

Technologies And Educational Opportunities Of Azerbaijani Economy

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Abstract

This paper presents the evaluation of Azerbaijani Economy from the perspective of information technologies and educational opportunities. The progresses on information technologies (IT) that denominated to this century have become the principal determinants of economic activities. Given advantage of its young educated population, Azerbaijan as one of the developing countries is taking an opportunity to survive from vicious circle of backwardness through the information technologies and educational development. From this point of view, it is explained the SWOT Analysis of Azerbaijan in terms of information technologies and education sector's role towards Azerbaijan economic development.

Key Words: Azerbaijan Economy, educational opportunities, information technology, SWOT Analysis.

Azerbaycan Ekonomisi Bilgi Teknolojileri ve Eğitim Fırsatları

Özet

Bu makalede; Azerbaycan ekonomisi, bilgi teknolojileri ve eğitim fırsatları perspektifinden değerlendirilmektedir. Bu yüzyıla egemen olan bilgi teknolojileri alanında yaşanan süratli gelişmeler, ekonomik aktivitelerinde temel belirleyici aktörleri olmuşlardır. Genç ve dinamik nüfusu göz önüne alındığında ve diğer kalkınmakta olan ülkelerle karşılaştırıldığında, Azerbaycan bilgi teknolojileri ve eğitim fırsatları üstünlüğü sayesinde geri kalmışlık kısır döngüsünden kurtulma yönünde önemli bir avantaj yakalamaktadır. Burada, konu bu perspektifle ele alınmakta ve sürdürülebilir ekonomik kalkınma için, Azerbaycan'ın bilgi teknolojileri ve genç nüfusunun eğitim fırsatları açısından SWOT analizi yapılmaktadır.

Anahtar Kelimeler: Azerbaycan Ekonomisi, eğitim fırsatları, bilgi teknolojisi, SWOT analizi

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Introduction

Recent rapid improvements in the information and communication technologies in the last decades of the 20th century have affected all parts of society by giving birth to new concepts such as “e-trade”, “new economy”, and “knowledge society”. Since scientific and technological developments required mostly the more educated and qualified labour in the production process, education has gained strategic importance in the achievement of economic development and productivity in the maintenance of competitive advantages. By the domination over the production process, information and technologies is also being indexed as one of the productions factors such as labour, capital, natural resources and enterprising as we regard to the classic factor of productions, only necessary technology and after getting efficient information on this technology, will have facility for disposal. It’s precluded the employment of production factors causing unsatisfactory information. Asymmetric information dilemma in accessibility of information is a big barrier for competition in the market to the full employment of production factors.¹

Each country that wants to successfully continue sustainable economic development while establishing its education system must think more globally and train more qualified human capital power that can compete easily in the global market conditions. Given an advantage of its young educated population, Azerbaijan as one of the developing countries is taking an opportunity to get rid of vicious circle of backwardness through the information technologies advancement and economic development. If Azerbaijan could provide efficient education standards for its young population and could constitute necessary structural changes in education system, then, it will be able to take a competitive advantage of education and have done a significant progress to establish R&D facilities infrastructure towards the information technologies.

Azerbaijan’s Scientific and Technological Position

On October18, 1991, Azerbaijan that gained independence with the

¹ William H. Schmidt, Richard T. Houang "Education in The Sciences" **Science, Technology, and Society**. Ed. Sal Restivo. Oxford University Press 2005. Oxford Reference Online. Qafqaz University in Azerbaijan.
<http://www.oxfordreference.com/views/ENTRY.html?subview=Main&entry=t210.e29>, 12 May 2006,

collapse of the USSR, at first, faced many social and economic problems, but then, achieved to solve its problems in the course of time. Furthermore, it, as an independent state, has been an important player in the international economic and political sphere. That powerful ruling party that has been in power for a long time and its successful steps in the direction of economic development has been the one of most important driving forces sitting behind the development of Azerbaijan.² Particularly, the oil-production sharing agreements called “*contract of the century*” that was signed in 1994 among the 33 companies from the 19 different countries, has been another significant motivating factor for the economic development approximately with the 60 billion-dollar investment and 200 billion-dollar returns goal.³ There are several government programs being implemented for the well-balanced development of oil and non-oil sectors in the country. At this point, it is the fact that there are still lots of serious problems and difficulties in the country; however, on the other hand, it can be seen that there are significant social and economic achievements and developments as well. These commitments and achievements are expected to continue according to the goals and programs of the State government.⁴

