

E-Government

– A proactive participant for e-learning in higher education

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ABSTRACT

The advent of Information Communication Technology (ICT) has empowered both learners and teacher with capabilities to reach and resource beyond physical borders. The information age is changing the way people work, learn, spend their free time and interact with one other. In the Knowledge era, communication technology has made it possible to have a Global University Campus in all its true senses: a collaborative community, multinational staffing, distributed campus resources and multimedia technology. ICTs are driving down costs, improving efficiency and creating a climate of innovation, with competitiveness moving from the national to the global level. They are challenging existing methods of governance, commerce, education, communication and entertainment.

This paper presents the findings of a research into the issues regarding the role of e-governance in higher education especially incorporating ICT technologies. The recent trends in higher education demand knowledge creation, capture, dissemination and application for crafting a sustainable development of the entire economy. The paper looks into the Vision 2020 statement for strategic goals, while analyzing the Census 2003 data for trends and direction of higher education in the local region. The research begins with an appraisal of the advent of higher education in Oman, the different centres of excellence and disciplines to begin with. It draws statistics from the Census 2003 to identify further requirements and potentials for future direction and initiatives.

A set of strategic issues in the practical implementation of e-learning in higher education through e-governance is presented along with coverage of ICT policy framework. The focus areas would be capabilities of e-learning mode enabled by ICT technology and its implications in the region, Oman market trends, current levels of literacy, legal framework, nation-wide digital library, public services online and citizen awareness. The paper concludes with strong recommendations both at National and Institutional levels for serving as guidelines in paving the path for their directions in future.

INTRODUCTION

E-government is the process of offering better government service to the public at a lower cost (1). The right balance to be achieved in implementing e-government with ICT is to balance the public ability to reach and access electronic information. Access to all official information and service offerings of the Government administration is of prime focus and the same applies to educational resources as well. As we move from an industrial to a knowledge economy, it's not what you produce but what your people know (and are capable of), that gives you competitive advantage.

E-learning is about use of networked technology to manage, design, deliver and support learning. In its simplest form, it is the use of technology to deliver and facilitate learning. It can cover a broad set of applications and processes such as online training and education (over the internet, intranets, and local or wide-area networks) and computer-based training (PC-based, CD-ROM). The definition of e-learning can also extend to digital collaboration, communities of interest, information and knowledge sharing. Online technologies are as much about communication as they are about information access and this creates a powerful combination in the context of learning. E-Learning, enabling the use of traditional print media along with electronic communication capabilities such as emails, Internet, instant message chats, discussion forums, voice and video conferencing in higher education has opened a plethora of opportunities as well as challenges.

E-government vision requires a community that is information and technologically literate to access the information they require. Information literacy involves more than computer literacy. It is the set of skills that allow people to find information, evaluate its accuracy and credibility, and apply it to help them solve real problems. Information literacy is perceived as a life skill. This requires an element of 'Trust' from the citizens ensured by 24/7 secure technology infrastructure.

HIGHER EDUCATION LANDSCAPE IN OMAN

The 1970s and 80s witnessed higher education in Oman primarily with the aid of overseas scholarships due to lack of local expertise and specialisations. However it enabled crucial personnel to gain valuable training to take over key positions across vital sectors. In 1994 the government has addresses this mass demands in higher education initiated a major expansion in numbers and scope of higher education institutions both by the government and private, to meet the local market needs.

The Higher Education Council set up by the Royal Decree No.65/98 in 1998 draws up a general policy for higher education and scientific research in the sultanate's higher education institutions. It also prescribes to regulate student numbers and intake procedures (2). The council is also responsible for evaluating the performance of existing institutions and approving proposals for new universities. The Accreditation Council set up by the Royal Decree No.74/01 in 2001 is an independent body responsible to the Higher Education Council. Three permanent committees of this board make recommendations on accreditation of higher education institutions, accreditations of programmes of study and quality control.

The advent of higher educational institutions in Oman began with the establishment of the Omani Bankers Institute (currently College of Banking and Financial studies) in 1983 and the Intermediate Teachers' Colleges (currently Colleges of Education) in 1984. At the same time the Technical Industrial College (currently Higher Technical Colleges) was opened to provide specialist vocational qualifications. Health institutes were opened to train Omani nurses, radiographers, physiotherapists and dental hygienists to work in the government hospitals. The former institute of Sharia jurisprudence is now divided into the Institute of Sharia Sciences and the Sharia and Law College. The private sector which began its operations after 1994 has scaled rapidly with about 14 private colleges and private universities at Soha, Nizwa and Salalah.

According to the Sixth Five Year Plan, the Oman government has allocated RO 539 million for education and training, in which RO 271 million will be used for enhancing various education programs and RO 268 million is reserved for human resource development. Currently Oman government encourages the private sector to invest in education. Specifically two private Information Technology colleges – The Middle East College of Information Technology and Waljat College of Applied Sciences have been set up to produce skilled ICT professionals.

