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A research on the problems encountered in the collaboration between university and industry

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Abstract

Industry sector needs to be in collaboration with university in order to reach the information that will contribute its performance. The university also has some expectations from such kind of collaboration such as increasing the capacity, conducting R&D, institutionalizing, making firms ready in terms of intellectual capital and providing financial benefit as well as processing data and finding an application area. Collaboration of university and industry both leads the firms to provide a competitive advantage by creating synergy and also causes set of problems. The aim of this research is to investigate the level at which the university and industry collaboration exists in Konya province, to ascertain the frequency of collaboration subjects and the problems encountered during this collaboration. According to our research that we did on 142 firms in Konya, by not being on enough level of collaborating degree, there is a positive directed linear relationship between the frequency degree collaborating with the university and the abundance of the number of employees in the institution which is the necessity of being institutional. Because of this, the collaboration in the institutional firms is often inclined to come true. Furthermore, it was set higher that the problems of the administrators whose frequency degree of collaboration with the university is high in comparison with the people whose frequency degree of collaboration is low.

Keywords: University-industry collaboration; Academic; Industrialist.

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1. Introduction

Universities are inclined to work as research aimed organizations to combine the information coming from a lot of markets and technological surroundings and to represent with a huge capacity (Petruzzelli, 2011: 310). On the other hand, firms acquire their technology and knowledge acquisition mostly from external resources. These resources are firms which are in rivalry, research institutions, government resources, industry research partnerships and universities. The place of a university is unique in existing resources (Santoro, & Chakrabarti, 2002: 1163).

The aim of our research is to search the perceptions of administrations that activate in Konya inclined to university industry collaboration and to investigate in which level of university industry collaboration comes true and frequency degree of collaborated subjects with problems seen in collaboration. On the parallel of this aim, the results of research and gained findings have been analyzed and their results have been evaluated.

Because of the different expectations of university and industry sector and the problems about these expectations' coming true, the collaboration could not reach to the desired level yet. At the end of our research, in the administration which is one of the necessities of more institutional structure, it has been found that in a positive way between there is a linear relationship which is the majority of number of employees and frequency degree of collaboration with the university.

2. Literature review

2.1. *University-Industry collaboration*

The concept of university-industry collaboration contains all the systematic works in the field of scientific and technological development by combining the possibilities such as students, scientist, knowledge accumulation and technical devices with production of business district, the condition of students' apprenticeship and practicing the theoretical knowledge of scientists (Yıldırım, & Güven 2008; Odabaşı, Helvacıoğlu, Insel, & Helvacıoğlu, 2010: 20).

Universities and innovative performances of the firms have a key position about appearing the innovation with university-industry collaboration (Agrawal, & Henderson, 2002; Cohen, Nelson, & Walsh, 2002a; Feldman, Feller, & Bercovitz, & Burton, 2002; Murmann, 2003; Baba, Shichijo, & Sedita, 2009: 756). Besides, academicians, industry leaders and politicians have been hugely interested in the university-industry collaboration recently and nowadays these relationships have a huge value for innovation (Butcher, & Jeffrey, 2005: 1273).

The structure of technology platform is very important to be created synergism by dispersedly gathering existing accumulation and potential in the universities and to form projects about associated subjects in the support programme by forming R&D infrastructure around the perfection centers and techno cities (<http://www.moment-expo.com/universite-sanayi-is-birligi-icin>, Accessed: 20.11.2012).

In the new economy; risk capital, the rights of mental ownership and the efforts of enterprising are more strongly emphasized. By means of university technology transfer offices, the increasing of university-industry technology transfer evokes to increase the complexity of agreement of partnership which includes firms and universities and the field of effect together (Siegel, Waldman, Atwater, & Link, 2003: 128).

University-industry collaboration necessitates the harmony between different disciplines (Perkmann, King, & Pavelin, 2011: 548). University-industry collaboration is especially focused on four basis reasons; research supports, research collaboration, information transfer and technology transfer (Santoro, & Chakrabarti, 2002: 1164). On the other side, D'Este, & Patel, (2007) categorize this collaboration as to be created of new financial easiness, research agreement and counsellorship, common research, education, meeting and conferences (D'Este, & Patel, 2007: 1309).

