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Introduction

This conference was the eleventh in a series of conferences on Information Technology (IT) that has been taking place in Kabul, Afghanistan on an annual basis since 2005. It was hosted by the Ministry of Higher Education (MoHE) with technical assistance from the Center for international and intercultural Communication (ZiiK) of the Technische Universität Berlin (TU Berlin), with funding from the German Federal Foreign Office and with support from the German Academic Exchange Service (DAAD).

This year's **IT conference** topic was "**Improvement and Challenges**". Representatives of Afghan universities as well as international guests were invited to this event. In total, more than 150 persons participated at the conference.

During the three-day conference from December 15th through 17th, 2015, the invited guests discussed about challenges and proposals for improvement, mainly in the areas of **Education** and **E-Learning**, the **Afghanistan Research & Education Network** (AfgREN) and the **Higher Education Management Information System** (HEMIS). During the second day of the conference, these topics were addressed by workshops with respective keynote speeches. During the third day of the conference, the results of these workshops have been presented as well as solutions have been found for how and when to implement these measures within the scope of the IT Strategy of the MoHE.



Highlight of the conference was the opening by the President of the Islamic Republic of Afghanistan, H.E. Dr. Ashraf Ghani. Further guests were representatives from Afghan ministries, the Ambassador of the Federal Republic of Germany in Kabul, H.E. Mr. Markus Potzel, and

numerous representatives from public and private Afghan universities, their presidents, deans of computer science faculties, heads of IT-departments, computer science lecturers and students, as well as representatives from the Afghan Ministries of Communication and Education. The reception and opening of the conference was broadcasted by several Afghan TV stations.

First day: Tuesday, December 15th, 2015

Reception and Opening



Dr. Safiullah Jalalzai, spokesman of the Ministry of Higher Education welcomed all contributors and guests to the 11th conference on Information Technology for Higher Education in Afghanistan. He stated that the conference will be opened with the recitation of a few verses of the Holy Quran, followed by the national anthem of Afghanistan. In the following, Mr.

Jalalzai gave the word to H.E. the Minister of Higher Education Prof. Dr. Farida Momand.



The Minister of Higher Education, **H.E. Prof. Dr. Farida Momand**, welcomed all guests to the 11th IT Conference and thanked H.E. Dr. Ghani, President of the Islamic Republic of Afghanistan and the guests for their participation. She stated that the attendance of H.E. Dr. Ghani at the IT Conference is a

great honor for the MoHE. She also conveyed a cordial welcome to the Ambassador of the Federal Republic of Germany, H. E. Mr. Markus Potzel, and the presidents, lecturers and students of the Afghan universities. In her speech she addressed the relevance of IT for higher education and emphasized that today, IT is the most important tool for higher education. She expressed her thanks to the Ministry of Communication and Technology, the world community and mainly Germany, the German Federal Foreign Office, the DAAD, the TU Berlin and especially the ZiiK for their support. Today, 22 Afghan universities are connected to the Internet, and 12 further IT Centers are going to be established soon. This year, she went on, the MoHE updated its IT strategy and is working on an e-learning platform. At last, she expressed her gratitude to all involved parties for the support with the organization of this yearly conference and gave the word to H.E. Dr. Ghani.



The President of the Islamic Republic of Afghanistan, **H.E. Dr. Ashraf Ghani**, expressed his thanks for the invitation. He commenced his speech by stating that today, technologies and knowledge are connected fields which merge and grow together. IT, as H.E. went on, penetrates many aspects of our day-to-day life and makes many processes easier, faster and more

productive. He stressed that we all have to be a part of these changes of our modern world. These changes would be most important in the field of education. The relationship between student and lecturer would have to be redefined from scratch. It is important, as H.E. stated, that we all collaborate to reach this goal. H.E. Dr. Ghani expressed his personal thanks to the ZiiK of TU Berlin for its long-standing commitment to Afghanistan and for its activities throughout the entire country.

H.E. Dr. Ghani is convinced that young women and men already made great achievements in this direction. However, there are still problems existing in today's education, as H.E. pointed out. Traditional teaching is still predominant in Afghanistan. In H.E.'s opinion, modernization and facilitation of modern infrastructures are among the most important tasks of the government in order to make these technologies and the knowledge accessible. Therefore, as H.E. explained, he proposed to the Ministry of Communication to interconnect all Afghan universities with fiber optic cables. H.E. emphasized that we should recognize how to adapt modern technologies and knowledge to each other, because new modern technologies are important resources for the future of Afghanistan. At the end of his speech, H.E. wished all participants a successful conference and stated that he is excited to see its results and is looking forward to suggestions and ideas.



After the speech of H.E. Dr. Ghani, the word was given to the Ambassador of the Federal Republic of Germany **H.E. Mr. Markus Potzel**. He welcomed all participants and focused on the support of the German government in the area of higher education, mainly in the area of IT. He stressed that the ZiiK of the TU Berlin is active since 2002 in the construction of academic

structures in the area of IT in Afghanistan. Until today, the ZiiK has established five modern IT Centers at Afghan universities: At Kabul University in 2003, at Herat University in 2009, at Nangarhar University in 2011, at Balkh University in 2012 and at Qandahar University in 2014. As a further highlight he mentioned the computer science Master's program for Afghan lecturers. Within this program, 48 Afghan lecturers graduated from TU Berlin so far with an MSc in computer science, 25 more are currently studying at TU Berlin and in 2016, 20 more are supposed to come to TU Berlin. H.E. Mr. Potzel went on to emphasize the new project of an IT competence center in Kabul. He finished his speech by expressing his thanks to the MoHE for the invitation and by wishing the participants of the conference much success.

After Mr. Potzel's speech, **Dr. Nazir Peroz**, director of the ZiiK of the TU Berlin, also welcomed all participants of the IT conference and expressed his thanks to the German Federal Foreign Office and the DAAD for the financial support, and to the German Embassy in Kabul, the Afghan Embassy in Berlin and the MoHE for the smooth cooperation. He then referred to his keynote later that day about information technology and its challenges.

Keynotes

On the first day of the conference, in addition to the opening speeches, three keynote presentations were given on the subject of IT.