Rapid updates have been made to the Basic Education System which has introduced improvements into the syllabi through all levels with due regard to the requirements of the labour market and thereby enabling the omani society to keep pace with modern developments in the world at large.

Through ongoing efforts towards Omanisation current statistics show that the levels of Omani teachers stand at 76% and administrative and supervisory staff stands at 97%. There is an active plan to implement programmes to upgrade the qualifications of teachers and technical and administrative staff to BA level. In 2002, the training programmes held for employees and teachers and most of them are registered for BA, MA, and PhD degree courses. Principals and administrators are also enrolled at the Sultan Qaboos University for higher diplomas in administration, accreditation and quality control.

The Sultan Qaboos University (SQU) with about 12000 students currently is the highest provider of higher education to the cream of brains in Oman. It has seven colleges: Arts and Social Sciences, Commerce and Economics, Education, Sciences, Agriculture and Marine Sciences, Engineering and Medical and Health Sciences. Some of the new programmes introduced to meet the local labour market requirements are:

- BA in colleges of Education (Kindergartens and School Administration)
- BA in Agriculture Economics, Tourism, Translation and Social Services
- BA in Architectural and Environmental Engineering
- MA in Oil and Natural Gas
- Doctorate in Carbonic Studies

Industrial expertise and support in these programmes is also arranged for example with Shell Corporation for the Carbonic studies.

Research initiatives include academic research, applied research and strategic research which are utilised by both government and private institutions. They are funded with 500,000 OMR each year as a royal grant. Projects that have been financed by this funding include research into the advance of desert sands and the dangers thus posed

to roads and built-up areas, a study based on corrosion, research into the development of fish products for local and international markets, the use of sea water in greenhouse cultivation and a study on the incidence of abnormal blood pressure in the Nizwa region. SQU has about ten research centres including the recent one on Environmental Studies and Research. The centre for Omani Studies promotes activities in the economic, social and cultural spheres.

The Colleges of Education has about 8500 students currently provides intermediate diplomas and BA degrees with subjects like Islamic education, Arabic, mathematics, computers, chemistry, biology, physics, geography, history and life sciences. Currently the administrative positions in these colleges are mostly Omanised while the academic staff strength is targeted at about 20% by the end of the Sixth Five Year Plan.

The Sharia and Law College established in 1997 trains personnel in Sharia sciences, Islamic and legal studies to employment at the judiciary and auxiliary offices of legal profession. Sultanate of Oman's entry into the World Trade Organisation agreement has made a fresh list of legal professionals. With about 100 students graduating every year, the three main departments of this college are the Sharia department, Law department and the Fundamentals of religion and Islamic culture department. Higher education institutions in military studies include the Police college at Nizwa, Royal Air Force of Oman's technical training institutes, the Royal guard of Oman technical college and the Institute of topographical sciences.

Private Universities, Colleges and Institutes cater to about 5500 students currently. These institutions are funded by the government by the provision of land and exemptions from customs duties. In addition the Higher Education Council awards annual scholarships to about 1000 students based on family social security welfare. About 80 full scholarships for first university degrees or post-graduate studies including MA and PhD courses offered by the Higher Studies Scholarship Committee. Oman's first private medical college is in partnership with West Virginia University School of pharmacy. Most private institutions run courses accredited by foreign bodies or universities to ensure high international standards in higher education and enable them to award internationally recognizable qualifications.

The technical colleges offer diplomas in commercial studies, information technology, science, engineering and structural engineering. New courses such as architectural drawing, pharmacology and insurance have been introduced in 2003. The integrated syllabus at these colleges has been renewed with a focus on the labour market. About 3500 students are catered by these technical colleges with diploma, BA degrees. Vocational training scenario is shared by the government (with about 1850 trainees) and private vocational training institutes (with about 1500 trainees) focusing on skill oriented areas such as electrical and motor vehicle mechanics, general electricity, electronics, refrigeration and air conditioning, general mechanics, carpentry and construction.

In Oman, 13,000 teachers are to be provided with International Computer Driving License (ICDL - internationally recognized computer proficiency standard training) as part of a government move to offer computer education to students at all levels. ICDL GCC Foundation, in association with Shell Representation Office Oman has announced Shell's support to the government's initiative to adopt the International Computer Driving License (ICDL) program by sponsoring the testing and certification of 2,290 teachers in the ICDL program, in cooperation with Oman Ministry of Education and Ministry of National Economy (3). Such initiatives will enable rapid creation of IT literate school leaving students who are ready for higher education based on e-learning mode of study.

