LEARNING OBJECT REPOSITORIES IN E-LEARNING: CHALLENGES FOR LEARNERS IN SAUDI ARABIA

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Abstract

The advent of the millennium has seen the introduction of a new paradigm for ICT-enhanced education. Advances in ICT have led to the emergence of learning networks comprising people who want to discover and share various innovative technologies on a global scale. Over the past decade, there has been tremendous worldwide interest in the concept of reusable digital learning resources, usually referred to as 'learning objects' (LOs), and the organised content delivery mechanism for pieces of educational content, described as 'learning object repositories' (LORs). These elements of e-learning are said to offer many benefits to learners. LOR platforms are rich in digital content resources, and are reusable, accessible and adaptable at any time. Although the use of LORs in e-learning can have a positive effect on learners on a universal scale, issues have emerged at the more microscopic level. This study investigates the specific challenges of LOR use faced by learners in Saudi Arabia. It is hoped that the detailed expository discussion herein will help to eradicate or at least minimise LOR obstacles and eventually support the development of advanced e-learning practices amongst learners in Saudi Arabia.

Keywords: Learning objects; learning object repositories; e-learning; open and distance learning; development in education, higher education.

Introduction

Many initiatives have promoted content in the public commons. The past decade has seen tremendous global interest in the concept of reusable digital learning resources, usually referred to as 'learning objects' (LOs) and a branch of e-learning 2.0 (Wiley, 2001). This new approach to producing educational materials focuses on the construction of LOs that are stored in digital repositories, or 'learning object repositories' (LORs), and available for reuse in a variety of contexts. Ochoa (2005) noted that breaking the entrance barrier to these repositories would spread the sharing and reuse of LOs and introduce the benefits of economies of scale to the educational context. However, he also pointed out that even though LORs seem to be the solution to facilitating such sharing and reuse, they are not in widespread use worldwide.

Learners deserve an education that prepares them and their nation's economy to thrive in a world of rapid change and widespread globalisation. In line with Saudi Arabia's mission to move towards a more knowledge-based economy and produce an information society comprising exceptional advances in education and e-learning development, the country emphasised two notable goals in the national ICT Strategic Plan outlined by the Ministry of Education's Computer and Information Center (2009). These goals are:

1. to develop an infrastructure for ICT and its employment in education and learning and
2. to establish an integrated system for the application of communication technology in education.

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Another key government contribution in this area is the Plan for Achieving Excellence in Science and Technology in Higher Education put forward by the Ministry of Higher Education (MOHE, 2009). This megaproject is framed with reference to the Higher Education Plan of the Association for Academic Quality, the aim of which is to

1. develop e-learning and distance education,
2. implement information systems in college education,
3. achieve a high-speed educational network linked to the Internet and
4. create digital knowledge content.

Other high-level inputs in the form of national plans and strategies have also been formulated, endorsed and implemented to prove that the government is serious about establishing an advanced knowledge-based economy and embracing the information society. The following plans and strategies have had significant effects on the education, ICT, e-learning and Internet sectors in Saudi Arabia (National Center for e-Learning and Distance Learning [NCeL], 2009a,b,c,d):

1. National Plan for E-Learning – ELC Top-Level Objectives;
2. National Policy for Science and Technology;
3. National ICT Plan (NICTP);
4. MOHE National Plan;
5. KACST-ISU Top-Level Objectives;
6. Saudi Arabian General Investment Authority Investment Plan;
7. Saudi Arabia: Long-Term Strategy 2025;
8. Saudi Arabia's Eighth National Plan (2005-2009);
9. and the Saudi Arabian Communications and Information Technology Commission's (CITC's) Internet Development Strategy.

These high-level governmental inputs support the country's ICT, Internet and e-learning initiatives and its use of such revolutionary resources as LORs, which emerged during the Web 2.0 era.

Although numerous experimental and quasi-experimental research papers on e-learning have been published worldwide, there is a critical need for qualitative evidence on a specific element of e-learning, i.e. LORs, and their effect on learners in the Arab world. With the aim of providing that evidence, this study investigates the challenges of using LORs amongst learners in Saudi Arabia.

The study adopts a qualitative methodological approach to subjectively examine and reflect upon perceptions of LORs to gain an understanding of their use in social activities. The investigation centres primarily on published and unpublished materials, both online and off, on LORs and e-learning in Saudi Arabia and other countries. First-hand information on the e-learning status, infrastructure and by-laws of Saudi Arabia was obtained from reports and documents issued by the MOHE and NCeL. Time was a constraint in this study, and the findings – and their interpretation – may have differed had it been conducted over a longer period. A quite different perspective is also likely to have emerged had the study's approach been predominantly quantitative in nature.