IT Development in Higher Education in Afghanistan

Prof. Mohammad Osman Babury, Deputy Minister of Higher Education, Afghanistan



In his speech, Prof. Babury gave an overview of the development in higher education in Afghanistan. Main issues were the achievements of the MoHE, the IT activities in progress, challenges of the IT development, the IT demand and the modernization of higher education.

Among the achievements of the MoHE, Prof. Babury named the AfgREN project which provided Internet connectivity to 27 public universities so far, the HEMIS project for the modernization of the administration, an e-learning initiative and the establishment of IT Centers for major universities according to the model of the IT centers which have been created by TU Berlin.

As a current activity in progress, Prof. Babury explained that the ICT (Information and Communication Technology) strategic plan of the MoHE has just been revised and extended. It includes the plan to connect eight public universities to the national fiber network, the IT assessment of all public universities, the enhancement of HEMIS and AfgREN and particularly the coordination with the donor community to meet the needs of the public universities.

The Ministry of Higher Education is embarking on one of the most important initiative in its history – the transformation of higher education to bring its quality to required high standards and to meet the tremendous need.

As Afghanistan continues to improve the higher education opportunities for its citizens, education through modern methodologies and techniques such as e-learning, objective based learning and student-centered learning approaches is underway for implementation.

Prof. Babury went on to mention that the challenges for these activities still are the general electricity supply, low Internet bandwidth and not enough ICT equipment at public universities.

In the end, he emphasized the demand for the modernization of higher education in Afghanistan like a service-oriented research and education network, campus management systems as well as access to international digital libraries and the employment of e-learning.

IT as Game changers: Challenges or Opportunities for Higher Education

Dr. Mohammad Humayon Qayomi, Chief Advisor to the President, Afghanistan



In his speech, Dr. Qayomi focused on the changes IT brought to society. Examples are increasing storage capacities, cloud computing, social media, Internet of things, big data, wearable technologies, 3D printing and many more, which are shaping day-to-day life more than ever. However, there are

even more dramatic changes to be expected to come within the next years which will also bring tremendous economic opportunities. Today, as he stated, production processes are a global endeavor and cooperation. The parts of a complex product or a music orchestra can be originating from many different areas of the world.

He went on to focus on the aspect of cybersecurity and stressed that every technology has its hidden dangers. For example, there are more than 10 million virus signatures known today, as he stated, and there is a large need for cyber hygiene by everyone. Therefore he proposed to incorporate the topic of cybersecurity in the curriculum.

All these developments and progresses also have their impact on higher education, as he explained. Higher education is also ever more important for a sufficient salary and standard of living. IT, as he states, is a “game changer” which can substantially transform the delivery of education and raise productivity, GDP, and job growth. However, it would be crucial to renew the sector of higher education so that people will become savvy users of technology in order to meet all the challenges, dangers and risks.

Dr. Qayomi advertised the “T model” of education which will provide a general broad understanding and deep technical experience in a particular area. For this to realize, the global community needs a “more globalized curriculum” which consists of global, technical and professional competence. He cited the Venezuelan socio-economist Carlota Perez: *“Technological change is not an engineering phenomenon, but a complex social interaction process involving a mix of technical, economic, social and institutional factors. Simply stated, single inventions do not change the world; widespread waves of innovation do.”*

As a consequence he requested higher education leaders to take opportunities to drive innovation and investment. Eventually, he proposed a change of paradigm of education towards enticement with content, away from lecture halls towards collaboration of students and away from grades towards continuous feedback. This way, as he finally stated, technology can be utilized as a “weapon of mass instruction”.

IT and its challenges in Higher Education in Afghanistan

Dr. Nazir Peroz, Head of the Ziik at the TU Berlin



Dr. Peroz began his presentation by stating that the rapid development in IT has led to a central pillar of the Afghan society, institutions and universities. It changes communication – he stated that when he came to Afghanistan in 2002, no mobile phones were used by anyone in the country except by government employees. Today, there are more

than 22 million mobile phones being used every day. Also, the Internet was not known to the people back then while today, everyone is using laptops or smartphones with Internet access.

Besides many activities in the IT area by the world community and projects from international organizations, as he went on, the TU Berlin also contributed to this development with trainings for IT users, by vocational IT training programs (IT systems and network administrators) and with academic education programs (BSc, MSc and PhD programs in computer science). Furthermore, as he explained, five modern IT centers have been established at Afghan universities since 2003 by the TU Berlin. Additional activities include the establishment of an IT Department at MoHE, the development of a national IT strategy, founding of computer science faculties at the Universities of Herat and Balkh as well as an IT Board at MoHE, Alumni programs and the annual IT conference at MoHE.

Despite many achievements and successes in this field, he emphasized that a functional, secure and sustainable IT supply system is still missing at the Afghan universities. Such a supply system would consist of education, management, funding and infrastructure. This, as Dr. Peroz stressed, is one of the major challenges of the future higher education system in Afghanistan.

Such a functional IT supply system would consist, for example, of a reliable university network, secure server systems, dedicated Email systems and awareness for IT security issues and IT education and others.

According to Dr. Peroz, further challenges are the increasing amount of electronic waste, work and mobility in the digital world, and e-learning. Afghanistan would have to decide if e-learning should replace, supplement, enhance or support processes of teaching and learning. e-learning has been present in Afghanistan since 2002 and brings many advantages and chances but should not be used to grant degrees as the overall quality of education would suffer from this.

Dr. Peroz finished his speech by stating that an efficient and sustainable IT supply and its services can only be implemented if clear responsibilities are defined and the IT expertise of the staff is extended. For this, the IT Department of the MoHE and at the Afghan universities are to be strengthened in order to realize a smooth operation of the universities in teaching, research and

administration. Furthermore, international IT projects are to be coordinated in a demand-driven way.

IT Strategy in Higher Education in Afghanistan

Ustad Shukria Jamal, Director of the IT Department at the MoHE



Mrs. Jamal's presentation consisted of the topics "current situation", "National IT Strategy Plan for Higher Education in Afghanistan", "IT demand", "measures" and "action plan". She began her speech by explaining that with support from the world community, Afghanistan has been supported in different areas like "strengthening IT infrastructures, Internet connectivity for Afghan universities,

AfgREN, HEMIS, ICT trainings and literacy, digital libraries as well as E-learning.

