

Identifying the Effective Factors in the Process of Commercialization of Research from the Viewpoint of the Khoy Azad University Masters in the Academic Year of 97-96

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ABSTRACT

The present study was conducted with the aim of identifying factors in the commercialization of research from the point of view of the Khoy Azad University professors. The statistical population of this research is all 114 full-time faculty members of Islamic Azad University, Khoy Branch, who taught in the academic year of 97-96. Due to the low population density, the sample in this research is the same as the statistical society. A commercialization questionnaire was used by Abbasi Esfanjani and Foruzandeh Dehkordi (2013) to collect data. Validity of the questionnaire was confirmed by using existing resources and comments of the faculty members of the educational sciences and its perpetuity was obtained through Cronbach's alpha coefficient of 0.778. Descriptive statistics (mean and standard deviation) and inferential statistics (factor analysis) have been used to analyze the information. The results of the study showed that the underlying, structural and behavioral factors are among the effective factors influencing the commercialization of research from the viewpoints of the professors of Khoy Azad University.

Keywords: *commercialization of researches, underlying factors, structural factors, behavioral factors.*

Research and development is the main indicator of the dynamics of economic activities and is a key factor in the survival and successful presence in the field of competition. Nowadays, the competitive advantage of a nation is determined by the ability to innovate in a high quality, sustainable product at competitive prices, and it will be impossible to achieve this, except by utilizing the latest technological advances through research and development. In the meantime, commercialization of products is a concept used to express the process of transforming knowledge into production (Raji and Mahdian, 2012). The commercialization of research means that the results can be used in commercial and economic affairs.

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Identifying the Effective Factors in the Process of Commercialization of Research from the Viewpoint of the Khoy Azad University Masters in the Academic Year of 97-96

According to Bandriyan (2008), "Commercialization is the process of transforming new technologies into commercially successful products. Commercialization involves different factors of the significant technical, commercial and financial processes that transform the new technology to useful products or services. This process includes activities such as market assessment, product design, product engineering, intellectual property rights management, marketing strategy development, capital increase, and worker education".

In other words, the commercialization of research results is the transfer of an idea, method, object, skill, technical knowledge, intellectual property, discovery or invention arising from scientific research conducted in the academic sector (with or without partners) into an industrial Or service environment, in which it may lead to the development or improvement of products or processes. Also, the process of importing goods or services into the trading cycle is called commercialization (Bandiran, 2008).

In this regard, creative people can introduce interesting, diverse and different research results to investors and customers and provide better conditions for their commercialization (Jahed et al., 2011). In fact, the production and sale of new products is becoming possible in this way, and science becomes value, wealth and ultimately social welfare (the Support Fund of the Country Researchers 2008). Manufacturing and service organizations are also dependent on environmental actors that produce science in order to meet their resources, and universities and their professional members are valuable resources for achieving this objective. Accordingly, commercialization has become one of the main pillars in the technology innovation process. Despite the acceptance of the issue of commercialization by researchers, numerous evidence from around the world suggests that although a large number of researches have been technically successful, only a small percentage of them have been successful in commercialization. Which reflects the complexity of the business process (Bandiran, 2008)?

The results of research and development cannot be the source of general welfare and wealth as long as they are deployed in the realm of action and their revenues do not reach the community. In order to prevent accumulation of knowledge and survival of industries in a competitive environment using modern technologies and utilizing the competitive advantage of the industry in terms of financial and human resources and risk acceptance, it is necessary to recognize the process of commercialization (Mohammadizadeh, 2010).

Creating a platform for the provision of knowledge, in addition to providing significant economic value to organizations, leads to the economic and technical growth of society. The importance of commercialization of Research and Development and technology to the extent that at present, many research institutes, with advisory services and research projects, have jointly recognized their technology commercialization. On the other hand commercialization of research and technology plays an important role in the national system of innovation. During the past two decades, the role and responsibilities of the academic sector (universities

**Identifying the Effective Factors in the Process of Commercialization of Research from the
Viewpoint of the Khoy Azad University Masters in the Academic Year of 97-96**

and research organizations) had significant changes in the national innovation system of the countries. The academic sector as a part of the production and supply of knowledge faces the challenge of better accountability to other components of the national innovation system and increasingly tries to improve their efficiency in knowledge production and increase the quality of research in this sector. Improving the efficiency of knowledge production is only part of the process of promoting national innovation, and countries need more widespread social and economic use of knowledge generated in the academic sector to achieve this improvement this requires the mechanisms for the transfer and benefit of knowledge in other social and economic sectors, especially in the industrial sector, which is becoming increasingly important as the commercialization of research results (Jahed et al., 2011).

