a way of serving the needs of the large number of students dispersed by geography and time.

5.9 Conclusion

Chapter 5 presents the models, theories and literature chosen for this qualitative research study and uses models and theories to present an analysis of the components of the Saudi tertiary education system. This system is broken down into six components: university type, gender base, learning style, LMS, qualifications and majors. The e-learning systems used in Saudi universities are also discussed. A detailed discussion of the components of the existing Saudi system is given to provide a clear view of the existing system and how can it be improved.

The information gathered is presented in a hierarchical manner by developing taxonomies of the Saudi tertiary education system. Condensed and easy to understand versions of this detailed information are shown in infographic charts and figures that identify the features of the Saudi tertiary education system.

There is phenomenal growth in, and use of, ICT in the field of higher education in the KSA. The type of university influences the types of LMS implemented and the success rate of the programme. Although the tertiary education system is made up of different kinds of universities, the analysis concludes that there is no tangible difference in the implementation of e-learning.

The type of LMS chosen influences its implementation and overall success rate. The use of the Blackboard LMS in government universities is likely to slow down the rate of implementation

and success due to the extra licensing costs charged. This gives a competitive advantage to the private universities that make use of Moodle which is free.

There is a lack of correspondence between programmes offered and labour market needs. Almost half of those who graduate from the higher education system have majored in education, humanities and art studies – for which there is little need - and few have scientific, technical or management training. There is a general notion, therefore, that Saudi graduates are thus ill-prepared for careers in either the private or public sector. As a result, Saudi graduates tend to be viewed as unqualified and lacking in specialized skills. It is also clear that cultural and religious factors have a large influence on the roles and future careers of Saudi women. Historically, women were given little or no education, had limited social mobility and no possibility of employment. Currently, women constitute only 14 per cent of the workforce in the KSA which is low even by Gulf standards (Jamjoom, 2012). Even if the opportunities for women in higher education are increased, there are limited jobs for them in the labour market. These challenges would change and improve as there is tangible attention by offering available qualifications in technology, science and engineering.

The use of ICT in higher education in the KSA has had a positive impact on the education system; the success of programmes is linked to its flexibility and ease of implementation and adoption within the education system by both students and instructors in the KSA. E-learning has proven to be very efficient and can be applied asynchronously and synchronously, thus fulfilling a broad range of education requirements.

Chapter 5 examines selected universities in terms of e-learning, LMS and the impact of these areas on disadvantaged students. This examination is important as it offers insight into the Saudi Arabian tertiary education and tracks how it has developed over recent years. Tertiary education in the KSA faces several challenges and thus there is a need for collaboration between government departments, as well as private and public stakeholders in the education sector. Chapter

5 also presents the challenges of gender in Saudi Arabian education and there is enough evidence to suggest that cultural factors have a large influence on the future roles and careers of Saudi women.

The concepts exposed by the findings will be explored in chapter 6 in order to present a new theory that offers insight into tertiary education in the KSA and the outstanding development it has undergone over the past decade.

Chapter 6: Further Discussion

6.1 Introduction

Chapter 5 presents the theories, literature and the model selected for this qualitative research study in order to provide a comprehensive analysis of the Saudi tertiary education system. Chapter 5 establishes that the Saudi tertiary education system is divided into six elements: gender, qualification, majors, university type, LMS and learning style. A special emphasis is placed on the e-learning methods used in the tertiary institutions of the KSA. Chapter 5 also discusses the e-learning methods used in Saudi universities and offers a thorough discussion of the elements of the existing Saudi system to present a comprehensible analysis of the current system and how it can be enhanced. Chapter 6 explores the concepts exposed by the findings to present a new theory that offers insight into tertiary education in the KSA and the outstanding development it has undergone over the past decade.

The tertiary education system in the KSA has a lot of hindrances that still lie in the path of improvement. One of the main reasons is the increasing number of universities campuses as well as indicating a rise in the number of students attempting tertiary education, women in particular. Furthermore, restricted access to the Internet in the KSA is considered to be another main reason of delaying fast growth of online education and e-learning. The following sections explore and present good arguments in terms of the Internet availability in the KSA and how residents live in places that do not have network access and then discuss and explain why the issue of gender separation is important and how it is that technology can be applied to mediate knowledge transfer.

6.2 Internet availability in the KSA

The earlier analysis involving Learning Management Systems (LMS) incorporates the advantages of e-learning and LMS for a wide range of learners. However, a deeper analysis of the country case study of LMS setting in Saudi Arabia indicates several practical issues. Every party involved in this

process including educators, policymakers, learners and providers, plays a significant role of ensuring that LMS facilitates and improves the learning experience of e-learners in Saudi (Al-Shehri, 2010). The initial stages of the adoption of Internet in the Middle East, which dates back to the late 1990s, involved various challenges. A country like Saudi Arabia is struggling with aspects of censorship and how the government would control Internet use in the region. Therefore, the government is hesitant in allowing the Internet use or making potential Internet users face challenges. Moreover, in the KSA, religion is viewed as a powerful force that played a significant role in the slow adoption of the Internet in the area. The Saudi government is concerned about the negative impacts involved with the assimilation of the Internet use in the society. They feared that the Internet users would be manipulated by immoral content, inappropriate learning materials, negative political effects and other contentious online content (Elango, Gudep & Selvam, 2008).

When the adoption of technology is met with some resistance, especially technology that has the potential and offers an opportunity to improve education, there is a high possibility and the negative aspect of the country involved lagging behind in the developments achieved in the given area. Therefore, the government of Saudi Arabia and other countries in the Middle East are quick to realize that denying and segregating their countries from that golden global opportunity would leave them out in the technological developments achieved worldwide. Therefore, denying Internet access is not the solution. Over ten years ago, a study by Shata (2001) analyses the challenges that Saudi Arabia and the rest of the Middle East region would have to face in the implementation of efficient platforms of LMS for use by online learners, especially those in rural regions. The main requirement and fundamental infrastructure necessary for the implementation of e-learning systems was a computer, the Internet connection, and access to websites, emails, intranet, and LMS. However, in Saudi research and scientific institutions, computers, Internet connection, emails and intranet were already available at the time. Therefore, these institutions could effectively share information and communicate with others across the country and internationally. The main challenge to e-learning access in the KSA is the huge gap in the Internet adoption and ICT

infrastructure between rural and urban areas. Easy, equal and efficient Internet access and connectivity are issues in the country which meant that those residing in rural areas could not get quality education through the available e-learning platform. However, the Internet use started flourishing in the country making the adoption and use of LMS more efficient. Learners in Saudi Arabia could get access to database material from various regions of the world by 2001, although local platforms of LMS were still unidentified (Al-Shehri, 2010).

6.3 E-learning and gender separation in Saudi Arabia

In Saudi Arabia, the learning system is structured on the basis of gender separation. Therefore, it is essential to make comparisons of technology adoptions between male and female faculty members in the various learning institutions. Findings from previous studies indicated that female faculty members view technology and the use of online learning as a complex and unsettled process that is challenging, and at the same time the tendency or probability of female educators using technology or e-learning platforms is higher than that of male educators (Zakaria, Jamal, Bisht, & Koppel, 2013; Hamdan, 2014). Another report from Kamal (2013) indicates that although both male and female faculty members were equally competent when it comes to the use of computers and the internet in teaching and were equally aware of its benefits, males used technology more often than females.

However, findings from the study of Asiri, Mahmud, Bakar and Ayub (2012) indicate that female faculty members believe that the use of technology in teaching and routine learning activities was less significant compared to the responses from male participants, which were more positive. Conclusions from the study of Ziyadah (2012) indicate that female users were more confident when utilizing technology and distance learning than males. Since in Saudi learning institutions there is full separation of female and male students and educators, then the faculty must ensure that they offer equal separate staff and facilities for both student genders. These aspects of separation and ensuring that there is equal supply of learning resources put a significant strain on the available educational accommodation (buildings) and resources. In all academic levels of the Saudi learning system, there are fewer female instructors than males (Alaugab, 2007). Therefore, the ideal solution

for this situation is the adoption of e-learning which comes in numerous application modes. Therefore, universities and other institutions of higher learning in Saudi Arabia are encouraged to adopt e-learning techniques and offer e-courses for female students in diverse faculties because this would require fewer female instructors.

6.4 E-learning as a mediator of knowledge transfer

Universities in Saudi Arabia are increasingly adopting e-learning systems and facilities, a situation that is predominantly caused by the gradual increase in the population of higher education students in the country. For instance, in the academic year 2008/2009, there were a total of 608,000 students in the 20 universities in Saudi. In fact, overcrowding is increasingly becoming an issue in the Saudi universities (Al-Shehri, 2010). Therefore, to respond to the increasing demand for higher education and the challenges that come with it, the use of online learning is the good solution. However, the critical need to use e-learning systems in higher education institutions implies that faculty members must incorporate IT into the routine classroom activities and use LMS facilities as part of their teaching procedures. According Alzamil (2006) argues that one outstanding advantages of e-learning is that it facilitates the decrease of dependency on local teaching personnel. Therefore, the challenge of staff shortages can be reduced or solved completely through adoption of e-learning because internet offers a system of interactive course-material which can be delivered to the attending students via the network (Clark & Mayer, 2008)..

6.5 Conclusion

The use of e-learning tools such as learning management systems coupled by the rapid development in ICT has become indispensable in the education process. Many institutions of higher education have implemented LMS to remove limitations on space and time, encourage learners to become more productive and interactive, equip learners with educational skills and to increase the quality of the instructional processes (Elango, Gudep & Selvam, 2008). The LMS has become an important learning tool as it assists educators in the process of registering students for their

respective courses, synchronizing student communications with educators, easing the follow-up on student progress as well as evaluating the performance of the student. Nevertheless, offering the requisite technology infrastructure does not necessarily guarantee the correct implementation of LMS and therefore every institution of higher education should establish how to improve the use of the LMS by both students and the faculty to guarantee the successful integration of the new technology in the learning and teaching process. There are many factors that should be considered when implementing LMS for learning and teaching purposes. The first is the internal variables such as the level of competence in using the LMS and the individual beliefs towards e-learning. Individuals examine the belief towards e-learning with respect to personal preferences, constructivist approach, and design of content and the important of the e-learning platform to the educator. External variables on the other hand, refer to the characteristics on the individual's environment which inhibit or encourage factors the use of LMS. The external variables consist of demographic factors such as segregation of gender and technological barriers that relate to limitations on access to the Internet.

Chapter 7: Conclusion and Future Research

7.1 Introduction

Chapter 7 summarizes the study, identifies the study's limitations, draws conclusions and makes recommendations for future research. This study examines e-learning in general and how online learning complements tertiary systems. A brief analysis of advances in e-learning are discussed. Advances in modern technology, such as the use of the internet and cell phones have diffused into society. E-learning is gaining popularity and rapid growth is observed in the academic sector. As early as 2000, some countries, (e.g. United States) had adopted the use of distance learning through various technologies with more than 2 million students in the US registering for distance learning. However, by 2008, the awarding of university degrees in the KSA through distance learning had not yet been approved by the MOHE. Some online degrees from international universities such as Oxford in the UK, and Stanford, MIT and Harvard in the US were not recognised in the KSA as they involve distance learning. The failure to recognise these degrees meant that individuals who were awarded such degrees were not deemed qualified to take part in any government job and was not able to proceed with their studies at a graduate level within the KSA.

Prior to the adoption of e-learning in the KSA, there were many Saudi Arabian students who were qualified and capable of earning a degree from any reputable international university. However, most of these students could not manage to travel abroad for their studies due to financial constraints, employment or other issues such as family responsibilities. E-learning could have been an important opportunity for them. Although the KSA has adopted developments that have come with technology and globalisation, policies at the MOHE that had initially been dropped are slowly creeping back into regulations.

One of the requirements of acceptance of an international degree from a university abroad is proof that the student is fully committed to learning, and that they did not engage in any other activity, such as employment. Therefore, studies must be on a full-time basis, and the student must

show proof of commitment to studying during their stay in the country in which they earned the degree. Moreover, in the KSA, if a student is working and wishes to proceed with their studies up to the doctorate level, the MOHE requires that the student quit their employment so as to be able to participate in a doctoral program. This is an impractical requirement for an individual who has established their career and has a family to support. In fact, such individuals often fund their own education, which of course requires them to have a source of income.

In contrast to the situation in Saudi Arabia, more than 50 per cent of the students in the US and UK enrolled in post-graduate studies are working and paying their own fees. The government and educational bodies of Saudi Arabia may find it advantageous to make education as freely available to as many people as possible, for example, by allowing adult learners to continue to work and to support their families while they study. As long as the students use legitimate means to acquire their degrees, they should be allowed to do so. A student wishing to pursue higher education should not be forced to sacrifice their livelihood, and they should not be pressured into changing their social life and forgoing their family obligations. A student can easily pursue their studies without disrupting their employment or social lives. In the developed world, a large number of people are pursuing higher education because enrolment into programs has been simplified for people from all walks of life. E-learning is a great success in the developed countries because it offers convenience for students and flexibility for those who must combine studies with their busy work and family schedules. Students can organise themselves at their own pace and do as much as they can based on their ability. Moreover, some students live in small town and the local university may offer courses which do not fit their desired area of specialisation. Therefore, such students may opt to study for their degree from a distant institution through distance learning. Distance learning can also enable students who wish to earn a degree from international universities such as Stanford and Harvard to earn it, even if they reside in a different country.