She proposed different measures for the implementation to be included in the national IT strategy plan from 2012, like an analysis of the IT situation, the development of an action plan, the integration of IT into higher education and the coordination and supervision of national and international IT projects. According to Mrs. Jamal, the goals of this strategy plan are "IT education quality improvement", "reliable IT infrastructure", "modernization of the administration" and "sustainable and secure operation of IT systems".

She continued that the IT demand focuses on a demand-oriented education, modern administrative structures, IT security and coordination as well as funding.

In the end, Mrs. Jamal presented an action plan which has been developed earlier this year and has been updated in December 2015 by Afghan lecturers together with the team of ZiiK at the TU Berlin.

Organization and introduction to the workshop topics

Ustad Akmal Yaqini, Kabul University and PhD student at the TU Berlin



After the keynotes, the three workshops of the next day were introduced to the participants of the conference by Mr. Akmal Yaqini. The workshop topics were „Afghan Research and Education Network (AfgREN)“, „Education and E-Learning“ and „Modernizing of the administration e.g. the Higher Education Management Information System (HEMIS)“. Mr.

Yaqini asked all participants to decide in which workshop they want to participate on the next morning. He suggested to the participants from the different universities to join these workshop and work in a concentrated way.

Mr. Yaqini's words concluded the first day of the conference.

Second day: Wednesday, December 16th, 2015

On the second conference day, three workshops were being held in which improvements and challenges were discussed with the following topics: “AfgREN”, Education and E-Learning” and “HEMIS”. During these workshops particular keynotes have been delivered and in the afternoon possible solutions have been discussed.

Workshop: Afghan Research and Education Network (AfgREN)

Moderated by: Ustad Niaz Mohammad Ramaki, Kabul Polytechnic University

Opening by: Mr. Niaz Mohammad Ramaki, Kabul Polytechnic University

Introduction

Mr. Niaz Mohammad Ramaki presented the schedule of the workshop to the participants. He stated there were three keynotes in the morning. In the afternoon, measures and their implementation have been discussed. Altogether, 35 persons from different Afghan universities participated in the workshop.

Keynotes

Objectives and structure of AfgREN



Mr. Ramaki, Lecturer of the Computer Science Faculty at Kabul Polytechnic University began his presentation with an overview and a general discussion about research and education networks (RENs). The Afghan Research & Educational Network (AfgREN) is

a typical NREN (National Research & Educational Network) for Afghanistan. The goal of the AfgREN is to function NOT only as an 'ISP' (Internet Service Provider) for Afghan universities, research centers, teaching hospitals and others, another goal for establishing of AfgREN is to isolate research and education traffic flow from the traditional traffic.

The AfgREN infrastructure will be set using high speed fiber links.

The AfgREN is going to be the only infrastructure, and a vital prerequisite for implementing any e-platform approaches for higher education of Afghanistan. Currently five public universities are physically connected to the AfgREN by leasing an Afghan Telecom dark fiber. Mr. Ramaki hopes, in the future, the

number of connected universities will increase every year. Once the number of AfgREN members has significantly grown, the AfgREN should have a central Network Operation Center (NOC) and seven regional Points of Presence (POP) throughout the country. The AfgREN will have the council, the management committee, and the AfgREN members and each of these units will play various roles in the development of sustainability, maintainability and administration of AfgREN.

Bandwidth Management & Monitoring

Mr. Hayat Sina, NOC Manager, Kabul University

Mr. Sina began his presentation by defining the bandwidth and bandwidth policy. He then went on to speak about the total bandwidth of GEANT (the pan-european data network for the research and education community) and its distribution among all sites. GEANT provides the total amount of 155 Mbps. The major consumers are Kabul University and the Ministry of Higher Education. He then described the importance of Bandwidth Policy which mitigates complaints and provides Effectiveness and Efficiency (E&E) for the network. In addition he explained about the site survey that Mr. Sina did on November 14, 2015 for all AfgREN involved sites that are located in Kabul. This survey was like a feasibility study that gathered information mostly about the number of users at peak times, priorities and the total amount of computers. It can help to better allocate the bandwidth.

In the second part of his presentation he described the monitoring system that is being used at the AfgREN NOC office and the traffic policy which is currently in use. He went on to briefly introduce the Network Traffic that they monitor during the day. He added that the bandwidth is distributed very unevenly. Some universities have 80 Mbps and more, others only 6 Mbps. There are currently 18 universities connected via AfgREN.

The role of the IT Centers in AfgREN

Ustad Akmal Yaqini, Kabul University and PhD student at TU Berlin

In his presentation Mr. Yaqini talked about the importance of IT centers for Afghan universities. The role of an IT center in an university is to create and enforce ICT policy and strategy, create and maintain a stable IT infrastructure for the university and to provide basic IT services and necessary IT trainings. These tasks are crucial for the operation of AfgREN.

Currently there are five IT centers established at Afghan universities receiving technical as well as financial support. The first IT center (ITCK) was built at Kabul University in 2003.

After decades of war the ITCK was the first institution of information technology in Afghanistan. Following that, the ITCH was established at Herat University in 2009. The staff of the ITCK was periodically trained at TU Berlin and gained much practical experience in the field of IT. As a result the expertise from ITCK

was used to establish other IT centers across the country; the IT center of Nangarhar University (ITCN) in 2011, the IT center of Balkh University (ITCB) in 2012 and the IT center of Qandahar University (ITCQ) in 2014.

It is planned to establish IT centers at 12 more universities in Afghanistan. The project will be funded by the World Bank. The five existing IT centers established by the ZiiK of TU Berlin are successful examples to be used for establishing new IT centers at other Afghan universities.

Furthermore, he recommends that the five existing IT centers act as IT competence stations in five zones and participate in supporting other IT centers in the future. He also suggests that all IT centers at Afghan universities should host a unified server system and structure. For this reason the ITCK has conducted a national IT training in three phases which included participants from 20 universities around the country.

Discussion

After the presentations, there were collaborative discussions among the participants. Some of the participants expressed their problems regarding the Internet situation, the lack of or incomplete intranet, and the lack of ICT centers at their universities. Others have suggested reasonable solutions for their concerns. In the following, questions from the participants have been discussed:

Problem 1: Internet traffic should be filtered at the universities, unethical websites should be banned

Solution: A set of IT regulations has to be created and implemented for all universities in order to avoid such problems.

