

# E-learning in Afghanistan<sup>1</sup>

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## Abstract

*This paper looks at the promise of e-learning in higher education in Afghanistan viewed through the 2006 technological pedagogical content knowledge framework suggested by Mishra and Koehler and the findings of the 2009 meta-analysis and review of online learning studies prepared for the U.S. Department of Education. First, I will discuss briefly the Afghan socio-cultural context. Secondly, I will draw on three years of experience, from 2006-2008, on the development and implementation of the Afghan e-Quality Alliances to discuss the Washington State University strategies for building Afghan capacity and knowledge on information communication technologies, content, and pedagogy. I will discuss the use of free and open source software (FOSS) and open educational resources (OER) and initial attempts by Afghan instructors to create e-learning courses. Finally, I will suggest a way forward to improve the fulfillment of the promise of e-learning in Afghan higher education institutions and to develop policy that articulates a leadership role for Afghan institutions to reach secondary schools and adult learners, with the goal of bringing education to learners of all ages.*

*Qatra qatra daryaa mesha...*

Drop by drop, it becomes a river...

Dari Proverb

## 1. Afghan Socio-cultural Context

**Geography.** Afghanistan is a land-locked country that shares borders with Tajikistan, Uzbekistan, and Turkmenistan (three countries that gained independence from the USSR in 1991); Iran; Pakistan; and China. Afghanistan consists of extremely rugged mountains that reach 24,500 feet, plains in the north and southwest, and sandy deserts along the southern border. This diverse geography explains the difficulty faced by government and development workers in building infrastructure, including telecommunications infrastructure and in building capacity.

**Ethnicity and Language.** The major ethnic groups in Afghanistan are the Pushtuns, Tajiks, Hazaras, and Uzbeks. As a result of the drawing of national boundaries by the colonial powers all of these ethnic groups are found in the border countries. In addition to ethnic diversity, the Afghans are diverse linguistically; speaking Dari, Pashto, Tajiki, Uzbeki, Turkic, and other languages. Although the Pushtuns make up the largest ethnic group, about 40%, more Afghans speak Dari, a language closely related to Persian/Farsi than Pashto. For teaching at the tertiary level, the language policy under consideration as of 2009 is to shift all teaching in English. In practice, most lectures are done primarily in Dari, with most of the textbooks in English. Language is an e-learning issue since most of the e-resources are in English. While there is material in Persian, geopolitics have prohibited those with U.S. government funding to negotiate resources made in Iran.

**Power Struggles.** Afghanistan has a long history of internal strife and external invasions and pressures, resulting in alternating fusion and fission (Dupree, 1973). The external invasions have contributed to Afghanistan's heritage including Buddhism followed by Islam. In 1979 a rebellion by the mujahideen, Islamic fighters, against the Marxist government led to an invasion by the Soviet Union. The mujahideens, with covert aid from the U.S., fought the Soviets and in 1989, the USSR pulled out. Power sharing among the mujahideens disintegrated in 1994 and they turned their guns on each other. Different parts of Afghanistan were governed by different warlords with support by different external interests. Disillusioned mujahideen fighters, mostly Pushtuns then formed the Taliban movement. In 1996, the Taliban seized control of Kabul. After September 11, 2001, the U.S. invaded Afghanistan as part of its war on terror. President Hamid Karzai became transitional president and has served as President since December 2001. Given the significant role of multilateral agencies in Afghanistan, many observers question whether Afghanistan is a sovereign country or is an instance of what Bothe and Fisher-Lescano (2002) refer to as global

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<sup>1</sup> The author's views expressed in this paper do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

governance. The issue of sovereignty, along with the internal power struggles, has brought into question aid effectiveness and sustainability in higher education and higher education innovations, including e-learning.