The findings of this study are significant because they provide insights that will complement the organisational vision and strategic planning of e-learning development in Saudi Arabia. It is hoped that they will help Saudi's major decision-makers to produce resolutions as they construct

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strategic e-learning plans for the country's future development. This paper reports the key research findings, and thoroughly explores LORs and the challenges of their implementation in this context.

Overview of e-Learning in Saudi Arabia

According to a report entitled "Current State Assessment on Network Infrastructure and Internet Development in the Kingdom of Saudi Arabia" (NCeL, 2009a), the country has 28.69 million people and an annual population growth rate of 1.95 %. The population is relatively young, with those aged 20 or below accounting for 50 %. Researchers predict this young population will grow by a third every eight years (Quraishi, 2012). Saudi Arabia has a buoyant economy, and its government is strongly committed to heavy investments in technology, education and health. It achieved GDP of more than US$348 billion in 2009, with GDP per capita estimated at US$14,500.

The NICTP issued in 2003 calls for the implementation of e-learning and distance learning, along with all of its prospective applications in education, predominantly in higher learning institutions (NCeL, 2009b,c). Al-Shehri (2010) described the government as instrumental in unifying a national e-learning strategy to bridge the gap between the NICTP and unilateral developments and encourage e-learning at all educational levels. He further stated that the move towards e-learning has been fast-paced and robust and that Saudi Arabia has introduced a number of initiatives to boost it.

The MOHE has also recognised the importance of taking advantage of e-learning and distance learning developments, and recently established a full e-learning-based instructional system in the form of the aforementioned NCeL, which supports the e-education process in tertiary institutions at all levels, free from the restrictions of time and place (NCeL, 2009c). The NCeL, the establishment of which was provided for in the NICTP and which operates under the auspices of the MOHE, began operations in 2006 in Riyadh to provide technical support for and the tools and means necessary to develop e-learning content. The centre is responsible for incorporating the collective efforts and experiences of all the country's universities into establishing e-learning and distance-learning concepts that benefit different members of society regardless of their socioeconomic or academic background (NCeL, 2009c).

The government's annual investment in the development of the country and its people has resulted in an ideal combination of education and ICT into e-learning. The metamorphosis of Saudi Arabia's ICT market between 2000 and 2012 far surpassed expectations. According to InternetWorldStats (2010), the country, which was one of the last in the Middle East to allow its nationals Internet access, has the third highest Internet penetration growth rate (3.750 %), behind only Syria (11.800 %) and Iran (12.780 %). The number of Saudi Internet users grew from 200,000 in 2000 to a remarkable 7.7 million just eight years later. Further, 30 % of the Middle East's ICT and Internet spending comes from Saudi Arabia, proof that the government is committed to using a large proportion of the budget to integrate education into the country's ICT economy.

Mirza and Al-Abdulkareem (2011) noted that Saudi Arabia's budget appropriation for education and human resource development was equivalent to US$25.8 billion in 2007, rising to US$28 billion the following year. MENAFN Press (2008) reported that the country's e-learning expenditure was predicted to top US$125 million in 2008. Saudi's ICT indicator illustrated that the Internet penetration rate had escalated to 31 % in 2009, was forecast to pass the 55 % mark within three years and to reach at least 60 % by the end of 2016 (NCeL, 2009a). A recent RNCOS research report entitled "Saudi Arabia Education Forecast to 2013" predicted that

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demand for e-learning modules will be driven by such factors as rising investments and e-learning potential (SBWire, 2011). The government raised its funding allocation for education and training to US$40 billion in the 2011 budget. The size of the country's e-learning market alone is forecast to peak at US$670 million by 2014, growing at an impressive compound annual growth rate of approximately 33 % in the 2010-2014 periods. All of these statistics indicate that as the years pass, increasing numbers of Saudi citizens will go online, and with this increase comes the prospect of a concomitant rise in e-learning.

The transition from a classroom-based, chalk-and-blackboard learning environment to a more efficient technology-integrated education system may not be easy for the country's administrators, educators and learners. Nonetheless, the details of e-learning development outlined in this section suggest that the time is ripe for the full-fledged implementation of such online programmes as LORs into Saudi's mainstream learning environment to meet the needs of the country's learners.

Literature Review: Learning Objects and Learning Object Repositories

LOs go by many names, including content objects, chunks, educational objects, information objects, intelligent objects, knowledge bits, knowledge objects, learning components, media objects, reusable curriculum components, nuggets, reusable information objects, reusable learning objects, testable reusable units of cognition, training components and units of learning (Wikipedia, 2012).