Nevertheless, the KSA has made significant steps towards the advancement of education through distance learning. Over the last few decades, the Saudi tertiary education system has

demonstrated significant growth. This study explores and presents developments in technology that provide new opportunities for course delivery to students across the KSA. The introduction of e-learning in Saudi tertiary educational institutions enables students to utilise a learning option which may be better suited to their learning style, allows more students to enrol in courses, and provides women with opportunities to study in areas they have been unable to access previously. The number of learning institutions in the KSA has increased significantly with 24 government universities, 9 private universities and one public research university at tertiary level, which caters for the academic needs of more than 900,000 students. The MOHE has shown support for the agenda of e-learning through the establishment of the National Centre for E-Learning (NCEL), a national centre which offers various services related to learning. The NCEL has numerous other services to enhance e-learning delivery in Saudi institutions. For instance, Jusur has been created to provide higher educational institutions with an Arabic learning management system to manage all teaching, administration and learning processes including registration, scheduling, checking the availability of content, tracking the performance of the learner and issuing reports, facilitating communication as well as providing assessment tests and questionnaires.

The tools and management systems used in the tertiary institutions of the KSA have also been discussed. A description of faculty member training in e-learning provision is given and was followed by a discussion of the challenges facing e-learning, including poor internet infrastructure, high cost, resistance by some older faculty members and a lack of e-learning support in some areas of the KSA. Regardless of the challenges that adoption of e-learning systems in the KSA present, the attitude of both faculty and students towards e-learning is, for the most part, extremely positive. The improvement of ICT structures within universities has allowed the development of a system of teaching and learning that makes use of information and communication technology in order to offer e-learning as an option for both education providers and students. E-learning is a convenient method for expanding traditional teaching methods, while overcoming the problems of inadequate resources and overpopulated educational institutions. Through online interaction, the gender

equality of e-learning counters the previous issue of maintaining separate male and female colleges; something which had led to a severe shortage of female faculty members. Furthermore, e-learning has introduced a new culture of blended learning through the taking of conventional face-to-face class activities and online activities. This form of blended learning is a multimodal learning and delivery system that has reduced the amount of time students need to be in class, allowing them to ‘attend’ lectures online when necessary and to submit homework and join discussions remotely. More particularly, this mode of learning benefits women, workers and employees and is seen as a useful compromise between full online teaching and learning through traditional classroom-based teaching.

Data from various sources such as academic journals and databases of institutions of higher learning has been collected, and the information analysed to arrive at a more comprehensive understanding and historical reconstruction of the Saudi tertiary education system. The aspects examined are the methods being used to teach courses in the Saudi educational system and the available e-learning delivery methods and technologies. The information gathered regarding these aspects gives insight into the advances that are being offered by the Saudi tertiary education system. The detailed review of the models for course delivery methods in the KSA tertiary education system relies heavily on the information available from previous studies. The data gathered is analysed through the use of various research techniques. Chapter 3 provides a comprehensive analysis of the information gathered and the procedures that are employed to conduct the research. Chapter 3 incorporates the research design, data sources used in the research, and data collection techniques used as well as the analytical techniques implemented. The study applies a qualitative approach and the literature that outlines such an approach is discussed. The methodology employed is practical and achievable given on time constraints for the study. Since this is a qualitative study, the selection criteria involve data related to the subject and a meta-analysis of the qualitative findings from previous studies from different sources.

The latest literature on Saudi universities is chosen for review because it provides reliable information. For data collection, academic articles from Saudi university websites are used in addition to scholarly peer-reviewed journals, literature reviews from articles related to the subject and an analysis of previous theses by Saudi students. The data analysis involves a diversity of methods that consider cultural ethnography, institutional ethnography, partial listing and analyses for historical comparison and hybrid approaches, which include the whole or a part of multiple studies from the past. Taxonomy, the generation of common themes and theory, is a significant method used in the analysis of the data. Coding is one technique used in data analysis, and NVivo is used to facilitate the classification of similar ideas and themes for simpler data analysis. The concept of Symbolic Interactionism is significant to this study. This concept is important in the study of social contexts and the interpretation of social theories. Symbolic Interactionism challenges the mechanistic world view and the dualistic assumptions found in classical realism by focusing on people, societies, social interactions, objects, human actions and the relationships between them. Symbolic Interactionism deals with people, the meaning people give things and the interpretation of these meanings within social contexts. It helps to explore the mysteries of social interaction that occur in institutional settings, in this case universities in the KSA. The outline and the initial models for course delivery in Saudi tertiary institutions and a definition of the multimodal delivery methods and technologies needed to build a taxonomy of e-learning delivery methods in the KSA are also discussed in this study.

A model that defines how the Saudi tertiary education system operates and identifies the features that need to be developed to improve the whole education system is analysed in Chapter 4. The aim of this study is to identify the model that is being used in the Saudi educational system and the key features of the academic structure. The framework shows that the Saudi tertiary education system has six main features on which the system is based. These features influence the adoption and implementation of any new programs in the education system and are therefore important to analyse and interpret. The main model of the Saudi tertiary education system is developed using

NVivo, a qualitative analysis tool. The principle factors that affect education in the KSA are university type, gender, learning style, LMS, qualifications and course majors. These factors are explained individually and their respective roles identified. The complex sets of information related to the current model of the Saudi tertiary education system are effectively expressed using an infographic which depends on the taxonomy that organises this large set of items into a hierarchical order (refer to Appendix A, p. 153). Comparisons of the implementation of e-learning within the different features of the KSA education system are made following a presentation and interpretation of data from the infographic and taxonomy. A detailed interpretation of the components of the existing Saudi system is given to provide a clear view of the existing system and how can it be improved. Data are analysed and presented in a hierarchical manner by developing taxonomies of the Saudi tertiary education system.

Overall, the education system in the KSA has been positively influenced by the use of information and technology innovations (ICT) in higher education. The success of a program is linked to its flexibility and ease of implementation and adoption in the education system on the part of both students and instructors in Saudi Arabia. Generally speaking, the efficiency of e-learning cannot be disputed; it can be provided on a fixed time basis or on a flexible schedule, thus meeting a diversity of education requirements. The MOHE currently ensures the creation of education materials for use electronically through the NCEL. It also creates an electronic interface which faculty members from local universities can use to create online courses.

Although the tertiary education system is divided between the female-only and male-only universities or campuses, the analysis concludes that this has no tangible impact on the implementation of e-learning. The KSA offers majors based on gender and this is supported by religion and particularly by the culture. The science-based majors are offered to men, while female students are mostly offered the social-based courses. The findings from the study indicate that there is likely to be faster implementation and adoption of e-learning programs within the science-based courses than the social-based courses and that should be considered to prevent institutional gender

bias. There is also a higher probability that adoption of e-learning within post-graduate courses, that is, master and doctoral degrees will be greater than lower level courses that is bachelor degrees certificates, and diploma.

7.2 Study limitations

A lack of readily available data especially that which had already been translated into English was one limitation of this study. The other main limitation of the study was the time constraint which meant that there was not enough time to translate all the available data from the universities' websites. Learning to use NVivo software was also time consuming.

7.3 Future Research

This study provides opportunities for further research to obtain even greater insight, as the author plans to take and continue at PhD level. Recent researches involving distance learning platforms are still at the developmental stage. In addition to this factor, constraints of individual capacity and time mean that distance learning comes with several disadvantages. The limitations of distance learning can be seen as a direction for future work in this subject area. Regardless of the benefits of distance learning as a powerful education system, the theoretical findings of the studies conducted on the subject still leave a number of issues to be further investigated.

1. Distance learning education systems are yet to be described accurately as there are differences in definition of e-learning.
2. Developments in areas of e-learning application need a more specific and clear-cut definition of distance learning, hence the subject requires further research.
3. Given that e-learning is still in the conception stage in the KSA, the need to add new functions and applications can be expected to arise.
4. E-learning adoption in the KSA appears to favour male dominated programmes more than female based programmes such as socially based studies. This might be an example of institutional gender bias or social exclusion based on income, and possibly, tribal affiliation.

5. The expected changes in the education structure of the country must then be designed to complement the current framework while adding other features to improve the system. For example, given that the Internet is an open source where anyone can access data posted online and re-publish it as their own, solving the issue of plagiarism will need attention

Therefore, to address all these challenges and issues, some specific strategy procedures and algorithms must be integrated in the future to tackle the issue. Case studies with in-depth interviews may be conducted using digital recorder and note-taking in order to add detail and richness to the observed data analysis, which will help to add a foundation confidence and integrity to the analysed data. The aspect of data layer backup must also be dealt with to guarantee robustness of the taxonomy and make the system more dynamic.

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List of Abbreviations

CMC:	Computer-Mediated Communication
CMS:	Course Management Systems
DE:	Distance Education
ICT:	Information and communication Technology
KSA:	The Kingdom of Saudi Arabia
LMS:	Learning Management System
MOHE:	Ministry of Higher Education
NCEL:	National Centre for E-learning and Distance Learning
SI:	Symbolic Interactionism
VLE:	Virtual Learning Environment



Figure A.2 A hierarchical taxonomy for King Fahad University for Petroleum and Mineral.

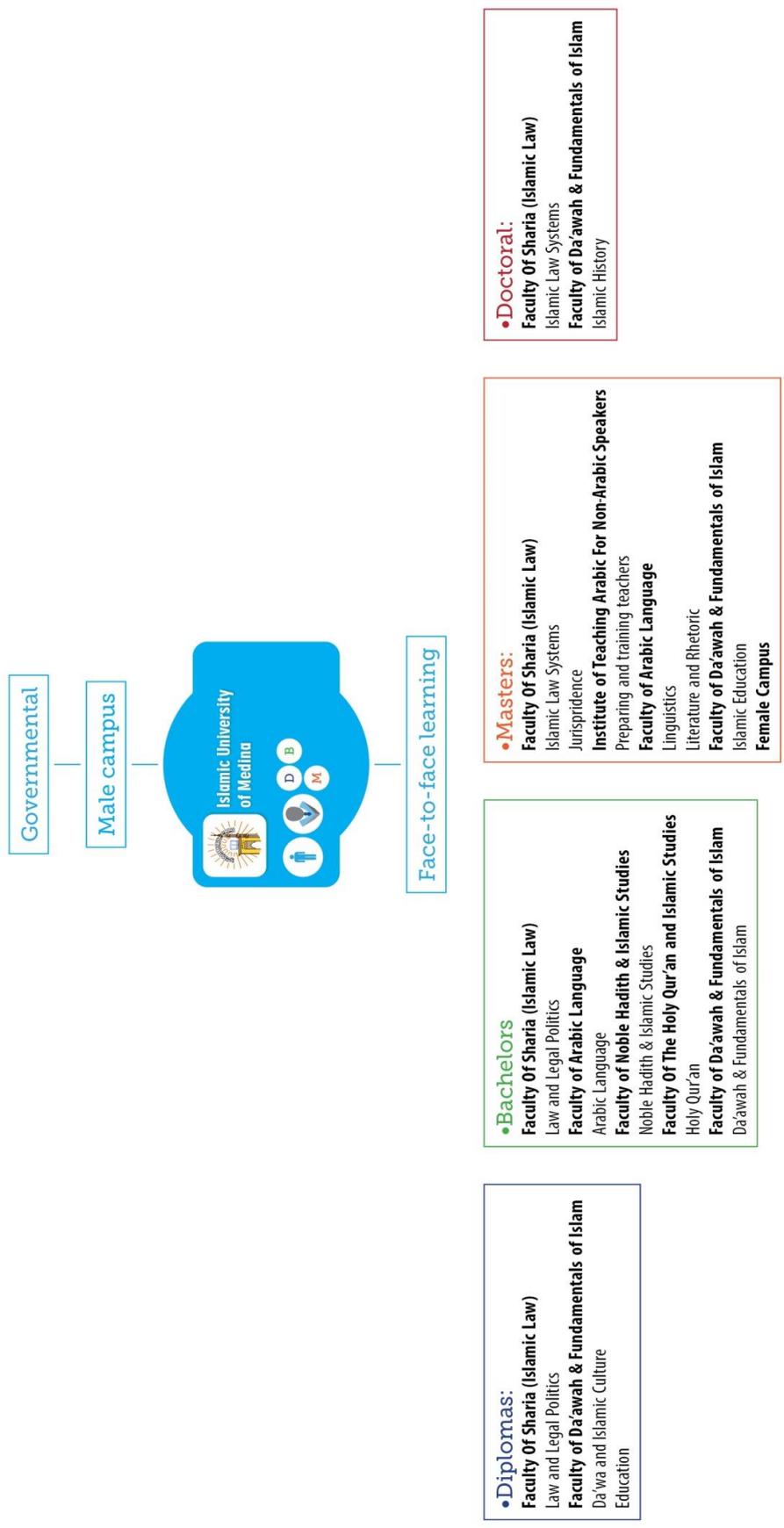


Figure A.3 A hierarchical taxonomy for Islamic University of Madina.



Figure A.4 A hierarchical taxonomy for Princess Nora bint Abdulrahman University.