**Islam.** The new Constitution, adopted in 2004, defines Afghanistan as an Islamic Republic and has been endorsed by the newly established government based on democratic processes of Loya Jirga (Grand Assembly) and results of two national elections. Thus, legislation is based on Islamic laws and values which clearly support women's education, but individual ideologies in the government has complicated the decision making process for higher education, particularly with regards to the education of women, as well as, use of ICTs for teaching and learning. Several articles of the Constitution make explicit the link between Islam and education including articles that indicated education is to be based on Islam.

**Human Development Indicators.** Afghanistan continues to rank at the bottom of the human development index. For under-5 mortality rate for all countries, Afghanistan is ranked number two from the lowest (UNICEF, 2009). Life expectancy at birth is 42.9 for males and 42.8 for females. Adult literacy rate is 43.1 percent for males and only 12.6 percent for females. Along with the 3 decades of war and insecurity, these human development indicators has meant low levels of capacity to deal with ICTs as users or as providers of technical support.

**Higher Education.** The World Bank (2005) reported that Afghanistan has made notable efforts to revive higher education. The World Bank also reported that 19 higher education institutions had reopened and enrollment had increased from 4,000 students in 2001 to 37,000 (17 percent of whom were women) in 2004; with the lowest university enrolment at 500. The World Bank report identified the key higher education issues as physical facilities, efficiency, quality, relevance, financing, governance and a shortage of qualified faculty members. Only about 50% of the instructors at Kabul University have a Masters degree. Teaching is based on curriculum developed in the seventies and is largely teacher focused. As of 2009 the draft higher education law was still under discussion. The choice between Dari, Pashto, or English as the language of instruction remains to be an issue. According to Ghani and Lockhart (2008) Kabul University students, more than anything else, wanted "to connect to globalization and take advantage of information and opportunity and that students in the Islamic Law School wanted to learn English and be computer literate" (p. 76).

Consider this: a typical 30-year old in 2009, was born in 1979 when the Russians invaded Afghanistan. He would have gone through secondary and tertiary schooling during the Mujahideen and Taliban period. She would not have been allowed to go to school during the Taliban period. The hypothetical 30-year old could be an instructor at the university. The knowledge of a 50-year old instructor would have been frozen in time because of lack of interaction with the outside world, among other things.

To summarize, the constraints to equal access in higher education: About 100,000 are estimated to want to go to postsecondary school within five years and about 1 million in ten years. Women who were banned from going to school and going to work by the Taliban now constitute about 30 percent of the student enrolment in higher education nation-wide. Constraints to educational quality in higher education include a constant refrain from university administrators, lecturers and students about outdated course catalogs, syllabus, course content and textbooks. For example, the Faculty of Engineering has continued to teach from a 1976 course curriculum. Moreover, most lecturers are locked in the traditional mode of lecturing which means that students are passive listeners. Constraints to electronic quality in higher education result from a lack of infrastructure. Although the power supply has improved, most of Afghanistan's 30 million people have no reliable access to electricity. More than 80 percent of the population live in rural areas and depend on traditional fuels for cooking and water heating, and kerosene for lighting. Absence of power also means that most higher education institutions cannot readily use ICTs, including the Internet. This lack of infrastructure hinders the implementation of a solution to the problem of outdated teaching and learning materials. As for Internet connectivity, the government, led by the MoCIT (see Figure 1) and, donor agencies, led by the NATO Science for Peace and Security (SPS) Programme ([www.nato.int/science](http://www.nato.int/science)) are implementing plans to develop the national infrastructure to connect to the international gateways.

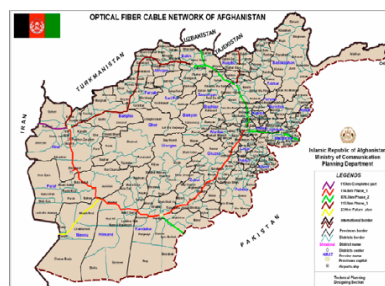


Figure 1. Map of Afghanistan and Optical Fiber Ring

**Higher Education Policy.** After the fall of the Taliban, the Government of the Islamic Republic of Afghanistan (GIRoA) followed a policy of centralization/reintegration/elimination with regard to the higher education institutions. The 2005 policy called for the strengthening of regional/provincial universities, including Nangarhar, Kandahar, Balkh, Herat and Polokhome.

