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Problems between Universities and Educational Research and Development Companies at Techno Centers

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Abstract

Problem Statement: University – industry relationship is one of the issues which have diverse effects on the academicians working there.

Purpose of the study: In this study it is aimed at finding out the problems that the owners of the educational research and development companies at the techno centers of the universities have encountered.

Method: The qualitative research method was used. Data were collected through interviews and they were analyzed via the content analysis. This analysis provided the codes, main themes and sub-themes.

Findings and Results: At the end of this process, in line with the problems, the main themes as following were obtained: 'not considering the education as one of the fields that research and development can be conducted, synergy brought about by the techno centers in the university setting, the descriptions for the techno centers and their own companies as an organization, sales and marketing, counseling and guidance, the laws and regulations and their implementation, and communication problems faced by the owners of the companies'.

Conclusion and Recommendation: This study pointed out that there had been major problems among the parties, which focuses on entrepreneurial university.

Keywords: Techno centers, entrepreneurial university, university-industry relations.

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INTRODUCTION

Today there has been a transformation from industry-based society to information-based society (Kongar, 2001, p. 36- 38; Gürüz et. al, 1994, p. 34). Universities, in the information age, "are considered as a main component to provide the economic development and to ground the innovation." (Florida & Cohen, 1999, p.604)This is due to the fact that the innovative products are preceded as a result of the researches in the universities and these are on the markets through different ways, which contribute into economic development. In the universities, it is required to build the centers in which information turns into technology to serve their needs of the universities (Kocacık, 2003, p.3; Visakorpi, 2008, p.23). These centers are the outcome of the university-industry relations.

University and industry cooperation is based on various causes. The reason why industry is required to work together with universities is the evaluation of the cooperation regarding the capital of knowledge and is that they can sustain their existence accordingly (Kiper, 2010, p. 17; Smilor et.al, 2007, p. 205; Etkowitz and Zhou, 2008, p. 631 and Gilley, 1991, p. 81). With respect to this cooperation, industry gets the benefit of supplying the human resource which can produce information necessary for high-technology products, utilizing the technical development of the universities and as a result, getting rid of the extra financial burden. This also provides the cooperation to produce required products in the competitive market (Okay, 2009, p. 95).

The government, in addition to industry, gets the benefit of the development in the country. Nowadays the indicator for the countries development level is their technological and socio-economic wealth levels. Through producing information directly and transferring the information into products, countries can reach the high level of development. Furthermore, the economic dependency of the countries can decrease. Additionally, with respect to social development the common good can be obtained and the public expectancy can be met. Thus, the government has the opportunity of increasing the scientific information by supporting fundamental and applied sciences regarding the definition of long-term aims (Küçükçirkin, 1990, p. 5, Kiper, 2010, p. 37- 38 and Fairweather, 1988, p. 19- 22).

In addition to government and industry, universities get the benefit of varying their financial source, decreasing their dependency on public finance and creating different study areas for their instructors, students and researchers. Furthermore, it is an obligation for the universities to provide public benefit, help them produce information required for the society. Bayrak and Halis (2003, p. 65) and Greenwood and Levin (2003, p. 78) stated that if the society cannot get the benefit of the information produced, this means the source is manipulated. Through this relation, universities can help the industry produce high technology products and this may raise the economic value. Thus, the content of the undergraduate, graduate and doctorate programs can be re-organized according to the needs of research development in the industry.

All these changes bring about the change in the roles of the universities. The change necessitates restructuring the universities and transforming themselves by harmonizing their roles of education and research through the role of

entrepreneurship. The entrepreneurship model in the universities is appeared and this role has recently been in the agenda of higher education. (Etzkowitz and Zhou, 2008, p. 682). Nowadays universities make the findings of the research on the market by establishing companies through the centers of incubator. Entrepreneurship is one of the paradigms impacting on the universities (Gürüz, 2008, p. 277). In this respect, universities are not however expected to take part in the market. What is expected is their support in transferring the information into high-technology regarding the expectancy of the market (King, 2004, p. 54, Etzkowitz and Zhou, 2008, p.629). Clark (2008, p.502,) highlighted the features of the universities as below:

- Driving to continuous innovation
- Using the different financial source
- Having a strong management regarding change in all levels
- Having research centers conducting interdisciplinary studies
- Regarding the social problems
- Maintaining enterprise in each level
- Competing with the others
- Having a sense of entrepreneurship in organizational culture
- Actualizing entrepreneurship as a process and as an outcome
- Sustainable transformation

Furthermore, Clark (1998a, s. 5- 7 and 1998b, p. 6- 8) stated five steps in transforming the traditional structure of the universities into entrepreneurial structure:

a. Strengthening the core administration
b. Extended administrative units
c. Variety in financial sources
d. Internalizing the entrepreneurial structure in every academic units as faculties, high schools and department
e. Harmonizing the organizational culture existed with the entrepreneurialism

These steps help the universities turn into an entrepreneurial organization which makes them more flexible and sensitive to the changes and renovate themselves. For this change, it is required to have some changes in administrative units such as research centers, incubators, and techno centers.

