COMPUTER RELATED EDUCATION IN ARMENIA

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Areg Gharabegian, Granada Hills CA, January 2016

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Number of IT Companies

One of the reasons for this fast growth has been the availability of relatively cheap and competitive human resources which has attracted foreign IT companies to establish branches and operations in Armenia. IT/high-tech is a high value-added sector, and increasing jobs in this high paid sector will have a positive effect for the economy as a whole.

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Armenia has a competitive workforce in comparison to the international market with a relatively favorable trade environment and regulations. Quality education is a key ingredient for a thriving IT sector in Armenia.

Growth of IT Sector

The outsourcing model has attracted the attention of the international companies which has led to foreign investment during the last several years. However, IT sector in Armenia is currently

undergoing a major transformation. Companies are trying to shift from the outsourcing model to a more value added and higher margin product development. This model requires a higher level of knowledge as well as new skills such as sales and entrepreneurship.

The presence of international companies, which bring specific work and development culture into the country, has had its impact on the move toward value-added activities. This shift could potentially cause more growth. As the business model changes, the education sector also needs to adapt for the new challenges in order for the IT and high-tech sectors to stay competitive.

The increasing demand for IT skills is a global trend, but in Armenia it is more constraining due to the small size of the labor force. The shortage of skilled workers is increasing as the industry is becoming more sophisticated. Lack of skilled IT workforce is a key factor that hinders sector growth.

In 2014, approximately 11,500 people were employed in the IT sector, which accounted for about 10% growth compared to 2013. In 2015 the number was raised to 15,000. The number of annual graduates with IT specialization is higher than the annual demand, but only 45% of the graduates are considered as qualified by various companies.

Synopsys is the largest software company in Armenia with 650 employees and their operation in Armenia is the largest office outside the US. Synopsys entered the Armenian market in 2004, after it acquired Monterey Arset and Leda Design. Later, Synopsys enlarged its presence in Armenia by acquiring HPLA in 2005 and Virage Logic in 2010.

The limited supply of qualified labor is inflating salaries; however, current salaries are still considered competitive. In 2014, the monthly salary of IT employees varied between $300 to $3,500 where as the average monthly salary in Armenia in early 2015 was about $341, which is almost equal to the lower range of the average IT sector salary. Monthly salary of some well qualified and knowledgeable specialists reaches up to $4,500.

The average labor productivity in the IT field is almost five times higher than the general average of the economy. Productivity is growing as well, which is a sign of the sector's maturity.

Universities with Computer Training

Approximately 8,500 students were enrolled in computer related studies in 2013-2014 academic year, which is about 10% of the total student population. In comparison, approximately 20% of students were in the fields of economics and business management.Annually 1,700 well-paid jobs are created in the IT sector and annually there are about 2,000 graduates from various universities, hence only the best ones are hired for these openings. The number of the graduates in IT related fields has been stable since 2010, even though the total number of students is declining due to low birth rate and emigration. Because not all the graduates are qualified to work in IT companies, in late 2015, there were approximately 2,000 unfiled positions in the sector when there is double digit unemployment in Armenia.

There are five universities that have most of the students in the field of computer related studies. There are also several smaller schools with limited capacities and infrastructure. The five large universities are: State Engineering University of Armenia, Yerevan State University, Russian-Armenian (Slavonic) University, American University of Armenia, and European Regional Academy.

Yerevan State University (YSU)
YSU was established in 1919 and is the largest university in Armenia with over 12,000 students. University offers programs in different specializations in a wide variety of areas including economics, history, linguistics, legal studies, mathematics, biology, physics, etc. The Mathematics and Physics Department which was established in 1924 and Informatics and Cybernetics Departments which started in 1971 provide courses in the field of IT.

The Information Technologies Educational and Research Center was established in 2007 to provide programs in tutoring/mentoring, continuous education, scientific research, as well as development and installation of information systems. The Center also offers online and distant learning courses.

State Engineering University of Armenia (SEUA) (formerly Yerevan Polytechnic Institute)
University was established in 1933 and it offers degrees in engineering and science. The main campus is in Yerevan with branches in several other cities. Presently there are approximately 10,000 students. SEUA offers courses in computer systems, design and installation of networks, artificial intelligence, study and development of dynamic systems, analyses and synthesis of management systems, microelectronics, as well as microchips techniques.