**ICT Policy.** As early as November 2003, the GIRoA Ministry of Communications and Information Technology (MoCIT) set forth an ICT policy that emphasized the use of ICTs in educational efforts so that Afghanistan can “leapfrog” some stages of development, and be better prepared to enter the global economy of the 21st century. The GIRoA viewed ICTs as critical towards educational improvement where large segments of the Afghan population (including women) are educationally disadvantaged and live in rural areas. For this reason, the ICT policy stated: “GIRoA through the MoC, the Ministry of Education, Ministry of Higher Education (MoHE) and associated institutions will take steps to:

1. Develop ICTs curricula at both the secondary and tertiary levels, promote participation in related courses (such as computer science, multimedia, communications, and engineering) and develop teacher training and training-of-trainers courses in ICTs-related subjects.
2. Invite prestigious foreign universities to collaborate with Afghan universities in establishing ICTs research and development programs. This will include initiating the highest level of academic education, including but not limited to Ph.D. programs, in ICTs in Afghanistan.
3. Create opportunities whereby students, in particular those in remote locations, can be exposed to technology. These would include Mobile Internet Units, i.e. buses equipped with computers and Internet access that visit schools; Networking Academies that give students and teachers the skills to design, build, and maintain computer networks; and tele-centres that would be operational in schools during and after class hours.
4. Support opportunities for distance education, including the establishment of centres that provide access to international online courses. Distance education expands resources available to both students and employees and can compensate for a lack of trained faculty and supervisors.
5. Establish partnerships with the private sector to develop and provide ICTs training for business personnel.
6. Coordinate public agencies in the training of civil servants in ICTs skills and applications.”

Compared to the comprehensive vision of the MoC, the 2005 Strategic Development plan of the MoHE stated only the need to “explore and develop the possibilities of distance education within the country, connecting internationally and partnering with overseas institutions of higher education.” With regards to distance learning, Kabul University’s 2005 plan indicated:

The rapid development of online courses suggests that Kabul University can address the national need for a better-educated workforce by building the capacity to offer academic and training programs—whether belonging to Kabul University or any other university—throughout Afghanistan. The university will, therefore, work with national and international partners to create a network that can be used to offer a wide variety of online courses throughout the nation.

**Afghan e-Quality Alliances.** Within the context described above, in April 2005, the Chancellor at Kabul University expressed interest in the potential of what he called distance learning and what Washington State University (WSU) called e-learning; while the words were different both meant the potential for flexible access to content and instruction at any time, from any place. Partly to respond to his interest, USAID funded the Afghan e-Quality Alliances Program to be implemented as a global development alliance with WSU as the lead implementing institution. The alliances are made up of leaders and stakeholders who work together towards a common objective, that of Afghans building capacity in higher education for sustainable nation building. Achievement of this long-term objective requires: equal access to quality education and e-education resources. Four interrelated results were envisioned: Improved capacity of the leadership and management of 19 higher education institutions to meet standards of excellence and quality assurance; Improved capacity of 5 Kabul-based and 4 regional higher education institutions to sustain services of an Afghans Next Generation e-Learning (ANGeL) Center for Teaching and Learning; Improved capacity (knowledge, attitude and skills) of lecturers to teach students by upgrading their curriculum, course syllabus, and online content in key academic areas; and, Strengthened capacity of Kabul University and the Civil Service Institute to build capacity in public policy and administration. The two key strategies are: Use of Global Development Alliances (GDA) to provide experts with relevant teaching or industry experience and peer to peer technical assistance and training opportunities to achieve shared objectives and the Use of ICT to provide access to up-to-date teaching and learning materials to be shared across 19 universities, to augment not to replace the lecturer, and to enable a variety of learning modes.