Triple Helix Model is considered as the most-frequently used model for the university-industry collaboration as it defines all the partnership and its dynamics profoundly. It consists of three main elements as actors, organizational structure and rules and regulations. The term ‘actor’ accounts for university, industry and government which has additional role besides their traditional ones. The organizational structure describes the units transferring the findings of the researches into the technological product or information which can be used for the benefits of the society. The last element concerns the bounders and the tasks of the spheres of the model, i.e university, industry and government. (Etkowitz and Leydesdorff, 1995, p. 152- 153; Etzkowitz and Zhou, 2008, p. 633). This model has been into the

implementation in various countries, especially in the U.S.A and England. In Turkey, this model has been regarded as the model since the 1990s. (Kiper, 2010, p. 108).

Techno centers are one of the organizations providing university-industry and government relations. Techno centers can be defined as the areas in which research findings are turned into a technological product or service. (Kiper, 2010, p.53, Massey et.al, 1992, p.34). According to International Association of Science Parks [IASP] (2013), the aims of the techno centers can be listed as below:

a) Stimulate and manage the flow of knowledge and technology between universities and companies.
b) Facilitate the communication between companies, entrepreneurs and technicians.
c) Provide environments that enhance a culture of innovation, creativity and quality.
d) Focus on companies and research institutions as well as on people: the entrepreneurs and 'knowledge workers'.
e) Facilitate the creation of new businesses via incubation and spin-off mechanisms, and accelerate the growth of small and medium size companies.
f) Work in a global network that gathers many thousands of innovative companies and research institutions throughout the world, facilitating the internationalization of their companies.

In the techno centers, the companies owned by the researchers are all developed via incubation and then they take place into those centers. Regarding Scott (2004, p. 4-17) and Zaharia and Gibert (2005, p. 35) those companies are established for the purpose of transferring the findings of the research into technology or service and they all are set up by the researchers. Their significance is considered as below:

- Fostering the regional and socio-economic development.
- Adding commercial value into the information produced at the university.
- Making universities provide research and education function.
- Creating new resources for the universities to license the companies

In this research techno center' is used for the terms "techno park, techno city, cyber park and science park" in the literature. This term 'techno center' is regarded in this research since it is widely-used and placed in the Turkish Language Association.

In Turkey, university –industry relations are one of the current issues though the background bases on the works in the 1980s. Moreover, there have been lots of references to this issue in the Turkish National Development Plan starting from the fifth one, referring to the technology transfer (DPT, 1985, p. 159). In the sixth plan, the establishment and the legalization of the techno centers are obviously emphasized in the article of 954. (DPT, 1989, p. 310). The eighth plan focuses on the techno centers in the articles of 1222, 1622 and 1206 (DPT, 2000, p. 156- 171). The ninth plan depicts the research and development studies from the article 165 to 172. (DPT, 2006, s. 30). As a result, those plans have brought about the basement for the university-industry relations.

Though the universities in Turkey, as in the others in the world, are the centers of knowledge and science, their collaboration with the industry has been limited. According to a study conducted by Okay (2009, p. 97), it is found that 43 % of the academicians did not participate into any activities regarding university-industry relations and 57% of them did not work any unit providing the service of these relations. Furthermore, it is pointed out that most of those relations were one-by-one and on the basement of organizing courses, seminars or a training activities. Bayrak and Halis (2003, p. 72- 79) carried out a research both regarding the academicians and the industry and concluded that the main reasons are lack of communication and reliability among the parties. They explained the case with the phrase of 'waiting for Godot' (2003, p. 66) instead of having connection with each other.

Since the 2000s, the university-industry relations have been highly taken into granted and some considerable improvements have already done in Turkey. The Law of Technology Improvement Regions numbered 4691 dated July 6, 2001 and the Implementation Regulation of Technology Improvement Regions numbered 4691 dated July 19, 2002 have already been in the implementation. These arrangements have provided some privileges in the financial and economical issues and helped the establishment of techno centers in the universities.

In terms of Turkey, the universities are the main centers of research and qualified researchers mostly employed there, as Turkish Statistical Institute stated, based on the data in 2009 that 73% of researchers had still been working in the universities. Thus, the companies which tend to work in the research and development activities desire to work in the techno centers situated there, which brings about the concept of entrepreneurialism in higher education. However, to achieve it, we need hybrid and innovative organizations in both the university and the industry. Moreover, Kiper (2007, p. 158) mentions that it is necessary to wait for 20 years to have this change.

In Turkey, there have been 27 techno centers and 1451 companies and 12743 staff working there. The companies can be categorized as 58% of them software and computer technologies, 9% of them electronics, 7% of them defense industry, 4% of them design, 2% of them biomedical and medical, 2 % of them metaurology, 3% telecommunication, 25 of them medicine, 1% of them automotive, 2% of them energy, 9 % of them others. 10 % of the software and computer technology is distance-learning programming. The patent obtained from the products have improved is 301 and the amount of money gained is 540 million dollar. (Ministry of Science, Industry and Technology, 2013b).

The purpose of the study is to find out the problems that the owners of the educational research and development companies at technocenters of the universities in Turkey have encountered. The data gathered from the companies at the technocenters of Hacettepe University, Middle East Technical University, and Bilkent University.

