

The Role of Academic Entrepreneurship in the Development of Technological Entrepreneurship

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ABSTRACT

As universities play a major role as the main custodians of human resources education in the community, the focus on the academic entrepreneurship sector helps to better develop it. Scholars and scientists have identified entrepreneurs as the main driving force behind economic growth and development, and they are highly regarded as a process of innovation and exploitation of opportunities with diligence and perseverance. Technology entrepreneurship is an interdisciplinary and growing field. In this paper, First the concepts and theories related to the two areas of entrepreneurship and technology are discussed, and then the importance of entrepreneurship education, academic entrepreneurship education, the role of higher education in economic development, university entrepreneurship research, the process of technology transfer from university to industry In line with the role of academic entrepreneurship in the development of technological entrepreneurship, the field of technological entrepreneurship has been studied in detail. Also, in the technology entrepreneurship section, a model of technological entrepreneurship is presented as the "Paradon Model". The field of technological entrepreneurship has been thoroughly investigated. The model consists of seven entrepreneurs, technology entrepreneurs, universities, companies, capital, customers and markets, government and consultants. The technology entrepreneurship model can help researchers explore future research as well as governments and areas that are planning to develop and promote technology entrepreneurship. It is concluded that the success of an entrepreneurial university in entrepreneurship requires not only the creation of entrepreneurial companies, which does not fundamentally provide entrepreneurship education solely in the context of company creation, But at the same time, when developing the training courses, the university must pay attention to the needs of the three groups, while promoting and facilitating the creation of new companies. It also focuses on consolidating companies created and helping to ensure growth and consolidation of their corporate finances. This is a *complementary task for the university*

Keywords: Academic Entrepreneurship, Technology Entrepreneurship, Entrepreneurial University, Entrepreneurship Education, University Relations with Industry.

INTRODUCTION

Issues related to entrepreneurship, especially knowledge entrepreneurship, do not have much precedent In our country, with the objective of the third economic, social and cultural development of the country in the field of entrepreneurship, the adoption of the Entrepreneurship Development Plan has been approved by the country's universities. Although education alone does not contribute to the development of entrepreneurship and business creation, but it is very important as part of a development system. [1]

Studies in the United States, Europe, and Southeast Asian countries show that if the training Entrepreneurship, along with other incentives and facilitators, will have a Significant impact. [2] The key to the success of entrepreneurship is to find innovative ways of using new technologies or better marketing, more fast-tracking Cost, which meet customer needs perfectly. This makes it possible to produce products at a lower cost or to improve their quality, or to create markets for completely products: also, technological new entrepreneurship is a phenomenon that has become increasingly important in recent decades. One of the main reasons for this is the role of this phenomenon in industrial renewal and economic growth. While traditional and mature industrial sectors experience widespread stagnation, technology-based and knowledgebased sectors experience significant growth. Technology entrepreneurship is a discipline that is influenced by two areas of research.

Therefore, it is necessary to consider the interdisciplinary view to know it. Although, in Review its implications of those cases, they are common with other disciplines. But there are some cases that are only the basic concepts of technological entrepreneurship. In this cases, can point to the phenomena such as technologybased firms, technology entrepreneurs and, to some extent, Academic types of companies reproductive. The importance of technological entrepreneurship can generally be attributed to the importance of the combination of technology and entrepreneurship. This has led to the emergence of a growing entrepreneurial field of technology. [7] In other words, today in most versions of development, there is a trace of technology and entrepreneurship. First, all scholars emphasize that from small firms to large regions and countries, they must seek the development and use of appropriate technologies for their sustainable development. Secondly, entrepreneurship is a factor in the direction of development in many countries, which means that an entrepreneur is looking for the right technologies to create value and thus introducing new technologies.

DEFINE THE MAIN CONCEPTS

Technology

In the past, the value of each organization was largely determined by its capital and its physical assets, such as land, buildings, equipment and inventories, but today, the real value of the organization is greater than the physical value and assets or its net worth. Technology for the organization's assets creates added value. This technology exists in the organization's people and technology systems. Companies derived academic achievements and from the achievements that universities have played a role in creating them. Zeleny. [8] Technology includes hardware, software (know-how of hardware), hardware (knowledge of the reason for passing through a particular path), and on another level, including technical know-how, which is the knowledge of the business or skill associated with how to do the right thing. Khalil. [9] According to the definition, technology is a combination of knowledge, products, processes, tools, methods and systems used to create and make goods and services.