This paper will focus on the ANGeL Centers designed to strengthen teaching and learning at all levels and in all contexts at the university, particularly with the use of ICTs. The ANGeL Centers were planned to help lecturers to

broaden their understanding of the learning process and to adopt processes to improve student learning and faculty instruction; help students with critical thinking and study skills; and; support lecturers, students and members of the broader learning community as they invest in personal and professional development. ANGeL Centers were planned at Kabul University, Kabul Polytechnic University, Kabul Medical University, Balkh, Herat, Khost, Nangarhar and Kandahar regional universities. By 2009, except for Kandahar, all the other ANGeL Centers have started to function.

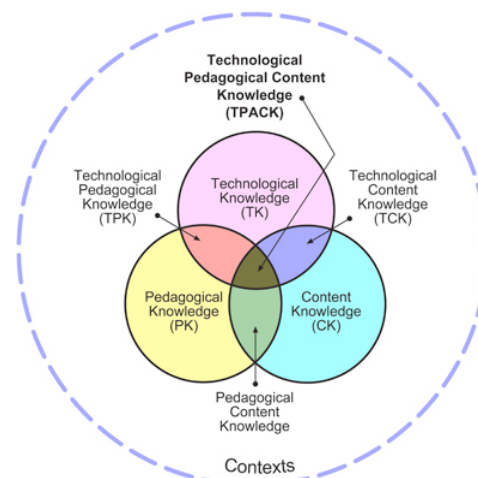
## 2. Technology, Content and Pedagogy: Building early wins

**Defining e-learning.** Electronic resources, particularly Internet technologies, have blurred the distinctions between traditional learning and e-education, e-learning, online learning, distance education, and distance learning. Common among these terms are three key components present in every teaching and learning situation: (1) a teacher and a learner or learners, (2) a communications system or mode as a learning process, and (3) content to be taught or learned. A fourth component that is becoming ubiquitous is information and communication technologies.

The Afghan e-Quality Alliances uses e-learning or e-education interchangeably, defined as: e for effective teaching and learning where students learn from traditional face to face interaction, as well as global engagement; using both physical and digital content. This definition which is closest to blended e-learning assumes: (1) a mix of lecturers, tutors, facilitators, course coordinators or other students; (2) a teaching and learning pedagogy that involves presentation, practice, assessment, and review; along with a mix of learning tasks and interactive activities; (3) a mix of content; and (4) a mix of technologies CDs, cell phones, the computer, and the Internet. E-learning builds on the notion of Gilbert's connected education (2000) – not among refs.!) and will contribute to the goal of Afghan e-Quality Alliances: equal access to quality education and e-education resources.

This definition which is based on experience has been reaffirmed and validated by the U.S. Department of Education meta-analysis and review of online learning studies (Means et al., 2009). The analysis found that learning outcomes for students who engaged blended learning or a combination of online and face-to-face instruction exceeded those of students who received only face to face instruction or purely online instruction. The study also found that online learning appeared to be an effective option for undergraduates and graduate students as well as professionals.

The discussion that follows is structured around the technological pedagogical content knowledge framework (Mishra and Joeher, 2006). The framework suggested examining three main components of learning environments and their interrelatedness: content, pedagogy, and technology. In Afghanistan, content was needed to address outdated textbooks and teaching materials; training in pedagogy to address rote memorization; and technology to leapfrog access to content knowledge and pedagogical knowledge.