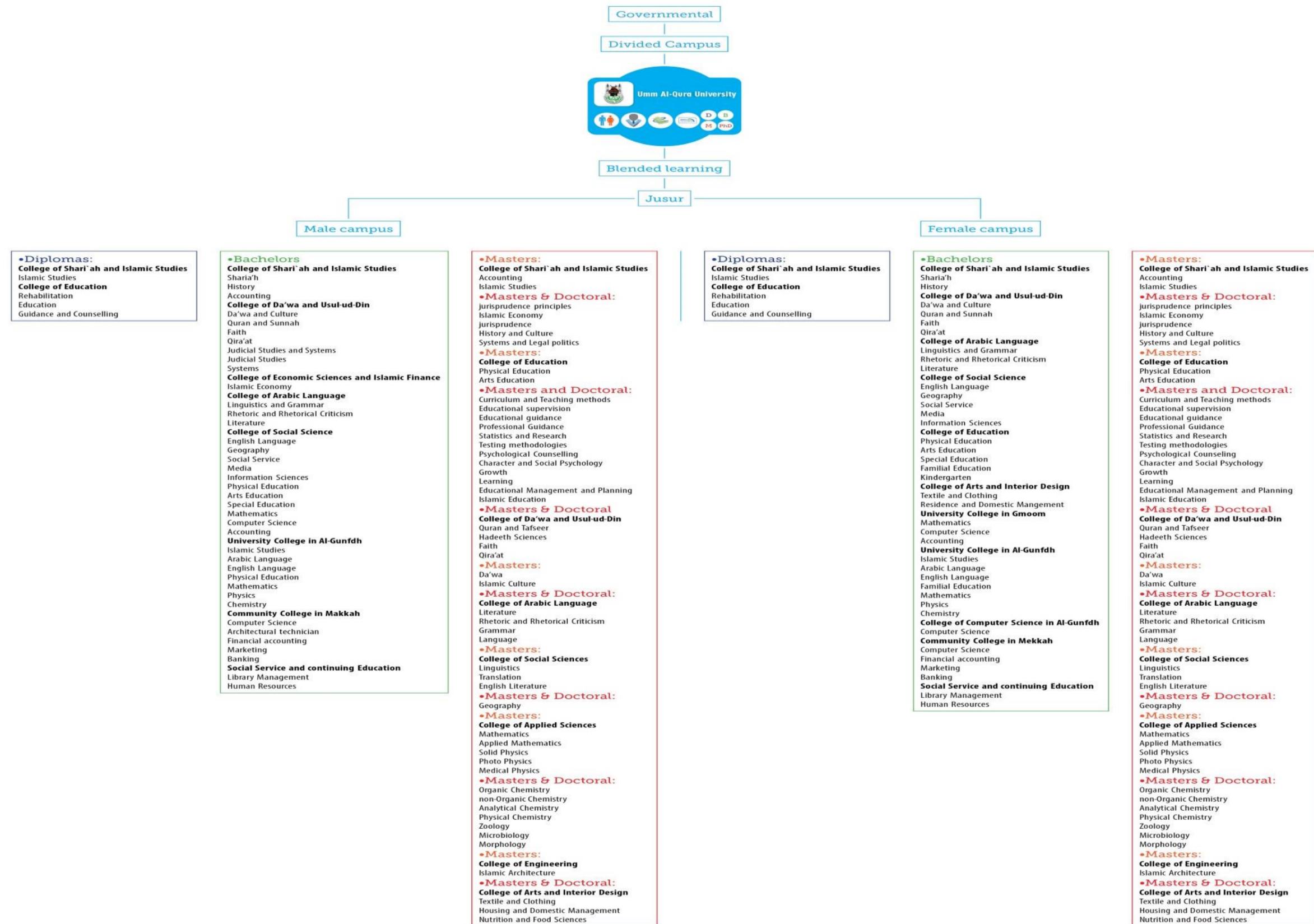


Figure A.5 A hierarchical taxonomy for Umm Al-Qura University.

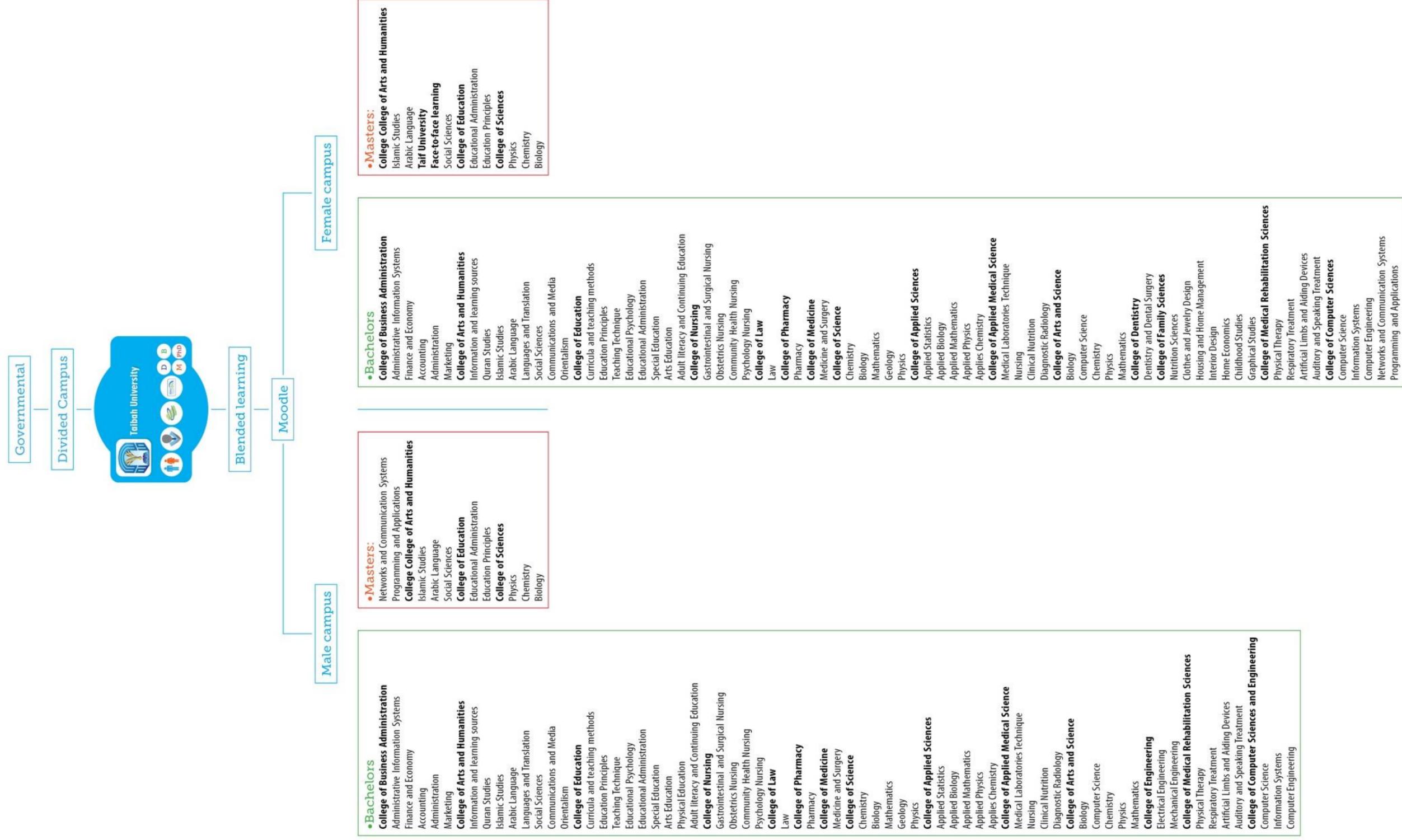


Figure A.7 A hierarchical taxonomy for Taibah University.

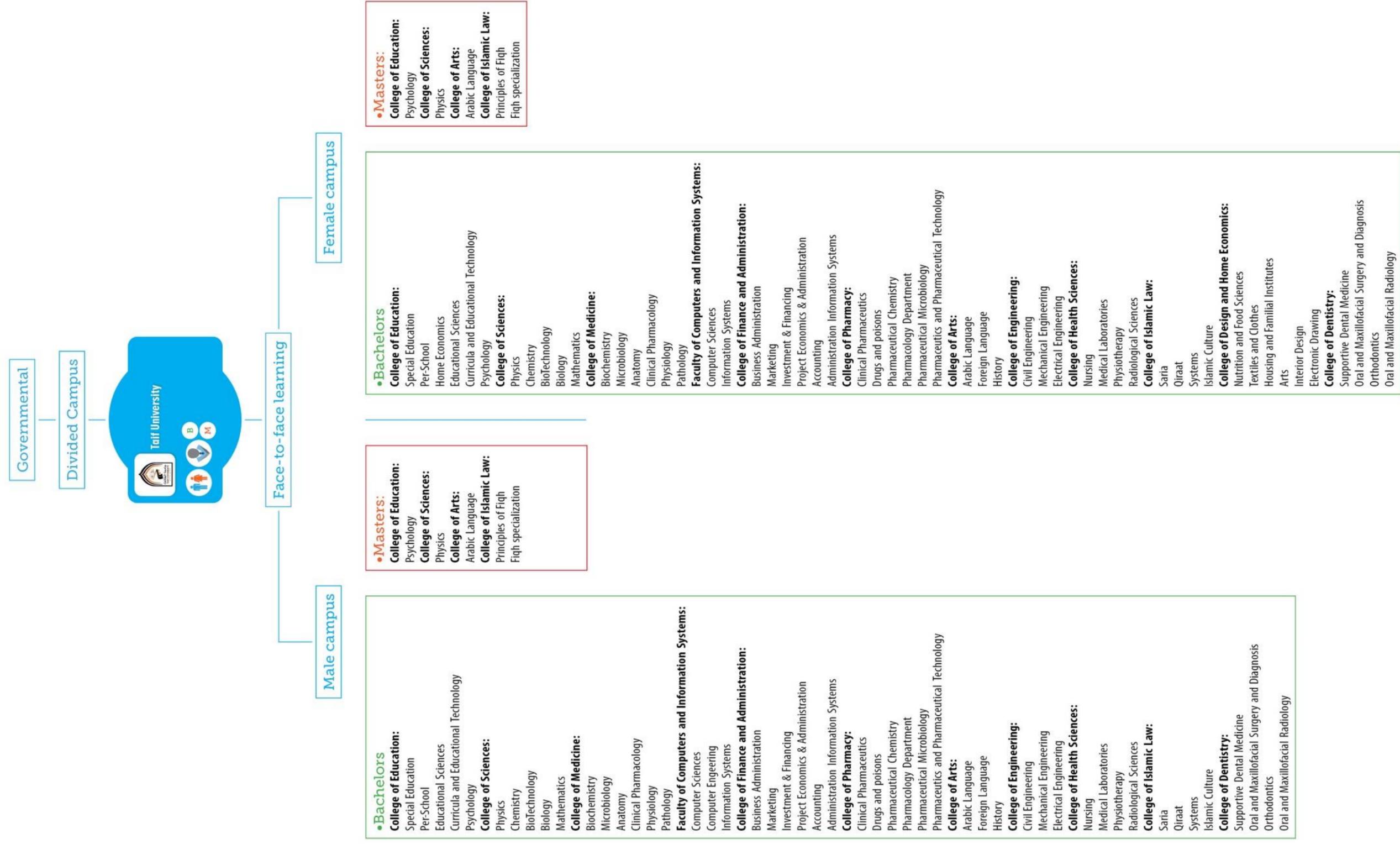


Figure A.8 A hierarchical taxonomy for Taif University.

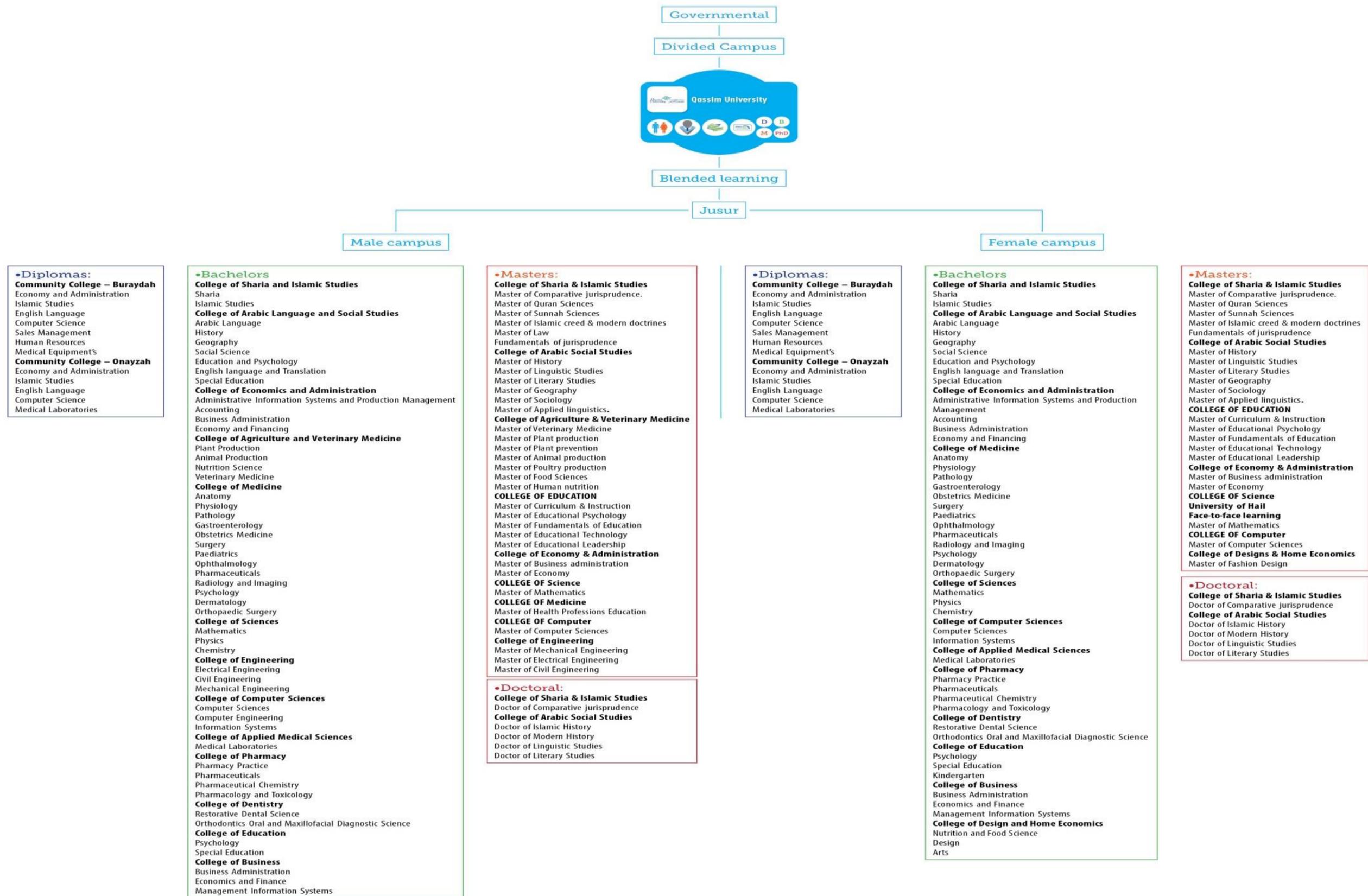


Figure A.9 A hierarchical taxonomy for Qassim University.

