Implications of theTriple Helix Model in Peshawar, Pakistan

A Case Study of the Entrepreneurship Development Centre (EDC) IMSciences

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Contents

Tables: Page

Figures

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Abstract

The study aims to explore existing university-industry-government linkages in Peshawar, Pakistan and study the factors that determine these linkages. Furthermore, the research examines the extent to which university-industry-government collaboration can address regional industrial problems and promote economic growth. Hence, the quest is to seek a model that not only enhances innovation in the region but also improves industrial competitiveness. Therefore, Etzkowitz's Triple Helix model, based on academia-industry-government collaboration, provides the intellectual context for this research. As universities have a crucial role to promote innovation and stimulate economic development, the study begins by examining the different roles that emerge in different areas. In this regard, the university's traditional role of teaching and education has evolved to the present focus on knowledge production. Secondly, a systematic literature review is undertaken of studies in developed, developing and newly developed countries to examine how the Triple Helix model is operationalised in these regions. The literature review then guided the primary research which examines how the model could work in Peshawar, Pakistan. Primary data were collected with the aim of establishing the extent to which university-industry-government linkages existed in the region. A case study of the Entrepreneurship Development Centre (EDC) at IMSciences was selected because the centre had already initiated U-I-G linkages to some extent in Peshawar.

The study uses semi-structured interviews and a narrative approach; with descriptive and analytical approaches to investigate the nature of university-industry and government linkages in Peshawar. Research findings suggest that university-industry-government linkages are too weak. Moreover, the EDC needs funds to sustain its activities; government level support for research funds and industrial recognition of the centre's potential as a well-developed mechanism for U-I-G linkages. Furthermore, the Triple Helix model cannot be implemented in its original form for many reasons. To overcome these challenges, the study recommends that the EDC should first develop strategic partnerships with government and industry that could be mutually beneficial. IMSciences through EDC should adopt the third mission of academia, i.e. innovation-based economic development and should engage in research and development that transforms the region into a knowledge-based economy. The

model must be modified to make it functional in Peshawar. The Small and Medium Enterprise authority (SMEDA) should be included as an intermediary in bridging the gap among university-industry-government collaboration. Moreover, a more conscious, evolutionary approach is recommended for the implementation of the model in Peshawar.

Abbreviations

BIC	Business Incubation Centre
EDC	Entrepreneurship Development Centre
EU	European Union
FATA	Federally Administered Tribal Areas
GTZ	German Agency for technical Cooperation
HEC	Higher Education Commission
HGF	High Growth Firms
IBA	Institute of Business Administration
ICT	Information and Communication Technologies
IT	Information Technology
IMSciences	Institute of Management Sciences
KBE	Knowledge-Base-Economy
KPK	Khyber PakhtunKhwa
MOU	Memorandum of Understanding
MNC	Multinational Cooperation
NCEED	National Centre for Entrepreneurship and Enterprise Development
OECD	Organisation for Economic Co-operation Development and Development
ORIC	Office for research Innovation and Commercialisation
R&D	Research and Development
SME	Small and Medium Enterprise
TBIC	Technology and Business Incubation Centre

TIE	The Industry Entrepreneur
THM	Triple Helix Model
U-I-G	University-Industry-Government
UK	United Kingdom
USAID	United States Agency for International development
USO	University Spin-offs
USA	United States of America
WCCIP	Women Chamber of Commerce and Industries Peshawar

Chapter: 1

1.1 Research background

The basic idea of the widely practiced Triple Helix model is that universities have a central role in innovation (Steiber and Alänge, 2013). The desire for a knowledge economy worldwide has not only enhanced the role of universities in regional economic development but has also demanded the interaction of the three helices for innovation and economic growth (Etzkowitz, 2007). Moreover, a shift from natural resources to intellectual capital (Mongkhonvanit, 2008; Etzkowitz, 2007) makes universities "knowledge factories" (David, 1997: 4) which are expected to generate new ideas; intellectual capital; produce industry specific graduates and generate innovative research publications. Furthermore, to compete with their academic counterparts, they are required to engage in such R&D practices that lead to new discoveries. Therefore, universities hire academically excellent faculties; admits quality students who help in the creation of new knowledge (Mongkhonvanit, 2008).

Moreover, universities have to strengthen their links with the industry to achieve excellence, while industry, in return, also benefits from such bonding. Hence, universities - to regain prestige and meet their financial requirements - depend on industry to fund their R&D practices, while industry's desire for innovation and economic gain is fulfilled by academia (Mongkhonvanit, 2008). For example, industry benefits through academia spin-off firms and technology licensing, while academia meets its financial needs through these spin-off activities (Florida, 1999). The desire of universities for financial resources to sustain themselves and the industrial need for innovation and economic gain have resulted in a win-win situation for both institutions. Their bonding and increased interaction has created opportunities for new, innovative industries that ultimately results in the development of knowledge economic regions (Mongkhonvanit, 2008). Therefore, this study aims to discover the dynamics of industry-academia-government linkages that drive regional economic growth and development in general and also Peshawar in particular. Hence, the roles and relationships of the three helices in regional economic development are examined and

recommendations for how to facilitate and enhance their roles and linkages in Peshawar, Pakistan for economic development are provided.

1.2 Background of the study

1.2.1 The industry

Peshawar is the capital city and economic hub of Khyber Pukhtunkhwa (KPK) province (formerly known as NWF) of Pakistan. The economic profile of KPK consists of minerals, hydel, horticulture, tourism, furniture and fisheries (www.**smeda**.org). However, Peshawar's local economy consists of an industrial estate in the Hayatabad region, which hosts 212 operating units; where 43 are sick units (closed due to failure) and 62 units are under construction. The main, dominant, industrial units in Peshawar are: a match factory; vegetable ghee oil mills; pharmaceuticals; marble tiles; chemicals; woollen mills; engineering; steel mills; printing and packaging; ceramics; chip board industry; food industry; furniture industry; fibre industry; herbal medicine and plastic industry. (http://www.sda.org.pk/content.php?page_id=33).

MNC branches in Peshawar include Glaxo Smith international; Nestle Pakistan; Crescent Commercial bank LTD; Siemens Pakistan Engineering LTD; Novartis Pharma Pakistan LTD; SINGER Pakistan LTD; Faisal Bank LTD; Paktel LTD; Standard Chartered Bank; ORIX Leasing Pakistan LTD; Sanofi Avatis Pakistan (PVT) LTD (http://epeshawar.com/business-directory/1201-multinational-companies.html); Pizza Hut and McDonalds.

Women-led businesses in Peshawar amount to 150. They consist of 51 boutiques; 14 beauty salons; 5 food businesses; 5 pharmaceuticals companies; 19 handicraft businesses; 2 flour mills and 1 manufacturing company. Furthermore, a few women-led businesses consist of education, consultancies, clinics etc. (http://www.wccip.org.pk/members-list.html); other businesses in the city consist of retail and trading.

An economic overview of Peshawar confirms that its major economic sectors represent traditional small and medium enterprises. Multi-nationals are nominal in Peshawar and exist either as franchises or branches. No official MNC headquarters have been established in

Peshawar due to its law and order situation. In such, the scenario's chances for the economic growth of Peshawar are only bright if an interactive institutional network approach is adopted. The assessment of Peshawar's economy finds that lack of infrastructure facilities; no foreign direct investment policies; weak politico-economic situation; energy crises; less governmental support for high growth businesses and innovation in the region have all led to a weak and crumbling business sector in Peshawar. Economic development in Peshawar depends on the collaborative efforts of government at grass root and provincial level; industry and academia – hence, congruent in the Triple Helix model introduced by Etzkowitz (1997). In order for the Peshawar economy to take off, it needs enhanced productivity and capability of its existing firms; to develop innovative high growth firms; to encourage technological development; to develop its Human Resources; to overcome energy and social crises and cultivate innovative R&D practices at academia. Furthermore, government involvement in linking university R&D breakthroughs with industry is required.

1.2.2 The University

Universities in Pakistan are required to produce graduates that are not only professionally well-equipped but are also morally developed. Therefore, universities not only impart knowledge that fulfils professional needs but also inculcates social norms and values in the graduates. Hence, IMSciences' Peshawar mission is to produce industry specific graduates along with moral integrity. Its research potential aims at producing knowledge capital that promotes entrepreneurial culture in the region (www.imsciences.edu.pk). In this regard, IMSciences established the Entrepreneurship Development Centre (EDC) in 2003 to bridge the gap between academia and industry (Jones-Evans et al., 1999) and enhance industry capacity in the region. Peshawar's industry, at present, is at a position where it needs dynamic approaches for improvement. Therefore, examining existing industry-academic linkages in the region is essential to achieve a higher level of productivity and industrial competitiveness in the region. However, a review of the existing literature on university-industry-government (U-I-G) linkages (see Chapter 3) found that there is limited information available on such linkages in the developing world. Hence, the need is to explore mutual benefits and opportunities that stems out from university-industry linkages and how further these ties can be improved to increase industrial competitiveness. Knowledge created from this study will not only benefit higher education; local business environment and public policy but will also strengthen U-I-G linkages for economic development.