Ten LO tools actively used on the Internet include video sharing (e.g. YouTube), podcasting (e.g. iTunes and Audacity), presentation sharing (e.g. SlideShare), blogging (e.g. WordPress), bookmark sharing (e.g. Delicious), online office suites (e.g. Google Docs), Wikis (e.g. PBworks), real-time communication (e.g. Twitter and Skype), social networking (e.g. Ning and Facebook), and social media platforms that provide a cohesive approach to formal and informal learning and collaboration (e.g. Elgg).

An LOR can be likened to a 'learning refinery' (Downes, 2001, 2003, 2004), and Marenco and Makevich (2009) describe a repository simply as 'a place, room, or container where something is deposited or stored'. Their definition of an LOR is thus 'an organised content delivery mechanism for pieces of educational content'. Lynch (2003) offered another, more specific, definition that is suitable for an understanding of the tertiary level of education and lifelong learning:

> *A university-based institutional repository is a set of services that a university offers to members of its community for the management and dissemination of digital materials created by institutions and its community members. It is most essentially an organizational commitment to the stewardship of these digital materials including long-term preservation where appropriate as well as organization and access or distribution.*

Marenco and Makevich divided LORs into four types:

1. a general content repository, which is a general platform that can be both educational and non-educational, such as YouTube and Screen Toaster;
2. an online textbook repository, which is a refinery that provides textbooks for all levels and various courses, such as Connexions by Rice University;
3. a module repository, which gives pedagogical help by providing modules, such as California State University's MERLOT; and

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4. a media-focused repository, which has an abundance of audio-visual items that are useful for study purposes and simulations that allow a glimpse of real-life training (e.g. iTunes by Apple and Intelecom Online).

Lynch (2003) argued that an LOR as an institutional repository is not simply a fixed set of software and hardware, but rather a network that must consider six views prior to its introduction, including policy/political, organisational, cultural, material, technical and infrastructural views. An example can be taken from the deliberation of material views, whereby academic papers, geospatial data, learning materials and research data are some of the vital components implemented in the system.

According to Wiley (2002), the advantages of LORs, particularly when used in higher learning institutions, are that they are:

1. reusable, accessible and adaptable;
2. easy to blend with other resources, whether digital or traditional;
3. suitably adaptable to meet the demands of local curricula;
4. designed for use on a range of platforms; and
5. cost-effective. Furthermore, LORs contain small chunks of learning materials that can be easily updated.

LOR-based learning thus constitutes a new 'school'. LORs allow for different learning and knowledge-seeking patterns to emerge. Although their characteristics cannot be equated to contemporary/conventional learning in all countries, they have been confirmed to equate to modern learning. LOR-based learning has one simple requirement: an Internet connection. It thus falls within the online learning or e-learning designation. LOR-based learning is also democratic, with patterns of learning being mixed or meshed with other forms (such as traditional learning) to result in 'blended learning'. The foundations of LOR entitle learners to many new ways of learning and to smoother knowledge-seeking. Although procedures vary from one LOR to the next, all LORs have the advantage of comprising a network. Instead of being designated as knowledge categories and group members, knowledge and users are the network or networks. LOR-based learning is an association of entities or members with a set of connections (Downes, 2007). Although learners have autonomy, there is a connection and openness between users. LOR-based learning champions 'personal learning', but should also run parallel to 'network learning'. Downes (2007) drew this conclusion: 'learning should not only be based on contents or objects that are stored in a library … learning is like a utility – like water or electricity – that flows in a network that we tap into when we want.'

Discussion: The Challenges of Implementing an LOR in Saudi Arabia

The foregoing discussion of LOR-based learning outlines the strengths of e-learning and LORs for a broad spectrum of learners. However, microscopic observation of the LOR scenario in Saudi Arabia as a country case study highlights a number of real issues. This section describes the challenges of implementing an LOR for Saudi learners. Policymakers, providers, educators and learners themselves play important roles in determining whether an LOR can enriches the learning experience of this group of learners.

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Early Challenges of Internet Implementation

In the early stages of Internet adoption, going back as far as 1997 (NCeL, 2009a), potential users in the Middle East, including Saudi Arabia, had to confront the obstacles of censorship and government hesitation to allow Internet access (Mirza and Al-Abdulkareem, 2011). Furthermore, religion is considered a strong pillar of society in the region, and that also had a bearing on Internet adoption. Governments were concerned that external manipulative political influences, immoral materials, unsuitable learning resources and other controversial digital content available online would have a negative effect on Internet users. When there is resistance to the adoption of a technology, particularly one that offers an opportunity for educational development, the danger is that the country in question will unavoidably be left behind in all areas of progress. Hence, the region's governments were quick to realise that isolating their countries from such a major worldwide technological development was not the answer.