The Ministry of Manpower in the Sultanate of Oman has undertaken responsibility for practical training and theoretical qualification through the systematic implementation of the Sanad programme, aiming at motivating young people and investing their energies economically, culturally and developmentally. Under the Sanad Incubator for Information Technology program for citizen welfare, Bahwan CyberTek has inducted 47 Omani students on a one-year intensive IT development programme to eventually sit exams to become Oracle Certified Professionals (4). Such public-private initiatives create IT literate entrepreneurs for the nation in its effort to economic diversification. Through the network of 300 ICT Sanad centers in Oman (a public private partnership between Ministry of Manpower and Bahwan Cybertek, citizens away from the capital city and other central local towns can utilize services such as payments of Water Bills, Electricity Bills, Telephone Bills, and services like electronic forms from the Ministries easy application and processing of licenses, Telephone on Line Registration, and Sale of Pre Paid Cards (5).

The Ministry of Education and Microsoft have signed a Memorandum of Understanding to bring improved ICT education to schools in the Sultanate of Oman, under the 'Partners in Learning' global initiative. This also

includes provision of ICT training materials for students and teachers from the Microsoft IT Academy program, as well an online forum to discuss ICT education where teachers will be supported through the Innovative Teachers Network (ITN). Partners in Learning will also provide ICT education for the wider community with the establishment of Community Technology Learning Centers (CTLCs) in Oman (6). This is again a public-private initiative encouraging teachers, staff and students to use ICT to improve the learning process, and will support teachers in raising their level of ICT awareness in a cost effective manner.

CURRENT STATUS OF OMANISATION

In Oman, the Omanisation programme has been in operation since 1988, working toward replacing expatriates with trained Omani Personnel. Omanisation, a campaign meant not only to ensure job for each citizen but also to reduce dependence on expatriates in search of self-reliance in human resource, has become the government's top priority more than ever before since the recent address by the Omani leader to the joint house of parliament, devoted as it was to the national manpower development. By the end of 1999, the number of Omani staff in government services exceeded the set target of 72%, and in most departments reached 86% of employees. (<http://www.omanet.om/english/misc/omanise.asp>)

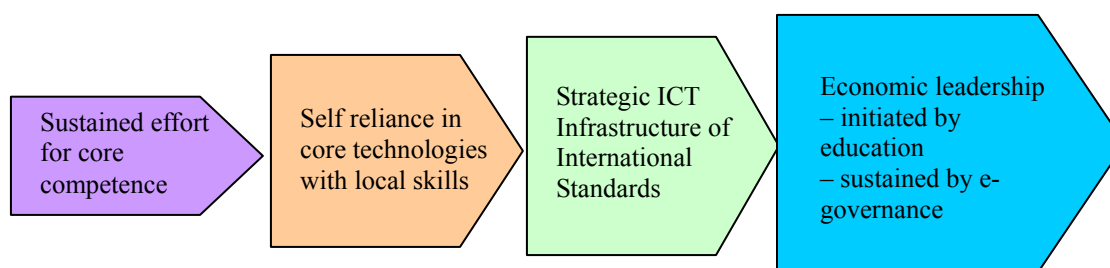


Figure 2: Path for economic leadership in the region.

The Fundamental Goals of the Omani Economy 2020 vision are enlisted below:

- To develop and upgrade Omani Human Resources in order to cope with technological progress and attain international competitiveness.
- To develop a private sector capable of optimum use of Human and Natural resources in an efficient and ecologically sound way, in close collaboration with the government.
- To utilize the geo – strategic location of the Sultanate, optimize the use of its natural resources and promote economic diversification.
- To distribute the fruits of development among all regions and all citizens.
- To preserve, safeguard and develop the achievements accomplished in the past twenty- five years.

Essential Social Indicators – Oman

Total population (thousands),2003	2851
Net primary school enrolment / attendance (%) (1996-2003)	75
Total adult literacy rate,2000	72
Annual no. of births (thousands),2003	91

Estimates of Social Indicators according to the Vision for Oman's Economy – 2020 (7)

Enrolment Ratio in Higher Education (%)	9%	40%
Percentage of Vocational Training Students to total Students in Secondary Level	4.5%	50%
Percentage of Omani Labour Force to total Population	17%	50%
Percentage of Women in Total Labour Force	6%	12%
Omanisation rate in Public Sector	68%	95%
Omanisation rate in Private Sector	15%	75%

Table 1: Essential Social Indicators – Oman and Estimated Indicators by Vision 2020 (8)

With the current framework of higher education radical expansion in the access to higher education to new qualified students as well as existing Omani staff is certainly feasible with e-learning. Opening of IT literacy to this extent can be incorporated into the International Computer Driving License certification programme. This curriculum ensures in building the skill required to access electronically stores information using different means including the Internet. Bi-lingual content created based on sound pedagogic principles of instruction design will motivate and empower the learner. Local expertise among academics existing in paper based format requires to be

converted into electronic data which will be a useful initiative across the Arabic speaking regions. This is certainly an economic diversification plan in building a knowledge community for the e-society.

