

University- Industry Linkage: Sohar University Experience with Case Study on Cisco Event as Experience for Learning in Developing Local Talent in Sultanate of Oman

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Abstract

As the first university in the Sultanate of Oman to pioneer in connecting practical training with educational curriculum, Sohar University has begun collaborations between technology market leaders such as Cisco Systems, Microsoft, and Oracle and international academic institutes such as The University of Queensland, Australia and the University of Mutah, Jordan. The goal of the university-industry connection is twofold: to focus technical degree programs at Sohar University to the job skills demanded of Oman's local industry, and to provide educational opportunities to the community in the fields of computer literacy and information technology. This practical-oriented method of education creates circumstances whereby the university's pedagogical method is closely linked with the requirements and demands of the job market. Thus, the university can institutionalize efforts to bridge the gap between the professional and educational world. This industry-focused approach to university education, in developing countries like Oman, will work to broaden the scope of economic improvement while nurturing a highly skilled workforce – a critical ingredient for the successful deployment of Oman's e-government by 2012. All levels of students are given an opportunity to work through the practical training component given by trained Cisco, Microsoft, and Oracle employees. In this model, all levels of students are given an opportunity to work through practical workforce training components provided by Cisco, Microsoft, and Oracle employees. While at the same time, partnering academic institutions such as the University of Queensland, play a vital role in Sohar University's global academic distinction by offering program development, academic review, and shared resources for joint research.

Key Words: University- Industry collaboration, Learning, Quality and Society, linkages, technology training.

1. Introduction

The Sultanate of Oman, with an area of 309,500 square kms, Sultanate of lies on the Tropic of Cancer in the extreme southeast corner of the Arabian Peninsula, covering an area of major strategic importance [1]. The country's breathtaking coastline stretches for over 1,700 kms, from the Arabian Sea and the entrance to the Indian Ocean at its south-western extremity, to the Gulf of Oman and Musandam in the north, where it overlooks the Strait of Hormuz and the entrance to the Arabian Gulf; a location that has played a vital part in Oman's strategic development. The population of Oman according to 2003 Census is 2,331,391 with expatriates forming 23.9% of total population[2], In an age of globalization the need for technical skills is essential, a realization that the country of Oman, and specifically Sohar University, has embraced. Sohar was an ancient capital of Oman and many believe it to be the birthplace of "Sinbad the Sailor". Having a rich sailing history, Sohar was traditionally a fishing town, but it is more recently known as Oman's industrial hub due to the massive developments in the Sohar Industrial Port. Figure 1 shows the location of Sohar in Oman.

Oman's economy relies heavily on its dwindling oil resources. Currently, Oman is planning to decrease its reliance on oil and move to diversification, industrialization, and privatization. Tourism is one of the areas that Oman starts to focus on increasing national income. Attracting new industries and opportunities in alternative fields is the other focus of this growing country. Trained and skilled manpower requirement is the foremost requirement for such venture for any country as the majority of Omani's is under the age of 35, with median age of 19. Oman has been a neutral country and has not been involved in any of the wars in the region. According to vision of humanity [3].org, Oman has been listed as one of the most peaceful countries in the world.

Oman's main economic driver stems from its internal population growth; it ranks 9th the indices of highest growth in the world at 3% per annum, based on The World Fact Book [4]. Following the footsteps of most developing nations, Oman adheres to the policy of developing and tapping the resources of its own 2.3 million populations - one of its most powerful major socio-economic influences, 83 % of Oman's population are under 35 with median age is 19. Further, according to Oxford Business Group [5], the publisher of Oman, 2010, Oman's growing demographic

trend is young, well educated, affluent and with an increasing proclivity towards western-style consumerism. Oman is currently experiencing a rapid growth in the adoption of mobile access technologies and social media due to the large population of the millennial generation, indicated by 55% of its population is under 20. This phenomenon is made apparent in the surge in mobile telecom sector, expected to reach almost 2 Billion US dollars by 2012, according to Pyramid Research [6].

In the age of globalization the need to learn how to use a computer is essential. So Oman is one of the developing countries that motivates its people to learn how to use computers. As a result, Sohar (Arabic: صحار) is the most developed city in Sultanate of Oman outside the capital Muscat. It is about 200 km north of Muscat and about 200 km south of Dubai. Sohar was an ancient capital of Oman and many believe it to be the birthplace of Sindbad the Sailor. Having a rich sailing history, Sohar was traditionally a fishing town, but it is more recently known as Oman's industrial hub due to the massive developments in the Sohar Industrial Port. Figure 1 shows the location of Sohar in Oman.