More than a decade ago, Shata (2001) outlined the obstacles that the Middle East, including Saudi Arabia, would have to overcome to produce proper LOR platforms for learners in rural and urban areas. The basic infrastructure required for e-learning was computers connected to the Internet and Intranet, email, websites and LORs. Access to computers, Internet and Intranet connections, and email was already available in Saudi Arabia, particularly in research and scientific institutions, thus enabling the sharing of information and collaboration within the country and across borders. However, a major access-related issue was the rural-urban divide in ICT infrastructure. Questions arose about whether all learners in Saudi Arabia, including those living and being educated in rural areas, had equal easily available connectivity and Internet access. Nonetheless, websites began to proliferate in the country, which was vital to the development and use of LOs and LORs. In 2001, Saudi learners had access to database products from other parts of the world, but local LOR platforms remained unknown.

Complications: The Government and NGOs

The determining factor in the successful execution of e-learning and an LOR in Saudi Arabia is the commitment and support of decision-makers at the highest level. Complications from both the government and non-governmental organisations (NGOs) involved in e-learning policymaking also dictate the future development of the country's learners. Al-Draiby et al. (2010) argued that at the administrative level, bureaucracy and complex rules represent a major challenge for e-learning in Saudi Arabia. As e-learning evolves, the government, NGOs and think tanks will occasionally need to formulate, revise and strengthen existing or proposed national e-learning strategies. In addition, Saudi's executive, legislative and judicial support systems are obliged to continually address serious e-learning and LOR issues in need of improvement, such as policies, by-laws, quality standards, accreditation, certification, copyright and censorship. These obligations can be fulfilled only by further research and development at the local and national levels.

The problems surrounding the implementation of an LOR platform in Saudi Arabia raise a number of questions. For instance, is there a policy for the application of a local/national LOR-based platform to ensure that it meets e-learning quality standards and is suitable for all learners in the country? Should LOR platforms be accredited by a government body before they are made available online? For the enrichment of all learners in Saudi Arabia, would applying a unified, truly 'open-door' system for all local/national and international LOR platforms be better than charging membership fees or restricting membership to individuals or groups from a registered institution? Can degrees offered using LOR platforms through distance learning, open-learning, e-learning or other online learning channels gain both proper certification and recognition?

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A qualitative study by Al-Shehri (2010) found no clear organisational links ensuring coordination and collaboration amongst the different bodies involved in e-learning in Saudi Arabia. It is important that the private and public organisations and institutions involved in this field, such as the MOHE and NCeL, are made aware of the need for official oversight in the development of e-learning to create a strong e-learning and LOR network that is able to share both information and innovation within the country. Better organisation and management can turn the current inequities and variation in administration into strengths rather than weaknesses (Al-Shehri, 2010).

Technological Challenges

The technological challenges facing e-learning and LORs have a direct effect on policymakers (governmental and non-governmental organisations/institutions), providers and educators, and thus have an indirect effect on Saudi learners. Issues such as budgetary support for and the accessibility, reliability, security, sustainability and mastery of e-learning technology are regularly raised. First and foremost, there is no doubt that the financial demands of implementing e-learning and related technology are enormous, particularly in Saudi Arabia, where the adoption of technology in the education system is still in its infancy compared with more developed countries such as the United Kingdom, Canada, the United States and Australia. Many local and international professionals believe that e-learning reached a primary level only in 2012. The government must fund e-learning technology and provide budgetary support for the planning, implementation and maintenance of Internet technology for educational purposes.

Al-Shehri (2010) stated that e-learning technology and infrastructure require the existence of sufficient telecommunications capacity, coverage and technical support. The general public in Saudi Arabia often complains about the poor performance and reliability of the Internet. In an assessment of network infrastructure and Internet development in the country, the NCeL (2009a) reported that network service quality, filtering and pricing were the three areas in greatest need of improvement. Consumers in both the public and private sectors are greatly distressed by Internet connection issues. Expressing his personal view, Bates (2009) wrote that although the 'backbone infrastructure for Internet access across Saudi Arabia and in the universities is quite good', some universities still lack wireless access. The result, he noted, is that Saudi university students continue to face obstacles in accessing the Internet off campus 'partly because many students do not have reliable and cheap Internet access from home, and because campus IT security makes it difficult for students off campus to access the servers on campus'. There are also examples of connections failing during lectures and while browsing and sending and receiving materials, which represent serious problems for both e-learning institutions and learners. The issues of filtering and censorship also came up for debate when several popular websites were banned by mistake, which also led to quality control questions (NCeL, 2009a). A further problem is that Internet services, particularly broadband services, are not affordable for the general public, meaning that e-learning poses a financial challenge for many of the country's learners.