METHOD

This study is based on a qualitative research. Within this framework, the research was conducted with the study group. (Miles and Huberman, 1994, p. 27, Marshall and Rossman, 2006, p.201 and Mason, 2003, p.149). The study group comprises of executives of the companies offering service in educational sector at technocenters in Ankara. What all these companies have in common is that they all conduct research and development projects in the field of education. Six companies from Hacettepe University Teknocenter, 10 companies from Middle East Technical University Technocenters and 14 companies from Bilkent University Cyberpark, in total 30 companies, were determined to be the study group. However, the number of companies that responded to e-mails and telephone calls and accepted to be interviewed within the scope of the research during data collection process is 15. From this aspect, the research falls under the purposive sampling category of the sampling methods of qualitative research (Patton, 2002, p. 45; Miles and Huberman, 1994, p. 27; Yıldırım and Şimşek, 2006, p. 107). They directly prepare research and development projects for the Ministry of National Education, state and private schools affiliated to the Ministry and in-service training units of other institutions. These projects are either supported by or conducted in partnership with such national institutions as TUBITAK, Technology Development Foundation of Turkey and such international organizations as EU or OECD.

In the profiles of company executives, gender, age, level of education and their motives for establishing these companies were discussed. Two of the executives are women whereas the others are all men. Their ages varied from 32 to 40. In terms of their level of education, all have graduate degrees. The number of executives who hold a masters degree is nine while the number of researchers with a doctoral degree is six. Four of the executives have their masters in the field of Curriculum Design, three of them in the field of Computer Education and Educational Technology while two of them hold their masters in the field of measurement and evaluation. Three doctorate holders have their degrees in Computer Education and Educational Technology whereas the others are graduates of the Department of the Curriculum Design. Five of the executives worked as research assistants or instructors during their graduate studies while the others pursued their studies outside the university.

In the research, data were collected through semi-structured interview form (Patton, 2002, p. 343). During the interviews, some additional questions were asked to clarify the issues (Patton, 2002, p.344 and Yıldırım & Şimşek, 2006, p. 123). Company executives were contacted via e-mails or phones. Company executives were asked for an appointment date within the predetermined date range. The interviews took place one to one and in person between the dates of October 1 and December 10, 2011 by the researcher's visit to the executives in their work offices.

For data analysis, the method of content analysis was used. After all the data that were obtained from the research was transcribed, the concepts in the data were codified and converted to themes in terms of their similarities and literature review (Strauss and Corbin, 1990, p.62; Yıldırım and Şimşek, 2006, p.227). Then, these themes were arranged to define the findings of the study. This analysis technique is called as "inductive analysis" (Patton, 2002, p 453).

FINDINGS AND RESULTS

The findings of the research are divided into seven sub-categories in terms of the problems as stated. The problems are listed and discussed under the given headings below.

Not Considering the Field of Education as One of the Fields that Research and Development can be Conducted

The companies dealing with the research activities in the fields of science and engineering can easily take part in the techno centers rather than the ones in the education. Eleven of the participants stated that educational researches were usually ignored in the techno centers, compared to science and engineering ones. One of the participants compared research activities in education and defense and stated as below:

> *Some software programs have been produced in the one side. There are some companies working in this area. These programs include some codes in millions of lines. They run on some researches on rockets. These are considered as innovative products. We, as a company in education, design a game through e-learning. They are not considered more different than the other internet games. In other words, they asked them what is new here.*

This statements deal with 'innovative product' and 'innovation'. The second statement the explanation 'what is new' is very significant since this expression show despising. The engineering and science fields are the ones which initiates this techno centers and entrepreneurialism. (Plosila, 2004, p. 114- 116; Scott, 2004, p. 28)These are regarded as 'techno sciences' and as natural parts of these centers (Delanty, 2001, p. 122- 123). As seen in this view, research activities in education are not seen as 'techno centers'.

Moreover, the directors of these companies are small and medium entrepreneurs having limited knowledge about management techniques and marketing due to the fact that they have almost no experience related. Therefore, nine of the participants in this study stated that being in the techno centers are more considerable for them than other companies as the facilities in these centers are required for them. One of these participants emphasized the points as below:

> *There have been a great number of international companies situated in Ankara. They also have a significant place in the techno centers and provide considerable amount of rent for them. When our companies are compared to them, it can clearly be seen that there has been a great gap. It is not a logical way to compare in fact. However, the administrators of the techno centers should support us to grow more than these ones since they have a much stronger infrastructure than we have. Nevertheless, we cannot see this.*

This statement shows a great 'cry' of the participant. Williams and Loder (1990, p.1) expressed that in the context of entrepreneurial university, social and human sciences are usually disregarded and these fields are not seen as important as the fields in engineering and sciences. Furthermore, Clark (1998a, p.5) stressed that the

people in the departments of social and human sciences, except business administration and economics, have difficulty in maintaining the culture of entrepreneurialism in the universities. As a result, the findings of this research are in line with them.