1.3 Research Objectives

1) To investigate U-I-G linkages in Peshawar, Pakistan.
2) To find applicable models and ways to improve the linkages in order to enhance industrial competitiveness.

1.4 Research Questions

The study explores the following questions:

1) What level of linkages and relationships exist between universities and industry in Peshawar, Pakistan?
i. Which factors determine these ties?
ii. To what extent do universities serve local industrial needs?
2) How to overcome university-industry linkage problems and what measures to adopt for improving such relationships to better serve the economy?
i. How universities can better serve Peshawar industry?
3). How government can effectively contribute towards bridging the gap between industry and academia in terms of regional economic development.

1.4 Background to the Research

To analyse U-I-G linkages in Peshawar, Pakistan, the study employed the Triple Helix model as a major framework. The model tri-lateral interactive model, coined by Etzkowitz and Leydessdorff (1997), explains how industrial knowledge economies benefited from university-industry-government collaboration to achieve innovation in their regions.

1.5 Significance of the Study

The results of this study will explore existing linkages among universities, industry and government in the region. Furthermore, the findings of the study will identify mechanisms that will assist in developing an innovation model relevant to the cultural environment of

Peshawar, Pakistan. The study's results will not only recommend measures to strengthen U-I-G linkages in the region but can also be adopted in other parts of the country and can also be a role model for developing economies.

This study is limited to the Peshawar region of Pakistan, EDC IMSciences' case study is selected from academia because the centre was the first regional initiative to work on university-industry and government linkages. SMEDA (Small and Medium Enterprise Development Authority) is selected on the basis of its active involvement with all of the stakeholders that work on the development of the small and medium enterprise sector in the region. Women Chamber of Commerce and industry Peshawar was selected due to its need for academic technical expertise in the region. Hence, a sample size from these institutions is determined by their contribution to U-I-G linkages on one way or another.

1.6 Research Methodology

The study uses the single case study approach to inquire university-industry-government linkages in the Peshawar region. The research begins with the researcher's personal account, informing the audience of how and why she got involved with EDC IMSciences; how she established university-industry-government linkages in the Peshawar region. The researcher, in her autobiography, explains how she established a business incubation centre at EDC and shares her personal experiences about her involvement with EDC IMSciences. In the second phase, semi-structured interviews are conducted with SMEDA; the Coordinator of EDC IMSciences and the Vice President of Women Chamber of Commerce to explore the extent to which university-industry-government linkages in the Peshawar region exist.

1.7 Outline of the Dissertation

The thesis is divided into the following 6 chapters:

Chapter I: Orientation about the thesis and academia's role in economic development and the emergence of a knowledge economy due to U-I-G linkages is provided.
Chapter 2: Systematic literature review of Triple Helix model from 2000 to 2013.
Chapter 3: Discussion on research methodology adopted for the study.
Chapter 4: Presentation of primary data, findings and results.
Chapter 5: Discussion and analysis of literature review, results and findings.

Chapter 6: Recommendations and conclusion of the study is provided.

1.8 Overview

This section begins with the historical evolution of the university and the emergence of the Triple Helix model. As discussed earlier, universities have a vital role in developing the regional knowledge-economic base in the developed world; therefore, detailed discussion on academia's evolution from traditional to entrepreneurial university is provided here. Secondly, the knowledge economy and knowledge-based economy (KBE) are defined and discussed then the university's roles in the knowledge-based economy and the innovation system are explained. Furthermore, Porter's Diamond model, Mode 1 and 2 down to the Triple Helix of university-industry-government (U-I-G) is discussed in detail. In each economic model, the role of academia is especially highlighted along with industry and government. Triple Helix links with institutional theory and the position of each sphere is mentioned. Finally, research recommendations for Peshawar, Pakistan are provided.

1.8.1 Academic Third Role

Universities, since the mediaeval era, performed two functions: teaching and scholarship. With time, teaching evolved as developing students' potential and skills as well as generating knowledge to serve the individuals in society. The scholarship role of the university was to create new knowledge through research in order to meet societal needs. The scope of universities expanded with time when new discipline and departments emerged due to increased demand of specialisation (Martin and Etzkowitz, 2000). The Second World War added a new dimension to the role of universities. In the US, the military supported research and graduate education that could help in war time; universities were expected to develop such knowledge which could be used and implemented in war-fare (Chakrabarti and Rice, 2003). Wartime R&D efforts in the industrialized countries yielded fruitful results in the form of radar, atomic, and other technological breakthroughs. Universities, due to their central role in war-related R&D, enjoyed more autonomy than before (Bramwell and Wolfe, 2008).

Different species of universities evolved with time to address a variety of social needs, such as the classical university, which was transformed from the mediaeval university. Examples of this species are the Humboldt University model; Cardinal Newman University in Britain;

Ivy League universities in the USA and the Imperial University, Japan. The second species of university that emerged in Europe was in the form of technical colleges or universities, such as institutes of technology or polytechnics. Ecole Polytechnique France; technical 'high schools' in Germany and Switzerland; institutes of science and technology in Britain at Manchester and Imperial College, London; Institutes of Technology, such as MIT and Caltech, are a few examples of technical universities that served their concerned industries through training and research (Martin and Etzkowitz, 2000). During the second half of the 19th century, land grant universities were set up in the USA by an act of US congress in 1860 to meet agricultural and industrial needs. This species was named as 'regional universities' since their main purpose was to meet local or regional needs for knowledge and technology transfer. The replica of the regional university was later adopted in Europe in the form of regional colleges (Martin and Etzkowitz, 2000; Chakrabarti and Rice, 2003). 'Region' derived from the Latin word 'regere' means to rule; geographically is used as sub-continental regions or neighbouring regions such as the Middle-East or the Balkans, etc. In the field of regional development, the term 'region' is applied to the administration of policies for economic development. Thus, region, from an administrative perspective, is a division of a country such as Pakistan which is divided into regions. It is also used for the military field of action or a cultural area (Cooke and Leydesdorff, 2006).

From a regional economic perspective, universities now produce tacit knowledge and human capital, whilst acting locally and globally as a networking platform (Bramwell and Wolfe, 2008). However, universities alone do not contribute to regional economic development and there are other factors (Goldstein and Renault, 2004), such as the type of university and region (Boucher et al., 2003); autonomy delegated to universities by national institutions (Lawton Smith, 2003); regional absorptive capacity and level of development (Varga, 2001) also affects the process. Therefore, the university role although critical in regional economy, does not drive technological innovation alone (Doutriaux, 2003). Moreover, a university research base is not sufficient to address various issues faced by firms. Therefore, it has to adjust its knowledge base according to firms' requirements (Gradeck et al., 2004). Furthermore, the interaction of university with local technology-based industry has led to the development of a new 21st century model of an "entrepreneurial research university" that links its technical expertise with local technology-based industry for regional economic development (Tornatzky et al., 2002). Universities are now actively involved in various

industrial activities, such as establishing business incubators; science and technology parks (Chakrabarti and Rice, 2003; Martin and Etzkowitz, 2000).

All species of universities, mentioned above, differ in their nature and purpose; especially the first two types of universities which had entirely rival ideology and ethos. The classical university followed a pure or immaculate ethos; thus, confining itself to teaching and knowledge for its own sake. In North America and Europe, pure ethos dominated in the early twentieth century. The technical university ethos was utilitarian, which meant to produce such knowledge and graduates that were useful to the society (Martin and Etzkowitz, 2000; Geuna, 1998).

Recently, a global trend towards a knowledge economy, where knowledge is the primary source (Penrose, 1959; Houghton and Sheehan, 2000), demands an increased role of universities for knowledge creation. The trend has increased due to a global trade that requires the latest technologies; value-added products and services. Moreover, the growth of multi-national corporations (MNC) that demand expertise in every sector and change the nature of world trade give knowledge economy a central role in the entire process (Houghton and Sheehan, 2000). Therefore, as the world moves towards a "knowledge-based economy' or a 'knowledge society' (Stehr, 1994), the expectation from universities increases. Therefore, knowledge creation is deemed critical in firm growth, innovation and entrepreneurship (Hayek, 1945, 1948; Penrose, 1959; Nonaka and Takeuchi, 1995). Hence, the university with its R&D potential can contribute towards knowledge creation.