Entrepreneurship

Entrepreneurship involves taking risks, pursuing opportunities, and meeting the needs and desires through innovation and the creation of an individual entrepreneur who creates a business or improves through innovative methods. Entrepreneurship is the driving force behind economic development and job creation and community reform. Entrepreneurs are individuals, groups, or people who set up and operate a new business in such a way that they create jobs at least for more than one person. An entrepreneur is someone who starts a small, new business with its own capital. The entrepreneur is the one who creates the maximum productivity from the minimum economic resources. The entrepreneurs are value-creating and are innovators who use the "creative destruction" technique to maximize economic benefits. Schumpeter, who is one of the greatest of entrepreneurship theorist, economists portrays entrepreneurs as the driving force behind economic development, and sees his role as an innovation or a combination of new materials. In his opinion, the distinguishing factor of the manager and the entrepreneur is his riskiness. John Batiste C considers the entrepreneur a factor that combine all of the of production and means to assume responsibility for the value of production, the recycling of all the capital employed, the value of the wages, interest and rent that it pays, as well as the profit. Richard Cantillon considers an entrepreneur to use the means of production in order to integrate them into the production of products to be marketed [10]

Technological Entrepreneurship

The technological entrepreneurship has many equations and definitions. Thinkers believe that technological entrepreneurship is one of the most important factors in creating economic value and development [11]. This has led to a significant increase in the importance of this phenomenon as a major factor in creating individual and regional wealth in recent decades. [12]Despite the key role of technology entrepreneurship in creating new technologybased businesses, it should not neglect the role of this concept in improving the performance of existing businesses and organizations. Using approach, the role of corporate this entrepreneurship in the non-technological part of entrepreneurship is non-denial, derff and Biers [13] define technology entrepreneurship as a business leadership style identifying highly technological opportunities. Which includes high growth potential, resource gathering such as capital and specialists, and ultimately managing rapid growth and significant risk?

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This business with using of specific decision making skills and risky practices and with Exploiting scientific and technological advances offer new products and services to the customers. These businesses are not usually looking for money, but have a strong desire for success in these activities. Shane and Vankhat ARAMEN also consider technology entrepreneurship processes to involve entrepreneurs, organizational resources, and technical systems and strategies to gain opportunities in entrepreneurial organizations. [14] According to another definition given by the Canadian Academy of Engineering (1998), technological entrepreneurship can be seen as the innovative use of scientific and technical knowledge by a person or group who builds and manages business and takes on the risks of achieving goals. [15] In fact, technological entrepreneurship can be seen as an important strategic choice for individuals and firms to enter a new market or new business. The position of individuals or firms in the market is determined through the commercialization of technologies not by trade or commerce. On this some thinkers. technological basis. entrepreneurship, thus, the method and the process of discovering, exploiting and exploring the opportunity have defined [16] Based on Patty, On the basis of these two concepts, technological entrepreneurship as a market for technologies, identification, discovery and Defines [17]. The important point is that, with technological development, attention to the definition of technology, "Even the creation of entrepreneurial opportunities for every ordinary opportunity of entrepreneurship also has a technological dimension. however. technological advancement emerges when technology becomes the main driver of entrepreneurship as an instrument for achieving the goal. Given the development of knowledgebased economies and the importance of using technologies in economic new growth. technology has become widespread and broader every day. The fundamental point of this concept is that technological entrepreneurship is sought after the bridging between technology development and business creation (and, in general, creation of value)

THE IMPORTANCE OF ENTREPRENEURSHIP EDUCATION

Some scholars have argued that entrepreneurial science is based on activity and thinking that is inherited and cannot be taught and learned. This

theory, which was heavily heeded in the 1960s and 1970s, completely excluded the effect of training entrepreneurship skills in developing this knowledge. But changes in the world's economic environment and the formation of a new generation of new entrepreneurs who, through the use of day-to-day knowledge, have created a context for prosperity and acceptance in various markets, Led to the explosive growth of entrepreneurial activities, the small growth of entrepreneurs economy in the and. consequently, the entrepreneurial theory of educational entrepreneurship instead of process entrepreneurship. The of entrepreneurship growth and the impact of entrepreneurship education in the late eighties subsequent development and the of entrepreneurship education in the nineties shows that entrepreneurship education not only boosts entrepreneurs but also leads to the of transformation generations of entrepreneurship and promotion The level of entrepreneurial skills, especially in designing business strategies and business management. was subject to rapid changes in optional domains [1]

ACADEMIC ENTREPRENEURSHIP EDUCATION

It seems that entrepreneurship education at universities should be done in three groups:

General and compulsory education for all students and professors Students who are in the general courses of various tests and entrepreneurship and have the relevant features and have the ability to set up a business.