The first priority in the Sixth Five Year Plan shall be given to raising the rate of enrolment ratio in higher education institutions and the upgrading and spreading basic education. It also supports the programmes that aim at promoting the activities of the youth sector as it is considered to be the ground stone for the building of the society. Henceforth it is imperative to draft the role of e-governance with a mandate to support national capacity-building in higher education more specifically for e-learning mode of operations.

HIGHER EDUCATION MARKET TREND INDICATORS

With reference to Oman Census 2003, let us consider certain indicators on a comparative note between Omani nationals and Expatriates to identify market potentials and market directions for future.

Distribution of Omani nationals and Expatriate Population by Age groups

Age groups	Omani Nationals		Expatriates	
	Total %	No.	Total %	No.
-1	2.44	43,487	0.84	4,705
1 - 4	9.66	172,044	4.03	22,524
5 - 9	13.33	237,481	4.19	23,447
10 - 14	15.17	270,351	3.21	17,974
15 - 19	14.33	255,228	2.07	11,581
20 - 24	12.03	214,287	6.89	38,516
25 - 29	8.32	148,175	15.59	87,188
30 - 34	5.21	92,755	18.07	101,079
35 - 39	4.10	73,069	15.62	87,361
40 - 49	6.26	1,11,518	21.24	1,18,779
50 - 59	4.15	73,827	6.69	37,381
60 - 69	2.83	50,425	1.11	6,243
70 - 79	1.36	24,317	0.26	1,459
80 +	0.80	14,216	0.09	468
TOTAL	100.00	1,781,180	100.00	558,705

Table 2: Distribution of Omani Nationals and Expatriate Population by Age groups (9)

Distribution of Omani Nationals and Expatriates by Educational Status

Educational Status	Omani Nationals		Expatriates	
	Total %	No.	Total %	No.
Illiterate	17.77	236,063	11.09	56,398
Can read and write	19.83	263,388	28.63	145,607
Primary stage/First stage of education	20.90	277,716	11.68	59,418
Preparatory stage/Second stage of basic education	17.47	232,124	15.51	78,889
Secondary stage	17.87	237,419	14.62	74,351
Post secondary non-tertiary	2.53	33,678	5.40	27,457
First university degree	3.12	41,445	10.51	53,447
Master degree	0.24	3,177	1.43	7,271
Ph D degree	0.04	557	0.45	2,307
Not stated	0.22	2,979	0.68	3,436
Total	100.00	1,328,546	100.00	508,581

Table 3: Distribution of Omani Nationals and Expatriates by Educational Status (10)

Considering the data presented in Table 1, it is notable that about 40% of the population is within the age bandwidth covering tertiary and higher education. An additional 10% comes from the adult learning requirements

for higher education thus representing a learners' population as 50% of total population. Considering the earlier statistics regarding student capacities in the existing higher education institutions along with these projected requirements the role of private institutions in expanding access to students is evident. Clearly existing campuses and resources will not be sufficient to keep in pace with the increasing demands. Hence implementing e-learning strategies now and adopting it improve the learning environments of existing learners will create market leaders of the future.

Table 2 presents a comparative distribution of Omani Nationals and expatriates displays a clear need for post-secondary and higher educational qualifications. When tertiary education accommodates specialized branches for various disciplines, more diverse degree programs need to be offered by colleges and universities. Clearly for those institutions currently offering Bachelor level degrees, there exist a tremendous opportunity and well as favorable market position in identifying the Masters and Doctoral programs to be offered in the next couple of years now. To begin with such programs can be offered on a franchise or associate college agreements and later suitably modify them for accreditation. Even the range of Bachelor programs need to broaden so as to create self-reliance within the Omani population.

Distribution of Omani Nationals and Expatriates Employed by Industry				
Industry	Omani Nationals		Expatriates	
	Total %	No.	Total %	No.
Agriculture, hunting and forestry	2.13	6,661	9.95	42,202
Fishing	2.42	7,549	0.40	1,702
Mining and quarrying	3.84	11,998	1.91	8,117
Manufacturing	4.43	13,831	10.76	45,661
Electricity, gas and water supply	0.58	1,826	0.52	2,219
Construction	3.24	10,128	25.49	108,129
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	6.93	21,665	15.36	65,169
Hotels and restaurants	1.07	3,334	4.48	18,989
Transport, storage and communications	5.51	17,202	2.47	10,472
Financial intermediation	2.25	7,042	0.43	1,839
Real estate, renting and business activities	1.80	5,615	2.52	10,704
Public administration and Defence; compulsory social security	46.31	144,699	4.25	18,043
Education	12.47	38,974	3.21	13,599
Health and social work	4.24	13,233	2.38	10,115
Other community, social and personal service activities	0.62	1,942	1.83	7,757
Activities of private households as employers and undifferentiated production activities of private households	0.16	503	12.09	51,297
Extra-territorial organizations and bodies	0.09	271	0.13	531
Not stated, not sufficiently defined	1.91	5,973	1.80	7,633
Total	100.00	312,446	100.00	424,178

