

WCES 2013

A Model Suggestion for Improving the Efficiency of Higher Education: University–Industry Cooperation

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Abstract

Higher education institutes (universities) make important contribution to the economy and social life. So universities effectiveness is important for industry. Cooperation between university and industry can facilitate the transfer of knowledge and even stimulate the production of new knowledge and technology. University knowledge is applied in industry to support innovation and creation for new technology. University-industry cooperation both foster new university capabilities and effectiveness of higher education.

The paper aims to examine the university-industry collaborations for effectiveness of education as a result of the four factor model. While some models explain two or three factors related to the university-industry collaboration, this paper explains four factors. We believe four factors more effective than the other models. These factors are consisting of university, industry, government and civil society organizations.

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Keywords: Higher Education, University-Industry Cooperation

1. Introduction

Looking at the general economic characteristics and innovation levels of industrialized countries, it is seen that they achieve efficiency by generating knowledge and using this knowledge in production. In this way, they achieve an important competitive advantage in world markets. One of the methods for gaining competitive advantage is thought to be university–industry cooperation (Balasco et al.; 2008:1285). This plays an important role in improving the efficiency of training higher education students. In addition to training students and generating theoretical knowledge, universities should be able to transfer this knowledge to the relevant sector, so that it is used efficiently within the economy. The methods of industrialized countries for generating and disseminating knowledge can be modeled for Turkey. This method can improve the efficiencies of both higher education training and the use of knowledge by industry. However, such cooperation raises an important issue of “whether industrialist will go to the university or university representatives will go to the industrialist”. Although the problem initially appears to present

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a challenge for industrialists, the first step is expected from higher education institutions (www.emo.org.10.09.2012); however, in practice, the problem involves higher education institutions, industrialist and government. A disconnection (lack of communication) is observed between higher education institutions and industrialist in this subject. Effective method is generating knowledge in higher education institutions and transferring it to industry (Gerner et al., 2011:626). Thus, it is important to initiate attempts to improve communication between higher education institutions and industry. Our cooperation model is thought to contribute to gather relevant parties and collaborative problem-solving.

2.The Importance of Cooperation with respect to Higher Education

The cooperation of industry with university in terms of training efficiency provides the following benefits: helping instructors update themselves; providing the basis for them to conduct scientific research; conducting research to develop basic sciences; contributing to scientific knowledge by publishing research (Okay, 2009:98); and preparing students for practical life.

A research in literature identifies the methods required for efficiency of industry–higher education collaboration as follows (www.emo.org.tr):

- Improving connection between higher education institution and industry,
- Conducting conferences and technical visits,
- Internship and increasing internship periods,
- Giving more active role within the cooperation to trade associations,
- Higher education institutions assigning students projects that direct them to industry.

One of the reasons why university–industry cooperation has not been sufficiently improved is university structures. University research remains at a theoretical level, and is conducted without taking the needs of the relevant industrial and commercial sectors into account. In other words, it is seen that most Turkish universities traditionally have an inward-oriented, theoretical structure rather than a sector-oriented education tradition. In order to overcome this problem, universities should adopt measures promoting sectoral initiatives. As referred in the cooperation mode that the present study suggests; universities, industrialists, trade bodies and non-governmental organizations can be encouraged to work together through incentive measures of the governments.

The general reasons for the cooperation of higher education institutions with the industry are as follows (Sevim and Karamete, 2003:16):

- The necessity to train suitably qualified students: University graduates hoping to enter industry and the service sector should have sufficient competence and knowledge to meet the requirements of these sectors.
- Transferring academic skills and knowledge to industry: Industry should be allowed to take advantage of the experience and theoretical knowledge of the academic sector.
- Allowing universities to take advantage of sectoral opportunities: Students should gain industrial experience via internships or exchange courses before beginning their careers.
- Creating synergistic effects: The potentials of the cooperating parties should be brought together systematically, thereby facilitating synergy between respective parties.

3. The Importance of Cooperation with respect to the Industrialist

The concept of university–industry cooperation refers to conducting educational training, research-and-development, and other activities collaboratively, within a system that allows all parties and society to benefit from available opportunities (knowledge, personnel, financial power, etc.) of universities (Okay, 2009:98).

In this concept, ‘technology-based’ young firms, young generation with just innovative (Boardman; 2009:1506), and creative entrepreneurship and without any capital play important

roles. Current support programs in Turkey lack financial support mechanisms to protect these entrepreneurs who seek close partnerships with a higher education institution, and most of whom graduated from higher education. Therefore, financial support mechanisms are required to provide initial capital for such entrepreneurs (Göker, 2002:7). However, financial support alone is insufficient to establish and sustain a business. Running an established business within scientific principals is as challenging as establishing a business. At this stage, it is mandatory to benefit from scientific knowledge. Since the production and dissemination of scientific knowledge are mostly the responsibility of universities, cooperation with universities is inevitable. When instructors find an opportunity to transfer information and theoretical knowledge to practice, it will favor industrialists at the micro level, and favor the sector and the government at the macro level. It is important to provide cooperation and communication between higher education institutions—where scientific knowledge is generated, and industry—where technology-based production is performed according to scientific principles. Technoparks are a good example of higher education institution–industry cooperation (Alkibay et al.;2012:65). Thus, improving technoparks is an important strategy for industry and university.