Having Lack of Synergic Relations in the Techno Centers

Techno centers are one of the hybrid organizations in university-industry collaboration, which requires synergy among the parties. Synergy refers to collaborative work of industry-government-industry. This study revealed three types of synergy as below:

- Synergy as a result of direct relation between academicians and companies
- Synergy among the companies
- Synergic relation between graduate researches and activities of research and development

Research and development companies in education are the ones established by the academicians and graduates. Thus, they tend to research and development studies (Scott, 2004, p. 26). Ten of the participants stated that they needed the help of academicians in every step of the research but especially in the step of implementation. However, they also added some problems they had faced;

1. Not contacting academicians with the companies
2. Prejudiced attitudes of the academicians
3. Financial problems with the academicians

Since there has been little collaboration between the companies and the academicians; thus, some activities are required to make them work in that way. An administrator of a company expressed that academicians had a good idea; however, they did not have any opportunity to work with together. One of the other participants explained that as he had worked in the field of education; therefore, he had some friends to help him find out academicians in the related fields and he formed a group of academicians to support their researches apart from the techno centers. This reveals that there has been little contact with the companies and the academicians in this field.

Moreover, another participant regarded that “the academicians usually expected them to ask for the help; even they implored from the academicians; they do not come to them and ask.” The word “implore” is a very significant word since it points out the gap between the companies and the academicians. Also, this word regards the difference in status between these two parties. As a result, this clashes with the triple helix model, which equally deals with all the parties, i.e industry, university and government (Etkowitz, 2003, p. 308).

The prejudiced attitude of the academicians is the issue stated by seven administrators of the companies. One of the participants regarded that they could face with some prejudices focusing on the idea that they could be deceived by the companies and their ideas could be manipulated. This same participant added that this was due to the fact that academicians did not know the process and procedure of

the techno centers. This is directly linked with the finding of the study by Meneghel and others (2004, p. 180), in which this attitude was described with the word "hesitation". It is also signified that this problem bases on the in adequate description of the responsibilities and duties of the parties. Furthermore, the other reason could be little experience of the academicians working with the companies found out by the studies by Bayrak ve Halis (2003, p. 71) and Okay (2009, p. 104)

Besides the issues above, it is pointed out that there has been some conflict about the financial issues. In the entrepreneurial university, information has an economic value. Kiper (2010, p.27 & 47) emphasized the diversity of the universities with respect to information's economic value. He focused that universities had a mission to spread the information regarding the universality; in contrast, the industry would like to keep the information oneself in the competitive world. Thus, this contradiction can be problem. One of the participants expressed that;

> *In this respect, though I do not feel well to express this, the academicians are not familiar with the markets and trade so they could ask for higher payment for the task. We said 'it is impossible for us to get this amount of income from this, we respect you and your work, we are sure that you have a hard life to achieve that'... Academicians focused on higher payments. We usually suggest them work in a project and share the income accordingly and equally. However, of course, there are some of them who accept the offer but mostly they reject. In the first step, the share of the income makes them away.*

As a result, how the income is going to be shared is one of the hot issues to be regarded. Therefore, law and regulation related should be formed urgently. In the Law of Technology Improvement Regions numbered 4691 and the Implementation Regulation of Technology Improvement Regions numbered 4691 do not include any information related. Hence, this bothers the collaborative among the parties (Cohen et.al, 1998, p.188-189, Soares & Amaral, 1999, p. 12, Leydesdorff and Etzkowitz, 1995, p. 9).

The synergic relation is another sub-theme of the findings. The techno centers are the places where the research and development companies from various science fields have come together. One of the administrator stated that the "techno centers provide them opportunity to work with all other companies in their own sector and also other sectors; which leads to synergy". This finding is considerable for all the participants in the study. Nevertheless, all of the participants agreed that this synergy has not been provided sufficiently. They also reasoned that it was because of the fact that techno centers are at the level of 'crawling' like babies. For this reason, the companies have to find ways to stand on their own foot.

In addition, it is pointed out that there has been lack of synergy between the graduate studies and the projects at the techno centers. The dissertations are also one of the main resources for the projects (Meneghel et. al, 2004, p. 179); however, the participants expressed that they could not be get the benefit of these. They explained this with regard to two reasons: One of them is that there was no well-established and well-structured system to inform them. One of them stated that searching for a dissertation that they could turn into a project took a lot of time and they could not

spend that time because they had to do some other tasks as well. The other reason could be the feasibility of the dissertation to be conducted as a project. Another participant explained that;

> *We could face with a problem: The graduate students are educated in a closed area of the universities. Their dissertations can be a perfect for the study. Nevertheless, it cannot be a project as it involves some potential problems related to marketing and sale. Therefore, it could not find a place in the market. We have to consider this as well.*

In this quotation the word 'marketing' referring to the products of applied sciences, which entrepreneurial university has highly focused on. With regard to fields of education, the projects in line with the classes via computer and information technologies. According to Mendoza (2007, p. 81) pointed out that the dissertations in education should be feasible, in line with the needs and should have the economic value. Kiper (2007, p. 158) explained that companies and the universities had not collaborated as it was expected.

Depicting the Organizational Culture of Techno centers and the Companies

The participants described the techno centers by using the codes below:

- bureaucracy
- statism
- slow process
- inflexibility
- being static

These descriptions refer to traditional organizational structure of a university rather than the entrepreneurial university, which involves the characteristics appealing to the market, constantly changing and fast-moving. Clark (2008, p. 501& 438) emphasized that universities should empower their coral structure and establish new hybrid organizations to support the entrepreneurialism.