Universities in Europe and America focus on institutions that have enterprising spirit. Woolgar (2007) has observed that organizational and cultural changes come true in five points. These points are organizational capacity for university-industry collaboration, staff to collaborate, planning movement method related to collaboration, encouragements, the history of institution and past experiences (Woolgar, 2007: 1262). This collaboration must contain motivating elements for sides.

A firm from collaboration with outstanding academic institutions can also ensure benefits such as reaching the students who have received high education both obtaining talents and opportunities and raising its image (Santoro, & Chakrabarti, 2002: 1164). In this connection, as scientific and technique, in the interaction of university- industry, the approach of man capital has been studied in literature in many numbers, the theory of social capital and man capital have gained useful contributions in this field (Boardman, 2009: 1505). Furthermore, there are academic consultancy typology development studies for this collaboration.

Perkmann, & Walsh, (2008) were emphasizing the development of academic consultancy typology in their researchers, they mention from three different ways; opportunity incentive, the activity of commercial incentive and research incentive. The first one of these three ways is about to get income because of the consultancy of academicians (Boyer, & Lewis, 1984; Rebne, 1989), the second one is the success of technologies created in the universities and having a doctorate of the academicians bachelor's degree with the expertise of the academicians (Agrawal, 2006; Shane, 2004), the third one is the consultancy activities which are direct connected with the research projects of the academicians (Perkmann, & Walsh, 2008: 1885–1886).

In the university- industry collaboration, when the characteristic behaviors of the members of senior males who are in the position of faculty administrations were considered, it was envisaged that because of the tendency of making contract of them with the firms is higher, they will vitally play an important part in this collaboration (Marques, Carac-a, & Diz, 2006; Rasmussen, Moen, & Gulbrandsen, 2006; Azagra-Caro, 2007: 712). As the other important collaboration criterion, these people play a part in conglomeration actively, too. Conglomeration means gathering the firms' which are in rivalry with each others, the other firms which are in the chain of trade with the firms that produce the same products and the firms which buy their products and transports other suppliers by adding new things (Kandiller, 2009: 9).

In developed countries, especially in the U.S.A, the university-industry collaboration shows so strong and internal feature that the demands of industry have become the projects of the universities. According to Güvenç (2009); a group, which can be carried on after being constructed, matured and reached to a critical mass, that is to say, can rival with the world, will turn into a place which can produce its own innovations. Besides, one must follow the innovations and technologies in the world at close range, R&D culture can merely exist in such a healthy group (Güvenç, 2009: 4–6). The development of R&D culture and increasing of numerator which is separated from budget have a part between the important indicators.

From the point of view of invention and discovery in the increasing of the productivity, university-industry collaboration is seen as effective basis instrument (Balconi, & Laboranti, 2006: 1629). Beside this, access easiness for R&D activities of university-industry firms is compulsory to utilize from special expertise and technique support (Grossman, Reid, & Morgan, 2001; Mowery, Nelson, Sampat, & Ziedonis, 2004, Muscio, Quaglione, & Scarpinato, 2012: 640). Countries have done various legal regulations about this subject.

The law of Bayh-Dole, came on the scene in the U.S.A. in 1980, is very important because of the extraordinary effect in the university researches. The law ensured possibility and research institutes which are supported from federal budget in the U.S.A. the sharing of incomes which will be gotten from commercialized of the R&D activities results and interface which provides the university, researcher and the process of technology transfer. The universities which constitute average 250 charters before 1980, have produced 3278 US charters in 2005 and gained 1.46 billion USD income (Kiper, 2010: 57).

There are about 250 universities in Germany that can be comparable with the U.S.A. from the point of view of the source separated for R&D about hundred of these universities mostly concentrate on applied sciences and called as “Fachhochschule” (Kiper, 2010: 58). In this relation, there is university-industry collaboration in the back plan of recent concentration in applied sciences.

In our country, 1505 coded university-industry collaboration supporting programme has been developed by TUBITAK innovation and support programme (TEYDEP). The aim of programme is; to contribute to industry and trade, the information and technology in the university, public research center and institutes, the institutes which undertake the applying of project results in Turkey and by transforming the project results to product or process as meeting the need (Aksoy, www.dengeymm.com.tr, Accessed: 22.11.2012). Financial encouragements have been applied and sides have been directed to collaboration in this direction of aim.