In considering the fact that the oil-production will have been reached to its maxim level of 1 million-barrel a day in 2012-2015, it is clear that Azerbaijan will be able to adapt easily to the fast-changing world conditions, and its social and economic development will continue. Furthermore, the governments’ commitments in the direction of information technologies and scientific tasks realized in cooperation with international companies ensure us in this. Azerbaijan is expected to even pile up the gap in the information technologies in the region after completing its development. For realizing this, priority is given to the establishment of the important techno parks and the training of human resources; therefore, they are all considered in several state programs. In addition to this, several infrastructure investments planning such as setting fibre optic cables for transmitting information with no trouble from

² Ali Hasanov, **Modern International Relations and Azerbaijan’s Foreign Policy**, Azerbaijan Publications, Baku, 2005, pp. 211-212.

³ Musfik Atakisiyev, **Azerbaijan’s New Oil Policy and Economic Development**, Azerbaijan Publications, Baku, 2005, p. 77.

⁴ İlham Aliyev, **The Conference Devoted to Second Year of the Government Program about Social and Economic Development of Regions**, http://www.president.az/s09_speeches/speech_177_a.html, 28 Nisan 2005.

the north-to-the south and the east-to-the west were made because of Azerbaijan's central geographical position.⁵

It could be the important advantage for Azerbaijan to have such a big potential in taking an active role for the development of information technologies in addition to its young and dynamic population. Relatively lower-wage levels within the country compared to the western countries particularly draw foreign investors' attention. It seems attractive for the Western countries to use these advantages for transporting technology through Azerbaijan to the other countries. Thus, the country can reach success by evaluating internal programs and assistance of the some external organizations from current and potential scope.

Table-1: General Information about Azerbaijan Profile (2008)

Official Name	Azerbaijan Republic
Capital	Baku
Territory	86.600 (km ²)
Official Language	Azerbaijani
Monetary Unit	Manat (1\$=0,8020 AZN)
Population	Total : 8.68 (2008) Distribution : %51.8 Urban (2007), %48. Rural Annual Growth Rate : %1,1 (between 2006-2008) 0-35 Ages : %62
Unemployed	Registered : 55.945 Percent of the Active Population : % 1,5
GDP	46 (current US\$) (billions)
Budget	6,006 mln USD
Inflation	11%
Economic Growth	25% (2007) 10.80 %(2008)
Foreign Direct Investment	3,6 billion USD
Present Value of Debt(%GNI)	23,2%

Source: State Statistical Committee of Azerbaijan, World Bank, UNDP

Asian Development Bank:

http://www.adb.org/Documents/Fact_Sheets/AZE.pdf

⁵ Ali Abbasov, **Azerbaijan is being Transformed to Economy with High Information Technology**, <http://www.rabita.az/azrabita/pressa/16.aspx?lg=3>, 26 April 2006.

As of the early 2006, Azerbaijan with 8 million population has 1.761 kindergartens with 110.081 kindergarteners, 4.542 primary schools with 1.6 million pupils, 107 technical vocational high schools with 23.817 pupils, 55 specialized vocational high schools with 54.173 students, 47 universities with 120.000 students in 97 branches of which consist of 15 private and 32 states. While 7.702 students are doing their masters, more than 10.000 lecturers are working at the universities. Furthermore, some important measures are taken in the higher education system according to the Bologna criterions. As of the April 2006, there were 15 programs covering several areas of education system of which 9 have been carried out in the last 3 years, 3 have been waited for approval, 3 are in the preparation process.⁶