However, to understand the university's role in knowledge society it is essential to understand knowledge economy or knowledge-based economy. The knowledge-based economy, as defined by Brinkley (2006), consists of industrial, occupational, and innovatory activities. Industrial sectors consist of knowledge intensive industries and services that require ICT-technology and a highly educated workforce. Occupations include knowledge workers, such as top level managers and professionals; high level expertise in ICT and systematic thinking. Innovation means the transfer of innovation among firms/institutions (Brinkley, 2006; Mongkhonvanit, 2008). Hence, it is not just one aspect of economy rather it covers an entire economic structure. Today's economy is governed by knowledge intensity and the globalisation of trade, therefore knowledge economy is a continuous process that has emerged due to increased used of information and communication technologies (ICT); national and international desire for border less trade and revolution in communication

technologies (Houghton and Sheehan, 2000). The term 'knowledge-based economy' is based on system perspective (Sahal, 1981; 1985), such as to develop policies for science, technology and innovation (Nelson, 1982); governments must adopt a systems approach. Creation of the Organization for Economic Cooperation and Development (OECD) in 1961 is the example of a systems approach to furnish science and technology policies for member states.

At present, the economic status of advanced economies is determined by their knowledge base instead of resources, land, and capital and labour (Dunning, 2000). Hence, knowledge economies consider technology as an important and equal factor in their development (Cooke and Leydesdorff, 2006). Moreover, Machlup's (1962) mapping of US sectors identified education, R&D, artistic creation, communications media, information services, and information technologies as knowledge-based. Furthermore, these knowledge sectors share in GDP and job creation in the US economy is larger than other sectors. Machlup's (1962) identification of sectors that he thought intensely concentrate knowledge assets such as human and fixed capital are favoured by OECD and EU (European Union). This leads to the conclusion that other sectors not mentioned by Machlup (1962) or international organizations are not based on knowledge or they are not knowledge sectors at all. This is due to the reason that knowledge is understood from the perspective of science which provides a narrow view of knowledge. Knowledge is a broader term which does not mean science alone, rather it is more than that: it can be synthetic (technical), or symbolic (creative). Hence, knowledge is required in all sectors whether industrial, i.e. manufacturing or service and agrarian (Cooke and Leydesdorff, 2006). The broader scope of knowledge shows that a large part of economy is getting more knowledge intensive. So industries such as genomics, research, software and nanotechnologies are based on analytical knowledge while creative and technical industry requires synthetic or symbolic knowledge. In such scenarios where knowledge pervades, all sectors of economy; the generation of scientific and technological knowledge needs to be institutionalized and systematic (Cooke and Leydesdorff, 2006).

The two terms, i.e. knowledge economy and knowledge-based economy, focus on knowledge creation and knowledge transfer for economic gain. Knowledge creation takes place at academia and national research institutes and centres; it is then transferred to industry. Knowledge transfer is a broader term that includes industry-academia interaction for research collaboration and sharing; formal and informal means of communication between the two. Academia assistance to industry comes through expertise exchange, such as students working

on corporate problems in the technical collages; the faculty providing technical support and sharing its research facilities. Industry in return offers industry education programs such training and the development of staff and internship programs to university students (Chakrabarti and Rice, 2003).

1.8.2 Significant Changes through Emergence of the Knowledge Base

The industrial economy has significantly changed with the emergence of the knowledge economy. Firstly, due to information technology, the transfer of codified knowledge is made possible (Mongkhonvanit, 2008). Furthermore, firms have to adapt to emerging management; organizational and skill challenges to face innovation and globalization. They are expected to avoid excessive specialization; reduce waste and increase productivity and substitute middle management with teamwork and job rotation (Oman, 1996: 19). Since a knowledge economy is based on the hierarchy of knowledge and learning networks, therefore firm socio-economic position is determined by the type of knowledge and learning networks it joins (David and Foray, 1995; Mongkhonvanit, 2008). The purpose of firms in joining these networks is to reduce the costs and risks associated with innovation, and have access to the new knowledge that is required in business processes. Faced with the challenges of competition and innovation, firms have to determine which institutes to collaborate with because innovation in science and technology depends on the nature of the relationship that exists among industry, academia and government (Mongkhonvanit, 2008). Firms, because of this scenario, are compelled to collaborate with universities and other research institutions or government.

1.8.3 Academia's role in Knowledge-based economy

Literature on the knowledge-based economy and innovation confirms that the economic competitiveness of a country depends on how well it exploits new ideas and generates innovation that ultimately results in new invention in the global market (Wolfe, 2005). Global demands, such as rapid technological changes; shorter product life cycles (Ali, 1994; Bettis and Hitt, 1995; Eluinn, 2000) have changed the competitive environment for firms. In order to survive in the global competitive environment and reduce the cost of innovation and risks, successful firms are compelled to outsource technological development to academia (Eluinn, 2000). Based on the above discussion, governments and academics have valid grounds for collaborating with the industry because of the growing knowledge-based industry. Governments are expected to facilitate the above mentioned inter-organizational collaboration by funding research and enacting friendly economic policies (Chakrabarti and

Lester, 2002). While university contribution is considered critical in high-tech industries, it is expected to produce relevant expertise in ICT and produce intellectual property. Hence, university's new role is not only to create but to disseminate applied knowledge and produce the knowledge workers needed by industry. Thus, academic contribution in industrial development makes it an engine of regional development that fosters innovation and entrepreneurship (Wolfe, 2005). Furthermore, the university due to its research facilities and expertise like teaching and research staff known as technopreneurs (Yam, 2000), collaborate with industry and national research centres and institutes to produce industry-specific knowledge. Moreover, industry's demand for technical assistance and scientific knowledge to overcome globalization and innovation challenges can only be fulfilled by academia. To meet the above industrial requirements, academia is required to develop strong links with the industry on the one hand and get directly involve in research commercialisation on the other hand. Therefore, Etkowitz and Webster (1998) suggest that government must strengthen long term industry-academia relations through sponsoring academic research that is relevant to the industry.

Moreover, tacit and explicit knowledge (Audretsch, 1998) being key components of innovation must be shared by the three institutions to achieve economic growth. Hence, scientific and technological knowledge spill over (Jaffe et al., 1993; Audretsch and Feldman, 1996) from universities that is essential for economic networks and clusters remains tacit (Pavitt, 1991), unless firms have the relevant knowledge base to exploit this external knowledge (Cohen and Levinthal, 1990). The transfer of knowledge from the university to firms depends on the firms' research capabilities (Cohen and Levinthal, 1990). Furthermore, Wolfe (2002), in his case study of the three clusters, suggests that the presence of universities and research institutes attract foreign investment. Big firms take advantage of local knowledge and qualified people produced by these universities and establish their subsidiaries in that region to exploit these available resources. Hence, universities in Canada have two roles: 1) developing local clusters; 2) developing a networking platform that links local talent with the global networks. In this regard: Pavit assert that firms hirring highly qualified people from academia not only benefit their knowledge base but also develop linkages with academia that helps in knowledge transfer (Pavitt, 1991).

To sum up, the university's role in this changed environment has expanded due to growing demand for applied research and globalization. The university, being a primary source of the scientific knowledge, enjoys a more powerful and central position in economic development. Hence, demand for applied knowledge, societal and industrial needs has increased university role in the economy (Ziman, 1994; Gibbons et al., 1994).

1.8.4 Academia and Innovation

According to the Organization for Economic Cooperation and Development, an innovation system is defined as:

"*The network of public and private institutions, within which Production, diffusion, and application of new knowledge and technology takes place*" (Brundin et al., 2008;p,81).

Therefore, innovation takes place when new knowledge is created; industry-academia linkages are developed, and the spread of industrial innovation and technology takes place (Freudenburg, 2003). To foster innovation for economic development, institutional collaboration and coordination is inevitable. However, to understand the innovation system at national and regional level, identification of these institutions and their linkages is required (Cook et al., 1997). Furthermore, measures such as government sponsoring university spin-offs and academic research; trilateral initiatives for knowledge-economy and inter-companies ties foster an innovative environment. To achieve mutually agreed motives of economic development and promote innovation, academia, industry and government need to cooperate by eliminating their differences (Eriksson et al., 2002; Brundin et al., 2008).

Tödtling (1999) believes that innovation takes place in a non-linear manner. It fosters where communication takes place in different institutional networks; hence, leading to a new institutional set up. Hence, the old linear model is replaced by the interactive model. In this new model, knowledge is no more sent or received, rather it is mutually constructed by the interaction of the three helices. Thus, the Triple Helix becomes essential in the process of innovation at regional and national level (Freeman, 1995; Cook et al., 1997). To promote innovation in the region, all the three helices are expected to develop and implement economic growth policies. The innovation process in this trilateral cooperation within an entrepreneurial university depends on a well-established research base with commercial potential (Brundin et al., 2008). Moreover, new venture creation; promotion of entrepreneurial culture and intellectual property legislation also helps the process to take root

smoothly. Therefore, when an entrepreneurial university engages in such entrepreneurial activities this ultimately results in regional development (Etzkowitz and Zhou, 2007).

Chakrabarti and Rice (2003: 2) quoted a few inter-institutional collaborations for innovation:

"*Helsinki University of Technology contribution towards the growth in wireless communication and information technology, University of Oulu developed the Oulu region's capabilities in electronics and information technology. Tampere focused on electro-mechanical and automation industries. The development of pharmaceuticals and chemistry based innovations by University of Turku*."