Saudi Arabia lacks local expertise or mastery in many Internet and e-learning technologies, and is therefore heavily reliant on foreign professionals. Writing in 2009, Bates (2009) stated that 'there is almost no professional support base for e-learning at the moment ... [and] there are almost no instructional designers in Saudi Arabia – indeed, educational theory or design is not a topic taught in the universities.... [A] great deal of training for e-learning will need to come from outside'. Pedagogical challenges also remain. As Quraishi (2012) reported, the 'transition from blackboard and chalk to a more efficient technology integrated education system may not be easy for teachers, students and administrators'. Al-Draiby et al. (2010) presented this challenge as an organisational obstacle to educational institutions, noting that to establish an efficient e-learning programme, Saudi Arabia must recruit educators who can understand and implement technology

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or equip existing educators with the means to do so. A bird's eye view of the current scenario, they said, shows that

> *'the majority of teachers lack … basic knowledge of e-Communication.... They are reluctant to change and accept a new method of teaching dependent on the computer[, which] could be a result of the closed society they grew [up] in, their fear of failure, and their unawareness of the importance of the new system' (Al-Draiby et al., 2010).*

Furthermore, usability problems also demand extra time and work from the teacher. Ochoa (2005) noted that it is very difficult to convince the majority of faculty members, who are normally reluctant to adopt new technologies, of the advantages of using LORs.

Low Degree of Public Awareness

There is a disturbingly low degree of public awareness of ICT, e-learning and LORs in Saudi Arabia, which may be connected to the other challenges facing the country's learners. A 2007 nationwide CITC survey with 7,500 respondents concluded that a large portion of society remains unfamiliar with e-learning technical advancements and concepts (Mirza & Al-Abdulkareem, 2011). The CITC (2007) reported that only 49 % of respondents were aware of e-learning, and that only 5 % of that group actually use it themselves. Al-Khalifa (2010) commented that despite the unique features of e-learning and LOR platforms for the Arab world, there has been no serious uptake or usage of these repositories in the region since their inception. Two factors may be at play:

1. a lack of public awareness concerning the usefulness of such technologies and
2. a lack of support and advertising.

One reason for the low level of public awareness is the government's initially passive attitude towards e-learning (Mirza & Al-Abdulkareem, 2011), as reflected in the country's low Internet penetration rate (Al-Kahtani et al., 2005). Also responsible are the high initial costs of Internet access and the low speed and poor quality of Internet connections. The society's low self-esteem with regard to technology is also related to the low degree of public awareness of e-learning (Mirza & Al-Abdulkareem, 2011). The lack of a desire to know about, learn and use new technologies can be attributed to technology phobia, which is relatively more common amongst the older generation. Quraishi (2012) highlighted the generation gap in the use of e-learning amongst Saudi citizens as an issue of great concern. Quoting Dr Des V. Rice, Dean of Preparatory Programmes and Director of Professional Development for the Academic Affairs Department of Prince Mohammed Bin Fahd University, he wrote that 'on the one hand we have a generation of young adults who are technologically savvy, while on the other we have generally older instructors who are either not interested, or cannot keep up with the rapid changes' (Quraishi, 2012). A fairly unfavourable perception of online degrees also prevails in Saud Arabia. Al-Kahtani et al. (2005) reported that holders of e-learning university certificates have fewer job opportunities, noting that these certificates are not comparable to traditional degrees. Negative attitudes and a lack of prior knowledge of IT use amongst learners are also contributing factors to the lack of public awareness of e-learning. However, it must be emphasised that in 2005, when Al-Kahtani et al. gave their negative assessment, there was no strong e-learning presence in higher education in Saudi Arabia. E-learning was generally associated with distance learning, a form of off-campus study also known as *intsab*.