American University of Armenia (AUA)
AUA was established in 1991 and initially offered only graduate programs in accordance to U.S. educational standards. In 2013, AUA started providing undergraduate programs including computer science. Presently there are 1,000 undergraduate and 500 graduate students.

Russian-Armenian (Slavonic) University
The Slavonic University was founded in 1997. Programs include mathematics and math modeling, software development, electronics, information and telecommunication, and chip design in addition to non computer related programs. Presently about 425 students are enrolled in various programs.

European Regional Academy
The European Union established this academy in 2001 which offers computer programming and IT business management. It also has programs in three foreign languages; English, German, and French. Currently, 250 students are enrolled in various programs.

Quality of Education
Despite the recent reforms in the education system, the instructional methods that are currently used in the universities do not fully satisfy demands of the IT sector for highly qualified specialists. Funding is the main hurdle for improving the quality of education in universities. Government provides limited funds to the universities but these funds are not adequate. Universities are not able

to raise tuitions either as most of the students cannot afford to pay even the existing tuitions.

Another issue that effects education is the low faculty salaries and the aging staff. Salaries are especially low in the larger universities, such as SEUA and YSU, due to higher overhead costs and laboratory expenses. There are also other issues that include lack of textbooks and specialized literature as well as inherent difficulties associated with private sector cooperation.

There hardly is any financing from private donors for various educational programs. Only a small number of companies have established joint programs with the universities such as R&D projects or competitions for students.

World Economic Forum has ranked 140 countries for 2015-2016 and according to their rankings; the primary education in Armenia is at 68th place and the higher education is at 72nd place. In addition, the quality of math and science education is ranked 47th.

Training by Private Companies

Because the current educational system is not able to provide graduates who possess the required skills, some companies have established their in-house training programs to prepare their future employees. Some students attend these training programs right after high school without attending any additional formal training at a university.

Many companies provide non-paid internships for new graduates. It is a common practice to recruit interns and train them to take part in company's small projects, then select the best ones for permanent positions.

The objective of such trainings is to prepare entry level specialists for Armenia's IT companies. These types of educational establishments do not charge any tuition but have limited openings and select only the best candidates. Class sizes are kept small to allow quality training and one to one interaction with instructors. After graduation from the company training center, the best graduates generally receive job offers and the rest have no legal obligations to the training company and are free to find employment in other IT companies.

Specialized company labs have been established and financed in the universities by private companies to provide training to the students. These labs are mainly aimed at preparing specialists for the investing company. Due to the more certain future employment possibilities under this model, company labs are in high demand among the students. The best known lab is the one established by Synopsys Armenia in SEUA. The disadvantage of such labs is the fact that they provide specific training geared to the needs of the company which may not be applicable for other companies.

While training by private companies generates employees with basic IT skills, the ever-increasing sophistication of IT products will require a strong multi-disciplinary educational background that can be provided only by universities.

Other Training Facilities

Armenian National Engineering Laboratories (ANEL) was founded in 2013 as a joint effort of Government of Armenia, USAID, National Instruments, State Engineering University of Armenia, and Enterprise Incubator Foundation. It is a center of excellence that hosts 30 state-of-the-art education and research laboratories located on the campus of State Engineering University. The main goal of the ANEL is to meet the demand of the engineering industry by providing quality specialists.

There are also training centers supported by government/donor or international corporations, such as the Microsoft Innovation Center, the Armenian-Indian IT Center of Excellence, and mLab ECA.

Faculty of Universities

The average gross salary of a full-time professor in the large universities ranges between $300 and $500, whereas the average IT sector salaries could be potentially ten times higher. This imbalance in compensation makes it hard for universities to hire well qualified specialists for various teaching posts.

Less than 1/3 of university lecturers have ever been employed in the sector and have hands-on experience in the industry. This, in combination with the high average age, implies that the teaching methodology is rather theoretical. Younger faculty members mainly work part-time in the university as they are also employed in private companies. Part time faculty members that work in the field could teach the latest techniques and innovations to the students but they may not engage in academic research due to lack of academic career priority, which could affect teaching quality.