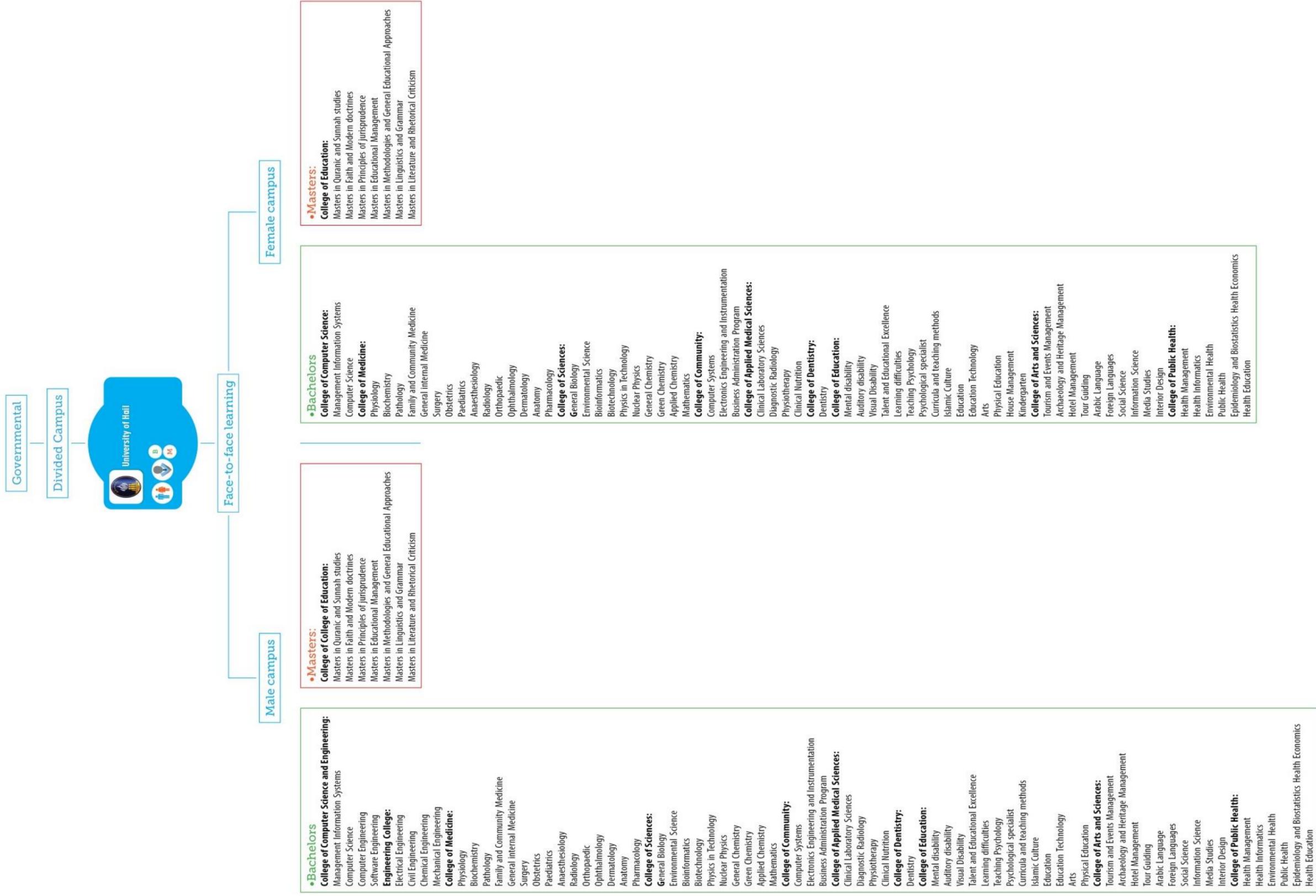


Figure A.10 A hierarchical taxonomy for University of Hail.

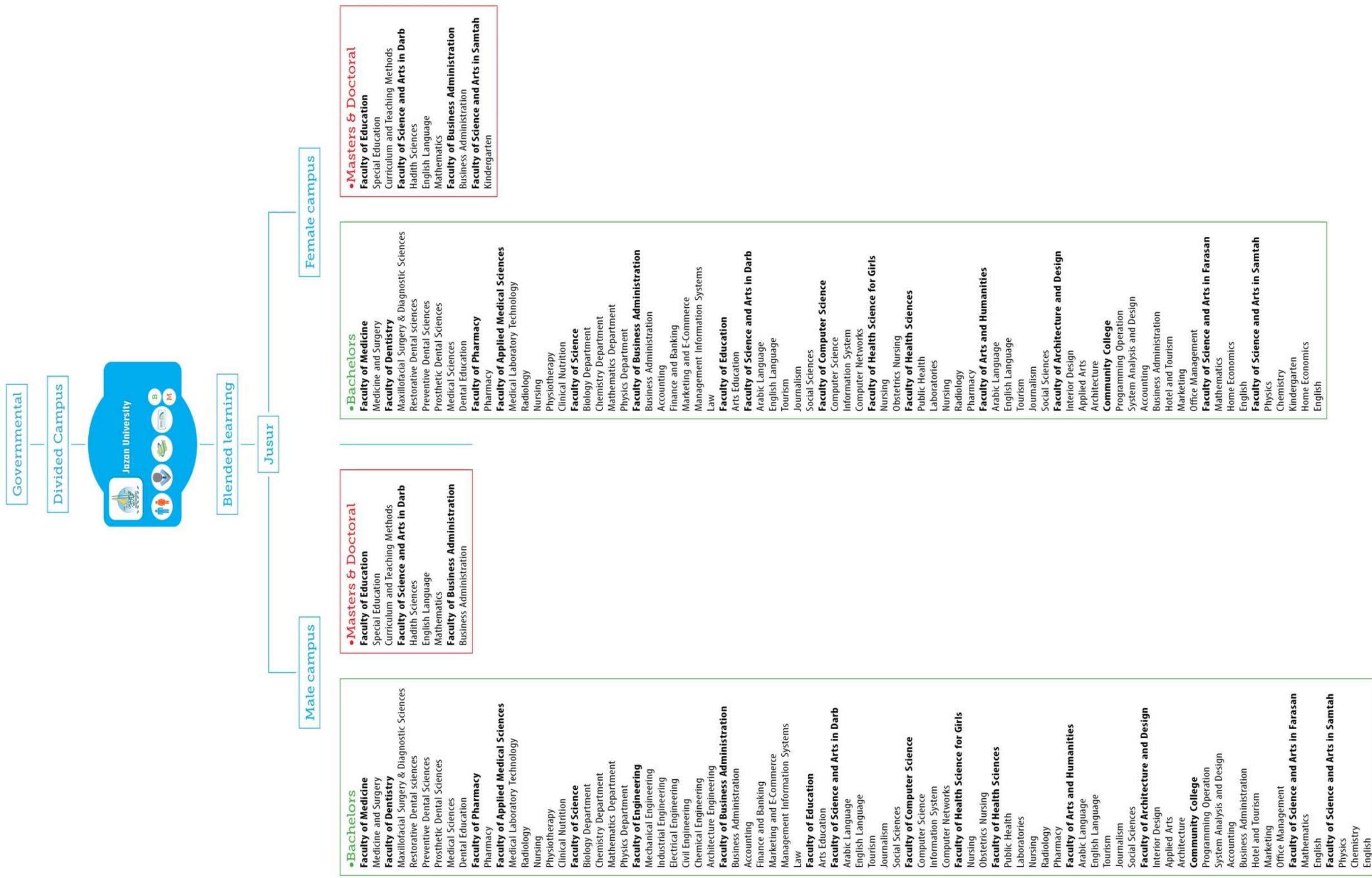


Figure A.11 A hierarchical taxonomy for Jazan University.

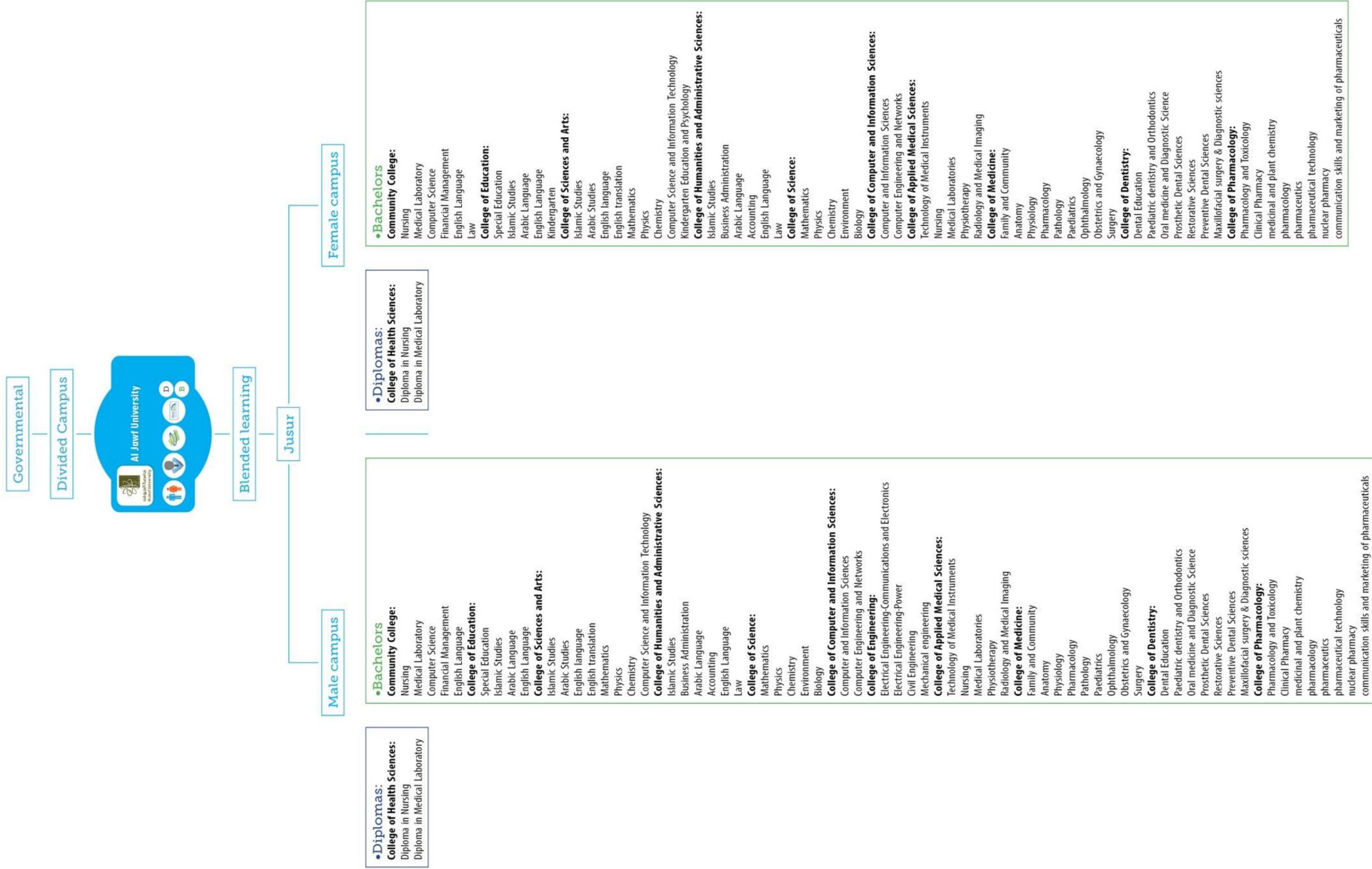


Figure A.12 A hierarchical taxonomy for Al-Jawf University.