Problem 2: Some participants complained about low Internet bandwidth and the lack of IT technical staff as well as ICT centers.

Solution: Mr. Ramaki explained that there is allocated bandwidth to each university based on the number of users and staff of the university. The MoHE plans to work on how to solve/reduce this problem for all universities. In the near future the IT administrators and staff would be trained either in Kabul or in other provinces.

At the end of this workshop, the participants agreed on the following suggestions:

- Implementation of a nation-wide wifi access at the Afghan universities like the European “Eduroam”
- Emphasis on implementation of Univention-based Linux systems (Univention Corporate Server, UCS) at the universities' IT centers
- The UCS trained administrators from TU Berlin are to be requested to develop the UCS implementation plan
- Using IPv6 during the implementation of AfgREN
- A set of ICT regulations should be developed for the MoHE

- Prioritizing using open source systems/software at universities
- Preparing trainings and creation of awareness for the employment of open source solutions
- The AfgREN should get an organizational structure

Workshop: Education and E-Learning

Moderated by: Ustad Foawziah Naseri, Herat University
Ustad Hassan Adelyar, Kabul University

Opening by: Ustad Abdul Rahman Sherzad, Herat University and PhD Student at TU Berlin

Introduction

Mr. Hadelyar, Lecturer of Computer Science at Kabul University and Mrs. Naseri, Dean of the Computer Science Faculty at the Herat University, presented the schedule of the workshop to the participants. They stated there were four keynotes in the morning. In the afternoon, measures and their implementation have been discussed. Altogether, more than 50 persons from different Afghan universities participated in the workshop.

Keynotes

Challenges for Education in Afghanistan

Ustad Abdul Rahman Sherzad, Herat University and PhD Student at TU Berlin



With his presentation "Challenges for Education in Afghanistan", Mr. Sherzad reviewed the developments and challenges in the emergence of modern education in Afghanistan, the structure of the education system, and the consequences thereof.

In this presentation, the term "modern education" refers to public schools that are run by the government with a standard syllabus that includes natural science as well as social and historical studies with a minimum of Islamic studies. This is in distinction to the traditional education known as Islamic or religious school (Madrassa) that refers exclusively to religious-oriented form of education where the children learn the fundamentals of Islamic religion with basic reading and writing skills in mosques and private homes. Traditional education in mosques are run and funded by the community.

The applied sources related to the history of education in Afghanistan show that modern education in Afghanistan began in 1875 with the establishment of schools for civil and military purposes by the royal family. Subsequently modern

schools were re-introduced with the founding of Habibiya School with elementary, lower and higher secondary education levels. The development of many general and vocational schools in Kabul and other major cities led to the formation of the Ministry of Education (MoE) in 1922. Next, due to the expansion of institutions of higher education in 1970, the Ministry of Higher Education (MoHE) was formed in 1977 to consolidate the country's institutions of higher education.

The main aim is to discuss the factors that have impacted the growth of modern education in Afghanistan. For example, external aggression and war, political use of educational institutions, intervention of external powers, radical and rapid change in cultural and traditional aspects, lack of literacy and knowledge, lack of qualified human resources and teaching materials, etc.

In this presentation, the author proposes the following recommendations for improving the quality of education in Afghanistan:

- Establishment of Kindergartens and pre-schools in major cities,
- A dialogue and harmony between Madrasa and public schools for creating a better understanding between the more secular public schools and the religiously oriented Madrasa,
- Offering specification studies upon successful admission to higher secondary schools,
- Establishment of a strong and close cooperation between MoE and MoHE,
- Emphasis on completing the syllabus in schools properly by the Ministry of Education through efficient monitoring and evaluation mechanisms,
- Teachers training seminars and building capacities for professional teachers.

E-Learning specifications and challenges

Ustad Ashuqullah Alizai, Computer Science Faculty at Herat University

According to his research, as Mr. Alizai stated, E-Learning and the drastic usage of new technologies in education have recently become a solution to lower universities' costs and to increase teaching quality. E-Learning can be a key to revolution and modernization of a passive education system. This change can be by revising the traditional teaching techniques and substituting them with new effective and more responsive ones in all education sectors. The technology-based application will be more perceptible in this regards.

E-Learning in its very definition means the delivery of a learning, training or educational program by electronic means such as Computer, mobile phones, Internet, multimedia etc...

The context of E-Learning derived from distance education which means learning that takes place with the instructor and learner(s) in physically separate locations. It has different types and generations, which are based on technology evolution. E-Learning fits on third and fourth generations of distance education which rely on Internet and multimedia technologies. Currently, Afghanistan has

no underlying foundation to carry out distance education and there has been no regulation developed for it. However there is a policy plan for implementing this kind of education in the near future through the MoHE. Deployment of distance education in Afghanistan depends on the political situation, economics, telecommunication status, IT infrastructure, culture behavior, society awareness, literacy rate both institutional and social, commitment of stakeholders especially institution, instructors and learners.

Many problems were discovered concerning the implementation of distance education in Afghanistan such as the electricity problem, high Internet costs & low bandwidth, mail problems and accessibility to materials, the lack of ICT knowledge, lack of ICT infrastructure, low literacy rate both social and institutional and social awareness and the most important one, the lack of expertise. It has been noticed that the pedagogy concerning distance education is totally different from conventional education. For distance education he identified the following three areas as relevant:

1. the dialogue between instructors and learners
2. the structure of a course
3. the autonomy of learners

Furthermore he listed some issues and challenges as below:

- Innovative teaching ability to utilize technologies and facilities for effective teaching
- Effective understanding of shared responsibility between the instructor and learner
- Initial costs are high and the cost of developing course content is significant
- Need to integrate all tools including the authoring tools, the learning management systems and other HR applications

Relevance of E-Learning: A feasibility study on implementing blended learning at Balkh University: Challenges from a micro-perspective

Ustad Nasim Sadat, Computer Science Faculty at Balkh University

Mr. Sadat spoke about the relevance of E-Learning and presented a feasibility study on implementing blended learning at Balkh University.