Figure 1. Sohar

Oman's youth population, with its propensity for using technologies as their medium of communications, provides a suitable backdrop for businesses willing to invest in Omani infrastructure both in private and public sectors. As a result, Oman has been heavily investing in the educational development of its youth population and has opened its education sector for privatization.

At present, there is one state university and four main private universities operating in Oman, providing various levels of expertise and demand-driven knowledge, in addition to a number of university colleges and colleges offering diploma, advanced diploma and bachelor degrees. In today's climate, the market requires an entrepreneurial approach to education and high demand for students who need to *create opportunities rather than search for opportunities* in the market.

2. Sohar University

Sohar University is the first private university at the Sultanate of Oman. It is founded as a college in 1998 and transfer to University in 2001. Sohar University's educational approach is entrepreneurial. The university is taking initiatives to enhance and innovate the education of youth in Oman through collaborations with education and industry partners [8]. As shown in Figure 1, Sohar University interacts with four groups in order to offer enterprise service to society. From the education side, Sohar University partnered with The University of Queensland in Australia in the areas of Computing and Information Technology, Engineering, Business, Translation, and Journalism. In addition, Sohar University partnered with Mutah University in Jordan to offer master courses in teaching methodology and curriculum development. As a private university dependent on student fees for growth, support, and research, Sohar University, has greatly benefited in 2009 from alternate funding totalling close to one million US dollar from a variety of streams. However, students are still expected fund their enrolment or find scholarships from the government or private sectors. In addition, Sohar University has number of scholarship schema to best students from secondary schools to complete undergraduate study. Sohar University recently approved partially scholarship to Omani staff to complete their postgraduate study at The University of Queensland. This is based on the commitment of the university towards the development of Omani society. Furthermore, Sohar University is working with local industries to offer scholarship to Omani students. For academic year 2010-2011, Sohar University signs an agreement with Sohar Aluminium to offer number of scholarship to Level One students in

Faculty of Computing and Information Technology and Faculty of Engineering to complete their undergraduate program.

Sohar University works closely with industrial sectors to leverage the practical side of the offered program at Faculty of Computing and Information Technology (FCIT). Therefore, Sohar University through FCIT has established a number of agreements with global organizations to offer practical programs that are embedded with the current programs. Such programs include the Cisco Academic Program, Oracle Academic Initiative Program, Adobe Programs, Microsoft IT Academy and Digital Literacy Program (Internet and Computing Core Certificates (IC3)) from Certiport. The above programs are selected to cover some of the basic areas of computer sciences, such as: Networking, Database, Programming, Computer Concepts, and Multimedia. In some cases, the students need to pass a specified exam by the program in order to obtain a certificate. Examples include in the Cisco Academy, Adobe, IC3 and Oracle Programs.

Regarding the community services, Sohar University assists the community through offering training programs, free lectures to students in schools and others, and sharing in different community activities. Faculty of Computing and Information Technology run a training program on June-July 2009 in collaboration with Sohar Aluminum and Ministry of Social Development to train one hundred Omani people from community on digital literacy. Students from final year students and Level Three students acted as instructors in this session.

All the three parts of the university involvement assists the students to have better education, training and be more active in serving community. This has positive impact on the whole education process in the university and hence in serving society.