In other words, competitions between organizations, attempts to continuously improve, focus on privatization and financial independence of organizations, and, on the other side, new problems and challenges facing human beings, make government and non-governmental organizations eager to search for a logical solution and access to scientific and innovative tools and processes. In responding to these conditions and in order to access more resources and income, universities have turned to commercialization, and have considered income-generating activities as an important part of their strategic plan (Book, 2003). In this space, students are as customer and consumer, colleges and research centers are as revenue centers, education is as a marketable product, research is as intellectual asset, and academic leaders are senior executives. (Feldman, 2007).

In Iran, the development of science and knowledge is the basis of the 20-year vision plan and every day a huge amount of new scientific thoughts is produced in various scientific fields, and effective solutions have to be made to reduce the time gap between the transformation of scientific findings into application and knowledge in order to develop knowledge. The solutions that already have been used to convey scientific achievements and their applications in decision making have not made much success, and this indicates that the conversion of research results into usage is difficult, complex and requires the existence of several factors, such as a powerful intellectual framework, Creativity, skill, awareness and more practice in both individual and organizational levels (Jahed et al., 2011). In fact, the movement towards commercialization without providing infrastructure and meeting the requirements not only does not make progress, but also disrupts the major missions of universities, and the lack of scientific, cultural, political and economic infrastructures, makes the higher education system disable to create a coordinated system based on the commercialization of scientific achievements (Baniasadi, 2013). Researches, including Golresan (2013) have pointed to this issue that institutional, organizational, environmental and individual factors (with defined variables) were identified as key factors affecting the success of academic research commercialization at Yazd technical faculty which also has many variables and indices. Safari and Kolahi (2013) concluded that institutional factors, individual factors, environmental factors, organizational factors, government factors, financial factors, can be identified as effective factors on commercialization. These grouped factors provide a

**Identifying the Effective Factors in the Process of Commercialization of Research from the
Viewpoint of the Khoy Azad University Masters in the Academic Year of 97-96**

conceptual model which can improve the scope of quest and academic research and, accordingly, improve the industrial situation. Rassai (2014) showed that organizational deterrents and structural requirements are of higher importance and priority. Also, there is a significant difference between the viewpoints of faculty members and university managers regarding individual and organizational inhibitors and in other cases there is no significant difference. Rajabi (2001), in his research, mentioned the distrust of decision makers to researchers and the impossibility of some of the findings regarding the characteristics of society as obstacles to the application of research results. In his opinion, conducting qualitative research by competent researchers is a facilitator of the use of research findings. Mahmoodpour (2012), in the research named the design of the commercialization model of humanities research emphasizing the field of educational management and with the management consulting industry approach, showed that the challenges of humanizing commercialization and educational management in issues like scientific identity of humanities, academic disability, Policymakers, researcher's inability, commercialization pessimistic, and research structures have been identified as major themes. Also, using the major categories of changes in the role of universities, the promotion of academic humanities, policy making and redesign of structures, the institutionalization of commercialization, the legal framework, networking, the achievement of competitive advantage, and within the framework of the theory of the optimal model of commercialization of human sciences research with emphasis on the field of management education and within the framework of the management consulting industry has been proposed. The results of Matin's research (2000) shows that lack of proper planning, lack of legal tools for implementing research findings, and lack of interaction between researchers and managers of organizational units is one of the obstacles to the implementation of research findings. Among foreign researches, Allan (2002) concluded in his dissertation that the knowledge of the inventors of the university (how knowledge) plays important role in the development of technology by them. Richman (2015), in a study entitled Student and Professors' Look at the Causalities of Higher Education and Research commercialization, showed that factors such as the duration of the research, the type of research (more usefulness), and the budget allocated to research, facilitate commercialization. Wu et. al (2015) in a research named "Commercialization of University Inventions": The individual and organizational factors effective in licensing the patented university found that individual factors such as inventors' attitudes toward research commercialization, further research during the registration process Invented and collaborated with industry scientists play a role in marketing and licensing. Among the institutional factors, the cost-saving measures for transferring technology costs have a positive impact on licensing. Jensen & Thursby (2001), based on the theoretical analysis of empirical observational findings of researchers, concluded that if universities participate in the licensing process of university technology, the result will be more successful and technology will be more efficiently transmitted. Siegel et al. (2003) concluded that considering the licensing number of technology transfer offices, the outputs are constant and, considering licensing earnings, output will increase, and environmental and organizational factors can have a significant impact on them. Therefore, commercialization of research requires

Identifying the Effective Factors in the Process of Commercialization of Research from the Viewpoint of the Khoy Azad University Masters in the Academic Year of 97-96

preconditions, expertise and existence of many factors. Meanwhile the role of the human force in any change and social transformation is critical. Human resources are those attributes and characteristics of researchers, managers of research and technology field and also users of research results that provide the necessary incentive for commercialization of research findings or exploitation of them. On the other hand, the researcher of the present research, faced with the professors, has always witnessed this complaint that researches carried out by them or their neighbors, is not appropriately used by the institutions and organizations. Therefore, the present research seeks to the answer to this question that what are the factors affecting the commercialization of research from the viewpoint of the professors of Khoy Azad University?