Table 4: Distribution of Omani Nationals and Expatriates Employed by Industry (11)

Table 4 presents a comparative statistics based on the Industry sectors which clearly point out the need for formal qualifications as well as training opportunities in the following areas:

- Agriculture, organic farming and food processing
- Manufacturing involving engineering, processing or production areas
- Construction related quantity survey diplomas, civil, structural engineering studies
- Automobile engineering and electrical, electronics diplomas
- Real estate related law, land use economics, property appraisal and real estate financing
- Social welfare studies and personality development programs
- Service sectors in small and medium finance enterprises

ICT POLICY FOR EDUCATIONAL INSTITUTIONS

E-Government enables national capacity-building in higher education. It handles organisational, political, technical and cultural issues while leading the higher education reforms initiated by the use of ICTs. It also initiates and regulates a stage to adapt education systems to the emergence of knowledge societies and the new social,

cultural and economic challenges of a borderless digital world inhabited with convergent forms of data and access media.

Change is constant in the area of policy management and hence a dynamic framework is solicited. As suggested by Wada and King (2001) 'there are lessons in the formation of effective IT policy, noting that technology is evolving much more quickly than law and business practices' (12). An iterative policy development process is suggested (refer Figure: 3) for any institution involving its key players in an open consultative process. Legal counsel, campus professionals, governing bodies should circulate draft for review and finally approve amended policies. Periodic review of policies is essential for ensuring their relevance and effectiveness.

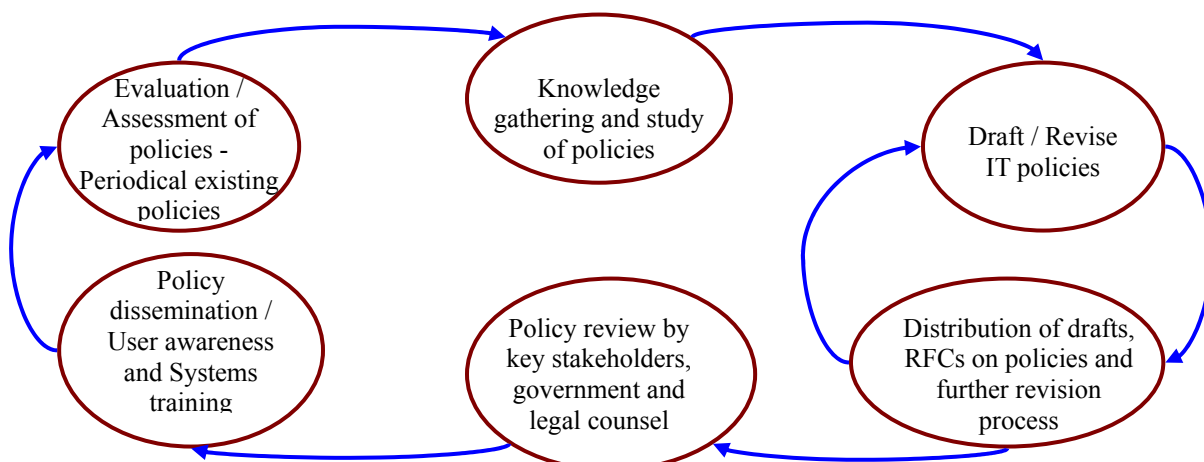


Figure 3: Iterative IT policy making process for E-Governance

The generic IT of any higher education institution will comprise of the computer network policies, acceptable computer usage policy, electronic content creation and dissemination policies, course copyright policies, transaction logging and encryption policies and telecommunication policies. Such policies will encompass pertinent issues as ethics, fair-use, privacy of sensitive data, etiquette in electronic communications, access to the disabled, security and encryption, access to intranet and internet, password management, etc.

Some of the key issues to be considered under e-governance for higher education are:

- Technical and communication infrastructure
- Supportive legal and public policies
- Affordable accessibility to e-sources
- Secure and privacy enhanced centralised resource and information archives
- Interoperable systems, data and digital devices working integrated
- Citizen awareness campaign with simple interfaces
- Public-private collaborative efforts with sustainable investment initiatives
- Provision for benchmarking efficiencies and achievements

TECHNICAL INFRASTRUCTURE

The technological dimension of the framework examines issues of technology infrastructure in e-learning environments. This includes *infrastructure planning, hardware and software*. Basic access to digital content made available within and between higher education institutions depends of the maturity of the communication and information systems architecture. Access control is equally an important issue involving systems, users, policies and technologies. Refer Figure: 4 for a schematic representation of this infrastructure.