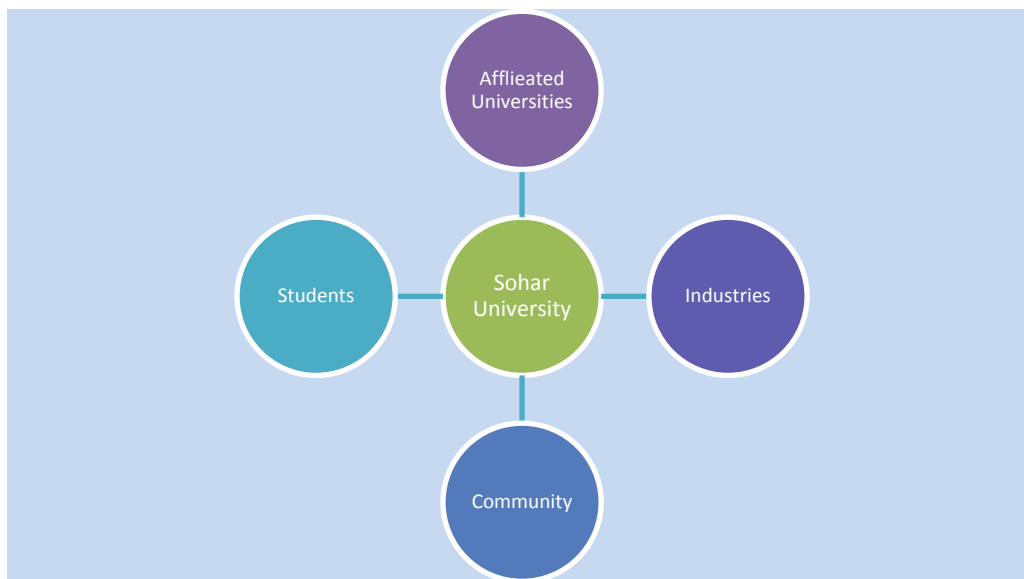


Figure 2. Sohar University Model

3. Challenges Facing Higher Education in Emerging Nations

Sohar University is a small regional university, owned and operated by private body in the sultanate of Oman and serves an on-campus population of around 4,500 students as well as over one hundred off-campus part time students. Like many other institutions of higher education, Sohar University sees the potential for learning through an entrepreneurial approach that addresses core costs, infrastructure, and quality issues related to instructional learning [11]. We have invested early and significantly in campus-wide systems to produce an improved method to coursework design and delivery. This approach and initiative has required close cooperation and coordination between the university's partners: University of Queensland, University of Mutah and industry market leaders in their respective fields. Ongoing collaboration amongst these and additional partners is needed to ensure a shared understanding of university-wide challenges that need immediate attention [7]. The choice of Sohar University for its leadership as a partner with world-class universities reflects their commitment to quality programs and follow-through for the long term. At the same time, Sohar University student's access equipment and labs that rarely, if ever, offered at the junior university level [9]. This collaboration assists Sohar University staff to do joint research

with the researchers at both universities. Sohar University is looking now for student exchange program with The University of Queensland to give international experience to Sohar University students.

3.1. Lack of Funding/Resources

Sultanate of Oman is a developing economy and institutionalization of entrepreneurial learning is very much needed. Contrary to popular belief, resources for private universities are not abundant and students cannot afford to attain various professional courses. The government is taking initiative in providing sponsorships for professional courses. However, the demand to cover the gap of offering professional skilled workers reflects a need similar to many developing economies [14, 15].

3.2. Lack of Local Expertise

Oman acknowledges a lack of trained manpower. At the same time, the industrial sector in Oman is growing very fast and the demand for a local skilled work force is high. Industries are looking for graduated students with strong practical experience. Sohar University, in particular, is taking initiative for developing local talent in the field of information technology and engineering.

4. Youth Engagement (Male/Female)

Sohar University represents an opportunity for enrichment, particularly because of the receptivity to women's education. At Sohar University, we found that the male- to-female ratio in technical education is comparable to the rest of the world. Female students formed approximately 65% of the total number of the students in the university and approximately 80% of the number of students in Faculty of Computing and Information Technology. Female students are diligent and motivated to learn. For example, in Level One in Faculty of Computing and Information Technology, up to 150 students are admitted. The current student ratio is around 130 female students to 20 male students. From Level One to Two, about 65 % of the female students pass the level, while only around 20-20 % of the male students pass to Level Two. In short, female students find greater success and are more motivated than their male colleagues.

Sohar University is aware of the need for all students to achieve, and is taking the initiative to motivate the local youth through these industry oriented courses. Secondary school students are invited into a number of technical training sessions in order to increase their interest and awareness in completing their studies. More focus and attention are brought to male students, because they are not doing better, there is scope of improvement in the area. Academic staffs of Sohar University are approaching students at the secondary schools through conducting lectures to schools.