Due to Mr. Sadat it is crucial to assess the context for which a strategy is being designed before taking action in designing a national E-Learning strategy. In order to architect a context tailored, sustainable, long-term and realistic E-Learning strategy, a scientific discourse needs to be created to answer questions such as: What are the challenges we face in implementing E-Learning? How ready is Afghanistan for digital education? To find answers to such questions, Mr. Sadat undertook a study at the Center for Information Technology and Research at the faculty of Computer Science at Balkh University. Hybrid learning methods were applied in a class of mathematics to explore the challenges emerging during classes. The results of the study reveal that the university does not fulfill basic requirements on different levels which are crucial for taking advantage of IT to enhance the quality of education. The lack of a sound

technical infrastructure such as an unreliable power supply and Internet connection, the lack of sufficient know-how in using digital systems, the lack of a legal framework and an inflexible social environment were seen as major challenges.

The results on the other hand, highlighted, if put properly in place: IT can enrich and enhance the quality of education effectively. It concludes that introducing hybrid learning technology in Afghanistan can only be successful if the challenges outlined in this study are addressed effectively.

Measures need to be taken to improve the technical infrastructure, put appropriate policies in place and raise the capacity of the staff and users utilizing digital technology. Further relevant aspects such as the level of IT-literacy and self motivation of students need to be further investigated.

Introducing E-Learning in Higher Education of Afghanistan: Progresses & Challenges

Mr. Bahadur Hellali, Higher Education Development Program (HEDP) at the MoHE

The presentation of Mr. Hellali covered MoHE's E-Learning plan and policy. The presentation was mainly focused on the goals, implementation approach and progress made to the date. In addition, the presentation also covered additional aspects of E-Learning in developing nations such as contextual framework and E-Learning prerequisites.

MoHE is undertaking a new initiative to modernize higher education in Afghanistan by integrating modern teaching approaches and E-Learning. As Afghanistan continues to improve the higher education opportunities for its citizens, education through modern methodologies and techniques such as E-Learning, outcome-based education and student-centered learning must be considered. With the E-Learning initiative, MoHE will collaborate with Afghan public universities to integrate technology into the learning environment, provide greater access to alternative education and globalize education via electronic access for information and to experts worldwide.

The E-Learning initiative heavily relies on stable ICT infrastructure, well formulated rules and regulations and elevated knowledge of academic members in the area of modern teaching and learning techniques. Initially, MoHE will pilot and implement the E-Learning initiative in eight major public universities: four major Kabul-based universities, Herat University, Balkh University, Nangarhar University and Qandahar University. To this day, E-Learning committees have been established in each of the aforementioned universities and they have developed their plans for next three years in the area of E-Learning.

In the end of presentation, the E-Learning group participants had an interesting discussion on the presentation.

Discussion

After the presentations, the workshop participants discussed very controversially about the employment of E-Learning. Most importantly, it seems necessary to specifically define what E-Learning actually is.

The following questions were asked by the audience:

- Are the lecturers and students ready for E-Learning?
- Do universities have the capacity and ability to introduce and implement E-Learning?
- Is it possible to have pure Distance Learning / E-Learning?
- Basics of E-Learning i.e. using Email and social media for academic purposes are already there, but how much time will it take to take over traditional teaching and learning?

It was replied by the participants that the main goal and objectives of MoE and MoHE should be standardization and quality of education rather than quantity.



Some of the participants stated the employment of E-Learning can be difficult in the beginning, but once established, the following assets can be used over again; but designing an online course and transferring web based study materials requires a lot of time and accountabilities e.g. online texts, other resources, online discussion and chat, interactive content (animation, PowerPoint, audio, video,

CD), submission of assignments, self-assessment activities (Quizzes), methods of assessments, glossary terms and more. Therefore, devotion and commitment of the lecturers are very crucial and essential for the enrichment of education through E-Learning. He continued that most of the lecturers unfortunately do not have much responsibility for their duty.

The participants then discussed about the reality of today's situation, for example that lecturers sometimes use outdated lectures, are not paying serious attention and research while preparing slides, have low writing skills, etc.

It was added that the MoHE policy draft proposes a period of three years for the enrichment of courses and five years to issue online degrees, if everything is running smoothly.

It was proposed that lecturers should acquire technical knowledge in order to create a culture of using learning platforms and to develop a policy for E-Learning.

A suggestion of the conference participants was to use the term "Basic IT education for universities" instead of E-Learning, because the term E-Learning may be too general.

Some participants complained about the lack of budget which leads to a lack of infrastructures including a lack of buildings, a lack of professional lecturers, a lack of pedagogical concepts for E-Learning, a lack of establishing a new

department, etc. How is it possible to implement E-Learning when having such obstacles and challenges on the way?

Almost all the participants agreed that E-Learning is a good step for the enrichment and support of lectures, but it should be realized step-by-step and not be used for issuing degrees.

Workshop: Modernization of the Administration in Higher Education

Moderated by: Ustad Ghezal Ahmad Zia, Kabul University

Opening by: Mr. Ghezal Ahmad Zia, Kabul University

Introduction

Mr. Zia, Lecturer of Computer Science at Kabul University, presented the schedule of the workshop to the participants. He stated there were three keynotes in the morning. In the afternoon, measures and their implementation should be discussed. Altogether, more than 25 persons from different Afghan universities participated in the workshop.

Keynotes

The importance of HEMIS for the Afghan administration



Mr. Zia started his presentation by asking two questions:

What problems and challenges have been faced in the HEMIS implementation processes?

What are the key issues that need to be identified for successfully extending HEMIS?

A Management Information System (MIS) is a set of interrelated components such as

people, tools, hardware, software, communication network, data resources, and procedures that collect, process, classify, store and distribute information to support decision-making and control.

MIS can help the managers to schedule their activities in an organization. As a result the MIS will support the manager in her/his decision-making process. The main aim of this presentation was to make clear that understanding the role of MIS in an organization is vital because the MIS provides accurate, timely information for the manager to proceed the decision-making in a feasible way. Mr. Zia pointed out that the MIS plays a great role inside each organization. It takes the raw data and processes it into information, which is understandable to different departments of that organization for appropriate decision-making. With the growing of the staff or the number of students at a university, keeping related data of employees or creating reports will be crucial aspects for the decision-making process of that organization. Therefore, Mr. Zia argues for replacing the paper-based systems with computer-based systems as a solution for any

business process. This workshop is an attempt to define a concept for the main role of an MIS in an organization and to show how it will help the top management.