**Figure 2. Technological Pedagogical Content Knowledge Framework (Mishra and Koehler, 2006)**

**Technology.** For Internet connectivity, the MOC has the lead in building the national optical fiber backbone that follows the route of the national highway system. To connect the higher education institution to the international gateway, NATO-SPS initiated the Virtual Silk Highway (SILK) project in 2002 to provide affordable, high-speed Internet access via satellite to the academic communities in the Caucasus and Central Asian countries. The Kabul University in Afghanistan was included in 2006. The Caucasus and Central Asia sites are migrating to terrestrial

connectivity with support by the European Union, the new NATO-SPS project “SILK-Afghanistan” will extend the connectivity to initially seven provinces of Afghanistan. In the meantime, Afghan e-Quality Alliances has to pay for expensive bandwidth, about \$4500 for 1Mbps per month. In May 2009, the MoCIT announced that the cost would decrease to about \$400 for 1 Mbps per month upon completion of the Noori Fiber Tech Project.

**FOSS.** An early decision was to make use of free and open source software (FOSS), thus open office is used for basic computer functions. Software used for the learning management system is Chisimba, a Web 2.0 enabled, Free Software development framework for creating web and distributed applications. Written in PHP5 using the model-view-controller (MVC) architectural paradigm, implemented via the front controller to facilitate cross modular functionality, it has over 100 modules available. The Chisimba framework provides the functionality to create a variety of systems and platforms such as, Content Management System (CMS), Learning Management System (LMS), Collaboration Platform, Blog, Podcasting Solution, and Wiki and many others. The multilingual capabilities of the framework allow localization, and its help system allows for the presentation of basic textual help, or extended help via Flash or video in multiple languages. Chisimba, which is a Chichewa (Malawi) word for the framework used to build a traditional African house, is the product of a collaboration of the 12 African universities, under the leadership of the University of the Western Cape.

To get the instructors ready to create a course on the learning management system, training in the basic use of computers preceded the training in e-learning. Initial training included basics of a computer, such as logging in, remembering to use the same spelling for logins and passwords, saving, copying and organizing files and images.

**Content.** Early on, as in the use of FOSS, the decision was made to make use of free and open source software (FOSS) and open educational resources (OER). Access to updated subject matter content was made through a digital library and online course content, especially open educational resources. The digital library, developed under the leadership of the University of Arizona, consisted of a digital catalogue of library holdings in Afghanistan and access to e-books, e-journals. For example, SpringerLink provided access to full-text database for more than 1,250 peer-reviewed journals and more than 10,000 books online, WorldCat (OCLC First Search) provided access to dozens of databases and more than 10 million full-text and full-image articles. Moreover, the University of Arizona Libraries (UAL), in partnership with the Afghanistan Centre at Kabul University (ACKU), collaborated on a digitization project “Preserving and Creating Access to Unique Afghan Records” to add to the digital resources.

Access to content for online courses was provided by the Digital Learning Commons and the MITE/NROC hippocampus. Digital Learning Commons has advanced placement courses that are equivalent to first and second year university level courses. To ensure a quality academic experience, the Digital Learning Commons vetted course content that employed: Course material and organization, student engagement, classroom management (Academic integrity and netiquette expectations regarding lesson activities, discussions, email communication and plagiarism and a protocol for dealing with inappropriate student behavior), student assessment, course evaluation and management (feedback), student support, mentor support, and ease in navigation.

The National Repository for Online Courses (NROC) based at the Monterey Institute of Technology and Education (MITE) provided access to the hippocampus courses. The focus of NROC is general education subjects, such as algebra, biology, and U.S. History. These courses were developed by NROC with course developers and evaluated using the NROC course development guidelines. NROC has contributed additional development resources to ensure that the content is editorially rigorous, complete from a curriculum perspective, and the technology is compatible with popular content management systems. All courses include presentational materials, problem sets, assessments, and all necessary teaching materials.

Access to educational e-resources has been beneficial with regards to addressing the problem of outdated textbooks. To appreciate e-resources, training included navigating the courses, using search engines, identifying and applying criteria to articles, and using bookmarks. Mindful that access to e-resources does not necessarily translate to improved use of the materials for teaching and learning, training for instructors included a module on pedagogy.