5. Types of Jobs/Economic Opportunities

As discussed earlier, though Oman currently depends on its oil-based economy, the country is making efforts to diversify and invest in its other sectors such as metals, cements, building, fisheries, and seafood. The country has the intellectual resources amongst its youth to make this a reality. Information technology and allied fields also create ample opportunities in the country. There is a vast range of emerging industries in Oman now and several potential job opportunities. At the time of global recession, the country has survived with little effect on the economy. Most of the industries and government sectors are looking for skilled graduated students in these new ventures to ensure continued economic growth.

6. Government Proactive Programs to Overcome Challenges

The Ministry of Manpower, Ministry of Higher Education, Ministry of Social Welfare, and the Information Technology Authority of Oman are taking a proactive approach to overcome the challenge of preparing an Omani skilled workforce. Most of the ministries have scholarship opportunities for the students to continue their higher education. The government announced in 2010 a yearly scholarship for 500 female students to complete their university study. This is in line with increasing the education opportunities for Omani women.

The Omani government has recently created the Research Council of Oman, a new government body devoted to promoting research in the country. More specifically, the council is heavily funding research proposals and projects to develop the area of Information Technology.

The Information Technology Authority (ITA), the body responsible for bridging the digital divide in Oman, has launched an e-government initiative in August 2009. The mission of the initiative is to provide governmental

services to all citizens and residents through an E-Government Service Portal, through the mobile and fixed line services already in the country

In spite of the high coverage in telecom access, internet penetration is relatively low. An OpenNet initiative reported a 16.8% penetration rate in 2008, mainly due to a lack of competition in the telecom market - most internet services are provided almost singularly by OmanTel, a state-owned incumbent Internet Service Provider.

Additionally, a lack of adequate telecommunications bandwidth poses a serious barrier to providing 21st century communications-based technology, which has been the hallmark of many developed nations. High labour productivity in these nations has been largely attributable to the efficient incorporation of these technologies into the fabric of socio-economic infrastructure.

7. Engagement with Secondary Schools

Sohar University takes the responsibility towards assisting the students in secondary school in improving their skills. Therefore, the university conducted number of lectures and training programs for the students at the secondary schools. The programs are distributed among IT, Engineering, Physics, Chemistry and others which have positive impacts on the students. Faculty of Computing and Information Technology conducted number of lectures in concepts of computers, introduction to multimedia, computer troubleshooting and others. Faculty of Engineering run a workshop for secondary schools students at university labs to do some basic physics and chemistry experiments.

8. Community Project

Sohar University is taking its role in assisting the community through conducting number of training programs, lectures and workshop. For example, Sohar University, in partnership with Sohar Aluminium, the Ministry of Social Development and ITA implemented the idea of teaching a group of people from the local community about how to use computers. The idea of the course was initiated by a small group of students from the Faculty of Computing and Information Technology at Sohar University, which supported by the staff at that faculty. The selection of participants was organized by the Ministry of Social Development and Sohar University on the basis of 80 people from the Ministry of Social Development and 30 from Sohar University. The Ministry of Social Development selected participants from the families that they look for a job. The course ran for 2 months (June and July, 2009) covering 33 hours. The number of participants on this course was 110 and their ages ranged between 20 and 38 years. Figure 3 shows the number of male and female participants. The course covered computer concepts, working with Web and e-mail, and using Office applications.

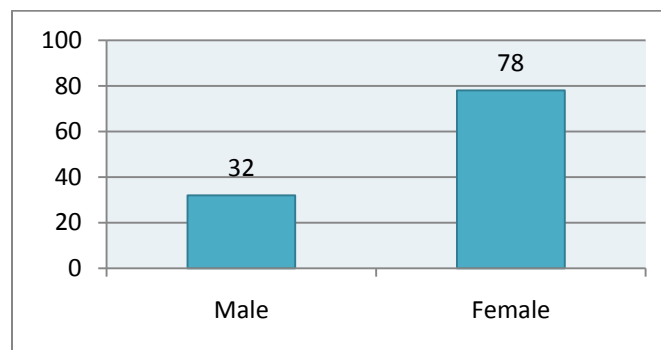


Figure 3. Participants in Community Training Course

9. Case Study: Sohar-Cisco Program

A joint-venture effort between Sohar University and one of technology market leaders, Cisco Systems, took place mid-December 2009. It took about a year and half from the time the idea was conceived to executing it into reality.