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Finally, the low degree of public awareness has also been attributed to the digital divide created by Saudi Arabia's adverse geography. Citizens living in urban areas (e.g. Jeddah and Riyadh) have better Internet access. E-service-expert.com (2009) recommended a more community-based approach, including 'stop gap measures' to provide the broadest high-speed broadband access possible, and hence e-learning opportunities, to all Saudi citizens to avoid losing 'a generation of potential learners' and the creation 'of a two tier system where those living in new smart cities or major e-enabled conurbations have unfair advantage and opportunities compared with those in less technically advanced locations'. The Saudi government and relevant organisations have taken steps to improve public awareness of ICT, e-learning and LORs, such as promotion, education and infrastructure upgrades.

Language and Communication

A society's culture can be defined in terms of its language, traditions and religion, all of which are related to the many e-learning and LOR dilemmas that Saudi learners confront when seeking knowledge in the digital world. The fundamental issue of language when communicating on the Internet, in LOs and on LOR platforms constitutes a major challenge for Saudi learners (Shata, 2001; Al-Khalifa, 2008, 2010; Bates, 2009). Arabic, which predates Islam, is both the national language and the mother tongue of the majority of the population. No occupying power in the country's history has been able to diminish the language's importance to the Saudi people. Contrary to other countries, whose original languages have become less significant than, or equally significant to, the languages of foreign powers, Arabic is still very much intact. Today, it is spoken by 300 million people in 22 countries, and is used in both formal (e.g. commerce, administration and education) and informal situations (e.g. when relaxing with families, friends and relatives). However, the language's popularity has not coincided with the development of Arabic e-learning or LOR content. Arab learners and the Arab world at large have experienced difficulties with digital content, most of which is available only in English. The refusal to learn and use the English language presents a direct cultural challenge to e-learning and LORs. Such refusal may be the result of low self-esteem with regard to learning and using another language or of a simple 'don't care' attitude rooted in the opinion that because Arabic is the learner's mother tongue and the national language, there is no need to learn another language.

Saudi learners who are not proficient in English suffer limitations in using the digital learning content that is currently available online, as most of it has not been translated into Arabic. Al-Khalifa et al. (2008) stressed that the lack of online repositories containing educational materials in Arabic is the result of few university faculty members being capable of creating such materials. Hence, their courses do not generally lend themselves to e-learning. Although some international LOR platforms do translate their LOs into several languages, little content to date has been translated into Arabic. Under the leadership and watchful eye of King Abdullah, the government and Ministry of Education have raised the country's English language standards by ensuring that students learn English from primary school to the tertiary level. In addition, institutions in Saudi Arabia and elsewhere in the Middle East have solved the language problem by planning and building their own LOR platforms in Arabic. Although much work remains to be done (e.g. increasing the quantity and quality of LOs and resolving the issues of LOR standards, accreditation, policy, copyrights and network collaboration), at least the problem has been recognised and steps have been taken to create LOR platforms that are suitable for learners in Saudi Arabia.

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Religious and Traditional Norms

Religious and traditional norms many also be hindering Saudi learners' full exposure to e-learning and LORs. Islamic teachings promote high morals, religious values, peace and harmony, and a person's actions involving sight (e.g. reading and watching), speech (e.g. communicating), sound (e.g. listening) and touch (e.g. doing) must be in line with Islam. Thus, in Saudi Arabia, where Islam is the sole official religion and the religion of the majority of the population, filtering or censorship of online content that is considered controversial or that could negatively influence learners is commonplace. Materials that promote immoral values and that could trigger societal and political unrest are particularly under serious scrutiny.

Religious and traditional practices may also contribute to the gender gap in educational attainment. Traditionally, Saudi women were barred from formal education and unable to have careers. Although this is no longer the case, they still suffer inequality with regard to e-learning opportunities, and the majority of students at Saudi universities are still male. Tubaishat (2008) pointed out that the social values concerning and expectations of men and women differ in Arab countries. Hence, even at co-educational universities, female students experience a number of issues pertaining to communication and learning. For example, they have limited opportunities to make optimal use of the e-learning offered through efficient on-campus wireless connections, as they are not allowed on the campus grounds after lecture hours and are prohibited from being in a lecture hall/room where they could come into direct contact with male students or faculty members. Bates (2009) observed that during his course on enhancing e-learning knowledge and skills in Saudi learners, this gender divide created unequal and less effective training for female students.

However, solutions to the gender gap are gradually transforming the e-learning situation in Saudi Arabia. For example, women-only universities have appeared, and the e-learning principle is being optimised in distance learning to accommodate female learners. Quraishi (2012) considered the e-learning prospects for women to be quite good. He noted that, in the context of Saudi Arabia, where religious and cultural norms restrict educational opportunities for women, 'the concept of e-learning is bound to play a larger role' and that in situations in which courses can be taught by either male or female instructors, special modifications can be applied 'in [the] utilization of technology for male instructors, so that it does not violate cultural biases while still ensuring that there is a free flow of information between student and instructor'.