Nowadays, industrialized countries such as the USA, Japan, Netherlands, and Germany directly support programs that develop university–industry cooperation (Coburn, Berglund, 1995:487). For example, the Knowledge Transfer Partnership (KTP), established in the UK between universities and industry, promotes cooperation between three partners: (i) Academic: the latest graduated one generally counted as a knowledge partner; (ii) partner; and (iii) as a member of a cooperation organization— a company partner that is either a public- or private-sector organization. KTP is the activities associated with the bridges which consisted of humans and which connect academic and industry partners to one another. The KTP scheme focuses on benefits brought to both industrial and academic institutions via the knowledge transfer between these partners (Gertner et al., 2011:628).

4. Suggested Cooperation Model

Dooley and Kirk developed a triple-helix model of university–industry cooperation (see Figure 1). This structure foresees cooperation between university, industry, and government (Dooley and Kirk, 2007, p.317).

Within the triple model, government has a facilitatory role, through the regulatory and policy framework that facilitates cooperation between industry and university.

When assessing the case for Turkey, it is currently difficult to identify policies that provide sufficient motivation for universities to cooperate with industry. Similarly, there is no common practice encouraging industry to cooperate with universities. If government policy is employed to bridge this gap, it can be said that the efficiency of both academic and industrial sectors will increase.

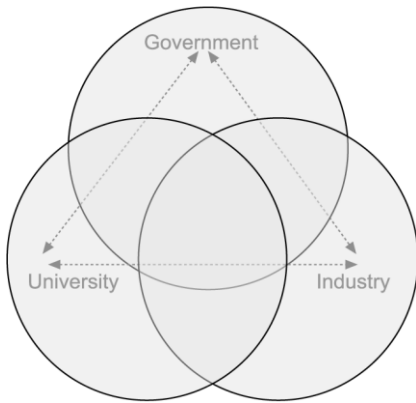


Figure 1: Triple helix model

As stated by Drucker, “real investment will be made on the knowledge of a knowledge worker not on machines or assets”. According to previous studies on the development of countries, the role of capital accumulation was calculated as 30%, whereas the role of education, knowledge and technology was calculated as approximately 70%; it is therefore compulsory to update requirement-purpose dilemma and orientation to quality-quantity search in investing in intellectual capital, and to reconsider university–industry cooperation within this framework in generating and using knowledge (Bayrak, Halis :65yordam.manas.kg/ekitap/pdf/).

Our suggested model extends that of Dooley and Kirk by involving non-governmental organizations and trade associations in the system, because decisions taken solely by a central administration cannot reflect regional and sectoral requirements in practice. Thus, the parties of the suggested model are: Government, Universities, Industrialists, Trade Associations, and Non-governmental Organizations. The model is shown in Figure 2:

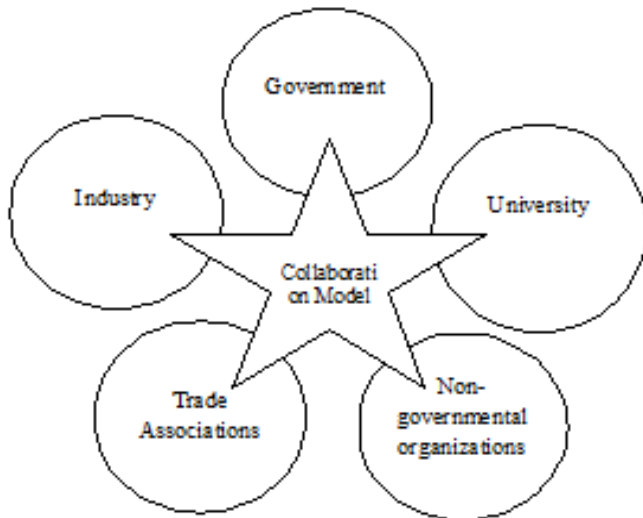


Figure 2: Star model of university–industry cooperation

The basic elements of the suggested model are as follows:

Government: Ensuring the participation of respective parties by providing incentives to the development of cooperation.

University: Ensuring cooperation with industry according to their own skills and equipment by utilizing the support of non-governmental organizations and trade associations.

Industry (sector): One of the main actors in the collaboration, with the support of government and trade associations. Ensuring the transfer of instructors' and students' knowledge to the production processes by preparing the basis for practicing scientific knowledge gained in academic settings.

Trade associations: Organizations such as the chamber of accountants and financial consultants, or the chamber of electrical engineers can play a facilitatory role in the collaboration, because they both operate within the sector and employ academic knowledge.

Non-governmental organizations: As NGOs are well placed to know the priorities of their region, they can play an effective role in determining the fields of cooperation, and can also take a facilitating role in collaborative practices.

University–industry cooperation presents the following benefits to the parties:

(Philbin, 2008:490):

- Productivity for both parties,
- Opportunity for cooperation involving mutual trust,
- Future collaborative opportunities if the initiative is successful,
- Contribution to the management of the partnership by being aware of the distinctness of human beings.

5. Conclusion

University–industry cooperation is thought to increase both industrial productivity and educational efficiency in university. Combining theory with practice accelerates the learning process, and facilitates the transfer of knowledge to the field of production. In this context, the adoption of governmental measures to promote cooperation is a central part of realizing such objectives. University–industry cooperation should be realized in order to optimize the use of resources (human resources, capital, technology, natural resources), and to ensure sustainable development and improvement.

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