Training of managers and staff of companies created to help stabilize and continue their activities. One of the important issues in designing training courses is to provide a clear definition of the goals of the course and determine the target groups.

Each entrepreneurship training course at universities should follow some of the below objectives:

- Students' acquaintance with the concepts of entrepreneurship and business.
- Creating an entrepreneurial spirit and culture, introducing successful and entrepreneurial patterns.
- Transfer knowledge and skills of entrepreneurship.
- Research in the fields of entrepreneurship and familiarity with research that had done.

- Business Startup Techniques.
- How to set up new knowledge based companies.
- Workshops on creativity, negotiation, business ethics.
- Education related to the creation of knowledge and technology and how to keep information and registration of intellectual property.

THE ROLE OF HIGHER EDUCATION IN ECONOMIC DEVELOPMENT

An economic firm is sometimes changing ahead of its transformation, and sometimes later into the knowledge economy. Given the fact that the economy works more as a source of knowledge, scientific knowledge production is like a media enterprise, economically [4]. The knowledge of an alternative economic growth engine has emerged for the three traditional sources of land, manpower, and capital. In most sectors, the growth of technology related to science remains outside the framework of economic models [5]. Even as an institutional range of science and economics, university and industry, which until now were relatively distinct and separate? They are often tied together through government initiatives and more are expected the companies to be key players in the economy, who could be at least a colleague close to a university or other knowledge production institutions [1]. In the second half of the 20th century, the development of new industries was based on university research. Academics and industry owners communicate with each other, which included consulting, research contracts, and the establishment of research centers and the formation of the company. In parallel with evolution in the mission of the university, Rationality of the university has also changed. The evolution of university rationality from three dimensions of the goal of activity, the method of financing activities and promotion of faculty members can analyze. Previously, knowledge was a general commodity, therefore, the purpose of academic research was to increase and expand human knowledge without regard to scientific use, and hence there were only two methods for exploiting it:

- Education, in order to provide students with the opportunity to acquire knowledge.
- Publications (books, articles, and conferences) that helped the process of accumulation of knowledge. In this respect,

the criterion for most universities is the promotion of their faculty members was based on the quantity and quality of scientific writing and publications, and members of the board scholars also obtained credits from the publication of their knowledge. Accordingly, researchers used the criterion of maximizing the utility of universities for analyzing university research behavior [1]

In recent years, this method has lost its effectiveness in analyzing university research behavior and explaining current changes in the academic system. Therefore, some researchers have introduced a new rationality that can be called the acquisition of maximum competitive ability to attract financial resources and knowledge systems. In the past, entrepreneurship was based on material resources and experience. But since the early 1110s, the phenomena of knowledge-based innovation have evolved and interacted with one another. In fact, the main reason for the emergence of a knowledge-based economy was the emergence of innovation and knowledgeentrepreneurship. Entrepreneurship based education experiences in some countries, regardless of culture and religion. By training entrepreneurship, entrepreneurs can be trained and Entrepreneurship can be done with research. The university is a good place for knowledgebased innovation due to basic features such as human capital in the form of students and faculty members. Hence, the university can be entrepreneurial as the most important reference for the production and dissemination of new knowledge. A firm derived from the university. Reduces commercialization tensions and provides a mechanism for moving economic and technological knowledge at the national and regional levels. In fact, a university-based firm is a firm founded by the university on the basis of technological ideas developed by university members (faculty members, staff and students). Knowledge-based entrepreneurship is a complex system that has many factors in shaping it's operating, and developing. The quantity and quality of these factors varies in different countries, and, accordingly, the performance and the level of development of science-based entrepreneurship are also diverse [1]

ACADEMIC ENTREPRENEURSHIP RESEARCH

Academic entrepreneurship is the solution to the scientific problems of society, government and enterprises, the creation of a framework for the development of innovation in the members of the university, the provision of academic research results to the market, the production and delivery of new technologies and innovation in expanding the boundaries of human knowledge [3]

There are three meanings from academic entrepreneurship:

- The university as an organization is an entrepreneur; university members such as professors, students and employees have entrepreneurial behavior; the interaction of the university with the environment will create a flow of entrepreneurial patterns. According to researchers, entrepreneurial capabilities are an important factor in the development of companies. Entrepreneurs, technically well-known, have scientific and technological backgrounds and work in educational and academic centers above the level of the lab.
- The university entrepreneur is someone who engages in entrepreneurial activities, but considers it only as a minor subject in academic works and activities. One who is full time in risky businesses and needs to pay attention to important scientific issues.
- The university entrepreneur is one who has the merit and qualifications of the business, has acted at risk and considered science as a business.