For 'bureaucracy' and 'slow process', one of the participants explained his experience: He stated that they involved an academician working with them in their project. For financing his payment, they need to have the approval of the techno centers. He expressed that the techno centers replied them eight months later when the project had already completed. Another participant stated that they had to sign 30-40 pages of documents to report their project though they could send it though emails. Soares & Amaral (1999, p.13-16) expressed that traditional universities are similar to tanks in terms of putting their decisions into action, which clashes with the flexibility of the entrepreneurial university.

The other description is 'being static' related to other descriptions. One of the participants stated that;

> *You should always follow all the files and documents related to your project. If there were a program, we would enter all the necessary data and the administrators of the techno centers would take them. This makes it easier to follow. Nevertheless, we have got used to the system for 5 years. We need to adapt ourselves because they have already made no change.*

In this quotation, the last part shows the techno centers' being static. Moreover, since they need to adapt themselves, the techno centers are not sufficient to meet their expectations. In conclusion, the techno centers require structuring themselves to respond quickly as support organizations.

The administrators described themselves with some descriptions though these descriptions clash with the ones above. These are as below;

- small enterprises
- having small number of staff
- quick decision-making
- changing quickly
- project-based
- establishing in the techno centers

One of the participants stated that they were not big companies so every staff worked according to their job description regarding their expertise. This also makes them change much more quickly and adapt themselves (Weiss, 1985, p.90). Another participant expressed that they were faced with the changes in their own sectors and they would like to see the same changes. The other participant explained this as "we can easily decide, we are only ten colleagues: when it is needed, we come together and decide and then implement, this is it." These all signify their speed in their work load.

One of the main findings of this research is that techno centers could not get rid of bureaucracy and adapts itself into the speed of the companies and the change. This brings about a clash among these two parties. Companies highly consider the time of the work, need to keep up with other companies, and be quick to transfer their product to the market. However, universities consider finding out the information through the best method. Time is second in their concern (Yücel, 1997, p. 5; Cohen et.al, 1998, p. 171- 172). This is directly is related to the fact techno centers have not been a hybrid organizations.

The other issue stated is 'project-based', which is the requirement of settling down in these centers. The project regards their number of staff working, workload and timing. However, this can cause some problems concerning the project they are to conduct. One of the participant focused on the office work of the project staff and their taxation and he stated that,

> *We have 10 staff for the project for example. They have to attend to the office regularly and these recorded. They could not attend only 10% of the days, which makes about 20 days in total. If it was more than this we have to pay the tax. However, they need to spend time for the issues to be handled outside the office. This is the field work in fact.*

The last description is 'landlord and renter', which indicates the perception of the participants. Moreover, this relation is at the surface level and consists of little interaction except payments. One of them expressed that they had almost no contact with the administrators of the techno center and that if you had done everything you had to, nobody would have disturbed so everything seemed to go well. Another participant mentioned that they had interaction with the center only when they are informed about the rise of the rent like the simile This considerably signifies that the techno centers have not met the expectations of the companies yet and this shows entrepreneurialism have not been internalized (Clark, 1998a, p. 13; Zaharia & Gibert, 2005, p. 40).

The other simile is 'time of crawling' like babies. This regards that techno centers have not developed as they should be. One of the participants stated "techno centers cannot do some tasks as they are at the level of crawling". In Turkey, these centers firstly started to be established at the end of 1990. When compared to U. S.A., where these centers originated, Turkey seems about thirty years back (Smilor et.al, 2007, p. 212). As a result, it could be said that these centers need time to 'walk' or 'stand still'.

Sales and Marketing

In the entrepreneurial university, information resulting from the research is transformed into a product and marketed. Gürüz et. al. (1994, p. 35) stated that marketing is the step after the production. This step is the most challenging one for the companies at the techno centers as their administrators are not masters of the trade but have academic background. All the participants stated this as their main and 'classical' problem. One of the participants expressed that;

> *Sales and marketing requires a team. How we provide this is a big question for us. Our company is in the seventh year and we have been in this area for about 10 years. We do not have the team for sales and marketing. This is what we need most.*

Duberley et. al (2007, p. 493) also emphasized that this was one of the major troubles of these kinds of companies. They have really difficulty in providing the innovative products which can meet the needs of the markets. It is a fact that the findings without meeting these needs cannot become a product (Stankiewicz, 1986, p. 73).

Counseling and Guidance

Lack of counseling and guidance is the other problem the participants stated. In other words, they need facilitation provided by the administrators of the techno centers. All of the participants agreed about their need of guidance in financial supports and tax exemption. Besides, they all mentioned about some kinds of activities related to these issues were conducted. However, they did not think it is effective and efficient. One of them pointed out that;

> *There are some companies running for guidance in our center. They provide some seminars but these are general. It can take about 5-10 hours; however, this does not usually focus on my problem as all the companies have their own problems. It is not possible to solve them through general suggestion. Instead, an expert should come and identify the problem and propose a solution accordingly. We are in the commerce though we do not have background related. When starting this sector, we have directly come across with lots of problems; even we have no idea about them. Nobody gives you any information and there is no guidance how to get information.*

This quotation emphasizes how the participant is lost and helpless in the world of commerce as someone from the academic world. Bullock (1983 cited Bowen 2003, p. 99) regarded this kind of situation as "harsh transformation", leading to difficulty in sustainability of these companies between these two diverse worlds. In order to provide "soft transformation", he proposed them to work with the experts in the market. Also, Etkowitz (2003, p. 324) signified the importance of the expertise these companies, which supports the findings of this study.