Other examples in the technical universities' roles in innovation are the establishment of centres for technical expertise by a Finnish innovation foundation in Finland. The aim of these centres was to develop links with the premier universities of Finland for high tech development. The New Jersey Institute of Technology (NJIT); Worcester Polytechnic (WPI), in central Massachusetts and Lehigh University in the Bethlehem area have all facilitated economic development in their regions by contributing towards the new industries of information and biotechnology. Rensselaer Polytechnic Institute (RPI), located in New York, in collaboration with the nearby state university, established incubators for new venture creations (Chakrabarti and Rice, 2003). Inter-institutional collaboration of industry-academia-government, for competitive economic development with a special focus on academia role is discussed in the context of following economic models:

1.8.5 Porter's Diamond and University-Academia-Government Linkages

Porter's (1998) Diamond model offers a holistic and flexible picture of how to improve competitiveness in a region or state by involving all stake holders. Every field of the Diamond model leads to competitive success. Porter (1998) asserts that four broad attributes shape a nation's competitive advantage: factor condition; demand condition; related and supported industries and firm strategies; structure and rivalry. Apart from these four factors, the Diamond model involves two separate factors: the government and the chance. These two factors create such grounds due to which industrial actions can be encouraged or discouraged. Governments' main role in this model is to create a conducive environment for companies to compete. These attributes directly or indirectly influence competitive advantage by creating an environment that enables a particular or overall industry of the country to compete in the surroundings (Porter, 1998, p. 166).

a. Government

Porter's model (1998) suggests that government's role in cluster-based development at federal, state and local level is to upgrade business environment conditions at micro and macro levels; also support and facilitate cluster competitiveness at national and local level. Furthermore, to establish specialized education and training programmes; encourage local industry research; provide a relevant and effective infra-structure as well as to attract cluster-related foreign investment. Finally, it is to enact cluster friendly policies and promote cluster-based exports.

b. Private Sector

The private sector's role in Porter's Diamond model is to develop clusters; government and academia jointly upgrade the cluster by developing specialized curricula. Therefore, academia not only offers vocational and technical education, it offers college and university level education that can better serve industry needs. Moreover, government sponsored, specialized university research centres, offer training to industry managers on a need basis (Ketel, 2003; Porter, 1998: 12).

1.8.6 Universities and Research Organizations

Factor conditions are further divided into four types: basic and advanced; generalized and specialized (Gulbrandson, 1997); they primarily require universities to play their role more actively towards cluster development. A crucial feature in factor condition is education and basic or fundamental research to advance the specialized level. In such scenarios, a university contribution in cluster-based development has become much more important than before. Now the university under Porter's (1998) model is required to produce graduates from a basic to a specialized level of education as required by the cluster industry. It not only facilitates the enhancers of competitiveness but also generates and transmits basic and applied knowledge relevant to the cluster industry. Universities benefit the clusters of their region by actively engaging in creating new ventures through an incubation process. The university through research and scientific knowledge directly or indirectly influences the other three attributes, such as a firm's strategy; structure and rivalry; demand condition and related industry. This is done by collaborating with the industry and other research institutions for the promotion of innovation and business environment in the region (Ketels, 2003). Due to

the enhanced role of universities in the cluster industry, it has become more important for competitive advantage.

1.8.7 A Shift from Mode 1 to Mode 2

As university-industry-government relations in cluster development are acknowledged in Porter's model, Gibbon et al. (1994) further added that the demand for new knowledge and its applicability has led to a more active role of academia in innovation. Due to the changing nature of knowledge production in universities, Mode 1 is shifted to Mode 2. In Mode 1, new knowledge is produced primarily within individual disciplines or by the scientists of the particular field. The knowledge generated here would have little links to societal needs. Results of the research conducted in the individual discipline or universities were of little or no interest to end users. The researchers did not need to justify the public funds being used in the research project; thus, they enjoyed more autonomy to choose which project to work on with less societal accountability. The late twentieth century witnessed a shift from Mode 1 to Mode 2. Mode 2 is not considered to be something new but rather a shift from Mode 1, where emphasis is on meeting societal needs while producing new knowledge and more accountability on the part of the researchers towards the society (Martin and Henry Etzkowitz, 2000; Weingart, 1997; Godin, 1998). Mode 2 is a multi-disciplinary research framework, a pluralistic approach based on a "networked" innovation system (Sampat and Mowery, 2004).

It is a new concept of academic research applied in the late twentieth century to describe academia's role in industrial societies. Unlike Mode 1, where research is carried out by researchers of particular field in an individual department, in Mode 2 the research model involves academia along with other institutions in the production of new knowledge to address societal needs. Since Mode 2 reflects increased scale and diversity of knowledge, involving academia alone in research especially in applied research as bio medical research (Sampat and Mowery, 2004) cannot produce desirable results. This model requires more inter-institutional collaboration, involving many communities of researchers to produce new knowledge. Public funds that the researchers receive in this case have to be justified by the researchers, thus limiting their autonomy while choosing their research projects. Gibbon et al. (1994) claim that the production of new knowledge has fundamentally changed from the way it was previously done. Now established institutions, disciplines and policies are either replaced or reformed to produce new knowledge. The universities under Mode 2, in return of

public funding, are expected to benefit the society with their research more than they did between 1945 to 1980 (Martin and Etzkowitz, 2000). Mode 1, as main source of knowledge production, was in use after 1945 while Mode 2 was practiced in the second half of the 20th century for the purpose of serving the defence, agricultural and health needs. Mode 2 was practiced not only in technical universities but also in classical universities with the purpose to serve societal needs. Nevertheless, Mode 1 was still in more demand than Mode 2 in the universities of that era (Martin and Etzkowitz, 2000).

The increased scale of knowledge within modern innovation systems does not necessarily lessen the importance of universities as key research centres; rather academia has become more central to the economy - making it more powerful than before. This new role of university leads to the idea of the entrepreneurial university. According to Etzkowitz (1997), such universities along with teaching and research ought to perform the third function by contributing to economy. So the university role in the knowledge economy has become more central by producing not only intellectuals but also economic and social capital.

1.8.8 The Changing Social Contract

A third change that is under way in research and in universities is the changing 'social contract' between science and university, on the one hand, and society and the state, on the other (Guston and Keniston, 1994a). Formerly, the social contract was based on Vannevar Bush's 1945 report: Science: The Endless Frontier that existed between the eras of 1945 to late 1980's. This report suggested a simple linear science-push model of innovation. It put forward that if governments sponsor basic research in the university, the end results will always be health, wealth and national security. This social contract between academia, state and society stated that the end results of basic research ultimately leads to applied research and technological development which finally results in innovation (Etzkowitz and Leydesdorff 1997; 2000; Leydesdorff and Etzkowitz 1996; Godin, 2000). George Brown, a leading congressman in the USA in the 1980's, suggested a new version of the social contract that lessened the autonomy of academia regarding research and public funds and demanded more explicit research that is directed towards societal needs (Brown, 1992).

1.8.9 The Emergence of a Triple Helix Model

Etzkowitz and Leydesdorff (2000) put forward an alternative but related model to Mode 2 to meet the challenges in the production of new knowledge by universities and other institutions. This inter-institutions' collaboration for knowledge production can be termed as the Triple Helix model. The Triple Helix model, espoused by Etzkowitz and Leydesdorff (2000), is a trilateral network that consists of industry, academia and government helices. This model that has a key role in the innovation process since late twentieth century is considered equally helpful in fostering entrepreneurship and growth at national and international level. The process of innovation can best be defined under the Triple Helix mode (Etzkowitz and Leydesdorff, 2000).

The need for trilateral relationships was aroused because of the second academic revolution or of the emergence of third mission of universities. The university, since its inception, has gone through two academic revolutions: firstly, taking up research along with teaching; the second revolution is its role in the economy by producing applied research (Jencks and Riesman, 1968). The university now needs to develop close links with government and industry to perform its third mission which is economic development. The increased role of the university that is economic development transforms it into an entrepreneurial university (Etzkowitz 1997; Etzkowitz et al., 2000; see also Clark: 1998).

The concept of academic entrepreneurship is not new and can be traced back to the German chemical industry (Gustin, 1975), and the engineering industry in Germany and Japan which established links with their relevant universities for research and innovation. Lord Kelvin and Marie Curie, leading physicists of France and Britain, while carrying out their basic research worked closely with industry to solve practical problems (Pestre, 1997).

In the first dimension of the Triple Helix, academia assumes the role of economic development by transferring knowledge to the surrounding world. It contributes to the economy by creating new ventures through incubation and training industry related personnel. While the second dimension is the industry assuming academic function, such as training and research at the same level that exist in universities, or government sponsoring

academic research and technology transfer facilities that result in academic technology transfer to the profession. In the third dimension, the interaction of the three helices helped to develop such trilateral ties that lead to high-technology development (Etzkowitz, 2002). Three different configurations of the Triple Helix model have been proposed so far: the first configuration of the Helix Model 1 (see Figure 1 of 1-1) was socialist in nature and its stronger version was applied in the former Soviet Union and its socialist Eastern Bloc. In this model, the government would strictly control academia and industry. Here, the government gives little room for bottom-up initiatives and directs academic-industry relationships (Etzkowitz and Leydesdorff, 2000).