Three different types of Spin-off have been identified:

- Official Spin-off: It is created by one or more students, that is, those who leave the university to form a company. Bairley takes these people as a college entrepreneur.
- Technology Spin-off: Where the manager or investor of the outsider IP buys or acquires intellectual property (intellectual capital) from the university and forms a new company in this way.
- Disparate Spin-off: The dominant form of Spin-off at the university is the combination of the inventor and the investment of academics.

A university entrepreneur is an individual who balances across interdisciplinary and Technology-driven technology transfer strategies and opportunities created by the university across technology companies, (IP) from the intellectual capital of a field of discipline it determine the university's admissibility in special courses. An academic background is increasingly recognizing the capital of organizational knowledge as individual capital. Founders of technologybased technology companies based on specific knowledge. University involvement in the commercialization of organizational knowledge. University involvement in creating, supporting science and engineering in technology-centric companies. Academics entrepreneur are those who are independent of the university involve with technology-based companies.

PROCESS OF TECHNOLOGY TRANSFER FROM UNIVERSITY TO INDUSTRY

Large R & D or from a sub-R & D section Many researchers have been conducted on the flow of technology transfer in an organization to a larger company [6].

But our focus is on the technology transfer process from university to industry or the transfer of business knowledge from academia to companies.

Key Beneficiaries References in the process of technology transfer from university to industry are as follows:

- University scientists and students who discover new technologies.
- Managers and staff of university technology which are the interface between academics and industry And Manage the intellectual property of university.
- Entrepreneurs and companies that commercialize knowledge-based technologies.
- Of course, the above items are not a complete list of them. For example, the government, which finances many university projects, can be considered as a stakeholder. A scientist discloses his invention by registering with the technology transfer office.

This is where the university authorities should decide on a patent for this innovation to protect their intellectual property and this will cost. Because its commercialization potential is examined by the process of technology transfer from university to industry. Often, the technology demand of a partner in the industry provides the necessary justification for its patent registration.

Since most universities have a small budget for patent registration, a fundamental decision must be made, especially when the university is

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seeking a universal copyright protection, it will be quite expensive. A university can apply for national rating protection because it protects technology at a lower cost [1]. When the copyright are awarded, sometimes the process of technology transfer from university to industry. with the faculty to technology marketing can at. Faculty members can participate in the process of identifying potential companies. The next step involves working with private companies or novice entrepreneurs (newly established companies) to negotiate a copyright agreement for intellectual property. The agreement may be include benefits such as copyright or Share in newly established companies for the university. In the fifth and final stage, technology becomes a commercial product. The university may continue its relationship with the company by providing new resources to keep the current agreement open. In addition, faculty members may serve as technical advisers or board members and have a share in the newly established company.

COMPONENTS OF ENTREPRENEURSHIP TECHNOLOGY

Several actors with different roles for the process of creating a technological entrepreneurial environment are including the following network:

- The Organization for Economic Cooperation and Development, which, as one of the most influential global economic institutions, has provided a forum for like-minded countries to discuss, develop and refine their economic and social policies.
- People like academicians, engineers, entrepreneurs, company directors and new graduates;
- Companies;
- Academic and Research Institutions;
- Government and government institutions involved in the transfer of technology or international organizations;
- Private investors such as business angels;
- Other organizations, such as nonprofit organizations [17]

However Proudan believes that, according to Schumpeter's view, the function of entrepreneurs is to change and complete the patterns of production through the exploitation of the invention or, in general, a technological possibility. Research on technological entrepreneurship has taken place at many levels.

Produn have identified seven key factors of technological entrepreneurship:

- Technology-based Enterprise,
- Technology Entrepreneur,
- Universities,
- Companies and Organizations,
- Capital,
- Customers and Market,
- Government and Consultants.

So, research is about interdisciplinary and multifaceted technology entrepreneurship.