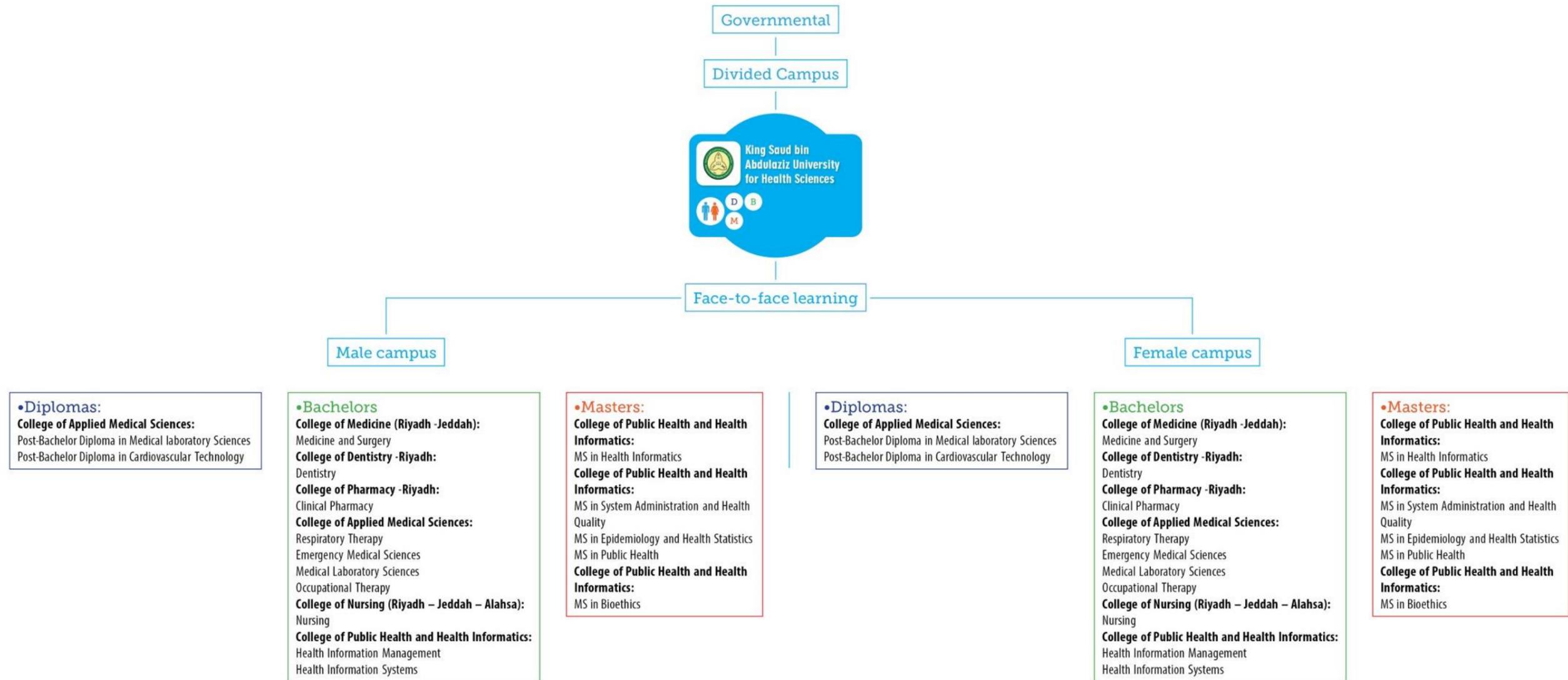


Figure A.13 A hierarchical taxonomy for King Saud bin Abdulaziz University for Health Sciences.

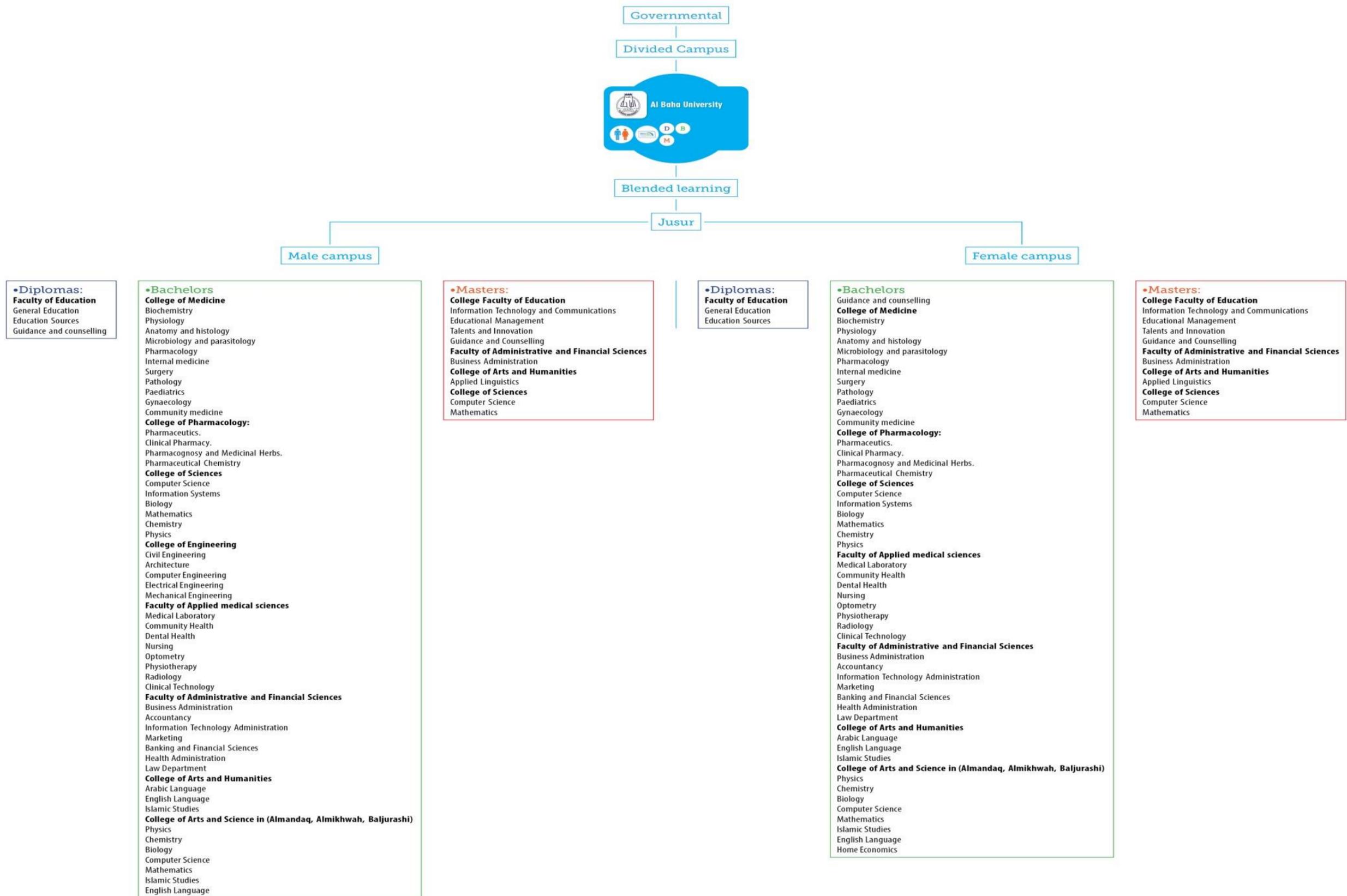


Figure A.14 A hierarchical taxonomy for Al-Baha University.

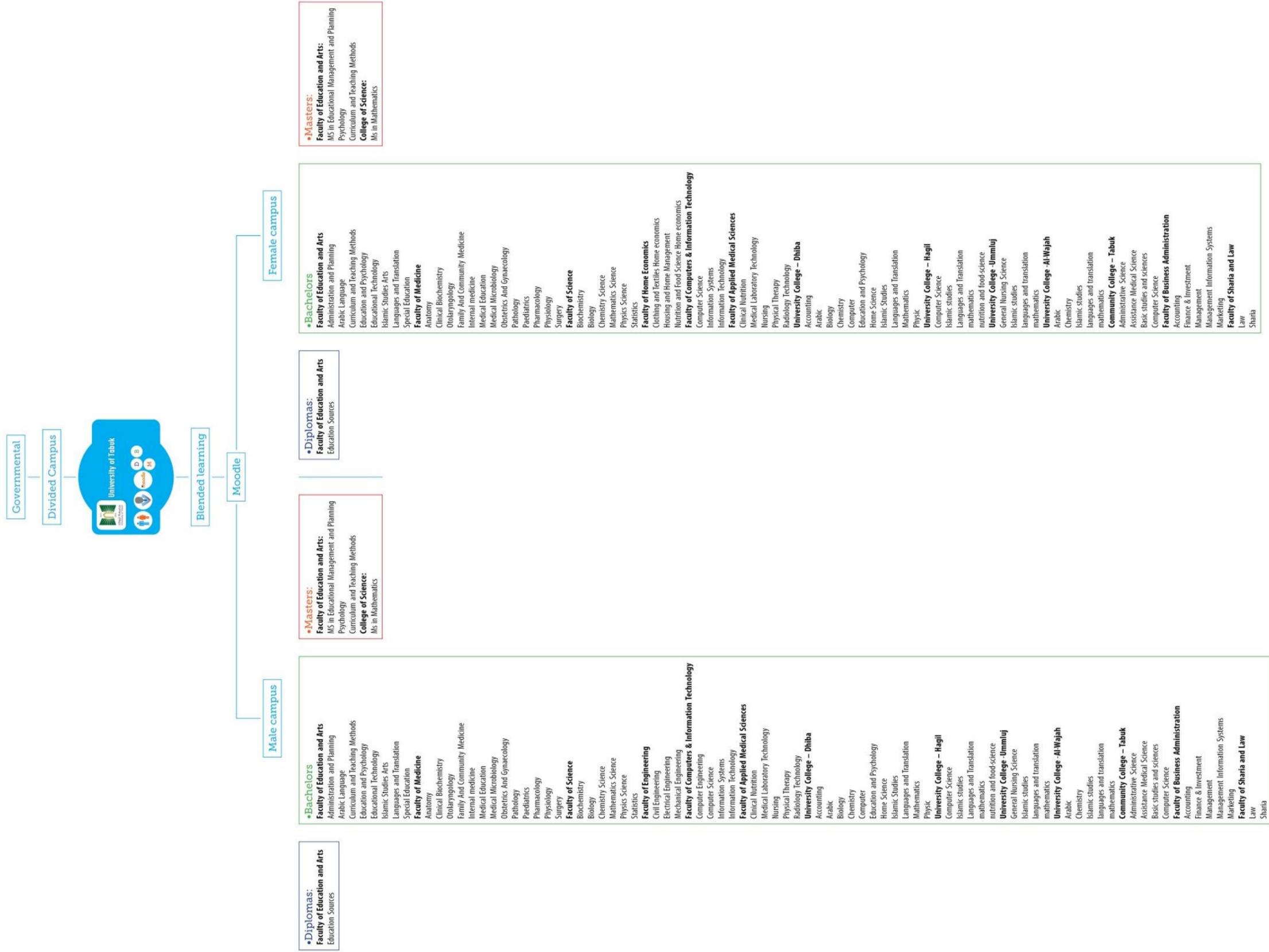


Figure A.15 A hierarchical taxonomy for University of Tabuk.

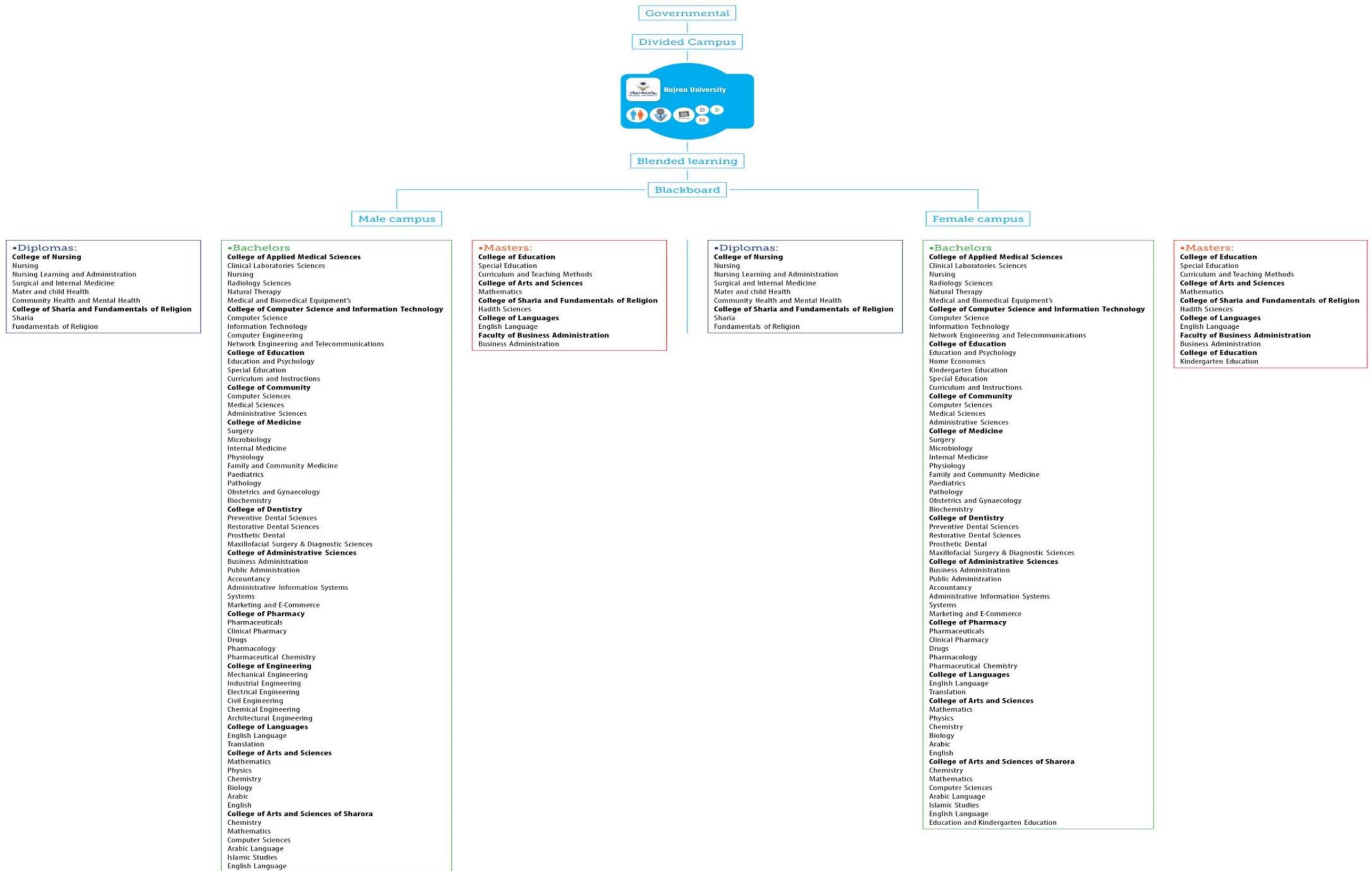


Figure A.16 A hierarchical taxonomy for Najran University.