MIS has three levels: the operational level, the middle management and the top management. The information flow is from bottom to top. There are a lot of organizations today that are using management information systems, such as banks, ministries, telecommunication companies and even small business organizations. Due to Mr. Zia the use of management information systems can facilitate the work procedures and improve productivity and performance.

The challenges that they have faced with HEMIS:

- Shortage of staff, competence of staff, poor data storage, financial constraints, shortage of material, bulk of unprocessed data, non coordination of data and data-related processes, poor distribution of information and material, leadership problems, and more.

The proposed solution is a concept of a distributed system (Distribute MIS) that should be expandable, flexible and usable at low cost (Open Source technology). The system should be developed with the Agile methodology or spiral model to complete the business mapping and all requirements.

After the presentation the benefit of the distribution of such a system was discussed. It was declared that each university should be responsible for their own system while the MoHE should have access to its own. The participants have seen no need that all the data of the universities should be stored at the MoHE.

Creating awareness for the requirements of modern technology for the administration

Ustad Naweed Rahmani, Computer Science Faculty of Balkh University

Mr. Rahmani stated that the usage of emerging technologies has been an efficiency requirement for administration and workplaces for a long time. The same necessity is also noticed in administrative offices in Afghanistan. Organizations strive for better management and effective administration and this is concomitant to the usage of emerging technologies. Mr. Rahmani thinks that it is crucial to raise awareness among administrators in Afghanistan to know about the importance of emerging technologies for better management. Though it is not a new item in learning and teaching, still the adoption and use of emerging technology shall be promoted and awareness shall be raised within the workplaces in Afghanistan. Mr. Rahmani described the current situation of emerging technologies in Afghanistan and further explained the challenges and issues. In the end, he made the following suggestions:

One of the challenges in adopting an emerging technology in administration in Afghanistan is the lack of awareness and knowledge of Information Technology by most of the lecturers and administrative staff. There are still lecturers at Universities who use hard copied lecture notes and who have no idea what a presentation slide means. Staff in the Universities also still use pen and paper for official work processing and don't know how to use a personal computer.

At the end of his talk he concluded that it can be possible to promote the usage and adoption of new emerging technologies in administration through awareness workshops and campaigns. The practitioners will know the importance of technology in education and adopt it for an effective management and a better future.

Scholarships Management Information System (SMIS)

Mr. Abdul Hai, MIS Manager at ITCK, Kabul University

Recently, Mr. Abdul Hai developed a SMIS for MoHE under the supervision of Mr. Ghezal Ahmad Zia. During his speech, he presented the results of his work.

He explained that SMIS is a module inside the HEMIS system which is implemented using new web technologies. The design and implementation was done on behalf of the MoHE. The Scholarships Management Information System is a large database system, which can be used for managing and storing the types of scholarships information electronically. It is a multi-client system and can be used by several users at the same time.

Specification of scholarships:

- Bachelor
- Master
- PhD
- Short term courses
- Agreements

Functionalities and features of the new system are implemented and designed according to the data received by the MoHE.

Functionalities and Features:

- Type of user-accounts according their privileges
- Super admin full privilege
- Section admin for directors
- Section admin for staff
- Each user can access the system separately without interfering the other user session
- Can easily create reports for all types of scholarships
- Agreements
- Uploading attachments
- Downloading a candidate's file
- Searching, updating and inserting records.

Use of Technology:

- HTML 5
- Laravel 5.1 (PHP framework)
- Session

- JQueryUI
- AJAX
- JavaScript
- Servers Apache 2

Discussion

The participants of the workshop stated that the employment of HEMIS so far has not been successful. This is due to a number of reasons: The system itself, the technology, the infrastructure and mostly a lacking awareness of the staff. After a long discussion, the participants proposed the following:

- A unified training manual (Basic, Intermediate, Advance) shall be drafted
- A national program for awareness of modern technology shall be implemented
- Goals for use of technology in Administration have to be defined
- IT department and Computer science faculties in all Universities shall organize workshops and awareness campaigns.

Furthermore, a new plan for the successful implementation of HEMIS was discussed. As a result it was suggested that the MoHE and the Universities should be connected, AfgREN should be extended and the local traffic should be implemented. The main focus however was the role of the IT centers (currently five IT centers established by the ZiiK of the TU Berlin) as a functional IT center. The planned new IT centers with funding from the World Bank should also implement the unified system structure (based on UCS).

Moreover, the usage of Open Source technologies for the development of an extended HEMIS was discussed and all of the participants agreed with that. Within the discussion the IT policy was one of the most important aspects.

Third Day: Thursday, December 17th, 2015

Moderation: Prof. Osman Babury, Deputy Minister of the MoHE,
Dr. Nazir Peroz, Head of the ZiiK of the TU Berlin and Mrs.
Shukria Jamal, Head of the IT Department of the
MoHE

Presentation of the Workshop Results

The aim of the last conference day was to discuss the results of the three workshops.

The results of the workshop "**Objectives and structure of AfgREN**" were presented by Ustad Akmal Yaqini, Kabul University. The outcome of the workshop "**Education and E-Learning**" was presented by Ustad Hassan Adelyar, Kabul University. And the conclusion of the workshop "**Modernization of the Administration in Higher Education**" was presented by Ustad Ghezal Ahmad Zia, Kabul University.

For each workshop, the time frame for questions and answers was 20 minutes.

Results of the Workshop AfgREN



Ustad Akmal Yaqini, Kabul University and PhD student at TU Berlin began with a short summary of the presentations from the previous day. After this, he explained that the workshop contributions showed the current situation and demand. More than 25 persons took part in this workshop.