Modern educational-teaching technology practices are being widened day by day. Important and dynamic cooperation with the international organizations and institutions such as the UNICEF, UNESCO, and World Health Organization has been realized. For example, in the March of 2006, a contract with an aim to the improvement of infants' education was signed with Asian Development Bank (ADB) that covers 12 regions and will be valid for the period of 2006-2011. In addition, general education sector gained priority because of its great importance at all development programs. In 2005, through several programs 194 new schools for 36.016 students were built, classes for 13.716 students was added to 134 school buildings in general. Furthermore, according to the current state program computer and accessing to internet opportunities are being provided to every school in the country.⁷

Through the state program on "*Poverty Reduction and Economic Development*" all pupils are provided with free course materials and thus, Azerbaijan is the only post-soviet country to achieve this. In addition, several incentives are introduced for developing educational staff and increased the private sector's share in the education system. As a result of these implementations and commitments, Azerbaijani students got a number of

⁶ **Educational Ministry of Azerbaijan Republic,**
<http://www.min.edu.az/contents/>, 22 April 2006.

⁷ Misir Merdanov, **Achievements and Problems in the Azerbaijan's Educational Sector**, <http://www.voanews.com/azerbaijani/archive/2006-01/Aze-MMteh.cfm>, 23 April 2005.

medals such as 3 golden, 3 silver and 3 bronze in_world chemistry, biology, physics, mathematics Olympics of 2005. The number of medals won between “1998-2005” was only 11 golden, 12 silvers, and 47 bronze. In these accomplishments, the share of private sector as a result of Azerbaijan’s new education strategy that has given enough support to this sector has played very important role.⁸

Having ratified Bologna criterions in 19 may 2005, Azerbaijan accepted that amendments and reforms in the higher education institutions must be made according to the European norm and standards. Ministry of Education introduces important priorities in the direction of several information and experience handover in order to speed up the integration to the European Education Union. In this light, some new applications such as the introduction of credit system in education, increase of e-library and academic equipment options, modernization of academic content, development of education staff, improvement of physical conditions are given speed.

Some of the adopted subjects in order to direct scientific and technical development in social and economic development program covering 2008-2012 years in the long-run are; government should support basic scientific areas thus controlling and programming every scientific and technologic sphere, scientific research should fit in with economic structure, practical studies should be encouraged, informational-chemical and electronic technologies should be environment friendly and be in its best usage, intellectual property rights should be protected, scientific research should be esteemed in the society and qualified young people should be directed into this area, financing opportunities for scientific researches should be bettered.

But, in spite of all precautions and shown enthusiasm there are still some important problems in the education sector. In 2006, educational allocation in the state budget was 14%, which was not enough to make a comprehensive reform and to eliminate all educational problems. This low rate makes the solution difficult because of the insufficient current physical infrastructure despite the increased school buildings, 74% of general educational sector are being applied in 2 and 3 shifts in a day. Only the

⁸ Misir Merdanov, **Educational Strategy Focused on Development Programs**, 8 April 2006, <http://www.xalqgazeti.com/index.php?Lng=aze&Pid=281>, 22 April 2006.

number of 1430 state general education schools out of 4512 in total applies one shift.⁹

Table-2: Technology Using Profile of Azerbaijan

Scientist and Technicians (per 1.000 people)	33
Expenditure on Research and Development (as of GDP)	0,3 %
Internet Users (per 1.000 people)	50
High-Technology Exports (% of manufactured exports)	2,5%
Fixed Line and Mobile Phone Subscribers (per 1.000 people)	335
Expenditure on Education (% of Budget)	%14
Number of General Educational Schools	4.542
Number of Pupils in General Schools	1,6 million
Number of Institutions of Higher Education	47 (32 Sate)
Number of Students	127.000
Education Index (UNDP)	0.897
Human Development Index (UNDP)	0.767

Source: State Statistical Committee of Azerbaijan, World Bank, UNDP

Furthermore, even though there is a powerful scientific potential in the country, it is not being used efficiently. Because the share of funds allocated for the scientific research in national income is too low. While the world average rate of the scientific research expenses in national income (GDP) is 2.2%, but this rate (from the Table-2) is 0.3 % in Azerbaijan. If we pay attention that this rate for Azerbaijan was 0.5% in 1990, we can see that it has gone down recently. Also, considering the fact that professional experts' and researchers' income are very low and technical facilities are not sufficient for scientific research, then it should be acknowledged that the productivity of research could not be satisfactory.¹⁰

⁹ Misir Merdanov, **Achievements and Problems in the Azerbaijan's Educational Sector**, <http://www.voanews.com/azerbaijani/archive/2006-01/Aze-MMteh.cfm>, 23 April 2005.