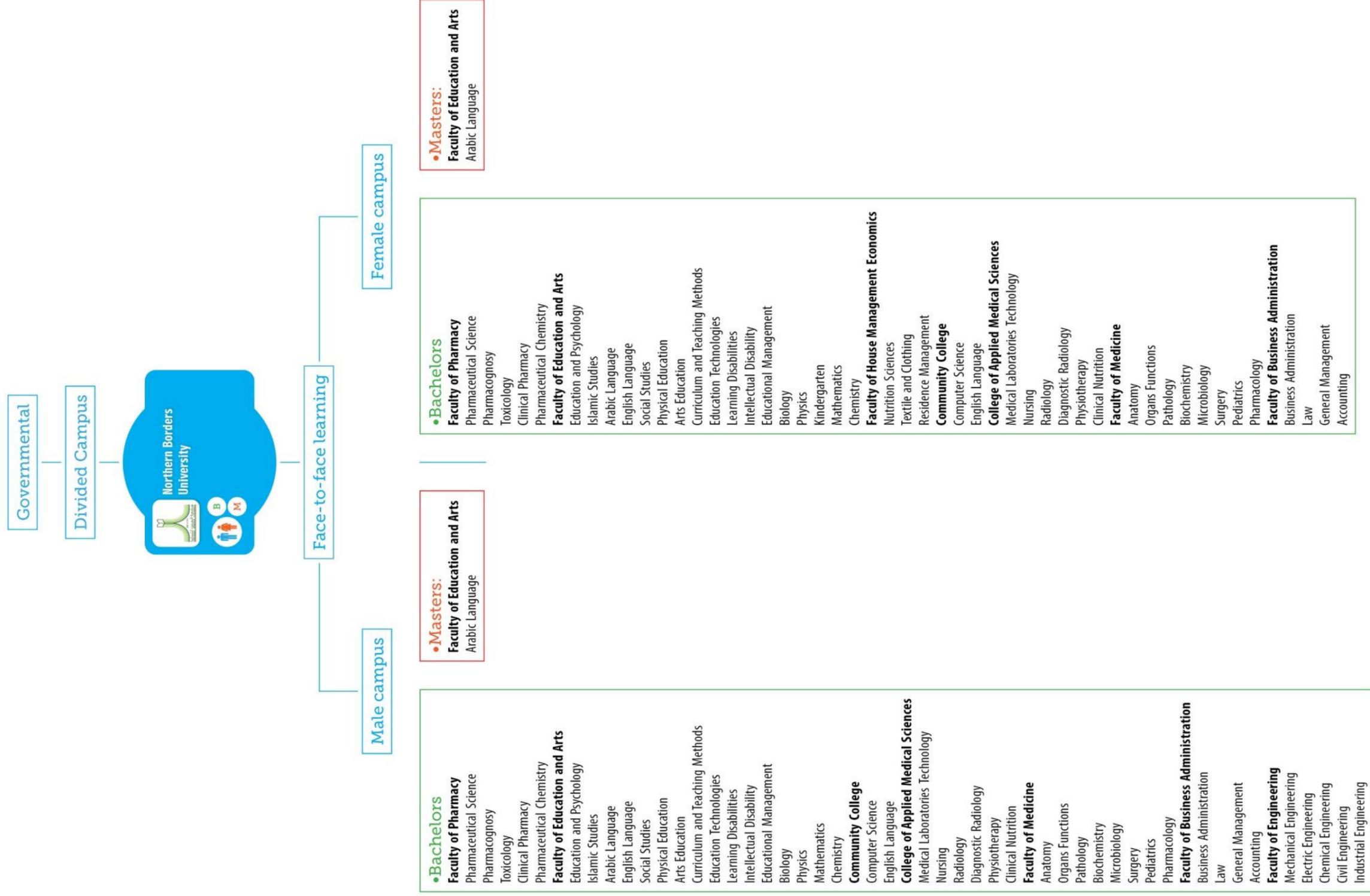


Figure A.17 A hierarchical taxonomy for Northern Borders University.

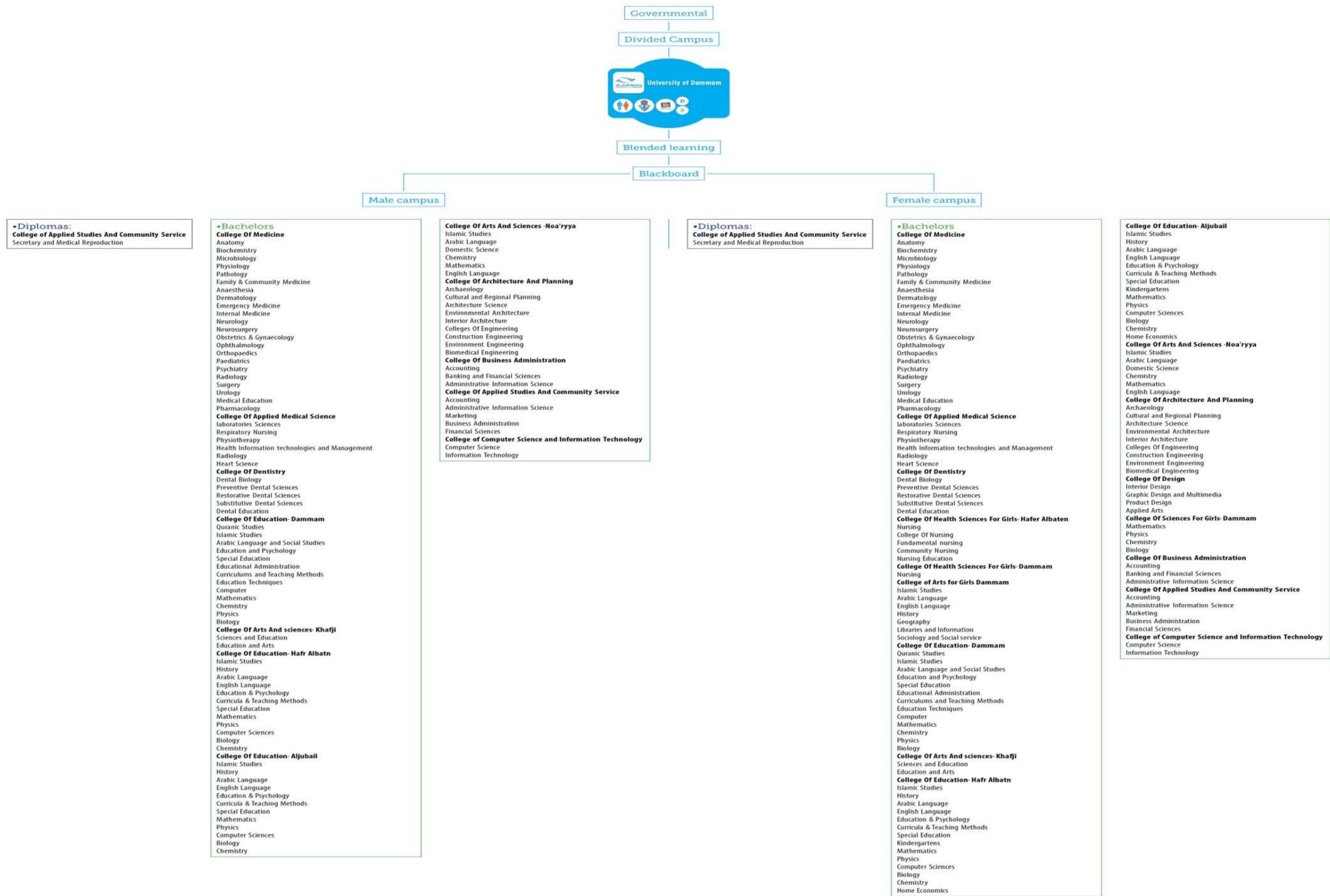


Figure A.18 A hierarchical taxonomy for University of Dammm

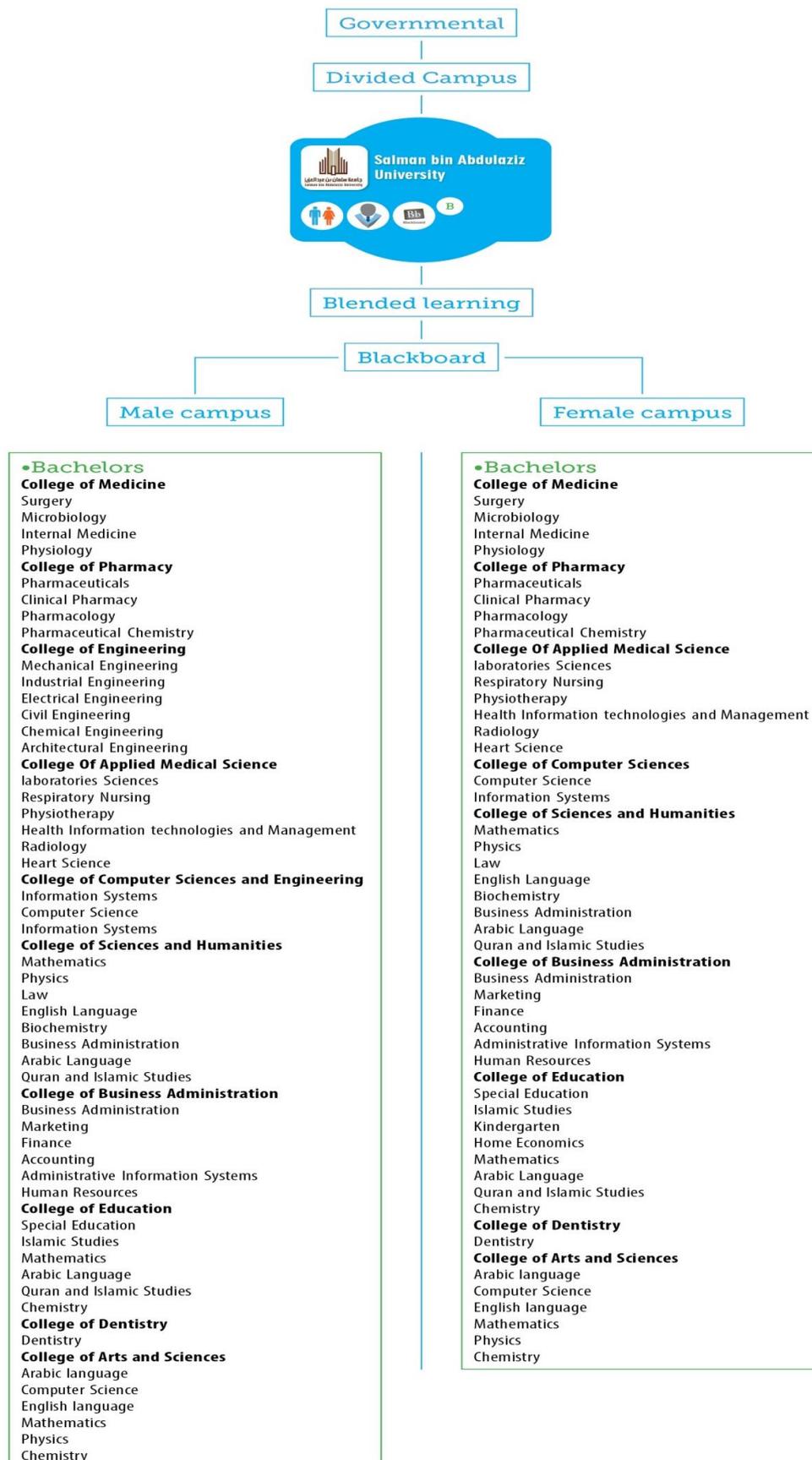


Figure A.19 A hierarchical taxonomy for Salman bin Abdulaziz University.