A good university-industry collaboration requires to be attained a suitable balance between the priority of academic aims and industry. Also, the active administration of university-industry collaboration must include the precautions which will help to carry on the benefits and responsibility of industry partners (Barnes, Pashby, & Gibbons, 2002: 284). Collaboration attempts have often been perceived as disappointments in spite of some important technology and concrete outputs. In this connection, as universal success factors directed towards collaboration; responsibility, trust, continuity of staff, previous project process and concrete outputs can be counted (Barnes et al., 2002: 277–281). In this connection, the collaboration of expected profits which protects the common benefits of the sides will be possible.

2.2. The problems which are seen in the university- industry collaboration

Academicians believe that the value of university-industry collaboration has increased and also the increasing of problems is a reality. Academicians consider this collaboration as an increasing of income as priority and secondly they evaluate good things such as technology transfer as to be transformed to public. Therefore, the development of academic capital and increasing collaboration bring together with contradiction of opportunity and problem (Welsh, Glenna, Lacy, & Biscotti, 2008: 1863).

In spite of increasing demands for new information of industry, giving limited permeability image to the outer world of the universities is named as “ivory tower” by Zuckermann (1971) (Abramo, D’Angelo, Costa, & Solazzi, 2009: 503). This sentence expresses that Zuckermann’s critical point of view about the

academicians' seeing themselves on the ivory towers. Nowadays, university-industry collaboration plays a role to decrease the differences between the academic environment and the industry. The way of contributing to effective industrial rivalry passes from the acceleration of technologic innovations in the economy period based on information, determining the processes of active technology transfer, collecting information and constructing the idea of property rights (Lai, 2011: 1218). Therefore, one of the strongest mechanisms about the decreasing of factors which prevent the interaction between university and industry is to found reciprocal trust between the organizations (Bruneel, D'Este, & Salter, 2010: 867).

Also, as the results of aims, cultures, procedures, permissions, value systems, encouragements, differences of communication and collaboration, there can be various obstacles and limitations in the forming of university-industry collaboration (Rappert, Webster, & Charles, 1999; Scott, Steyn, Geuna, Brusoni, & Steinmueller, 2001; Barnes, Pashby, & Gibbons, 2002; Butcher, & Jeffrey, 2005: 1274). According to Dasgusta & David (1994); university-industry collaboration is faced to face with important difficulties. While the universities were firstly focusing on creating new information, private firms focus on ensuring the advantage of rivalry and obtaining the valuable information for the recycling of the investment (Bruneel, D'Este, & Salter, 2010: 858). When being evaluated from this point of view, there are priorities of both of the sectors according to themselves and these priorities have occasionally clashed.

The states of obstacles to the successful collaboration can be summarized like that from the perspective of industry (Othman, & Omar, 2012: 577);

- The industry is unwilling to ensure financial contribution related with the subject, to the education programme.
- It has not got sensitivity about the necessity of education programme and a serious contribution will be ensured by means of the university.
- By interrogating the education programme which was formed by the universities, industry is inclined to think that perhaps they know all the solutions much more than them.

At the same time, when considered from the university perspective;

- Educators can not be sensible about the sensitivity of time limitations of the industry and developing the expert productive power.
- University can not be aware of the real problems that the industry is faced with and for instance, limited with uninterested programme and imaginary world,
- Possibilities can not be adequate to ensure the needs of the industry.

Cultural differences which came into being at one time are also an obstacle to university-industry collaboration. In the concrete research projects, cultural differences have obstructed about logical inferences of the institutions joining at a point where the institutions mostly met (Bjerregaard, 2010: 106). In this connection, if understanding both of two sides, reciprocal expectation and being considered of the profit, are possible, it can be talked about successful and long-term university-industry collaboration.

3. Methodology

3.1. The aim of research, extent and method

The aim of the research is to search the perceptions directed towards university-industry collaboration of the administrators of managing who get active in Konya and to study in which level the university-industry collaboration come true and with the frequency degree of collaborated subjects and problems

seen in the collaboration. As a research method, application of sampling public survey has been done. In this application; public survey questions have been improved by being utilized from Santoro (2000) and Akçi (2004), demographic questions and in addition to Likert Scale with five which has 19 questions, and open-ended question such as “What are your suggestions about the active working of university-industry collaboration?” has been asked.