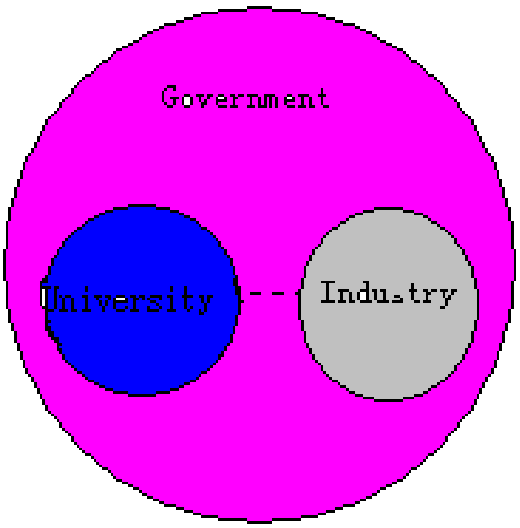


Figure 1-1 The Statist Model

Figure 1 of 1-1

Adopted from Etzkowitz, 2007

A weaker version of this model was adopted by many Latin American countries and to some extent European countries, such as Norway. The model was adopted in the Soviet Bloc and Latin American countries because of governments' dominant position in these countries. In Latin America, Argentinean physicist, Jorge Sabato suggested the top-down model of development known as the Sabato Triangle (Sabato and Botana, 1968). This model was in

contrast to the traditional model in which the government controlled and coordinated industry and academia separately for technological development (Dos Santosa and Fracasso, 2000). The second configuration is the Laissez-faire Triple Helix 2 (see Figure 2 of 1-2) model as shown in the research report of 2000 in Sweden and USA. This model consists of the institution operating separately in their own spheres with no close ties and coordination taking place among them (MacLane, 1996). In this model, the university's role is confined to providing basic research and trained personnel to industry. The research publication and graduate produced under this model is subject to industry interest whether to accommodate them or not (Etzkowitz, 2003). Furthermore, the model does not establish any coordination or links between university and academia to achieve economic development. Therefore, less coordination and more separation of institutional spheres have led the institutions involved to be more competitive rather than cooperative (Etzkowitz, 2007).

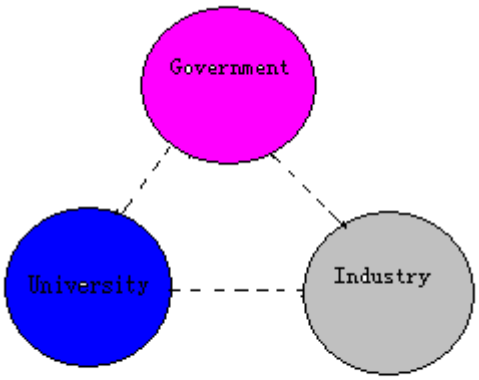


Figure 1-2 The Laissez-faire Model

Figure 2 of 1-2

Adopted from Etzkowitz, 2007

The above two models failed because Helix 1 lacked bottom-up initiatives and was subject to undue governmental control; that is why it could not encourage innovation. Helix 2, on the other hand, reduced the role of state resulting in Laissez-faire policy (Eztkowitz and Leydesdorff, 2000: 112). Finally, according to the third model, academia, government and industry together are:

"Generating a knowledge infrastructure in terms of overlapping institutional spheres, with each taking the role of the other and with hybrid organizations emerging at the interfaces" (Etzkowitz and Leydesdorff, 2000).

Most of the states in different regions are attempting to adopt one or another form of Triple Helix 3 with the motives to encourage innovation. The national governments offer direct or indirect financial assistance; enact laws that help develop start-ups and commercialize academic research, such as the Bayh-Dole Act (1980) in USA; establish research centres at national level for the promotion of innovation in their countries (Etzkowitz and Leydesdorff, 2000). Due to the emergence of the Triple Helix model, many economies have the chance to access and exploit the knowledge whether created previously or now by the universities that have regionally proliferated (Cooke and Leydesdorff, 2006).

1.8.10 Institutional Theory and the Triple Helix Concept

The Triple Helix model is based on institutional theory, as it works due to three institutions, i.e. government-academia and industry and there are chances of conflicts among them. The three institutions to collaborate and retain their respect and autonomy require a planned mechanism of rules, regulations and procedures (Brundin et al., 2008). Therefore, organizations set in institutional environments (DiMaggio and Powell, 1983) require legitimate status through social and legal acceptance. Hence, organizations obtain legitimacy by observing social norms and values (Suchman, 1995: 574) to become trustworthy for others. In order to survive, an organization is subject to different pressures depending on its position in a typology. As the Triple Helix model combines three institutionalized entities, university, industry and government, universities are positioned in the Triple Helix model at a lower right quadrant where they are subject to more procedural and structural control (Scott, 2003; see Figure 3).

Governments are compelled to their own restrictions and rules, and are placed in the left or right, lower quadrant, or in the upper right quadrant. Industry operates under strong technical pressure and with little institutional constraints; due to this, industry is not considered as an institution by some of the scholars; yet with the development of industry specific rules, it is subject to institutionalization. Industry is placed in the upper, left quadrant. University, industry and government in the Triple Helix model are forced to resemble each other in their institutional set-up; hence, the model leads to isomorphism (DiMaggio and Powell, 1983).

However, academia and government are subject to institutional isomorphism, while industry is forced to competitive isomorphism (DiMaggio and Powell, 1983; Brundin et al., 2008).

Technical Control

Strong	Industry	Government-owned Enterprises
Weak	Public Care Centres	State, Government, University

Weak Strong

Institutional Control

Figure 3

Adopted from Scott and Meyer's matrix. Source: Scott, W. R. and J. W. Meyer (1991); BRUNDIN et al., 2008.

1.8.11 Comparison of the Models

The above discussion shows that all the models mentioned in the literature reveals that 'Mode 2' and 'Triple Helix' and Porter's model emphasise strong linkages among universities and other institutional factors for economic development. The models maintain that university-industry collaborations have increased in practice and in demand (Sampat and Mowery, 2004; Lundvall, 2009; Nelson, 1993; Gibbons et al., 1994; Nowotny et al., 2001; Etzkowitz and Leydesdorff, 1997; 2000). The Triple Helix model, as compared to Porter's model, is more suitable for the technology industrial clusters that are developed by university whilst the Porter model is suitable for the whole industry. The two models confirm that university and government collaboration are important for development. The Triple Helix model emphasizes innovation and knowledge-based development while Porter's model suggests that competitive advantage is not only the result of innovation and or scientific knowledge but includes all factors that are involved in the value chain (Gulbrandson, 1997).

1.8.12 Industry Academia Linkages Established in Other Parts of the World

United States

The 2nd World War disrupted institutional collaboration that was established by the US government for research and development. This collaboration needed to be revitalised once again because the US industry, during the 1960's and 1970's, was faced with the challenges of international competition and it could only be overcome if academia and government were equally involved in the economic process (Etzkowitz et al., 2000: 317). The need for institutional linkages for research and development resulted in the enactment of the Bay-Dole Act in the US. This was almost the extension of 1862 Morill Act, in which government gave land-to-land grant universities for agricultural development. Through the Bay-Dole Act, Federal Government gave intellectual property rights to universities. This law, on the one hand, made it compulsory for the universities to commercialise their research and on the other hand, entitled them to 15% of the return on their invention (Etzkowitz et al., 2000: 318).

Universities then gradually got involved in entrepreneurial activities such as establishing incubators to create new ventures; assistance in providing seed funds through venture capital; technology transfer and facilitating the technology push process (Etzkowitz et al., 2000: 319). Government contribution in institutional collaboration came through the Small Business Innovation Research (SBIR) Program, which was established to assist in financing new firms. MIT and Stanford due to their commitment to support industry and regional growth became role models for other universities. Columbia University later on acted on the footsteps of the above two universities and established links with the local industry. A similar trilateral transformation that took place in the US later took place in other parts of the world (Etzkowitz et al., 2000).

United Kingdom

In the UK, due to the reduction in research funding from the government, Public Sector universities are forced to generate their own income (Etzkowitz et al., 2000: 319).

Universities are now expected to exploit industrial sources for funds, either by licensing patents or establishing innovation centres. This direct contribution of the university to the economy requires re-configuration of institutional relations. Academics in such scenarios need to modify their role in order to govern and promote entrepreneurialism. In 1985, the UK government decentralized the technology transfer rights to universities and privatized the state agency, the British Technology Group (BTG). This act led to the development of the entrepreneurial university in the UK (Etzkowitz et al., 2000: 319).