Another traditional norm in many collectivist societies, such as Saudi Arabia, is a preference for oral over written communication, another factor that thwarts the enhancement of e-learning. Quraishi (2012) reported that many decision-makers feel that, owing to Saudis' heritage of oral rather than written communication, they 'will not accept instructions that place the responsibility on themselves rather than being able to sit in a classroom and have the instructor teach and answer their questions'. E-service-expert.com (2009) summed up the cultural challenges facing Saudi learners by emphasising 'the need to overcome the cultural reluctance by many to the Internet, particularly prevalent in more conservative and often needy areas of the information society and the commensurate development of new and more "user friendly" ways of censorship and parental protection'.

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Universal Problems

The use of digital content repositories ultimately gives rise to the universal problems of communication, support, concentration and common sense. Garrido et al. (2010) argued that

1. the sole use of LORs results in a lack of real-life, face-to-face interaction;
2. in any learning environment, it is inadvisable to have no direct human support and guidance;
3. the use of visual, digital and 3D immersive environments in e-learning environments can make demands on the learner's concentration and distract him or her from the main goals of the course; and
4. the 'agents' used in LORs are far from human in appearance and behaviour. Indeed, the absence of actual human factors in LORs constitutes a challenge for learners, a challenge that e-learning experts suggest be overcome by combining these repositories with blended or similar learning.

The debates outlined in this section reveal the many challenges involved in LOR implementation in Saudi Arabia. Despite the challenges that policymakers, providers, educators and, most importantly, learners face in terms of e-learning and Internet technologies, the continuing commitment and financial support of the Saudi government, along with an enthusiastic generation of young learners, are proving priceless in shaping a more prosperous e-learning society.

Recommendations

Both governmental and non-governmental organisations in Saudi Arabia have made positive moves towards initiating an up-to-date e-learning experience for learners through a variety of educational developments, including the construction of LOR platforms. However, the country's engagement in generating LOR portals is relatively new compared with developed countries in Europe, North America and elsewhere. Thus, room remains for Saudi Arabia to improve, and eventually master, the digitalisation of learning content in repositories. Integrating the merits of existing high-calibre LOR platforms worldwide can help the country to keep up with the rapid e-learning transformation occurring globally. Prior to its production, execution, administration and maintenance, a comprehensive LOR framework – encompassing everything from content/subject, target, syllabus and evaluation activities to an online learning approach – must be formulated. The required LOR educational transformation will involve a partnership balanced by a central administration that connects educational reforms with a wide spectrum of network resources and a user network. Education reforms involve government and administration, policy and strategic planning, research and development, ICT, professional development, and curriculum innovation and assessment (see Figure 1).

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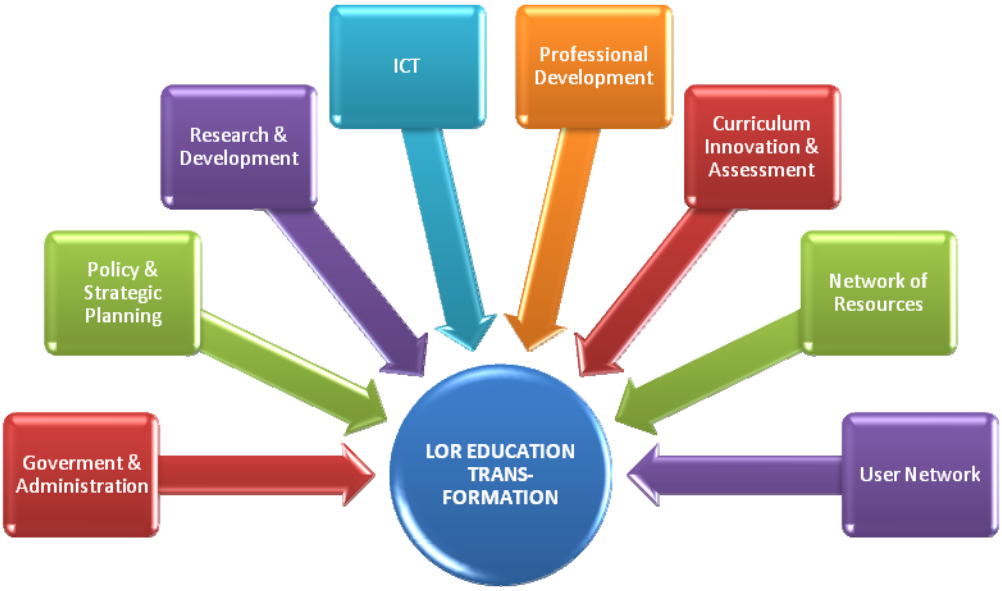