A Cisco volunteer team and Sohar University faculty and staff collaborated to organize a training week for young Omanis at Sohar University on December 2009. The goal of the training program is to showcase the important role of information and communication technologies (ICT) in bridging the gap between the haves and have-nots in an education vertical as depicted in Diagram 1.

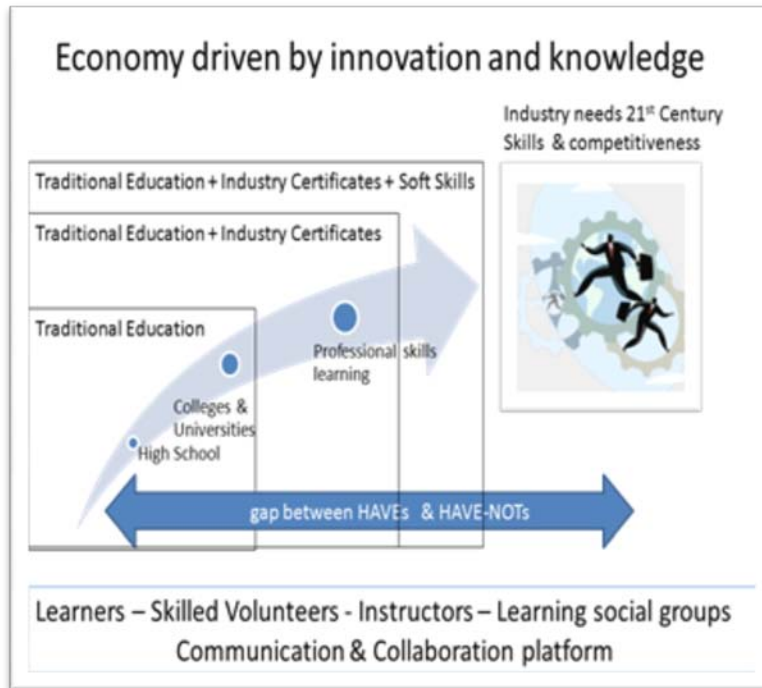


Figure 4 Economy driven by innovation and knowledge

A global team of 27 Cisco volunteers representing employees in Dubai, Egypt, KSA, Lebanon, Belgium and the US along with a team of 5 Sohar University faculty members came together in Sohar, Oman, with Fast Lane, a Cisco Learning Partner, to conduct technology training and promote discussions on how ICT training can facilitate the transformation of Oman’s society by developing and empowering Omani youth. The first event after beginning of the event included a panel discussion then followed by technical talks and then technical sessions for the students. Local governmental (Information Technology Authority of Oman) and industrial partner (Sohar Aluminium) participated in the discussion panel along with the senior people from Cisco. The target of the discussion panel was to increase the awareness of young Omani towards information technology

9.1. Business Outreach: Setting the Course

The goals of delivering a pilot training program to university students and high school students were three-fold

- Increase technology awareness,
- Enhance technical and business skills for local workforce development,
- Focus on philanthropic and community outreach.

9.2. Knowledge Exchange

In December 2009, Cisco volunteers delivered a five day IT development workshop to over 120 university and high school students at Sohar University at one of 12 Academy sites in Oman. Sohar University hosted the event and both private and public representatives from local IT sectors attended the opening session. Women pursuing bachelor degrees in Computer Science and IT related to engineering careers comprised more than 80% of the attendees.

The training tracks included IP Telephony, Wireless, Green Initiative and Professional Development. The topics, content and audience were selected based on input from various stakeholders, including Dr. Wail M. Omar, Dean of Faculty of Computing and Information Technology at Sohar University, Oman’s Information Technology Authority (ITA), and Cisco Networking Academy teams based in Dubai and Lebanon [12, 13].

The following is a detailed description of the four courses being offered during Dec 12 through Dec 16, 2009:

- **IP Telephony:**
 - This course provides an introduction to converged voice and data networks as well as the challenges faced by its various technologies. The course presents Cisco solutions and implementation considerations to address those challenges. In this course, students will learn about Cisco Call Manager Express (CME) architecture, components, functionality and features. They will also learn some Voice over IP (VoIP) and Quality of Service (QoS) technologies and apply them to the Cisco CME environment.