**Pedagogy.** Pedagogical knowledge was based on the following principles: (a) e-learning does not serve as a replacement for face to face instruction but as an enhancement of the face to face learning experience; (b) a range of learning experience included traditional didactic where content knowledge is transmitted by digital devices; active learning where the learner works with online drills, games, and simulations; and interactive where the learners learn from interacting with others through online discussion forums, collaborative projects, etc; and (c) a mix of synchronous activities, with instruction happening in real time or asynchronous, with a lag time between online stimulus and response.

Training about effective learning and education that uses electronic resources utilized a teaching and learning methodology adapted from experiential education theory. Using this four-step progressive/recursive design methodology, material covered during this course would be systematically presented (Step A), practiced (Step B), assessed (Step C) and reviewed (Step D). Starting at the top of the circle to the right, Step A represents the

introduction to new materials such as theory and skills. Progressing to Step B, participants will practice the application of the newly presented materials. Once applied, participants will assess their work in Step C, which will lead to a reflection or review of lessons learned in Step D that will inform and influence the next progressive iteration the learning cycle, with Step A.



**Figure 3. Teaching and Learning Methodology**

A full progression of this methodology was attempted each day of the training event. For example, the first day of this training focused on the fundamentals of eLearning, where materials were presented during the initial part of the day (Step A) and learning activities centered on the application of these materials were conducted during the latter part (Step B). Concluding the day, participants were asked to assess their understanding of the fundamentals of eLearning (Step C) and to identify questions and unresolved related issues for the next day's session (Step D). The second day built on the materials introduced and practiced during the first and were guided by the participants' assessment and reflection on the lessons learned from the first day. This training is considered progressive in that each step builds on the previous. This training is recursive in that the material presented in one day was reviewed and applied in a subsequent day.

**Putting It All Together.** To link technology, content, and pedagogy together, a special training program was designed. The learning outcomes were for the instructors to be able to:

1. Explain distance learning/eLearning/e-Education/blended learning and why it might be useful for their institution; it was important to get past the notion of doing away with the instructor or face-face learning to the instructor being able to enhance face-to-face instruction with e-resources. To own the e-learning process, instructors had to explain why e-Learning might be useful for their institution, highlight the top five challenges that decision-makers must face in order for e-Learning to succeed at their institution in Afghanistan, give their definition of e-Learning considering the level of development in Afghanistan, and articulate what pedagogy (teaching and learning methodology) could be used to deliver e-Learning.
2. Search the web and the Afghanistan Digital Library for examples of course syllabus and course materials that are relevant to the courses that they are teaching; for the instructors searching the web was a new experience while evaluating sites using criteria that they would use for textbooks and journals was an old skill that could be transferred to the online environment. In addition to learning the mechanics of navigating an online course, this provided an opportunity to experience the look and feel of online courses.
3. Experience ANGeL as an eLearning management system, from the perspective of being a student; this required relating the key functions of Afghanistan Next Generation e-Learning (ANGeL) to the practices of good teaching and learning.
4. Design an eLearning course with learning outcomes, tasks, and assessments to be uploaded on ANGeL; the first task was to write a syllabus for their e-learning course, followed by creating learning outcomes, e-lectures for each learning outcomes with links to e-resources, creating learning tasks and activities, and creating learning assessments, and,
5. Upload an e-learning course on ANGeL, including setting-up a discussion forum and developing online tests.

To achieve the desired learning outcomes, learning tasks and activities were consistent with Bloom's taxonomy of educational objectives in the cognitive domain (knowledge, comprehension, application, analysis, synthesis and evaluation). In addition to the short e-lectures, students were expected to participate in the following tasks and activities: Read for knowledge and comprehension; reading materials are shown as links or can be downloaded from the file manager; Search the digital library and the Internet for additional information; Discuss, analyze and synthesize lessons and reading materials through online discussion forums and, eventually through forming

communities of practice for face-to-face interactions; Interact with others by email and face-to-face interviews; Create presentations to be presented live for feedback and assessment; and, Create an online course.