Europe

Although the European Commission considers industry academic linkages fruitful for economic growth, there is no single European model. Linkages between academia and industry vary in European countries. Drawing on the work of Etzkowitz et al. (2000: 321-323) only in Italy, polytechnics located in Milan and Turin are the successful universities in developing linkages with industry. Germany, inspired by the US approach of industry academia linkages, is adopting sponsored internship by the companies and alumni organizations. Germany's interest in academic industry linkages can be judged by its Genecentrum research centre in Colgne, Munich, Heidelbourgh and Berlin, which it established for the purpose of research in Molecular Biology (Etzkowitz, H. et al., 2000: 323).

Canada

In the case of Canada, the University of Waterloo is considered a vibrant centre of knowledge creation in the region. The university, known for excellence in academic excellence in science, maths and engineering, has adopted an innovative cooperative program since the beginning. Hence, it is engaged in producing expertise; industry specific research and the talent required by the high-tech industry of the region (Nelles et al., 2005). The university, along with the above dynamic approach, opted for the Intellectual Property (IP) policy. The IP policy entitled the creator, whether students or faculty, with full IP rights to commercialize their ideas. According to the 1999 statistics Canadian survey of intellectual property commercialization, the Waterloo University high-tech spin-offs are more than any other university or college in the country (Bramwell and Wolfe, 2008).

Latin America

Latin America and Brazil adopted science policies, in which national governments enjoyed a dominant position in industry academia linkages. In these regions, major technology-based industries and universities were created by the state. The 'Sabato triangle' (Sabato and Mackenzi, 1982) (mentioned in the earlier section of the literature review), applied in Latin American, postulated that government should be playing a leading role in restructuring industry academia linkages. Colombia, keeping in mind the triangle model, first explored government economic policy, while dealing with technology in milk production to overcome milk problems (Etzkowitz et al., 2000: 324).

Japan

In Japan, the education tradition of training students for industry and government offices has taken a new turn by including research with potential commercial implications. The issue of patent and intellectual rights is yet to be resolved due to the informal relations of academia with industry (Etzkowitz et al., 2000: 324-325). The informal relations, also practiced in Thailand, are special characteristics of Japanese culture. This norm suggests that research collaboration in academia and industry is subject to industrial interest; industry will sponsor that research in an academia which it thinks that only an external research body can help in solving its problems (Etzkowitz et al., 2000). In short, Japan has now formalised better industry-academia linkages than before (Etzkowitz et al., 2000: 325).

1.9 Conclusions

The historical background on the Triple Helix model reveals that Porter's Model, Mode 1 and Mode 2 as well as all academia-industry collaboration, was applied for innovation in high-technology industries. Due to these reasons more institutional collaborations have been practiced in "technical universities or collages" and in "land grant universities", in the US, UK, Europe, Canada and in the rest of the world. The above literature on the Triple Helix evolution provides a picture of how the model evolved and gradually took root in the developed and newly developed countries, while less developed countries are still thriving to implement the model successfully in their respective regions. The historical background of Triple Helix alone cannot help to identify the research gap that exists in Peshawar, Pakistan.

To identify the research areas in a developing region like Peshawar, Pakistan, more extensive research is needed. For this reason, efforts are made to analyse sixty-seven empirical studies conducted worldwide especially in the developed, newly developed and developing world to examine how the Triple Helix model is operationalised in this countries. Chapter 2 provides the analysis of sixty-seven research articles in the light of which future research in Peshawar can be decided upon.

Chapter 2

Literature Review

2.1 Introduction

The Triple Helix model (discussed in detail in Chapter 1), as envisaged by Etzkowitz (1997), is emerging globally as a common theory. This is due to the fact that countries and regions believe that an innovative environment can only be attained if they opt for this specific model. These regions' common objective is to generate academic spin-off with the help of university research groups and establish tri-lateral networks for economic development. As such, the underlying model regards university as a significant partner in a knowledge-based economy (Etzkowitz and Leydesdorff, 2000).

This makes the Etzkowitz model of university–industry and government collaboration different from the national systems of innovation (NSI) approach (Lundvall, 2009; Nelson, 1993) and the Sabato Triangle of 1975 (Sabato and Mackenzi, 1982). The underlying model gives a central role to university in the innovation process of knowledge societies, while national innovation systems regard firms, and Sabato's thesis considers the state as a privileged institution in the knowledge economy. New academic roles in the knowledge economy have increased its scope of activities from mere teaching and research to economic development. Therefore, the university, due to its third mission, i.e. economic development, is emerging as a crucial agent of economic development worldwide (Etzkowitz and Leydesdorff, 2000).

As the universities' role in the Triple Helix model is to generate a knowledge economy, I investigated the empirical evidence by which it is sustained. To make it more pragmatic, I adopted systematic review method (Tranfield et al., 2003). The purpose is to generate collective insights through critical review of the findings. A total of 72 research papers on Triple Helix were reviewed and details of these research papers were then listed in table form. During the review process of these tables, four research themes were identified that were frequently used by researchers. The themes identified during the review process were R&D and Triple Helix; economic development and Triple Helix; innovation and Triple Helix, and the role of Triple Helix in the industrial growth of a country. Here it is worth

mentioning that the majority of the research is significantly influenced by the legacy of Etzkowitz. As such, knowledge in the studies chosen for review is treated as an asset that can easily be re-used. Finally, conclusions are drawn by identifying research future trends.

2.2 Mapping the Research

This review was restricted to publish peer reviews; academic articles held within the following databases: ISI Web of Knowledge; Business Source Premier; Science Direct; Scopus and Google scholar. These were chosen from amongst others as providing the largest number of returns using a basic keyword search of the Triple Helix model and developed* Developing* Newly industrialised countries* and empirical studies. Each database was interrogated by the search strings listed above. Research interest was limited from the years 2000 to 2013. Titles, keywords and abstracts that were published during year 2000 to 2013 were searched, where more than 150 studies were retrieved and exclusion criteria were included in order to refine the search. For example, studies on Medical Sciences were not included since the concept of Triple Helix carries other meaning in Medical Sciences. Therefore, inclusion criteria were limited to Social Sciences, Business Studies, and Computer Science. The total number of potentially relevant studies retrieved using search strings was 150. These were exported to Refworks, a referencing database where they were further reviewed against the inclusion and exclusion criteria in using key word, searches, year of publication and title analysis. Also, duplicate studies were removed. At this stage, a thorough review of the abstracts alone was conducted and the articles that were relevant to the year of publication, title, search strings were selected for review (Macpherson and Holt, 2007). It should be noted that the selection criteria at this stage was not the study quality alone but its fit within the literature review, which is empirical research conducted on the Triple Helix model worldwide. Abstract selection of the empirical studies on the Triple Helix model was made on the basis of methodology, sample size, main findings, country, and title of the paper, journal and year of publication.

All the abstracts that were exported to the Refworks data base did not outline the methodology; the main findings and sample size and therefore a second option was to read the full text of the articles. At this stage, the need for more coherent, succinct abstracts was felt that could enable its audience to judge the desired criteria of the topic without reviewing

the whole article (Macpherson and Holt, 2007). Whilst many of the studies about developed economies could be found in high impact journals, research articles published in top ranking journals were explored in the first stage. Locus of the study primarily falls in three types of countries: developed, developing and newly developed countries. Research articles about developing countries published in less-established journals were identified in the second stage, since many articles about developing countries could not be found in top-ranking journals.

The total number of articles chosen on the basis of relevance was seventy-two. Twenty-four studies were based on comparative analysis of two or more countries. In these comparative analyses, fourteen articles were comparatively analysed from developed countries; seven studies were analysed in developed and developing countries. Three researches were on a general discussion about many countries. Individual studies on developed countries amounted to twenty-eight in number, where the research article recorded on the US was highest in number, which is seven. Other developed countries researched were as such: Canada was researched three times; Australia, Germany, Denmark, Japan and Portugal were researched twice and the UK was researched twice. The remaining developing countries reported in the table were studied only once. African regions, as a whole, were researched twice. The total twelve developing countries were explored; out of which, Thailand and China were studied twice, while the remaining developing countries in the tables list were studied once. Research articles on newly industrialised countries (NIC's) amounted to ten; out of which Mexico and Brazil were studied three times, while articles on South Korea and Malaysia were two in number.