RESEARCH METHOD

This research is descriptive and it is applicable in terms of purpose. The method of research in terms of collection is descriptive witch it uses a confirmatory factor analysis method. The statistical population of this research is all 114 members of faculty members of Khoy Azad University. Sampling has not been carried out due to the low volume of population, and all people in the community have been used as examples. In this research, a commercialization inventory questionnaire was used who developed by Abbas Esfanjani and Foruzandeh Dehkordi (2014).The questionnaire consists of 29 articles that are answered by the individual and used to evaluate the commercialization factors. The response scale of the questionnaire is scored on the basis of the 5-degree Likert scale (I fully agree = 5, I agree = 4, I do not agree, I do not disagree = 3, I disagree = 2 and I totally disagree = 1) and all questions are in the positive direction. The validity of the questionnaire has been confirmed by Abbasi Esfanjani and Foruzandeh Dehkordi (2013) and its reliability is 89%. In the present study, the validity of the questionnaire has been confirmed by the professors of the educational sciences department and the reliability of the tool has been obtained through Cronbach's alpha coefficient of 0.778, which is a suitable coefficient. Also, a confirmatory factor analysis method was used to investigate the research question.

Findings

Confirmatory factor analysis has been used for data analysis, the results of which are shown in Table 1.

Obtained Values	Allowable Values	Indicators	Factors
2.12	Less than 3	k2 on degree of freedom	Underlying factor
0.00	Less than 0.05	meaningful level	
0.13	RMSEA>0.08	RMSEA	
2.35	Less than 3	k2 on degree of freedom	Structural factor
0.00	Less than 0.05	meaningful level	
0.158	RMSEA>0.08	RMSEA	
2.31	Less than 3	k2 on degree of freedom	Behavioral factor
0.00	Less than 0.05	meaningful level	
0.142	RMSEA>0.08	RMSEA	

Identifying the Effective Factors in the Process of Commercialization of Research from the Viewpoint of the Khoy Azad University Masters in the Academic Year of 97-96

According to the above table, the factor load of the questions is confirmed and the level of significance is less than 0.05 therefore, the items of the underlying, structural and behavioral factors have the ability to measure the behavioral commercialization of the research.

CONCLUSION

According to the results, the underlying, structural and behavioral factors are effective factors in the process of commercialization of research from the viewpoint of the professors of Khoy Azad University. About the above-mentioned explanation, it should be noted that the commercialization of researches needs pre-requisites, expertise and the existence of several factors. Meanwhile, the role of human resources in every social transformation is necessary. Human resources are those attributes and characteristics of researchers, managers of research and technology field and also users of research results that provide the necessary incentive for commercialization of research findings or exploitation of them. The results are in line with the results of the researches of Golresan (2012), Safari and Kolahi (2012), Rasaee (2013) and Richman (2015). Also, studies have shown that one of the factors of commercialization of research from the students' point of view is the underlying factor. In the above-mentioned explanation it should be noted that if the goals and priorities of the university are to provide access to the information resources required for researchers and to have the capabilities of the hardware, one can expect that commercialization of research would lead to a proper process. The result is in line with the results of the research (2013), Rajabi (2000) and Jensen and Thursby (2001).

In addition, studies showed that one factor in the commercialization of research from the viewpoint of professors is the structural factor of the university. In the above mentioned explanation, it should be noted that the enjoyment of universities from the place of business and knowledge of the world level can facilitate commercialization. Also, the development of science and technology parks and growth centers in the country is necessary for commercialization of research, and the ability to implement and the extent to which research results in terms of facilities, time and ... are necessary in commercialization. In addition, infrastructures and communication highways can be effective in commercializing of researches. The results are in line with the results of the researches of Baniasadi (2012), Golresan (2012), Safari and Kolahi (2012), Rasai (2013) and Siegel et al. (2003).

Also, surveys of the previous chapter showed that one of the factors of the commercialization of research from the viewpoint of professors is behavioral factor. It should be noted that the alignment of policies, laws, regulations, and government support sector is effective for commercialization. In fact, the capacity to receive and transfer research results in the industrial sector is essential for the commercialization of research. Also the education and training of individuals with capabilities and Commercialization skills are required. The results are in line with the findings of Mahmoodpour (2012), Matin (2000) and Alan (2002).

Identifying the Effective Factors in the Process of Commercialization of Research from the Viewpoint of the Khoy Azad University Masters in the Academic Year of 97-96

According to the results, it is suggested that facilitating measures such as the training of superior scholars, the creation of research journals, and continuous communication with industry in academic units, as well as scientific and technological parks and centers for growth in universities should be established. In addition, policies, Laws, regulations and government support departments for commercialization of academic research should be done.

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Identifying the Effective Factors in the Process of Commercialization of Research from the Viewpoint of the Khoy Azad University Masters in the Academic Year of 97-96

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Conflict of Interest

The authors colorfully declare this paper to bear not conflict of interests

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