Figure 1. The LOR Education Transformation Partnership

It is apparent that if the Arab world is to become fully involved with learning technologies, then a tailored LOR that meets the functional and language needs of the Arabic-speaking community is needed. Such a development would, in turn, bridge the learning-technology gap between Arab countries and the rest of the world. Moreover, Saudi Arabia is in need of a national LOR portal that is tailored to the country's education system, structure, culture and curricular requirements, and is able to relate to its learning community. The NCeL has already engineered a national LOR portal. Dubbed *Maknaz*, this platform is undergoing continual refinement and development, and is expected to provide the necessary learning and teaching resources and research owing to its local pool of expert networks, individual members and organisations within the country (MOHE, 2001; Zaidlearn.blogspot.com, 2011).

Establishing an e-university in Saudi Arabia will require answers to two significant questions. First, how can the NCeL as the main provider fully optimise its own national LOR platform and connect the country's higher education institutions (both public and private) under one roof? Second, how can the NCeL ensure the maximum use of its own LOR platform, which follows e-learning principles? The Malaysia-based Asia e University (AeU) may provide a suitable template. AeU is run by Asians and operates under the Asia Cooperation Dialogue (ACD). It offers a flexible delivery mode, and students from 30 countries are enrolled in its postgraduate, undergraduate and executive programmes. AeU serves as an instrument for human capacity-building, closing the digital divide, improving higher education accessibility and promoting e-education for the benefit of all ACD member countries (AeU website, 2012). Under the NCeL's supervision, a similar e-university could be a one-stop university for all public and private universities and other higher education institutions in the country. Students, academicians and researchers could make full use of its national LOR platform to enrich e-learning in Saudi Arabia. Today, the e-university concept is being realised through Saudi Electronic University (SEU; http:///www.seu.edu.sa.). To date, SEU has accepted more than 7,000 students into its three units: the Faculty of Administrative and Financial Sciences, College of Computing and Informatics, and College of Health Sciences.

A working model of the three recommendations outlined in this paper, i.e. a central key administrator for LOR platforms in Saudi Arabia (NCeL), an improved national LOR platform (*Maknaz*) and an e-university model, is represented by the *Maknaz* mandala depicted in Figure 2. This mandala illustrates the relationship between a centralised national LOR platform (for all

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local LOR platforms) and its administration and academia, and shows the significance of that relationship for the enrichment of learners and the country as a whole.

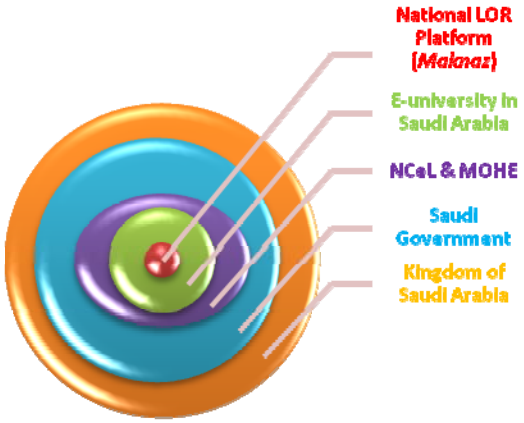

Figure 2: The *Maknaz* mandala

Conclusion

In today's borderless global society, it is important that Saudi Arabia become more accepting and open-minded, and open its door to knowledge and resources at the international level. Widening the sphere of collaborative networks can help the country to create high-quality LOR platforms. At the same time, it is also crucial that instructional materials such as LORs that are readily available online be customised or localised to facilitate the enrichment of e-learning and minimise the challenges that learners face in a learning environment such as that of Saudi Arabia.

Although the LOR platforms currently available in Saudi Arabia and internationally can be optimised to enrich the e-learning experience of Saudi learners, a gateway should be established to improve innovation and develop more localised LORs. A strategic plan for doing so needs to identify, deliberate upon and acknowledge the challenges facing LORs and e-learning for Saudi learners, which this paper discusses in detail. Such a plan will ensure the active participation of the public, learners in particular, in knowledge building, information sharing and lifelong learning.

Learning and education belong to no one nation or culture. Up-to-date global learning networks offer culturally rich and highly diversified learning environments that facilitate better learning, resulting in the growth of information and knowledge at both the local and international levels. LORs are currently an integral part of that growth, and are paving the way towards more advanced learning community networks.

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