Regarding the AfgREN project, the following points were

suggested:

- IT administrator trainings for provinces
- UCS implementation in new ICT centers
- MCIT collaboration with MoHE
- Internet up-link request via central Asia
- IT policy development
- Emphasis on open source technologies
- Separation of ICT centers from computer science faculties
- Replacement of GEANT connection
- Implementation of a nation-wide wifi access at the Afghan universities equal to European "Eduroam"
- Using IPv6 during the implementation of AfgREN
- Organizational structuration of AfgREN

All in all, the workshop participants agreed that it would be crucial to interconnect the Afghan universities with the same high bandwidth, according to international standards (>10Gbps) and on a toll-free basis. This bandwidth would be technically feasible via the existing fiber optic cables, even though the connectivity to the public Internet might still stay limited for some time. The organizational structure of AfgREN should be carried by its members and without economic interest. Only this way, the exchange between the universities for research and education would be supported in a stable and sustainable way.

Results of the Workshop “Education and E-Learning”

Ustad Hassan Adelyar, Kabul University



First, Mr. Adelyar stated that the discussion of this workshop focuses on three aspects: Enrichment, Integration and Virtualization.

He referred to the presentation of Mr. Sherzad about the development of higher education in Afghanistan. After that, he explained some of the definitions and goals. In general, E-Learning aims on providing greater access

for students on a range of learning material independent of time and place.

It should be considered, as he stated, that E-Learning is not to be understood as an alternative education delivery system but as a tool to enrich and support the current education system with integration of Information Technology. The goal of “offering fully online courses” is neither realistic nor feasible within the proposed implementation time frame of the MoHE.

The ultimate objective of E-Learning, as Mr. Adelyar explained, should be only support and enrichment for educational institutions. Not for issuing certificate degrees for undergraduate and postgraduate programs. The sustainability of the E-Learning policy should also be taken into consideration. In order to ensure sustainability the implementation plan should not be project based and should be integrated into the framework of the MoHE.

As a summary, the following proposals were made:

- Strong and close relationship and collaboration between MoE and MoHE
- MoHE should not consider E-Learning as an alternative education delivery system but as a tool to enrich and support the current education system with integration of Information Technology (IT), for example in the form of Learning Management Systems or Massive Open Online Courses (MOOCs)

- The main objective of E-Learning should be only enrichment and improvement for education sectors, not for issuing certificate degrees for undergraduate and postgraduate programs
- E-Learning should not be project based but instead be integrated into the MoHE framework.

Results of the Workshop “Modernization of the Administration in Higher Education”

Ustad Ghezal Ahmad Zia, Kabul University



Mr. Zia presented the results of the workshop from the previous day. He spoke about the role of MIS in an organization, the extension of HEMIS and proposed solutions. In particular, he mentioned a SMIS module for HEMIS and raising user awareness.

The workshop participants suggested to employ the existing HEMIS at the universities. At the same time, a new HEMIS should be developed from scratch until 2020 using Open Source technologies.

A unified training manual is to be drafted on basic, intermediate and advanced level. Also, a national program to raise awareness for modern IT is to be implemented. Goals for the use of technology in Afghanistan are to be defined and workshops as well as awareness campaigns are to be realized.

For the implementation of HEMIS, a functional AfgREN is necessary. Also, the role of the IT Centers is to be strengthened and they should be supplied with a unified system based on Univention (UCS).

Finally, an IT policy is to be developed with an emphasis on Open Source technologies.

The audience raised the issue that the employment of powerful local computer systems, data centers, PC labs for the faculties, standardized management and office solutions as well as network-based means of communication and E-Learning are depending on an efficient infrastructure.

After a long discussion, Prof. Babury stated that it is not about virtual teachings and online degrees but about using E-Learning for the support and improvement of the lectures.

After this discussion, the two topics of the workshops on “Afghan Research and Education Network” and “Modernization of the Administration in Higher Education” were discussed.

Regarding the AfgREN project it was agreed upon that it is crucial to interconnect the universities with high bandwidth, even if the Internet connectivity in Afghanistan is still limited. This is feasible via the existing fiber optics connections and should be free of charge for the universities. For the future, further Internet peerings with other countries (not Pakistan, though) should be established.

Regarding the HEMIS project, the participants agreed to make the use of HEMIS mandatory for the universities. It can, however, be used in parallel with existing management information systems, if required. The HEMIS system is to be extended and rewritten from scratch using Open Source technologies.

The presidents of the universities of Qandahar, Nangarhar, Kunar, Faryab, Baghlan, Bamyan, Badakhshan, Kunduz, Samangan, Jawzjan and Ghazni drew the audience’s attention on their particular needs, like network planning for the IT supply at their universities, high-bandwidth Internet connectivity, reliable power supply, buildings for computer science faculties, IT education and further trainings as well as an IT regulation policy.

Prof. Babury addressed the responsibility of the universities and stressed that the MoHE and the Afghan universities have achieved a lot already.

In the end Dr. Peroz thanked H.E. Dr. Ashraf Ghani, the President of the Islamic Republic of Afghanistan for his opening of the conference. Furthermore he thanked H.E. Prof. Dr. Farida Momand, Prof. Osman Babury as well as the presidents of the participating universities for their support. He also thanked the German Federal Foreign Office, the German Embassy in Kabul and the DAAD for their support and funding of the conference. He expressed his gratitude towards Mrs. Shukria Jamal, Mr. Ghezal Ahmad Zia, Mr. Niaz Ramaki and the other employees from the IT department of the MoHE and the team of the ZiiK at the TU Berlin for their tireless efforts and the organization of the conference and the workshops. At last he thanked all conference guests for their contributions. Prof. Babury also thanked the participants and the ZiiK of TU Berlin for the good cooperation. At last, the president of Kunar University, Prof. Mir Ahmad Hamed closed the conference with a prayer.

Attachment 1

Conference Pictures









Attachment 2

Conference "Information Technology for Higher Education in Afghanistan" Part XI Kabul, Afghanistan

December 15 - 17, 2015

This conference is the eleventh in a series of conferences on Information Technology (IT) that has been taking place in Kabul, Afghanistan, on an annual basis since 2005. It is hosted by the Ministry of Higher Education (MoHE) with technical assistance from the Center for international and intercultural Communication (Ziik) of the Technische Universität Berlin (TU Berlin), with funding from the German Federal Foreign Office and with support from the German Academic Exchange Service (DAAD).

This year's **IT conference** topic is "**Improvements & Challenges**". Representatives of Afghan universities as well as international guests are invited to this event.