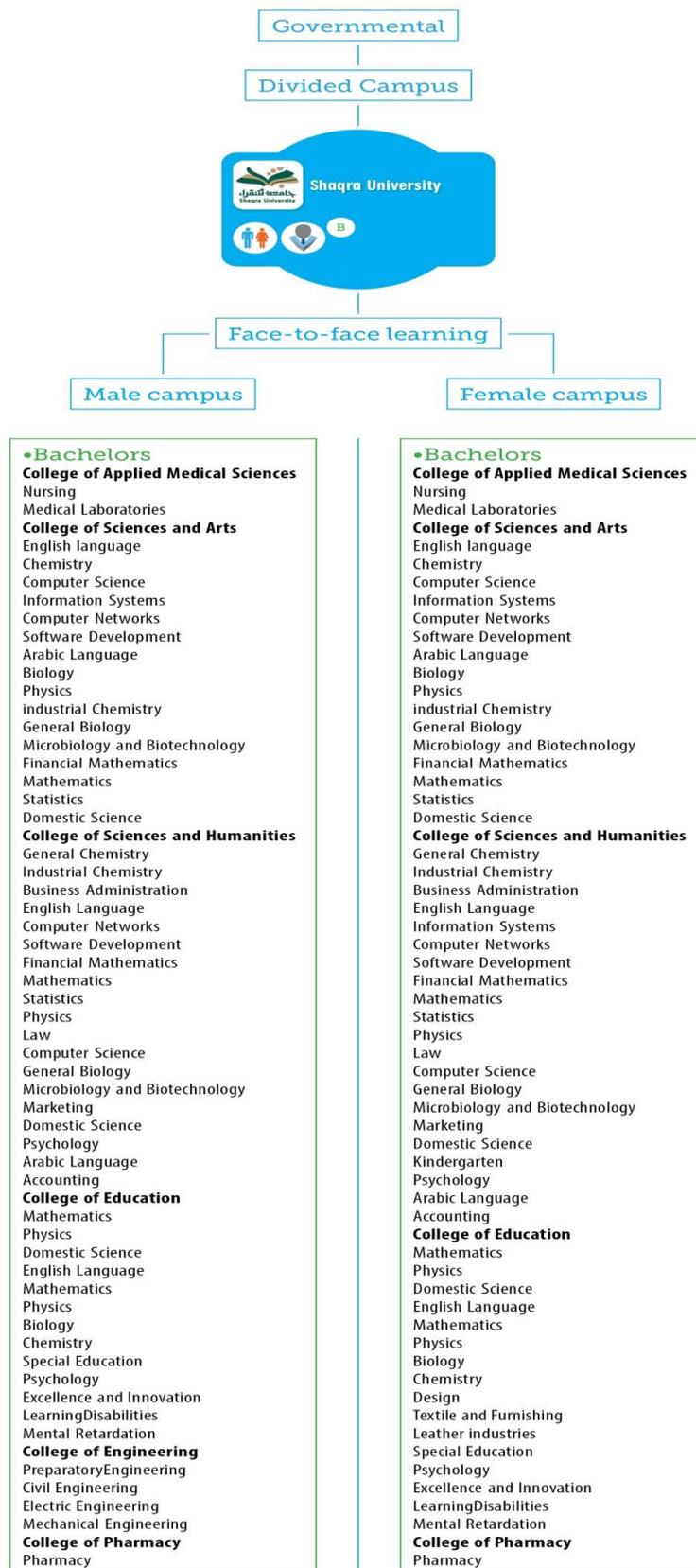


Figure A.20 A hierarchical taxonomy for Shaqra University.

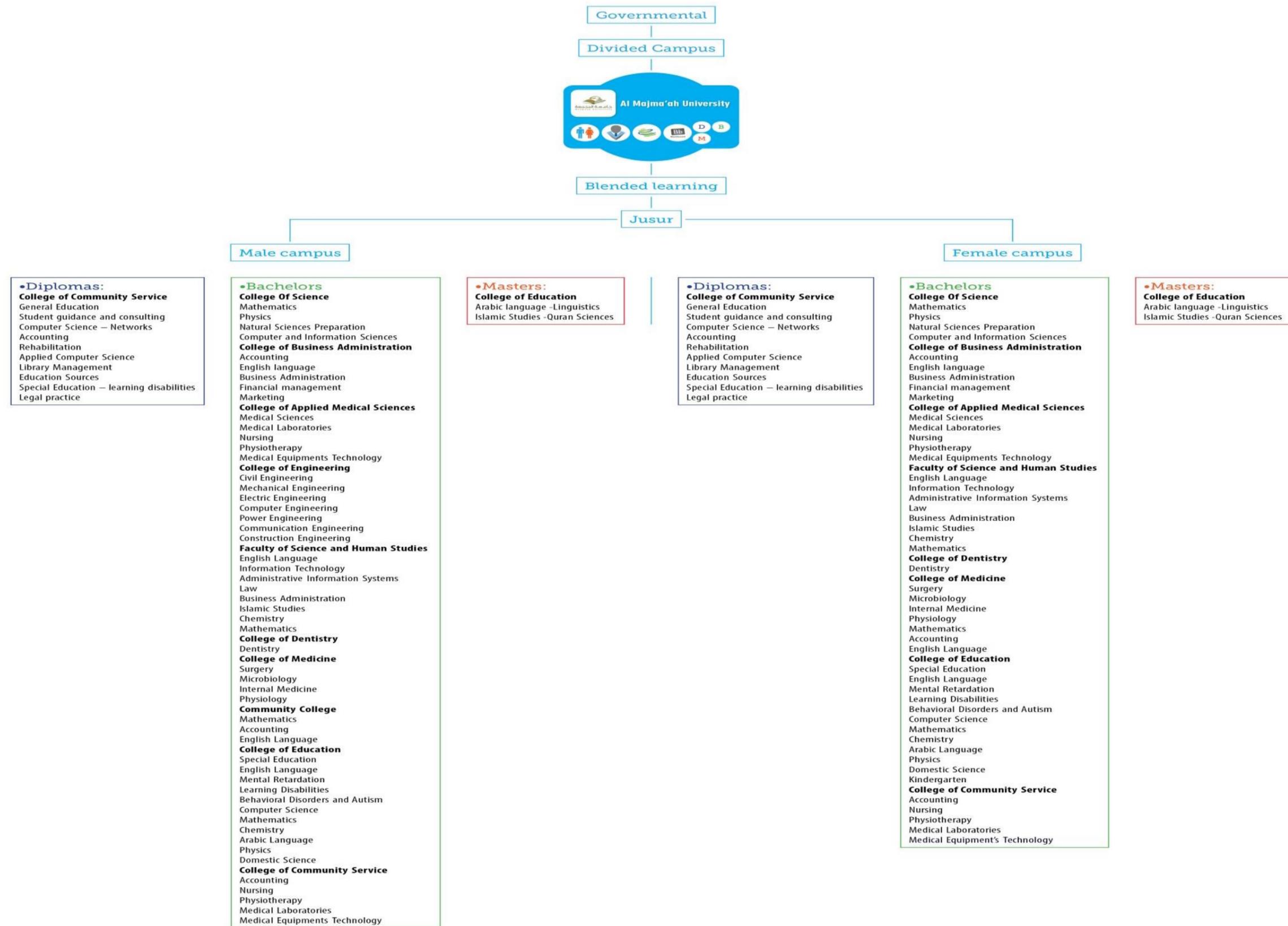


Figure A.21 A hierarchical taxonomy for Al-Majma'ah University.

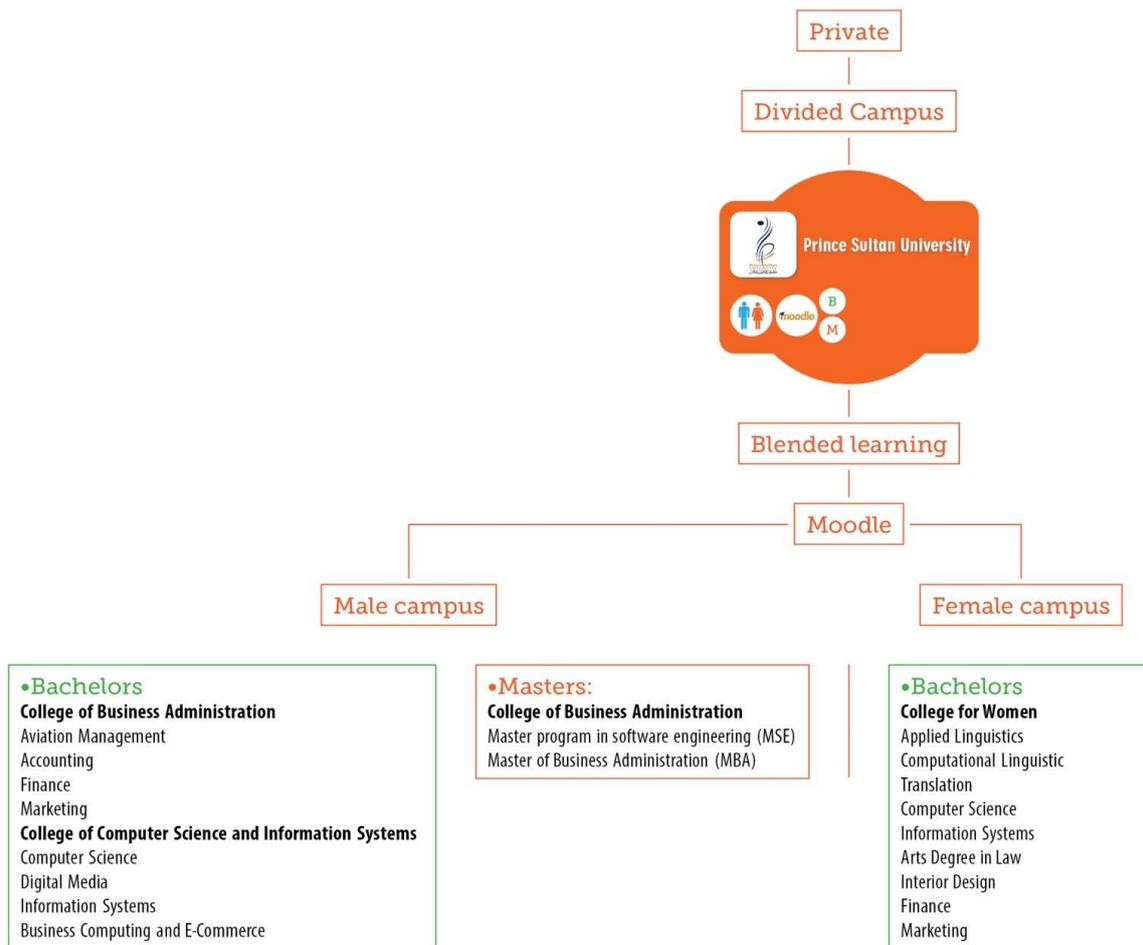


Figure A.22 A hierarchical taxonomy for Prince Sultan University.

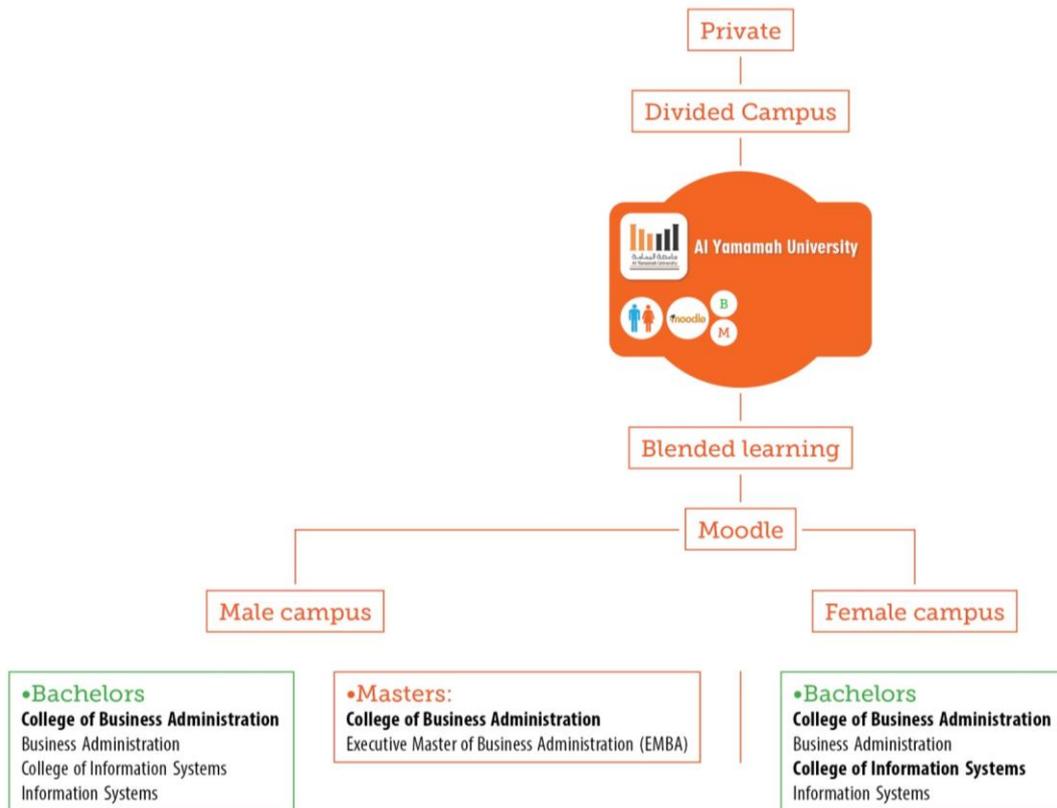


Figure A.23 A hierarchical taxonomy for Al-Yamamah University.