Public survey questions have been checked over by being discussed with the academicians who are the expert of the subject after the preliminary stage. The perceptions of first, middle, upper degree managers’ related to administrations which activate in Konya and the problems they are in have been searched with a public survey form that takes the last shape after necessary corrections in the direction of administrators’ suggestions and data which turns from 10 administrations where the pilot applications were done.

It has been reached to 160 firms chosen by random sampling system from 2815 firms that are registered to Chamber of Industry of Konya which is the fifth city about its developed industry with the rate of 4 % in the total industry administration in Turkey that constitutes the universe of the research (www.sanayi.gov.tr/.../81-il-durum-raporu-2012, Accessed: 15.09.2012). The filling of the public surveys has been ensured by being visited the company administrators from top, middle and first degree. At the end of the interviews, roll-back has been ensured from 142 firms. The number of 142 firms which the roll-back has been ensured is significant as statistical from the point that the trust is at the level of 98 %, when the acceptable mistake is + / - 10 over the calculated number of 130 firms.

The participants to the research are asked with 5 Likert Scale about the evaluation of the given answers of 19 expressions; it has been utilized from SPSS 15 packaged software. The reliability of the scale that belongs to variables acquired from the results of public survey application has been measured by the help of Cronbach Alpha Test. Because of the Alpha coefficient resulted 0.95, as the reliability of test measurements in our studies and this value is bigger than 0.70, we can say that the test measurements are reliable.

Participants expressed the frequency degree related to collaboration as (1) Never, (2) Seldom, (3) Sometimes, (4) Usually, (5) Always. 9 items that the participants answered for him frequency degree in collaborating with the university; minimum 9, maximum 45, 10 items that the participants answered for the frequency degree about the problems in the course of collaboration; the grading has been done as minimum 10, maximum 50. Transformed and breakpoint have been retained for the frequency degree collaboration with the university 21 points and problems in the course of collaboration 21 points again. According to this, it has been grouped that, for the frequency degree collaboration with university; 21 points and upper mean he/ she is collaborating, 21 points and lower mean he/she is not collaborating and by the point of frequency degree about the problems in the course of collaborating, 21 points and upper mean: he/she is faced with problems, a person lower than 21 points is not faced with problems.

3.2. Restrictions of the research

Only Konya’s being chosen city for the research constitutes the most important restriction. Besides, the unwillingness of the administrators’ managers for filling the public survey and the absence of the elements which will encourage them obstructed the number of public survey being more.

4. Evaluation of analysis and findings

4.1. Demographic features of the employees

Demographic features of 142 people who joined the public survey employees 35.9 % between 30–39 ages, state of education is: high school 31.7 %, state of sexuality is: male 95.8%, duration of work is more than ten years is 38.0 %, number of employees who are between 11–20 45.1 % and with 47.2 % top manager as position is the highest percent.

4.2. The evaluation of statistical result related to hypothesis

The hypothesis of the research, tests applied to hypothesis and the evaluation of the statistical results are detailed in table 1 below.