Requiring Well-Defined and Obvious Legislation and Regulation

The Law of Technology Improvement Regions numbered 4691 dated July 6, 2001 and the Implementation Regulation of Technology Improvement Regions numbered 4691 dated July 19, 2002 are two legal documents in line with the works of techno centers and the collaboration between universities and industry. According to these, the companies can have some financial supports, tax exemption and advantages as stated above.

In addition, all the participants stated that they had to confront with the conflict in sharing the income of the product between them and the academicians as this issue is not obviously explained in the documents. On e of the participants expressed that "We would like to earn some money together with the academicians. Some of them have accepted but some have not. There is no item in the legal documents about this. " This aspect is directly linked to 'copyright', which is one of the main gaps in Turkish law. Zinser (1998, p.201) and Gürüz et.al (2008, p.257) regarded the issue 'copyright' as one of the main clash in this collaboration.

The other sub-point deals with the working hours of the research and development staff. They have to fulfill a certain time in order that their income could be out of taxation. However, they have to spend some time in the field work regarding the project so they cannot complete this working time. Twelve of the participants pointed out this should be re-arranged as soon as possible. One of the participants expressed that,

> *In the implementation stage our staff should go to the field and work there. For example, one of our friends should work in the field in Istanbul for about two weeks. This causes them not to provide the completion of timing required. We cannot explain this to the administrators and the government. So, we have to pay the tax.*

This quotation clearly shows the need of revising the law and regulation. The main role of the administrators of the techno centers should be to submit this problem to the government.

Communication Problems Faced by the Companies

Techno centers are likely to be established near or inside the universities so that interaction among the parties can be provided closely and effectively (Smilor et. al, 2007, p.205). However, though they are located in this principle. The participants explained their communication with the universities can be attained by email and universities contact with them to ask for them about the employment and job opportunities for their students and graduates. The other participant added that they can have contact with the university and the techno centers to be informed about the changes in the financial issues; moreover, the communication is usually one-sided, in other words, they informed them and these companies implemented them. These all indicate that re-structuring universities with respect to entrepreneurialism, requiring effective communication between two parties (Clark, 1998, p. 13).

CONCLUSIONS AND RECOMMENDATIONS

This study has some results and implications in terms of the relationship between the companies and the universities. The first result is that in the techno centers, the research and development activities in education are limited compared to the fields of science and engineering. This can be based on the difficulties in producing feasible and visible things in education. Therefore, the products of these companies should be evaluated in a different perspective than others.

The next result is the lack of trust among the companies, the universities, and academicians. This can be due to the fact that there is no clear regulation or law to identify the roles, responsibilities and the tasks of them. Moreover, the techno centers as hybrid organizations should organize some activities to initiate the collaboration among the parties. Furthermore, they can follow the researchers conducted at the universities and announce them to the companies and even make hem communicate by providing some tasks. To establish trustworthy environment, techno centers are the key organization

The third result is that the organizational cultures of companies and the techno centers are completely diverse. The techno centers seem to have traditional organizational culture whereas companies are frequently changing, able to take action immediately, dynamic and flexible. Thus, techno centers, which are the faces of the universities in this collaboration, have to be re-structured so as to respond the needs and expectation of the companies

Sales and marketing are both major problems of the companies as the managers of these companies have limited experience in this area. Thus, they deliberately are in the need of counseling and guidance provided by the techno centers. Additionally, they have difficulty in tax exemption and financial supports provided. The companies should be guided by the team involving experts in these two areas.

One of the problems is also related to the gaps in the regulation and law. Copyright is the major problem causing trouble in their collaboration with academicians and researchers; which is also the conflict among them. Moreover, the working condition and time of the staff of these companies should be re-arranged regarding their project-based system.

The last result focuses on the limitation in the communication. In other words, there is almost no communication between the university and the companies except the administrative issues and graduates employment or apprenticeship. This can be considered directly an indication of the low development of the entrepreneurial university and so its culture.

In conclusion, the level of the collaboration is not at the expected level and all the parties should need to contribute to help this. Though the techno centers in this study are three of the oldest centers in Turkey, they still have the road to take to provide entrepreneurialism in the university. Turkish government has to conduct necessary organization for the basement of the university-industry relation.