2.3 Research Interest

The main concern of this research was to check the practical implications of Triple Helix in Peshawar, Pakistan, which is a developing country and this model has not been tested in the Peshawar region. In order to check the implications for Peshawar, I intended to empirically explore how the Triple Helix model has been applied worldwide and what the results are. Results of these articles can then enable a conclusion to be drawn on how to implement the Triple Helix model in Peshawar. For this purpose, seventy-two papers were chosen for the review. However, topics and findings of these research articles were so overlapping that

themes could not be drawn easily. Finally, four themes were derived from 62 articles while 10 articles were chosen for general discussion that can guide developing regions for adopting the Triple Helix model. Based on the Triple Helix's contribution to research fields, the entire research was categorized as such: twenty articles are chosen on the Triple Helix model and R&D; seventeen articles were selected under Triple Helix and the innovation theme; a total of twelve articles covered Triple Helix and economic development; thirteen papers were chosen for Triple Helix and industrial growth and ten were selected for general discussion which is provided at the end of the chapter. Each theme, sample size, research approach and findings are discussed in detail in their respective sections. At the end of each theme, two research articles, one on a developed or newly developed country and one on a developing country, is critically evaluated and then, in the light of these articles results, the implications for Peshawar, Pakistan are discussed in detail. Finally, a conclusion is given at the end of the essay. The criteria for selecting two articles for detailed evaluation under each theme is their research relevance and findings based on measured results. Articles whose results and findings were derived from library researches or secondary data only are generally discussed.

2.4 Triple Helix and R&D

Research articles that are selected for evaluation in this section are twenty in number. These articles are organised in table form (Table 1, appendices). Findings of eighteen articles are generally discussed in this section that recommends research has a central role in the regional innovation system. Two papers are selected for detailed discussion whose research topics and findings have direct implication for Peshawar, Pakistan. Justification for selecting these two papers is given in the beginning of the discussion section.

The Etzkowitz model (Chapter 1) emphasises strong research collaboration among the three spheres of the Triple Helix. The model suggests that university R&D plays a central role in regional innovation. Therefore, governments should encourage entrepreneurial universities and support R&D activities in their region. This concept of the Triple Helix model is empirically researched by many researchers in the developed and developing world to test the impact of the university and other public research organisations on regional economic growth and innovation. These studies are discussed in this section. Results of these studies identified many issues that affect research practices, such as research evaluation and performance (Cooke, 2004). For example, in the USA where research is funded from external sources, universities have to compete for these funds. High competition among universities to access

research funds in return influences research groups' behaviour formed within academia. Therefore, these groups develop firm-like characteristics as, hence, quasi-firms are formed within academia prior to their engagement in entrepreneurial activities (Etzkowitz, 2003). Pressure on research organisation is also found by Banner and Sandstrom's (2000) study in Sweden. While analysing the research performance of three research councils in Sweden, their findings confirmed that external funds change the norms system of the research councils and, thus, influences research on the whole. Moreover, conditions for academic research in Danish universities have also changed and, therefore, Ernø-Kjølhede et al. (2001) suggest a more conscious approach on part of the universities to manage the routine research practice. Similarly, recommendation for conscious approach is echoed in Langford et al.'s (2006) case study of Calgary University Canada. Langford et al.'s (2006) results supported a conscious approach towards research with the reason that with such approach universities and firms can avoid counterproductive activities and the true nature of innovation, based on Triple Helix ideals can be determined.

Research articles that supported strong research collaboration among university-industry-government, as envisaged by Etzkowtz, recommended certain policy level measures in this regard. Hence, Boardman and Corley (2008) and Boardman (2009), recommended the establishment of research centres by the government; while Wiltz (2000,) who studied 23 non-university and 17 university researchers in Germany, observed that research organisations should organise large scale research activities on the Triple Helix principle and suggested routine alliance between academic-industry researchers to ensure U-I-G research collaboration. Dietze and Bozemanb's (2005) study of 1200 CVs of academic research scientists and engineers in US; Boardman and Corley (2008) and Boardman (2009) in their analysis based on a national survey of US university scientists (covered individual level and centre level data of US universities), agreed on the crucial role of research centres in developing university-industry linkages on the one hand, and their contribution to different academic careers on the other hand. Therefore, they suggested policy level support for the establishment of research centres. A policy level measure to facilitate public-private research collaboration is again supported in the study of Shapiro (2007). In his comparative analysis of 108 directors of research centres and managers of funded projects in Korea, he stated that new forms of capital based on the Triple Helix model can only be materialised if government facilitates public-private research collaboration. Mueller et al. (2005) while studying 326 districts in West Germany found that technological progress and new firm formation activity

is higher in regions where university-industry research collaboration exists. Therefore, findings of the study emphasized upon the research partnership between academia and industry in order to generate new knowledge and ensure higher growth rates.

The above discussion touches upon research issues in Triple Helix more holistically, while the following articles explore the role of the research university in the Triple Helix model. Articles that focused on universities' roles in firm formation and cluster development found different patterns in different countries. Nishimura and Okamura (2011) surveyed 13 different technological clusters in Japan. Their findings reported that not only do clusters belong to different technological fields, they also differ in numbers, size and support programmes. The study supported the positive role of the R&D consortium in biotechnology and found that the university has a significant role in invention and commercial success of this cluster. This effect was not found in the overall results covering all technological clusters that were different in budget size, technological fields and support programmes. University importance until 2000 is also found in Japan by Sun and Negishi (2010). This study revealed that until 2000 not only university-industry-academia had strong ties, academia also enjoyed an inevitable role in national publication system. The university not only bridged industry and government but also linked foreign researchers with these national sectors. Since the centre of Japanese research network and members of U-I-G have become more foreign-oriented by seeking foreign collaboration, now the university role and the U-I-G network have grown weaker. Network importance is also emphasised by Park and Leydesdorff (2010) in their longitudinal study of South Korea. They concluded that the reason why Korean national research capacity could not be improved was because of new Korean national science and technology research policy. Since the policy neglected the network effects in science, technology and industry; inter-institutional collaboration among academic private and public domain could not be strengthened. Therefore, a country's national research capacity can only be improved if strong networks are developed among academic, industry and government.

As tri-lateral research collaboration is essential to boost national research capacity, there are still certain barriers to overcome. For instance, Tijssen (2006), analysing European universities' role in the field of immunology research, suggests that the nature of university–industry interactions and (the potential for) entrepreneurial orientation is determined by many factors. One important factor found by Acosta et al. (2009) is industry's willingness to collaborate with universities to produce new technological knowledge. Regions where industry does not encourage collaboration with academia, no average ties can be developed

between the two. The same views are reflected in Inzelt's (2004) study on Hungary, who found that along with the government's support for linking public sector research with private sector expectations, the interest of industry in establishing an innovation network is also required. This is also in the case of Hungarian business, where the lack of interest in innovation has made progress mainly in experimental development and design, in trials and in the tooling-up process only. Government programmes tries to promote interaction in the national innovation system, however, such interaction is still limited in the move towards a knowledge-based economy. Thus, the knowledge economy is generated if industry's hunger for innovation exists. Cooke (2004) linked the weak nature of research collaboration between the two sectors to the cumbersome, bureaucratic procedures and the lack of entrepreneurial innovation links from research to commercialisation.

As research commercialisation is one of the outcomes of the Triple Helix, certain studies observed that confusion over patent rights exist among research partners and demanded for proper procedures to overcome patents issues. For instance, Tuunainen (2002) critically reviewed a case study of a plant-biotechnology research group of Finnish universities. Critical analysis of the case study reveals that research commercialisation of public-funded universities is controversial due to three main reasons. Firstly, Intellectual Property rights policy is not very clearly designed which led to confusion about ownership of the group's invention exist. Secondly, the university-industry relationships are not strongly developed because consumers are reluctant to use agri-biotechnological product. Finally, hybrid entities and spin-off companies created by academic research were not feasible. Research commercialisation is not free from controversies in other regions. This is proven and supported by the study of Arza and Lopaz (2011) as they concluded that firm linkages with public research organisations in Argentina do not exploit their knowledge potentials. Despite the fact that firms in Argentina do benefit from public research organisations' (PRO's) research output, linked firms have a tendency towards patenting. Acosta et al. (2009) found that patents are determined by regional R&D funds. To overcome risks attached to publicly created research, Razak and Saad (2007) suggested that universities should design proper procedures for commercialising their research.

2.4.1 Detailed Analysis of Two Papers

The two papers selected for detail analyses are Acosta et al.'s (2009) and Razak and Saad (2007). As mentioned above, these two articles are chosen on the basis of relevancy of these research studies for the Peshawar region. Acosta et al.'s research focus is European universities, while Razak and Saad's research interest is the Malaysian university. Both the articles explore the role of university in producing technological knowledge in the region. Both the papers attempt to identify issues that are related to R&D funds and patents in their concerned regions. Since Razak and Saad's (2007) article is on the developing country and Acosta et al.'s (2009) paper is on developed countries, these studies can guide my research on how to link university R&D with the industry in the Peshawar region and motivate government to help support industry-academic linkages. Firstly Acosta et al.'s (2009) research interest, methodology and findings are discussed and then Razak and Saad's (2007) is touched upon.