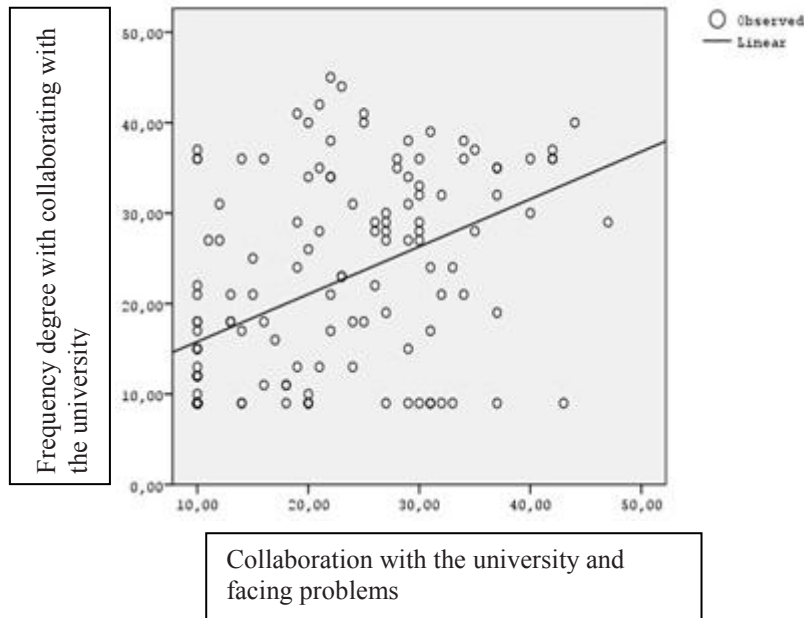
Table 1. Hypothesis, applied tests and results				
No	Hypothesis	Test	p value	Result
1	By increasing of activity years of administration, there is a direct aspect of relationship between frequency degree of collaborating with the university.	t= 0.837	0.404	Refused
2	There is a direct aspect of relationship between the majority of employees in the administration and frequency degree of collaborating with the university.	t= 2.575	0.011	Accepted
3	There is a direct aspect of relationship between the state of managers’ teaching altitude and frequency degree of collaborating with the university.	$\chi^2= 6.968$	0.138	Refused
4	There is a direct aspect of relationship between the years that the managers have worked and frequency degree of collaborating with the university.	t= -1.403	0.163	Refused
5	The problems that the managers whose frequency degree of collaborating is higher in comparison with the managers whose frequency degree of collaborating are lower.	$\chi^2= 32.570$	0.000	Accepted

p<0.05 accepted, p>0.05 refused

When the frequency degree of collaboration with university and faced problems in the course of collaboration are compared, naturally faced problems and deficiencies came true too many in the state of extra collaboration. Faced problems in the course of collaboration appear too many about 8.058 times according to small amount the frequency degree in which the collaboration with the university is too many [OR= **8.058**, % 95 CI (3.808–17.054)].

The relationship was found between the frequency degree with collaboration with the university and facing problems in the course of collaboration in positive course, in middle degree (r= 0.471). This relationship is significantly high as statistical (p= 0.000). When the analysis of regression was done, the 22.2 % (r²=0.222) of facing problems in the collaboration were attributed to being too much of frequency degree of help and collaboration from university.

Figure 1: The regression analysis between faced problems and frequency degree with collaborating with the university



5. Discussion and result

The research result of Abramo et al., the research performance of university academicians who collaborate with private sectors has been more outstanding than the people who do not collaborate (Abramo et al., 2009: 498). Furthermore, according to Boardman & Corley (2008), university-industry collaboration has increased as individual level collaboration in the academic meaning with private firms (Boardman, & Corley, 2008: 911). Some of the study related to university-industry collaboration are like that: At the end of the comprehensive study which Adams, Black, Clemmons & Stephan (2005) did between 1981–1999 periods set that the people who got established in the institution by graduating from the university beforehand have played a key role in this collaboration (Adams, Black, Clemmons, & Stephan, 2005: 259). In this respect, old graduates work as a bridge in this collaboration.

At the result of Lai's research directed towards university-industry collaboration, he set that because of the advantages of the institutions that are intervene to technology transfer, the effects of transfer processes' and basic resources on the willingness of the participation of technology transfer played a positive role (Lai, 2011: 1218). Furthermore, Carayol (2003), set a strong positive relation among the strategy of academicians in the collaboration variable, showing of the basic research and perfectness in high level becoming closer of the institutions (Carayol, 2003: 905).

According to our research that we did on 142 firms in Konya, by not being on enough level of collaborating degree, there is a positive directed linear relationship between the frequency degree collaborating with the university and the abundance of the number of employees in the institution which

is the necessity of being institutional. Because of this, the collaboration in the institutional firms is often inclined to come true. Furthermore, it was set higher that the problems of the administrators whose frequency degree of collaboration with the university is high in comparison with the people whose frequency degree of collaboration is low.

It could not be taken any contribution as a suggestion related to this question in spite of being asked an open-ended question such as “What are your suggestions directed towards active working up of the university-industry collaboration?” By showing that acquired results has not reached to the level of desired collaboration yet, in spite of some hesitations directed towards collaborations between parts, an expectation in the shape of willingness has also been observed.

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