**Feedback.** Instructors who attended the training courses in July/August 2009 provided positive feedback about the potential benefits of e-learning. A prerequisite was for instructors to have taken classes on Open office courses in word processing, spreadsheets and doing presentations. Most of the instructors had limited experience using the Internet. So that the instructors could better explain e-learning, distance learning, and online learning to themselves, their deans and to the Ministry officials, the online discussion forum was introduced and proved valuable in capturing responses. The instructors enjoyed learning how to search and find material relevant to their subject areas. For example, medical faculty were pleased with Medline after they figured out how to navigate the site. Islamic law faculty instructors were pleasantly surprised about the number of articles on Islamic law found in Google, Google scholar, and Google books although they were disappointed about the paucity of materials in Dari or Pashto, to which encouragement was provided to create their own materials and contribute to the knowledge base. To a person, the Afghan instructors saw the benefit of the Internet as a place to update their subject matter knowledge and thus improve their course curricula and their students' learning. Some of the instructors noted that they could ask their students to do web searches, evaluate or rate the sites, and make recommendation for sites that could be useful for their courses. The instructors also saw the benefits of the online discussion forum as a way of managing frequently asked questions, expanding student participation to other universities and locations in Afghanistan and beyond, and co-teaching courses. The tools for making online quizzes and creating surveys were also well received.

One faculty member from Kabul Polytechnic University writes: It is very good, interesting, enjoyable and easy to use (for me). I am teaching my subjects (Environmental Geology, Practical General Geology, Engineering Geology and Hydrogeology, Sedimentology, Prospecting and Exploration of Solid Mines, Physical Geography and GIS) through this site. I started my teaching with the subjects of Environmental Geology for 35 students and General Geology for 42 students. Students were very pleased about using the Internet for learning, when they pass the exam they were excited because they had found the result in one second after finishing exam.

Instructors also had a chance to test drive the advanced placement courses provided by the Digital Learning Commons and the hippocampus provided by the Monterey Institute for Technology and Education's National Repository for Online Courses. The instructors noted how well these courses were done but expressed doubts about access for their students, considering the number of computers and the slow bandwidth. Finally, instructors learned to create their own courses. This required working with the technology and making decisions as to which modules (online discussion forum, blog, multiple choice test, etc) would be helpful. The instructors had to prepare a syllabus, write learning outcomes, decide which Internet resources would be useful, make links, add e-lectures, write learning tasks and activities and assessments,

The instructors recognized that challenges for successful roll-out of e-learning courses included limited access to computers for students and faculty members, poor and unreliable Internet connections, and limited student and faculty experience using the Internet for teaching and learning. The instructors said that they would continue to develop the e-learning courses that they started in class, stressing the importance of getting more practice and follow-up training on the use of wikis, rubrics, and other plug-ins.



**Figure 4. Instructors getting help from their sons to navigate computer**

### **3. Conclusion and Way Forward**

Despite the contextual challenges, Afghan instructors from Kabul University, Kabul Polytechnic University, Kabul Medical University, Balkh University, Herat University, and Shaik Zayed University could appreciate the benefits of the Internet as a place to read information as well as a means for connection and collaboration. Without fully realizing it, the Afghan instructors who have participated in e-learning workshops have made initial steps toward using the Web 2.0 concept for teaching and learning.