¹⁰ Osman Nuri Aras, **Azerbaijan Economy and Investment Possibilities**, TUSIAB Publications, No: 2005-001, Baku, 2005, p. 114.

Country SWOT Analysis from Informational Technologies and Education Perspective

We can separately categorize the strong and weak sides together with the opportunities and threats of education and information technologies sector as followings:

Strengths

- Having a geographical strategic position in,¹¹
- Having young and dynamic population with high adaptation ability,¹²
- This young population, being competitive opportunity workforce cost to developed countries,
- Particularly, having wider usage of internet among young population,
- Having sufficient experience in some scientific subjects,
- Transfer of the modern technology and recent technical information into the country at some sectors, such as oil sector,¹³
- Having the primary and higher educational institutions with increasing quality of education,
- Increase in the demand for technology within country each day,¹⁴
- The growing support of international organizations for the development of country,
- High entrepreneurship spirit.

Weaknesses

- Unsatisfactory amount of resources allocated for education,¹⁵

¹¹ The Country is situated in 44° and 52° of east longitude and 38° and 42° of north latitudes in Caucasus, near the intersection point of Europe and Asia, Capital Baku is situated in 40° parallel.

¹² 62 % of the population is below 35 years old.

¹³ **Azerbaijan Issues and Options Associated with Energy Sector Reform**, March 31, 2005, <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/ECAEXT/AZERBAIJAN>, 12 May 2006.

¹⁴ According to Human Development Reports of the United Nations Development Program, Global Technology Using Ratio in Azerbaijan is higher than Similar Countries.

- Rise in internal migration because of speedy population increase and unplanned urbanisation,¹⁶
- Increase in the quality difference of education between rural and urban areas,
- Insufficiency of academic equipment and hardware,
- Insufficient number of classrooms in general educational schools and thus, there are 2 -3 shifts in a day,¹⁷
- Significant qualification gap among higher educational institutions,¹⁸
- Lack of professional and visionary managers in the education sector,
- Country's language is falling short of being science language,
- Lack of resource, infrastructure, and experience in technology production,
- Lack of non-institutionalization of company structures and organization management,
- Lack of reliable information and data for academicians and scientists,
- Not being able to keep up with the rapid improvement in science and technology,
- Insufficiency in the legal front on subjects such as trust, secrecy and intellectual property rights,
- Insufficiency of quality standards in science and technology,
- Weak scientific and technological relations among university-state-industry and international organizations,
- High technological differences between rural and urban,
- Unawareness of the population about the comfort that usage of data processing can bring,

¹⁵ While the average ratio of the world by the share of the education expenditure in GNP is over the %5, it is about %2.7 in Azerbaijan.

¹⁶ Approximately, 40% of the population lives in capital Baku.

¹⁷ Approximately, 70% of general education sector applies 2 or 3 shifts.

¹⁸ According to the decision of Ministry of Education (in May 2006), all branches of foreign universities in the country were closed and quotas assigned for private universities were taken down.

- Computer and internet access prices are too expensive compared to the purchasing power of people,¹⁹
- Insufficiency of the need interim personal education for technology production and application,
- Old-fashion and polluting technologies from the USSR, especially in oil refinery sector²⁰
- Lack of an Azerbaijani trade mark,
- Small domestic market and profit margin shrinkage,
- Some bureaucratic obstacles for foreign investment,
- Insufficiency of long-term strategies and policies.