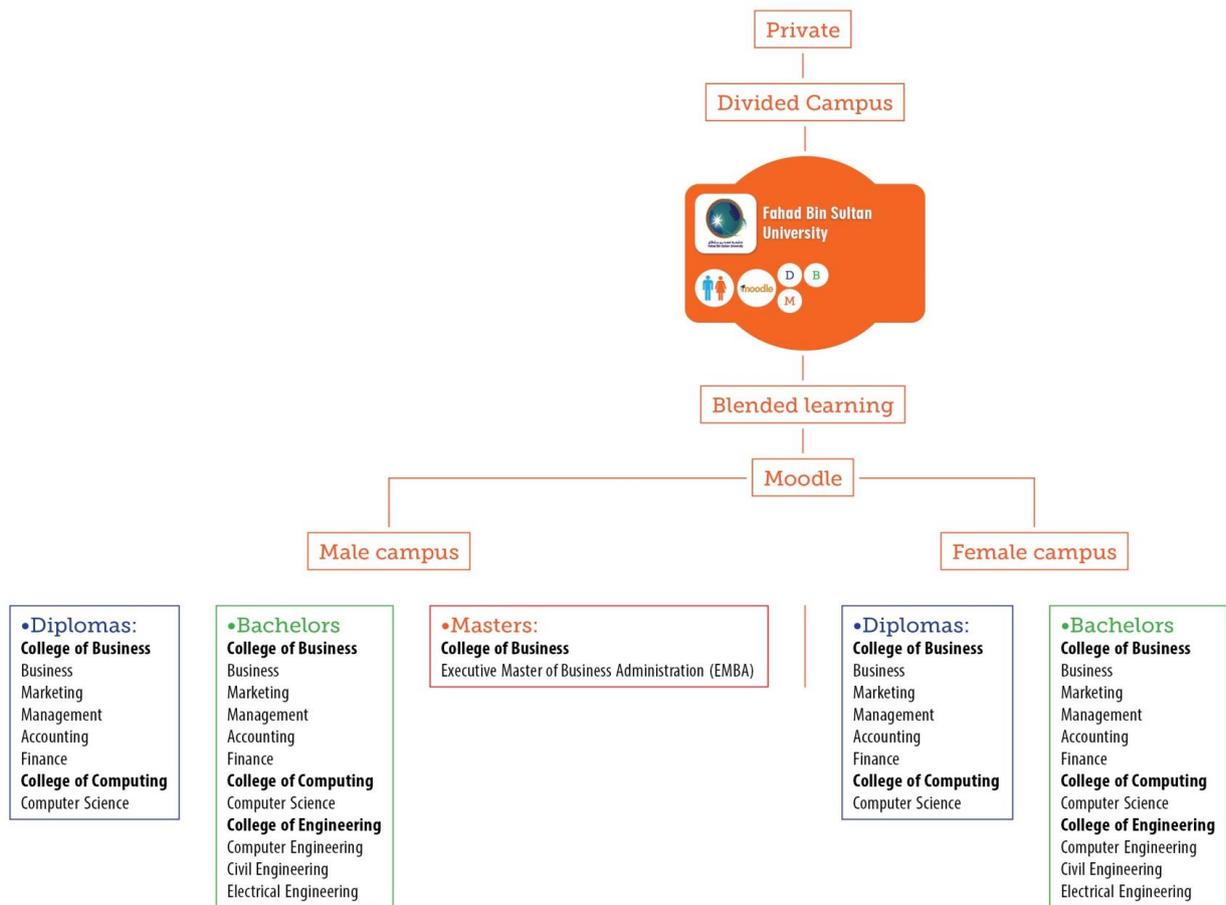


Figure A.24 A hierarchical taxonomy for Fahad bin Sultan University.

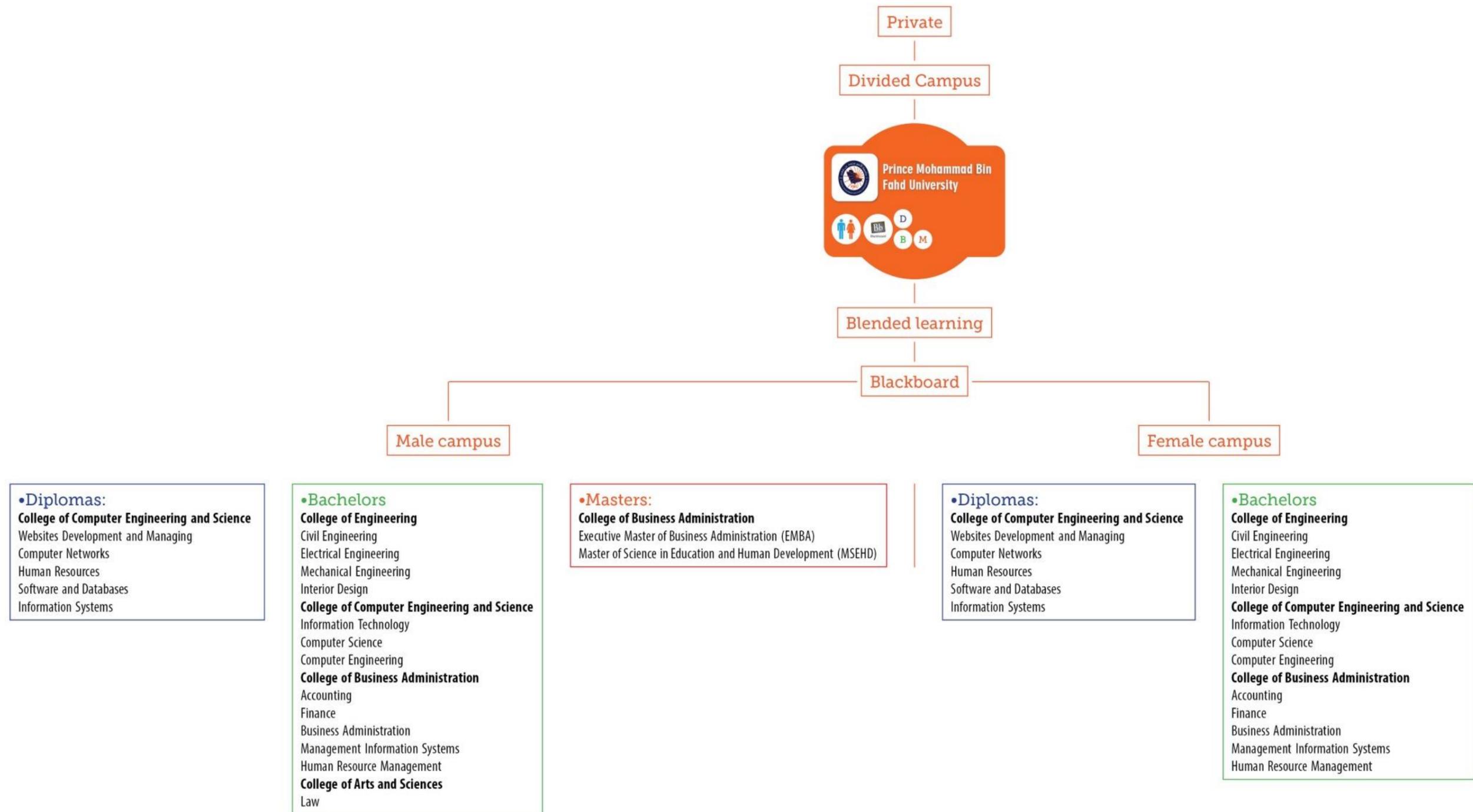


Figure A.25 A hierarchical taxonomy for Prince Mohammad bin Fahd University.

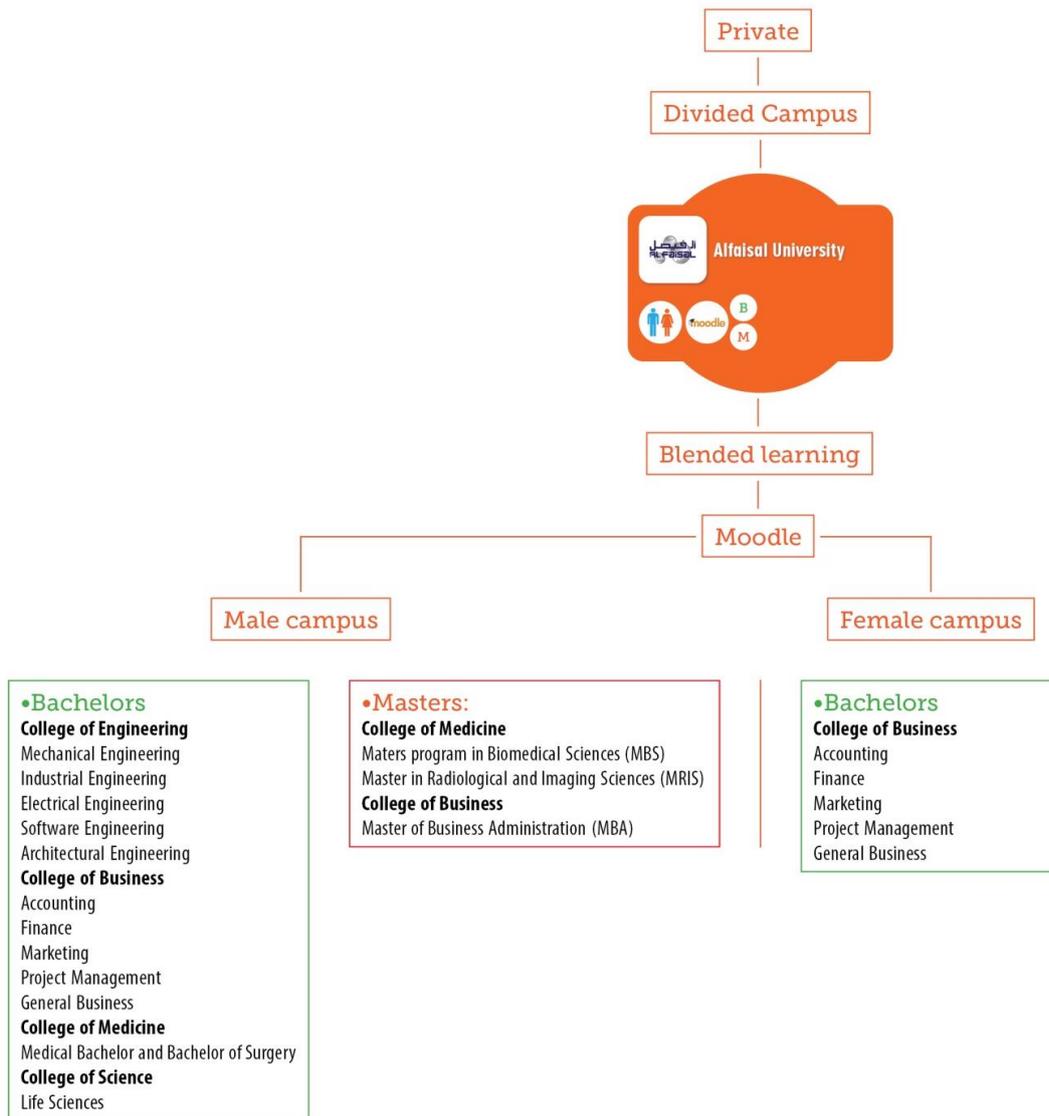


Figure A.26 A hierarchical taxonomy for Alfaisal University.

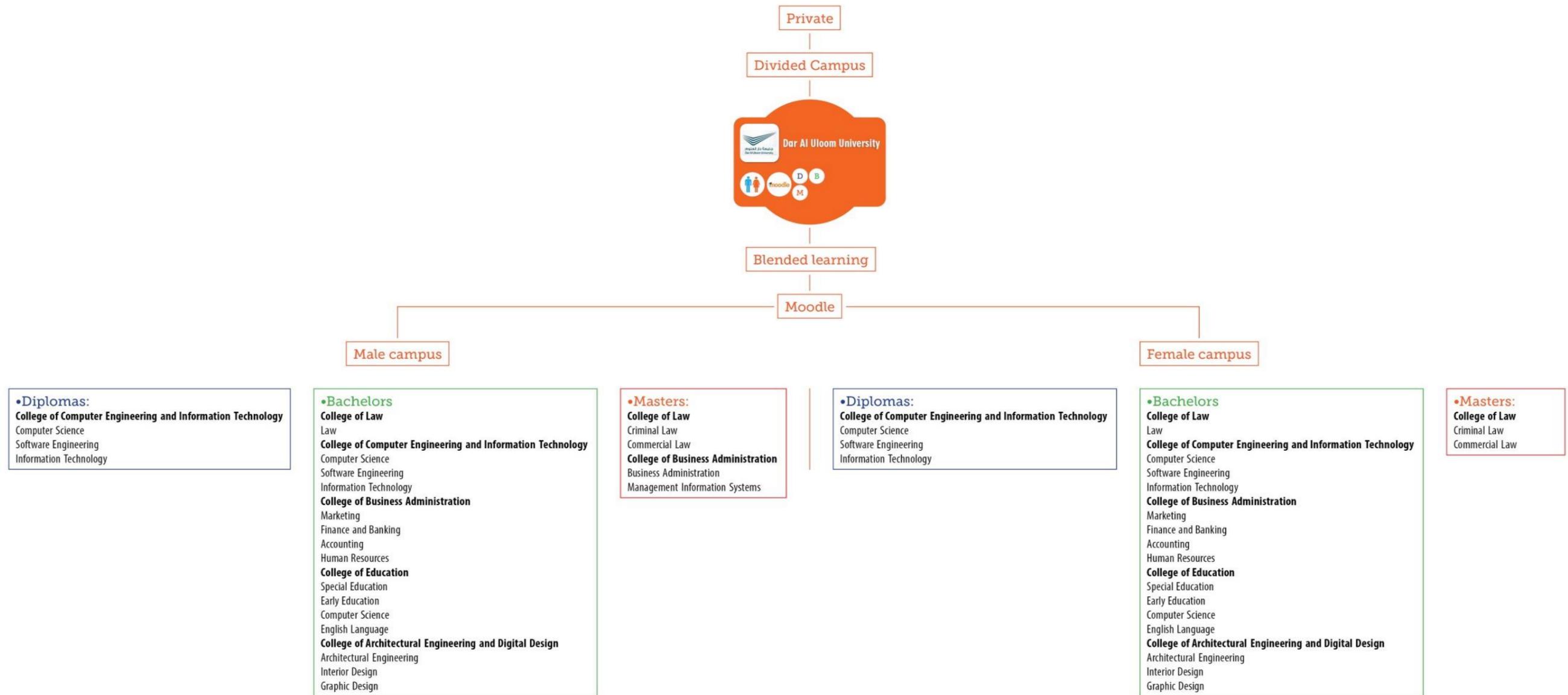


Figure A.27 A hierarchical taxonomy for Dar Al-Uloom University.