The technology infrastructure must have the capacity to support the users and network load and in addition it must be scalable to support growth. It must be stable to ensure a high level of availability for learners while providing an open environment with sufficient levels of security to protect distributed users and content. The infrastructure technology trends that require consideration are listed below:

- Wireless connectivity for access to remote areas
- Digital convergence among television, radio, telephone and computers
- Greater broadband access with multimedia and graphics rich capabilities
- Technical standards for portability of digital content across platforms and devices

- Affordable broadband Internet access through public centers
- Adaptive technologies such as voice/speech recognition, language translation and human centered interfaces

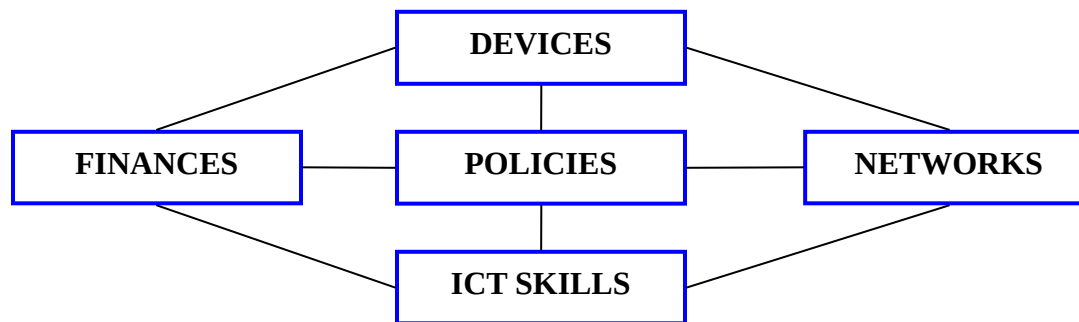


Figure: 4 Schematic model of communication and information systems architecture

The choice of hardware technology must enable interoperability while ensuring scalability. Oman has signed memorandum of understanding with industry leaders like Microsoft and Oracle for technical platform compatibility for software. Institutions with existing Intranets require little efforts in conversion to national grid. However an XML based content design will ensure document transferability across heterogeneous platforms in the Internet and legacy systems. With remarkable progress in the communication link services by Omantel higher education demands include a Multimedia and broadband network to provide multimedia facilities such as video conferencing, web-cast seminars, on-demand demonstrations or panel reviews, etc. A multi-user learning system called the Learning Management System (LMS) provides the required content based on achievement of competency by the learner while tracking the progress of the learner and recording all his interactivity with peer learners and the academics. Terabytes of data are to be organized into structured databases that are accessed based on queries. Interfaces can be designed so as to make this querying process simple yet powerful with visual development environments. To interface effectively with other components, content databases must maintain a searchable index of learning objects and descriptive information about the structure and properties of the objects. This descriptive information is called *metadata*. Like a library index card for a book, metadata are descriptive fields or tags attached to learning objects. Searching, management, and reuse of learning objects are all done using the metadata attached to the learning object.

RECOMMENDATIONS

Considering the vision for Oman, current penetration of higher education and focus areas for higher education a set of recommendations are made hereby both at national level and at institutional level. Government bodies are responsible for strategic leadership and large scale investments in infrastructural resources, while institutions of delivery are committed to providing a sophisticated learning environment with means to digital access for a range of specializations.

NATIONAL LEVEL INITIATIVES

1. Establishment of a nation-wide archive of student particulars which may optionally include a pro-metric analysis results will ensure single point source of personal particulars for registration purposes. This archive can be updated at every authorized graduation / certification point to include academic as well as training particulars for useful access by potential employers from the labour market.
2. A learning content management system comprising of learning material such as skill-based of training materials, teaching aid presentations, graphical images and electronic simulations combined with digital libraries of journals and books in bi-lingual mode will create intellectual wealth. This multi-user environment also enables authorized learning developers to create, store, reuse, manage, and deliver digital learning content from a central object repository.
3. A national level forum of recognized academics available for consultation to students, businesses and government departments when created is essentially a knowledge crown for higher education.
4. The government must bring together academics and businesspeople to combine their intellectual and entrepreneurial potential to develop marketable concepts. Practical examples of spin-off companies clarify the possible implementation of such endeavors and encourage participants to engage in similar activities.