Opportunities

- Strategic position for cooperation and trade,
- Availability of young and dynamic population to establish knowledge society in order to keep up with the modern world,
- Existence of capital that is wandering around the world looking for investment opportunities because of the globalization,²¹
- Huge market opportunities because of freer international trade,
- Forming opportunity to enter the new services and application areas due to rapid improvement in information technology,
- Opportunity to gain an advantage in the energy sector due to the creation of new technologies,
- Reach international standards due to the increased added value and marginal productivity with an application of modern education technologies,
- Potential of professional citizens working abroad,

¹⁹ If we take into account that income per person is 1000\$ **per year**, then it will be clear that purchasing power is low.

²⁰ Big factories that were built at USSR times have capacity more than demanded with old technology and so they have to either produce below the capacity or shut down.

²¹ According to the World Bank reports, total net capital trend to the developing countries is 327 billion dollar in 2004.

Threats

- Rapid improvements in the technology and increase of current technology gap,
- Rising international competition,
- Developing countries make the reach to the technology difficult,
- High costs of imported raw materials,
- Insufficiency of materials in Azerbaijani language on the internet,
- Increasing current technological deficit,
- Because of a little appropriate work and waging opportunities, productive brain power has to either migrate or work in the out of its expertise areas,
- Establishing international unfair competition that countries having cheap workforce like China and India,
- Change in the international regulations independent of country conditions,
- Increasing uncontrolled and undirected migration from rural areas to urban areas and from developing regions to developed regions.

Things That Need to be done to Develop Azerbaijan's Information Technologies and Scientific Potentials

As it is understood from evaluations above, Azerbaijan needs to make education and technology policies more effective for young population which is one of the important strategic variables in order to reach considered science and technological level. Orientation of young and dynamic population with effective education and technology policies by increasing Azerbaijan's competitive power will maintain country's development.²² The most effective way to establish economic power with young and dynamic population for Azerbaijan that wants to take its best position in the modern world is to cover the gap with knowledge societies by training individuals in the way that needs to be done, to speed industrialization in order to produce local technology, increasing share of global world trade and application of assigned science and technology policies

²² Ramiz Mehdiyev, **Azerbaijan Globalization Needs**, DA Publications, Istanbul, 2005, p. 75.

in order to cover every part of the society.

Thus, there are some activities in short that need to be carried out:

- Increase effectiveness and productivity in education by using new methods,
- Establish a flexible and innovative thinking style in the society,
- Making a transition from only teaching of information ,using and reaching education model to the education system that covers teaching of learning, inquiring and management of knowledge,
- Establishment of relations among schools and the the world surrounding them,
- Spread of new technologies as a method for population to get information, covering each layer of the society,
- Preparation of the new generations to the world where information is rapidly updated and reached,
- Maintain managerial and running excellence in education system,
- Increase e-learning opportunities by establishing interactive education portals for the usage of students, teachers and anybody interested in education,
- Propose of wide and flexible education models for the population to become an information reader and writer,
- Prepare conditions for forming local entrepreneurs to have sufficient technological equipment,
- Follow development trends in the world in order to assign priority research and development areas and strategic technologies in Azerbaijan,
- Establish widely used -and in the capacity- to meet future oriented needs infrastructure within the whole country, (?)
- Assign and apply standards related to the knowledge society transition process,
- Enable everybody to join knowledge based economy,
- Establish ensuring e-trade environment,
- Enable electronic trade-off of information and documents that are

used in trade operations,

- Form information resources, feeding innovation process,
- Encourage internet producers about using Azerbaijani language,
- Remove the technological opportunity inequality between rural areas and cities,
- Generalize wide internet usage at houses and schools,
- Train more quantitative and qualitative technology professionals,
- Encourage improving methods of university-industry cooperation and support this because it will increase innovation,
- Generalize wide usage of distance education opportunities that will cover sustainable education and workforce education programs,
- Enable more attractive environment for foreign investment than today's,
- Encourage training of personnel that is able to conduct scientific research abroad,
- Application of tax exemptions or incentives to encourage wider computer usage.

Azerbaijan can make its rich potential of young and dynamic population active users and producers of information technologies by applying certain steps. Thus, by using advantages of young and dynamic population in global economic competition, it might be possible to catch up the developed countries.

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