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Üniversiteler ve Teknokentlerde Eğitim Alanında ARGE Projesi Yürüten Şirketler Arasındaki Sorunlar

Özet

Problem Durumu: Üniversite-sanayi işbirliği, bilgi çağının getirdiği önemli etkileşimlerden biridir. Üniversiteler, bu işbirliği sayesinde, öncelikle gelir kaynaklarını çeşitlendirmekte, kamu kaynaklarına olan bağımlılıklarını azaltmakta ve öğretim üyeleri, öğrenci ve araştırmacılarına çalışma alanları yaratmaktadır. Ayrıca, toplumsal faydayı gözetmek ve toplumun ihtiyacı olan bilginin üretilmesini sağlamak, üniversitelerin kamu hizmeti veren bir kurum olmasının da getirdiği bir zorunluluktur. Devletin bu işbirliğinden elde ettiği yarar ise, ülke kalkınmasına yapılan katkıdır. Bugün ülkelerin gelişmişlik düzeyinin belirleyicileri teknolojik seviye ve sosyo-ekonomik refah düzeyleridir. Üniversitelerin bu kapsamda çalışabilmesi için yeniden yapılandırılması ve var olan eğitim ve araştırma rollerin, girişimcilik rolüyle harmanlanarak dönüştürülebilmesi gerekmektedir. Bu durum, üniversitelerde girişimci üniversite modelinin ortaya çıkmasına yol açmış ve artık girişimcilik üniversitelerin bir rolü haline gelmiştir.Üçlü sarmal model, günümüzde üniversite-sanayi işbirliğini tüm tarafları ve dinamikleriyle en iyi tanımlayan ve açıklayabilen bir model olarak, yaygın bir şekilde uygulanmaktadır. Bu işbirliğinin en iyi gerçekleştirildiği ve örnek alınan ülkeler olan Amerika ve İngiltere gibi ülkelerde bu modelin uygulamalarını görmek mümkündür. Türkiye'de 1990'ların sonunda başladığı üniversite-sanayi işbirliği çalışmalarında bu uygulamaları örnek almaktadır.Günümüzde üniversite, sanayi ve devlet işbirliğini sağlayan aracı örgütlerden biri de teknokentlerdir. Teknokentlerin amacı, teknoloji üretimini sağlamak, üretilen bu teknolojileri uygulama alanına aktarmak ve bu sayede ülkenin sosyal, ekonomik ve teknik bakımdan kalkınmasına hizmet etmektedir. Ülkemizde üniversite- sanayi işbirliği oldukça yeni olmakla birlikte alt yapı çalışmaları 1980'li yıllara kadar dayanmaktadır. Buna rağmen, üniversite-sanayi işbirliği ülkemizdeki üniversiteler için yeni bir yaklaşımdır. Üniversite-sanayi işbirliğinin en önemli adımlarından olan teknokentlerin kurulup işletilmesine ve denetlenmesine olanak sağlayacak yasal düzenleme 6 Haziran 2001 yılında yürürlüğe giren 4691 sayılı Teknoloji Geliştirme Bölgeleri Yasası ve 19 Haziran 2002 tarihinde yürürlüğe giren 24790 sayılı Teknoloji Geliştirme Bölgeleri Uygulama Yönetmeliği'yle yapılmış bulunmaktadır. Ülkemizdeki 27 teknokent bünyesinde 1451 şirket yer almakta ve bu şirketlerde de 12743 personel çalışmaktadır. Bu araştırmada da, Türkiye'de seçilmiş üniversitelerde üniversiteler ile teknokentler arasındaki ilişkileri çözümleme ve buna dayalı olarak sorunları ortaya koymayı amaçlamıştır. Bu amaçla da Hacettepe, ODTÜ ve Bilkent teknokentlerindeki eğitim alanında ARGE projesi üreten şirketleri incelenmiştir.

Araştırmanın Amacı: Bu araştırmanın problem cümlesi şöyledir: Hacettepe, Ortadoğu Teknik ve Bilkent Üniversiteleri Teknokentlerindeki eğitim ARGE şirketlerinin yöneticilerine göre; üniversite ile ARGE şirketleri arasındaki ilişkilerde karşılaştıkları sorunlar nelerdir?

Yöntem: Bu çalışma, nitel bir araştırmadır. Teknokentlerdeki eğitim ARGE şirketlerinin sorunlarına ilişkin olgular bulunmaya çalışılmıştır. Bu açıklamalardan yola çıkarak araştırmanın ortaya çıkarttığı kavramlar ve bunlar arasındaki ilişkiler ortaya konulmuştur. Kavramların tartışılmasında, sorun durumdaki kavramsal boyuttan

yararlanılmıştır. Araştırmada, modele uygun olarak, yarı yapılandırılmış bir görüşme formuyla veri toplanmıştır. Fakat görüşme sırasında, gerektiğinde ek sorular da sorulmuştur Nitel araştırma modeli çerçevesinde, çalışma grubuyla çalışılmıştır. Ankara ilindeki teknokentlerde eğitim alanında hizmet veren şirketlerin yöneticileri, araştırmanın çalışma grubunu oluşturmaktadır. Bu şirketlerin ortak özeliği, tümünün eğitim alanında araştırma geliştirme projeleri yürütmeleridir. Bu araştırma kapsamında Hacettepe Üniversitesi Teknokentinde 6 şirket, Ortadoğu Teknik Üniversitesi Teknokentinde 10 şirket ve Bilkent Üniversitesi Teknokentinde de 14 şirket olmak üzere 30 şirket çalışma grubu olarak belirlenmiştir. Fakat veri toplama süresi içersinde, eposta ve telefonla yapılan haberleşmelere cevap veren ve araştırma kapsamında görüşme yapılmasını kabul eden şirket sayısı 15 şirkettir. Bu yönüyle araştırma, nitel araştırmanın örneklem yöntemlerinden, amaçlı (ölçüt) örnekleme uygundur. Şirket yöneticilerine elektronik posta (eposta) yoluyla ulaşılmış, belirlenen tarih aralığında uygun oldukları zamanda randevu talep edilerek görüşmeler yapılmıştır. Görüşmelerden elde edilen verilerin çözümlenmesinde, içerik analizi yöntemi kullanılmıştır.