Technology Entrepreneur

Technology entrepreneur is one of the main accelerators of the process of economic growth and development. Usually more than one tech entrepreneur is involved in the establishment of а technology-based company. Generally, technology entrepreneurs have different knowledge, skills and characteristics than nonentrepreneurs. The entrepreneur's motivating factors are a key driver of his success, and somewhat different with non-tech entrepreneurs. Wealth, control and independence can be considered as three main motivations for starting a business. The desire for independence is divided into two forces of exploitation. While the desire for control and freedom of motivation for the freedom of the need to escape the Employee bureaucracy. Previously, in the public or private sector, the motive is the control of a complicated psychological thrust.

Universities

Universities play three important roles in technology-based firms:

Educational role, role in the creation of advanced technology companies using academic research and development, academic Productive companies and university development centers, and the role of collaboration with advanced technology companies of clusters, technology parks, and so on.

Companies and Organizations

On the one hand, organizations have an important role to play in creating new businesses, and on the other hand, they are improving their performance and upgrading with enterprise entrepreneurship. Organizational entrepreneurship is usually based on the company's research and development. Organizational entrepreneurs are an attempt to gain the style of thinking and behaviors that foreign entrepreneurs use to create business.

Capital

The manner in which a business acquires its required capital depends on the type of company, its credibility, the willingness of the entrepreneur to risk, and the various possible ways in which capital and money can be obtained. The liquidity of a company varies according to different stages of its development in a variety of ways.

Market and Customers

The main focus of entrepreneurs should be on the customer. Although technology entrepreneurs often focus on technological challenges and product development, on the other hand, they must, also pay special attention on market feedback, commercialization and marketing practices for advanced technology products, rapid growth strategies, globalization issues, environmental issues, and many other market-related issues.

Government

The government should Facilitate and encourage the formation of small and medium-sized enterprises.

Another goal should be to use certain criteria to ensure that the business environment is appropriate.

This is done in several ways:

- Macroeconomic policies, especially the environment with economic stability,
- Legislation providing favorable conditions for small and medium enterprises.
- Support for solving issues of small and medium enterprises,
- Promoting business and entrepreneurship and developing an entrepreneurial culture. To succeed in supporting firms, the government must combine three important aspects: the unity of strategies, institutions, and service plans.

Advisers

Research on small firms shows that there are gaps in their abilities that can be identified with (Industrial Technology) two years of discovery (2-10 years) of pre-clinical laboratory and animal experiments (first phase 20-30 volunteers for safety control (2end Phase 100 to 300) of the volunteer patient are used to control the efficacy and side effects (third Phase 1000 to 6000) of the volunteer patient is used to monitor long-term response, and confirmation of the funding of seed risk funds for research funding and Precede development examines after-market FDA (first, second, and third rounds) initial sales of stocks Various types of counseling and training can filled out.

These gaps in abilities are as follows:

- Information gap
- The gap in problem solving and technical capabilities
- Learning gap [18]

CONCLUSION

Entrepreneur University success Not only requires helping to create entrepreneurial companies that entrepreneurship education is not just about creating a company, but at the same time, when developing the training courses, the university must pay attention to the needs of the three groups, while promoting and facilitating the creation of new companies. It will also focus on consolidating companies created and helping to ensure growth and consolidation of their corporate finances. This is a complementary task for the university. Specific features of entrepreneurial technology include: Medium to long run time for product development, Need for a lot of capital, the unexpected results of technology research, With plenty of regulatory rules. Need for extensive skills and technical knowledge, one of the most researched industries in the world. The need to observe ethical rules in many cases, such as human and animal tests, High importance of maintaining intellectual property for success. Strong ties and strategic alliances universities. Institutions and with other companies. Increasing the need for capital and resources throughout the life of the company or organization. Given that the most important part of entrepreneurship is entrepreneurship itself, Entrepreneur has played a major role in shaping entrepreneurship And it's important to create conditions for it's establishment. Hence, university-based entrepreneurship with the training of highly skilled and expert scholars has a role to play in the development of Technological entrepreneurship. And in this regard, The College of Entrepreneurship is playing a key role in educating entrepreneurial forces in technology and knowledge. Therefore,

the formation and support of entrepreneurship faculties at universities is a wise investment and the necessity of the country to educate knowledge and technology entrepreneurs for the development of technological entrepreneurship. And the government needs to prioritize support for entrepreneurship and entrepreneurship colleges for the development of economic entrepreneurship in order to boost the country's strength and prosperity.

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