To maintain the momentum to fulfill the promise of e-learning, a concerted effort for follow-up discussions with NATO about fast-tracking the provision of bandwidth and with content providers, such as Digital Learning Commons, Springerlink about continued provision of free access to open educational resources, and for several levels of follow-up training is crucial. Training should include how to make use of open educational resources as face-to-face enhancement, with an emphasis on the pedagogical aspects of the available content and on using components of the software technology for active and interactive learning. For example, the hippocampus course on Environmental Science has suggestions for discussion topics, as do other hippocampus courses. The instructor could compliment these courses by setting up an online discussion forum or blog, along with the corresponding points toward a grade to be awarded for student participation. Discussion forums could be set up not only for students at a particular university but could be opened up for other students inside and outside Afghanistan. Moreover, training for instructors should include how to put together content, pedagogy and technology by creating their own courses for use by the Afghan students. Additional training for instructors on moderating online discussion forums, grading e-portfolios, including blogs and wikis, and designing online tests could be provided. See table 1 for illustrative modules, learning outcomes, and learning activities. Furthermore, to support e-learning in higher education institutions in Afghanistan, training is needed on how to modify the online learning management software to suit the Afghan learners, how to manage the network and bandwidth, and how to assure information security within the network. Instructors who already see the benefits of e-learning could serve as e-learning ambassadors.

Finally, there are e-learning policy issues that need to be considered if the goal is to embed e-learning by making it integral to broader strategies for teaching and learning not only for higher education students but also for secondary and adult learners. The policy dialogue should include a debate on why an investment in e-learning will help education goals, what is the economic rationale for investing in e-learning, what are the strategies to develop and sustain physical infrastructure, and how to coordinate infrastructure efforts between external donors and several Government of Afghanistan Ministries, particularly the Ministry of Communications, the Ministry of Higher Education, and the Ministry of Education. Moreover, the e-learning policy should consider lessons learned from current initiatives to support the objective of building and ensuring quality in e-learning, develop formal and informal collaborative and cooperative arrangements between the higher education institutions inside and outside Afghanistan, plan a leadership role for higher education institutions in building e-learning programs for secondary and adult learners, and, support research initiatives to create a more systemic approach to e-learning.

**Table 1. Illustrative Training Modules, Learning Outcomes, and Learning Activities**

TRAINING MODULES	LEARNING OUTCOMES At the end of this training module, participants (instructors) will be able to:	LEARNING ACTIVITIES THAT DEMONSTRATE KNOWLEDGE OR SKILLS
TECHNOLOGY	-Demonstrate knowledge about ICTs, including the Internet -Demonstrate skills required to operate ICTs	-Using the computer -Using open office or its equivalent -Using the Internet -Using search engines -Using skype -Using video conferencing equipment
TECHNOLOGY CONTENT	-Relate technology and content	-Using technology (Afghanistan digital library, open educational resources) to access content through the Afghanistan digital library -Creating course content
CONTENT	-Demonstrate knowledge of subject matter that is to be taught and learned	-Evaluating websites based on knowledge of subject area -Recommending websites -Constructing knowledge
PEDAGOGY CONTENT	-Arrange course elements for better teaching and learning	-Arranging course elements (learning outcomes, learning tasks and activities, learning assessments) for better teaching
PEDAGOGY	-Demonstrate knowledge of processes and practices or methods of teaching and learning	-Explaining learner centered, outcomes-based, experiential, active and interactive learning -Writing learning outcomes -Developing learning tasks and activities for active and interactive learning -Designing assessments
TECHNOLOGY PEDAGOGY	-Relate technology and pedagogy	-Searching the digital library and the Internet, using criteria -Annotating blogs -Designing online discussion activities -Moderating online discussion forums -Designing online group collaborative activities -Rating and recommending websites
TECHNOLOGY PEDAGOGY CONTENT	-Relate technology, pedagogy, and content	-Creating courses for e-learning -Sharing knowledge (blog, wiki, website) -Rating websites, books -Discussing, analyzing, recommending websites -Forming, interacting with, communities of practice or social networks -Editing and commenting on wikis, etc. -Participating in creation and completion of evaluation survey -Creating presentations for face to face feedback and assessment -Designing assessments--online tests, e-portfolios (documents, annotated blogs to share knowledge, presentations, essays, reflections)

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