5. A low-cost technical infra-structure communication grid with high-speed connectivity provided for exclusively academic purposes will promote not only higher education but also research enabled by science and technology.
6. Access to high quality International courses offered by foreign associations and institutions online through the Internet enabled by this national academic gateway will ensure application of International expertise to local applications and requirements.
7. A common set of web-based teaching modules for basic and specialized studies, particularly for courses that attract large numbers of students can be developed as a modular curriculum with common accreditation value among formal programs of study at higher education institutions.
8. Government must involve local academics and research scholars in the conduct of research projects for developing innovative solutions or developing future strategic plans under the leadership of foreign experts.
9. A national council must be formed to underpin the skill and knowledge content of common subjects that may be covered by any higher education institution in that subject area so that subject accreditations are at national level and mutual credit transfers are incorporated into this system. Entry into any program level is filtered by common entrance exam criteria applicable across the entire nation.
10. Creating a nationwide digital access centers for free public access will ensure 'higher learning access for all' without any social or gender or geographic or demographic discrimination.

INSTITUTIONAL LEVEL INITIATIVES

1. Every institution involved in higher education must have a clear mission statement highlighting the need of the modern times and their significant thrust areas.
2. Reinforcing the links between education and research can be done by establishing centers for excellence to catalyst initiatives to apply knowledge to local, regional and national development.
3. Institutions must include lifelong learning approaches giving learners a range of subjective choices combined with flexible entry and exit points within their systems and provide for viable bridging programmes and prior learning assessment and recognition.
4. Establishment of learning networks using forums, journals, conferences creates opportunities to pursue human development and education in general and higher education as a catalyst to education in particular.
5. Every college or university must define a policy framework for ensuring that their curriculum development, choice of programs of study will involve the relevant stakeholders from the government and industry.
6. Again an electronic learning campus will provide a higher level of participation and involvement from women who are under-represented at the moment are also bound by cultural issues.
7. The higher education mission statement must clearly recognize the need for teachers to engage in their intellectual pursuits as a continuous process and provide means for institutional support in this regard with academic staff development structures and/or mechanisms and programmes.
8. It is necessary for higher education institutions to act as active feedback mechanisms regarding learning experience by giving a forum for active student participation in curriculum choice, design, delivery and evaluation.
9. Higher education must prepare autonomous learning of the knowledge society rather than number and text crunchers focusing of assessment oriented pedagogy. The students must be capable for performing in the real world of work after completing their graduation with sufficient training.
10. Colleges can develop mutually beneficial agreements with industry, in order to undertake co-operative activities and projects through appropriate incentives and funding in education, research and development.
11. New program developments must not always be based on economic motives but they also take into account the need to stand by the rules of ethics while ensuring scientific and intellectual rigor for multidisciplinary applications.
12. It is restated that higher education must be made accessible for all people who have the necessary abilities and motivations.
13. Universities and colleges will need to liaison with financial institutions to projects through which higher education graduates could be supported in order to start small- and medium-size enterprises.
14. Continuing education programs could be designed extracting courses from existing study areas supplemented with training programs to create opportunities for adult learning in flexible, open and creative ways.
15. Creating or/and strengthening centers of excellence in core subject areas will encourage the return of expatriate academics so as to avoid brain-drain, as well as to provide leads to young academics.

Considering the above recommendation the following figure shows the Major components of E-Government initiative in higher education along with its key stakeholders.