- **Wireless:**
 - This introductory course to Wireless LANs focuses on the design, planning, implementation, operation and troubleshooting of Wireless LANs. It contains a comprehensive overview of technologies, security, and design best practices with particular emphasis on hands on skills in the following areas:
 - Wireless LAN setup and troubleshooting
 - 802.11 (a, b, and g) technologies, products and solutions
 - Radio Technologies
 - WLAN applications and site surveys
 - Resilient WLAN products, design, installation, configuration and troubleshooting
 - WLAN security
 - Vendor interoperability strategies
 - Emerging wireless technologies

- **Green Initiative:**
 - This course provides an introduction to Green Technologies as well as raises awareness on Green practices to help reduce one's environmental footprint. The focus of this course are listed below:
 - Green Overview – Introduction to Green technology and practices - Visual Demo showing technology in action
 - Cisco On Cisco Case Study – Green Technology as adopted by Cisco IT and Work Place Resources
 - EnergyWise Lab Exercise – Familiarizes the student with Cisco EnergyWise, an innovative technology embedded in Catalyst Switches that manages and monitors the power consumption of the network. EnergyWise provides optimizations in GhG emissions and operational efficiency and helps customers to proactively lower their operational costs while minimizing their carbon footprint at the same time.
 - Interactive Activities – Involve students in group activities to come up with Green Initiatives. Form a University Green Board for future participation and ongoing involvement.

- **The Professional development:**
 - The curriculum was divided into 4 classes:
 - Resume Writing: This class will demonstrate the importance of a well-written resume and provide useful tips about the do's and don'ts for preparing a resume. Students who have already prepared their resumes will have the opportunity to have their resume critiqued by the instructors.
 - Interview skills: This class will introduce the various types of interviews that employers may use to assess a suitable candidate. The class will then proceed to focus on the most common type of interview technique used by multinationals firms – the competency based interview. The students will have the opportunity to participate in mock interviews with their peers using their own resumes as a basis for conversation.
 - Teamwork and importance of collaboration: This class will focus on the importance of teamwork in the workplace. Students will participate in two fun team-building exercises. The instructors will provide feedback to the groups about individual as well as overall performance.

- Non- verbal communications: The class will address the topic of non-verbal communication. Students will be presented with differing scenarios that will demonstrate how body language can either enhance or endanger an individual's performance or perception.

The volunteers, who delivered the training on site, were motivated to openly share their knowledge and professional expertise in both theory and practical hands-on labs. The success of this program emphasized the importance of connecting academic offerings with practitioners and experts in the field.

The initial feedback collected from the university staff, students and IT professionals was very positive with requests for future programs. The students requested another training week in the second semester and following years. For the Cisco team, this was an opportunity to further develop their own professional skills, extend their professional network and gain a better understanding of the ICT needs of the region. For Sohar University staff, the goal was to increase the involvement of the university staff in community services and to assist the students in getting more practical experiences.

On the last day of the program, Sohar University arranged a special training session for high school students. A total of twenty students, fourteen females and six males from around the region participated in the session. The session comprised of a campus tour, briefing about the Sohar University and a workshop on Cisco IP Telephony and Profession Development. The session lasted from 9:30 am to 2:30 pm with a 30 min lunch break.

The students were very enthusiastic to learn about the Cisco technologies. They wanted to know more about the concepts and technologies. It was a very interactive class and students were really excited to work on the lab exercises. Students were seen enjoying their labs, interaction and calling each other on a Cisco IP phone. All the students were able to successfully complete the lab exercises with minimal help.

In the professional development class, the students learned about the importance of a team and team building in a professional environment. The students were divided into four groups with five students in each group for the team building exercise. As part of this exercise, students were given two tasks, "Survival Story" and "Lego Building".

In survival story, each group has to come up with a hypothetical story about how the team would survive a plane crash in Amazon Jungle. The teams were asked to select six items from a total of fifteen items found along the panel, debris that could help them in survival, and make up a story on how they used these items in their journey from the Amazons to civilization.

In the Lego building session, the teams were asked to replicate the prebuilt Lego model. Only one of the team members was allowed to see the model for two minutes. He/she then has to describe the model to the rest of the team and try to replicate the model. Both exercises were really fun and students enjoyed every bit of it. They were willing to extend the class duration to do more lab exercises. We received positive feedback from the students about this session. Some comments included: "[This session was] the best class I have ever attended", "After I graduate from high school, I will attend Sohar University to learn about Cisco Technologies", "Before this class, I had plans of becoming a doctor, but now I will reconsider it, I may become a computer engineer, I will join Sohar University", "This was an easy and fun way of learning new concepts, I learned a lot from this class", "When are you taking this class again, we want to attend again and invite our friends too", "It as a very good class, it's very good, one of the best.