During the three-day conference, the invited guests, presidents of Afghan universities, experts, Afghan computer science lecturers, Master's graduates and computer science students are going to discuss about challenges and proposals for improvement, mainly in the areas of **Education** and **E-Learning**, **Afghanistan Research & Education Network** (AfgREN) and **Higher Education Management Information System** (HEMIS). During the second day of the conference, these topics will be addressed by workshops with respective keynote speeches. During the third day of the conference, the results of these workshops will be presented as well as solutions found for how and when to implement these measures within the scope of the IT Strategy of the MoHE.

Languages of the conference: Pashto, Dari and English

First day: Tuesday, December 15, 2015

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|-----------------------|---|
| Moderation: | Dr.Safiullah Jalalzai, Spokesman and Director of Public Relations of the MoHE |
| 1:10 pm | Recitation of Quran-e-Sharif |
| | Welcome |
| 1:20 - 1:30 pm | H.E. Prof. Farida Momand, Minister of Higher Education, Afghanistan |
| | Opening |
| 1:30 - 1:40 pm | H.E. President Dr. Ashraf Ghani, President of the Islamic Republic of Afghanistan |
| 1:40 - 1:50 pm | H.E. Markus Potzel, Ambassador of the German Federal Republic in Kabul |
| 1:50 – 2:00 pm | Dr. Nazir Peroz, Head of the ZiiK at the TU Berlin |
| | Keynote speeches |
| 2:00 - 2:20 pm | Overview of IT Development in Higher Education in Afghanistan Prof. Mohammad Osman Babury, Deputy Minister of Higher Education, Afghanistan |
| 2:20 - 2:40 pm | Information Technology as a Game Changer: Challenges and opportunities for Higher Education Dr. Mohammad Humayon Qayomi, Chief Advisor to the President, Afghanistan |
| 2:40 - 3:00 pm | IT and its challenges for Higher Education in Afghanistan Dr. Nazir Peroz, Head of the ZiiK at the TU Berlin |
| 3:00 - 3:20 pm | IT Strategy in Higher Education in Afghanistan Shukria Jamal, Director of the IT Department at the MoHE and manager of AfgREN project |
| 3:20 - 3:40 pm | Tea break |
| 3:40 - 4:00 pm | Improvement and Challenges – IT in Higher Education in Afghanistan (introduction to the workshop topics) Akamal Yaqini, Lecturer of Computer Science Faculty at Kabul University and PhD Student at TU-Berlin |
| 4:00 pm | End of first day |

Second day: Wednesday, December 16, 2015

9:00 - 12:00 am **Three Workshops: Improvements and Challenges**

Moderation: **Workshop (1)**
Afghanistan Research & Education Network (AfgREN)
Niaz Mohammad Ramaki, Lecturer of the Computer Engineering and Informatics Faculty at Kabul Polytechnic University

9:00 - 9:45 am **Keynote speeches**
Objectives and structure of AfgREN
Niaz Ahmad Ramaki, Lecturer of the Computer Engineering and Informatics Faculty at Kabul Polytechnic University

9:45 - 10:30 am **Bandwidth Management**
Hayat Sina, NOC Manager, Kabul University

10:30 am **Tea break**

11:00 - 11:45 am **The role of the IT Centers in AfgREN**
Akmal Yaqini, Lecturer of Computer Science Faculty at Kabul University and PhD Student at TU-Berlin

12:00 pm **Lunch**

2:00 - 4:00 pm **Discussion: challenges, proposals and implementation**

Moderation: **Workshop (2)**
Education and E-Learning
Sayed Hassan Adelyar, Lecturer of Computer Science Faculty at Kabul University

Foawziah Naseri, Dean of the Computer Science Faculty at Herat University

Keynote speeches

9:00 - 9:45 am **Challenges for Education in Afghanistan**
Abdul Rahman Sherzad, Lecturer of Computer Science Faculty at Herat University and PhD Student at TU Berlin

9:45 – 10:30 am **E-Learning specifications and challenges**
Ashuqullah Alizai, Lecturer of Computer Science Faculty at Herat University

10:30 am **Tea break**

| | |
|------------------------|--|
| 11:00 - 11:30 am | Relevance of E-Learning Nasim Sadat, Computer Science Faculty at Balkh University |
| 11:30 – 12:00 pm | Introducing E-Learning in Higher Education of Afghanistan: Progresses & Challenges Bahadur Hellali HEDP at the MoHE |
| 2:00 - 4:00 pm | Discussion: challenges, proposals and implementation |
| Moderation: | Workshop (3) Modernization of the Administration in Higher Education Ghezal Ahmad Zia, Lecturer of Computer Science Faculty at Kabul University |
| 9:00 - 9:45 am | Keynote speeches The importance of HEMIS for the Afghan administration Ghezal Ahmad Zia, Lecturer of Computer Science Faculty at Kabul University |
| 9:45 - 10:30 am | Creating awareness for the requirements of modern technology for the administration Naweed Rahmani, Lecturer of Computer Science Faculty at Balkh University |
| 10:30 am | Tea break |
| 11:00 - 11:45 am | A module of HEMIS (Scholarship Management System) Abdul Hai, MIS Manager at ITCK, Kabul University |
| 14:00 - 4:00 pm | Discussion: Challenges, proposals and implementation |
| 4:00 pm | End of second day |

Third day: Thursday, December 17, 2015

Moderation: Prof. Mohammad Osman Babury, Deputy Minister of Higher Education, Afghanistan
Dr. Nazir Peroz, Head of the ZiiK at TU Berlin
Shukria Jamal, Director of IT at MoHE

Presentation of Workshop Results

9:00 - 09:30 am **Afghanistan Research & Education Network (AfgREN)**
09:30 - 10:00 am **Education and E-Learning**
10:00 - 10:30 am **Modernization of the Administration in Higher Education**

10:30 am Tea break

11:00 am **Discussion of the results and their implementation**

1:00 pm Lunch

2:00 pm End of the conference

Organization and Support:

IT Department of the MoHE
ZiiK of the TU Berlin

Location:

Conference Hall at the MoHE, Kabul, Afghanistan

Contact:

If you have any questions or inquiries, please contact:

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