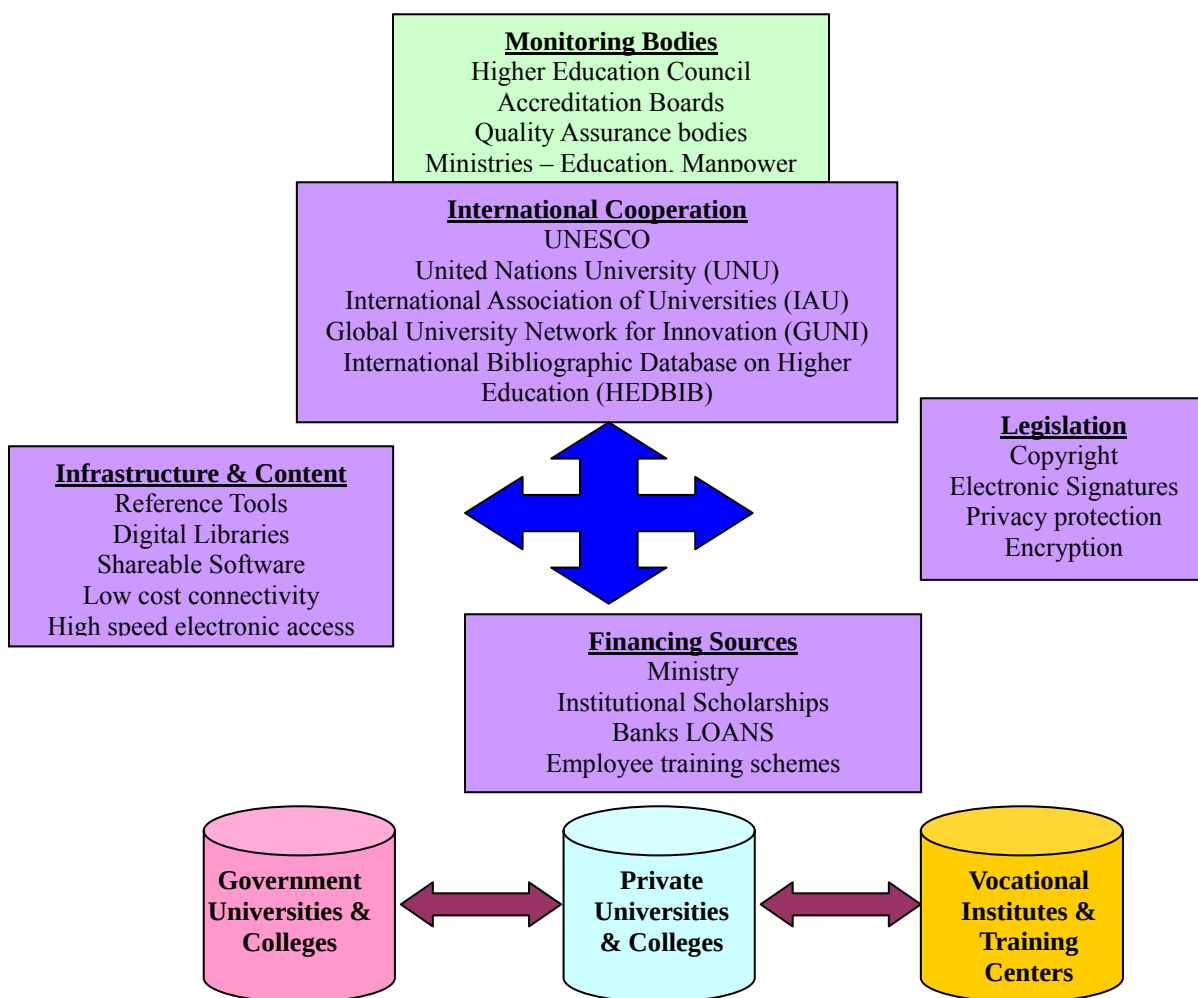


Figure 5: Major components of E-Government initiative in higher education

LEGAL PROTECTION FOR E-LEARNING

The application of ICT to government may encounter legal or policy barriers. Legislatures must ensure that laws are updated to recognize electronic documents and transactions. They must take proactive steps to ensure that policies support rather than impede e-government. Creators require adequate legal protection for their intellectual creativity such as books, training materials, simulation programs, multimedia resources for training, etc. A new Copyright Law, issued by Royal Decree No.37/2000 became effective from June, 2000. Oman is party to the Berne Convention for the Protection of Literary and Artistic Works as of July 1999. The Law grants protection to authors of literary, artistic and scientific works whatever the value, kind or purpose or way of expression of the work. Generally, the protection will be provided for the works whose means of expression is writing, sound, drawing, image or motion picture for a period of 50 years starting with the first year of death of the last surviving author of the work concerned. It will also include creative titles and computer software, which are published, acted or displayed for the first time in the Sultanate of Oman or abroad. A copy of this work along with the prescribed fee is to be deposited at the Ministry of Commerce and Industry. The infringers of this law shall be punished by imprisonment for a period not exceeding two years and a fine not exceeding Omani Riyals 2000 (13).

CONCLUSION

Quite apparently learning in the future will centre on a range of digital devices that expedite access to information and the way the students share and learn the information. Thus the campuses of tomorrow will mix the best features of both conventional and virtual pedagogy in creating a knowledge society of the future and in results

sustainable e-governance. E-Government and E-Learning are not a panacea for developing economies. Use of ICT is an effective tool or means to an end in the higher education setting and not the end itself. Higher education in the future requires a balance in training specialists to fit labour markets while empowering individuals capable of adapting to changes, having learnt how to learn.

Even with new-age multimedia components that enhance learning experience to be as realistic as possible, higher education is not all about productivity; it is the creation of a constructive learner in an exploratory manner. The society at large requires a change in attitude towards learning as a life-long activity and must treat education as the bone marrow of the nation. Networking of people with dedicated and sustained efforts for awareness will make an impact in all segments of the society and induce the masses to utilize the access to electronic means and resources. There exists a dream that in future access to higher education must have no difference to citizens who can afford and those cannot unlike today, with the advent of ICT in education. It takes a great dream to create a great nation – OMAN.

‘Education leads to enlightenment and innovation despite innate individual differences’

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