9.3. Post Project Analysis for Developing Local Talent at Sohar University

9.3.1. Panel Discussion

In the panel discussion, panellists touch on sensitive issue about the lack of practical pedagogical methodologies. Though academics try to remain vendor-neutral, in Oman's current economic and educational situation, specific technology training is vital to the countries growth. Vendor-specific training is necessary at this time. The panellist identified the following points:

- Need a program track for the 5-day to be displayed as part of the opening session
- Need to have a key takeaways to deliver to the students

- Need to involve more people, invite more government sector
- Need to focus on different technologies not just Cisco's
- Need to discuss specific elements of improving Omani talent – how can Sohar University help with both technical and academic parts
- Need to bring additional dimension to the program by adding coop/internship/job fair/exhibits
- Invite other industries such as financials, health, IT to present at the forum
- Bring topics to the forum to discuss government need to create more opportunity – address the issue of talent pipeline and supply chain to produce the talent

9.3.2. Training

There was a practical training session meant for students to acquire practical knowledge of the networking and following was some of the observation of the session

- Optimize the material to the right student level
- Provide pre reading course content for students
- Provide a 10 min video for the course – covering overall course content, goal and lab takeaways
- Students are eager to learn and need practical experience. University needs to do better job to give the students the appropriate-level program to achieve this goal. The academic world most often is removed from the real world.
- Pre-requisite for online survey – to find out the level of IOS familiarity
- Create follow-up plan for the students – how can we continue to engage and mentor the students. How the students gone thru the program can take lead and conduct similar course for their juniors
- Would like to offer similar training over WebEx once-a-month. Technology starving with hard working and fast learning students wanting to gain knowledge to support their country and the rest of the world

9.3.3. Professional Development of the Cisco-Sohar University Team

The following represents feedback received from Cisco volunteers regarding how the event had contributed to their personal and professional development growth

- Diverse group of people never worked with each other before yet driven by a single goal to give back to the community.
- Most unexpected and pleasant surprise to note that 80% of the students were females. They were more interested to learn and complete the course content than their male counterpart.
- Corporate Social Responsibility (CSR) employees working with Non-CSR employees - in different level of engagement and interaction as in difference between working with paying customers vis-à-vis non-paying customers.
- Challenges of inclusion – how to be more inclusive with team members who are less vocal but play a significant role. Could unintentionally send a wrong message resulting in a disengaging team member.
- Focus in higher collective value; deliver a cohesive solution, inclusive and collaborative. There are different approaches in the culture – we celebrate the diversity.
- Volunteers should share each other's tracks to broaden the scope of knowledge and share ideas. Digital Media Signage demo could have been delivered better with video portal/source avail from another volunteer.
- Learn to be more engaged and listen to the students' needs.
- Plan to develop a different method of teaching – lecture intersperse with labs rather than a whole day lecture and a whole day of lab.

Additional feedback for the event is posted on Ayelet Baron's blog [16]. Ms. Baron is the Cisco Director of Sales Strategy& Planning for emerging markets.

10. Conclusion

In this paper, we presented our experience of a successful university-industry linkage and how it facilitates the public-private partnership through a recent “Developing Local Talent” workshop event, which was successfully executed through a tight collaboration effort between Cisco and Sohar University. This event showcased how the delivery of practical network technology training, conducted by Cisco professionals, brought a glimpse of the real-world experience into the classrooms for university and high school level students. With this kind of learning approach we can produce a skilled workforce from eager Omani youth working to promote the economic success of Oman.

Currently, Sohar University is looking to leverage Teachers Without Borders’ [17, 18] Web 2.0 toolset as a valuable communication and collaboration platform to connect the learners to instructors, content and program designers, locally and globally. The use of an online collaboration tool will reflect a fundamental shift in how the society can participate in education, where learning can take place anywhere and anytime. The adoption and deployment of Web 2.0-based tools in our university environment, such as the one currently being developed by the non-profit organization Teachers without Borders, is critical to the continued success for sustainability and growth of our educational programs.

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