Bulgular ve Yorum: Bu araştırmada sorunlara ana temalar olarak aşağıdaki başlıklar belirlenmiştir:

- Eğitim alanında ARGE çalışmalarının yürütülebileceğinin düşünülmemesi
- Üniversite teknokentinde olmanın ortaya çıkarttığı sinerjik ilişkinin yeterince kurulamamasına ilişkin sorunlar
- Teknokent örgütüne ve kendi şirketlerine ilişkin betimlemeler
- Ürünlerin satış ve pazarlamasında karşılaşılan sorunlar
- Teknokentlerin şirketlere sağladığı danışmanlık ve yönlendirmeye ilişkin sorunlar
- Yasal ve yönetsel mevzuatta ve uygulamasında karşılaşılan sorunlar
- Şirket yöneticilerinin yaşadığı iletişim sorunları

Sonuç ve Öneriler: Bu araştırma, teknokentlerdeki eğitim ARGE şirketlerinin üniversiteyle ilişkilerinde sorunlara ilişkin bazı sonuçlar ortaya çıkarmaktadır. İlk olarak, eğitim alanındaki araştırma ve geliştirme çalışmaları, mühendislik ve fen bilimlerine göre teknokentlerde daha sınırlı yer almaktadır. Teknokentlerin ağırlıklı olarak fen ve mühendislik bilimleri ağırlıklı olmasının dışında, eğitim alanında üretilen araştırma sonuçlarının ürüne dönüştürülmesinde yaşanan zorluklar ve ortaya çıkan ürünlerin yenilik boyutunun diğer alanlara göre daha soyut kalması bunun sebepleri olarak görülebilir. Bu araştırmanın ikinci sonucu için ise, üniversitelerle şirketler arasında güven sorunundan bahsedilebilir. Bulgularda, şirketlerle üniversitedeki araştırmacılar arasında yeterince ortak projenin yapılamıyor olmasının ana nedeni olarak güven ortamının yaratılamaması gösterilmektedir. Araştırmanın üçüncü sonucu, teknokentlerin örgüt yapısının üniversitenin geleneksel yönetim yapısından farklı olmamasına ilişkindir. Şirket yöneticileri, teknokenti 'bürokratik', 'devletçi', 'esnek olmayan', 'durağan' ve 'yavaş işleyen' yapıda, kendi şirketlerini 'hızlı değişen' ve 'hızlı karar alabilen' olarak tanımlamaktadır. Bu tanımlamalar, tamamen birbirine zıttır. Satış ve pazarlama, ilgili şirketler için önemli bir sorun olması araştırmanın diğer bir sonucudur. Ürünlerin piyasaya ulaştırılmasında satış ve pazarlama oldukça önemlidir. Eğitim ARGE şirketlerinin yöneticileri, satış ve pazarlama konularında sınırlı deneyime sahip olmaları nedeniyle, bu alanda sorun yaşamakta, teknokentler bünyesinde halen sunulmakta olan danışmanlığı sınırlı, yetersiz bulmakta ve yeniden düzenlenmesini talep etmektedir. Bununla birlikte, muafiyetler ve mali destekler açısından da bazı sıkıntılar yaşanmaktadır. Bu sıkıntıları, şirket yöneticileri kendi başlarına çözmeye çalışmakta ve oldukça zaman kaybetmektedirler. Bu araştırma, yasal ve yönetsel düzenlemelerde önemli eksiklikler bulunduğunu ortaya çıkarmaktadır. Bunlardan biri,

üniversitenin araştırma ve sanayinin piyasa ve pazar konusundaki birikimleriyle oluşturulan üründen elde edilecek gelirin nasıl paylaşılacağına ilişkin acil yasal düzenlemeye duyulan ihtiyaçtır. Yine bu kapsamda, ARGE personelinin çalışma koşulları yeniden gözden geçirilmeli ve projenin saha çalışmaları da ARGE etkinlikleri arasında yer almalıdır. Bu çalışmada bulunacak personel, ilgili yasa kapsamındaki vergi muafiyetlerinden yararlanmalıdır. Bu durum aynı zamanda girişimci üniversite modelinin henüz gerektiği kadar yerleşmediği göstermektedir. Sonuç olarak bu araştırma, teknokentlerdeki eğitim ARGE şirketlerinin üniversitelerle işbirliğinin henüz istendik bir düzeyde olmadığı bunun için tüm tarafların ortak çabalarının gerektiğini ortaya çıkmaktadır. Ayrıca, araştırma kapsamındaki üniversitelerin teknokent uygulamasının ülkemizdeki en eski temsilcilerinden olmalarına karşın, girişimci modelin yapılandırılması ve örgüt kültürüne katılması açısından bu sürecin henüz çok başında oldukları görülmektedir.

Anahtar Sözcükler: Teknokentler, girişimci üniversite, üniversite-sanayi işbirliği.