Acosta et al.'s (2009) paper is an attempt to understand the distribution of technological knowledge generated in universities, measured by patent counts, at a regional level in Europe. The study used panel data set of 4,580 European university patents from 1998 to 2004, to collect information. The research involved two parts: firstly, a descriptive analysis was carried out to analyse spatial distribution of university patents. Secondly, an Econometric analysis was undertaken to identify the factors that determine the production of university patents. The results of the study are based on three main findings. Firstly, the data collected confirmed that institutional links are important for university to generate patents; furthermore, universities' role in producing market pull technological knowledge (patents) in European regions was supported. The study added that patent activities in the region are affected by variations in regional research and development (R&D); ten regions were found to have more than 100 university patents while more than 50 regions had zero university patents. To amend these regional disparities in future, the study recommended that European institutions and national governments should foster entrepreneurial university to strengthen the regional innovation system. The study confirmed that financial grants are essential for R&D, since the number of university patents is subject to university R&D resources. The study found that universities in many regions were doing projects that were not relevant to the local industry technological needs. Therefore, Acosta et al. (2009) recommended that regional governments should encourage university's interaction with the local firms and help

generate industry relevant patents in the region. Finally, the results stated that every country's legal framework is different from others which creates differences in university patents. Therefore, all European regions should adopt a homogeneous legal system for industrial property in the university.

Razak and Saad's (2007) research interest was to identify the challenges that aroused the evolution of the Triple Helix institutional system in the context of the Malaysian socio-economic environment. The research methodology used in the paper is a qualitative case study approach. Eighteen semi-structured interviews were used to gather information. Samples for the interviews were taken from the three spheres of Triple Helix: seven respondents were taken from the government (government ministries and agencies); seven from universities (from researchers, deputy vice-chancellors and staff of research management centres) and four sample interviews were taken from industries (managers and executives). The data obtained from the sample survey were analysed using the thematic analysis approach, which involves transcribing data and identifying patterns that enables the readers to better understand the role of each actor and the relationships between the actors in the Triple Helix model. Analysis of the interviews revealed seven main issues which influence the development of the Triple Helix culture in Malaysia and the role of universities in this context. The issues were technological factors, procedures and processes within universities; commercialisation issues; relationship/interaction issues; work culture; IP issues, and government policies (Razak and Saad, 2007).

Technology Factor: Malaysian universities have not made enough progress in the research and development of new and advanced technology such as fibre optic technology. This is due to the fact that Malaysian universities lack industry specific resources, such as research expertise and equipment that are required for new technological development, policies, procedures and processes within universities (Razak and Saad. 2007).

Procedures and processes within universities: another major issue highlighted by the research survey was that Malaysian universities cannot cater to the research needs of the industry due to the lack of staff. Universities' staff, apart from teaching, can only give 40% of their time to industrial research which means it can take up to two years for a research project to be completed. Industry needs a quick solution to their problem; therefore, local industry resorts to foreign R&D assistance and support (Razak and Saad, 2007).

Commercialisation issues: the third issue is the commercialisation of research in Malaysian universities. The survey revealed the lack of entrepreneurs in Malaysia; the lack of industry funding support for university research; rigid regulations and conditions that make it rather difficult for industry and universities to apply for loans to funds R&D activities and difficulties envisaged by universities in finding the right industrial partner (Razak and Saad, 2007).

Relationship/interaction issues: industry's perception about university staff that they cannot solve practical problems and that foreign researchers are superior to locals are factors that have weakened industry links with the local universities (Razak and Saad,2007).

Work culture, IP issues, and government policies: responses from the industrial interviews stated that industry wants a quick solution to their problems while university respondents argued that due to teaching duties they cannot give enough time to industrial research. Therefore, university research is a time consuming processes. Thus, the difference in the work culture of industry and university hampers their long term interaction. Intellectual property (IP) policy is based on a 50/50 partnership but it still is so confusing that university-industry and government relationships cannot be strengthened in Malaysia. Survey results revealed that due to the Malaysian Government's inflexible, rigid, vague and inconsistent policies, the process of Triple Helix is hampered in Malaysia (Razak and Saad, 2007).

2.4.2 Implication for Peshawar, Pakistan

Common issues that were found in both articles were: firstly, institutional context is required in the production of university patents; furthermore, R&D activities are determined by financial resources and research expertise of the universities both in the developed and developing (Acosta et al., 2009; Razak and Saad, 2007). Secondly, governments' support to foster entrepreneurial universities in the regions is highly required. Thirdly, governments should address Intellectual Property issues; design a proper mechanism to link local universities with the local industry and should avoid dependence on foreign research assistance, especially in the case of Malaysian universities (Razak and Saad, 2007). Universities and industry need to synchronise their activities to avoid confusion related to work culture and procedures.

Findings and recommendations of the two articles can be used as guidelines for the implantation of the Triple Helix model in a developing region like Peshawar. Firstly, an

entrepreneurial university as recommended in Acosta et al.'s (2009) article is required in Peshawar which can only be established with the support of the government. Secondly, the local industry links with the university should be established and for that purpose government should provide enough grants to academia for R&D that can provide a practical solution to industrial problems. Government should initiate academic-industry friendly policies to develop a Triple Helix culture in Peshawar, Pakistan.

2.5 Triple Helix Model and Innovation

A total of seventeen articles from the Triple Helix Model and the Innovation Table (Table 2, Appendices) have focused on Triple Helix's role in the regional innovation process. Initially, fifteen articles are generally discussed and recommendations of these articles in the light of their findings are touched upon. Finally, two articles are selected for detailed analysis due to their research techniques and measured results. On the basis of their findings, practical options for the Triple Helix model in the Peshawar, Pakistan, region are discussed. In this regard, methodologies, findings and recommendation of the two selected papers are discussed in depth.

The Triple Helix and R&D section confirms the undeniable role of entrepreneurial university in knowledge-creation and science-based regional development. Etzkowitz et al. (2008), using secondary sources, identified the same trend in US, Sweden, Japan, and Brazil State universities. The study found that the global trend is towards the emergence of entrepreneurial universities. These universities have taken a central position in knowledge-based economy that moves beyond etatism and pure market relations to an intermediate position within a Triple Helix regime. Whereas, Almeida's (2008) research on Brazilian universities stated that development of an entrepreneurial university is not an easy task, especially in the case of Brazil where differences exist between universities and institutions. Case studies, semi-structured interviews and secondary data employed in the study, found that different structures have emerged in Brazilian universities in order to stimulate innovation and entrepreneurial activities. It is further observed that although the Brazilian Government does support these initiatives at the federal, regional and local levels, but due to differences that exist among the three spheres of the Triple Helix, the dream of an entrepreneurial university in Brazil cannot be materialised.

As the entrepreneurial university is emerging worldwide as an essential source of knowledge economy, Etzkowitz and Dzisah's (2008) study which is based on library research, suggests that government and international agencies should facilitate the growth of entrepreneurial universities with a broad inter-disciplinary scope and mission, and support the birth of an entrepreneurial scientist who integrates knowledge and innovation. Moreover, Etzkowitz et al. (2000) from the comparative analysis (based on library sources of US, Japan, Italy, Germany, UK, Brazil and Asia found that the future role of the entrepreneurial university is getting more challenging; therefore, it has to be more proactive. This requires a more vigilant behaviour on the part of academia to sense future tendencies in knowledge production and their social uses. The weak points of Etzkowitz and Dzisah's (2008) and Etzkowitz et al.'s (2000); Nwagwu's (2008) Leydesdorff et al.'s (2005) studies are that findings and recommendations are based on library sources and no measurable techniques are applied to test the results. Due to this, suggestions of these studies can only be discussed but could not be accepted as standards to be applied in any country.

The innovation process worldwide depends how the Triple Helix model is implemented. This can be ensured by practicing the very ideals of Triple Helix in regional innovation, such as maintaining independence of university-industry and government and institutions respecting each other's role in the economy (Nwagwu, 2008). Moreover, academic willingness for institutional collaboration is also required. Once the will of the university is established for cooperation, policy level support is essential for knowledge production. As evident from the US case, where universities' contributions in the knowledge economy is highly facilitated by the government, therefore the USA enjoys a leading position in innovation especially in biotechnology, information technology and new media sectors. To be on a par with the US innovation level, Leydesdorff et al. (2005) suggest that the European Union should also utilise its university capabilities to generate new knowledge economy. Whereas, Nwagwu (2008) observed in the case study of a Nigerian University that such ideals are not practiced in that country. This is because inter-institutional collaboration in the Nigerian economy is not encouraged by the economic and political circumstances of the country. Therefore, academia's significant presence in economy is not found in Nigeria.

As mentioned above, innovation requires the will of the university to cooperate with industry and government, whereas there was no such willingness on the part of Australian universities (Gunasekara, 2006). The study used 102 semi-structured interviews for the comparative analysis of three metropolitan universities of Australia. Results revealed that although senior

management modified their institutions to meet the regional needs, universities were reluctant to act like the state and industry. Due to the reluctant behaviour of the Australian universities, the innovation process could not take off. As academic will is the essential factor for a Triple Helix culture to take roots, Etzkowitz and Dzisah (2008) suggest that universities should complement the industrial enterprise as a source of new economic activity both in the developed and developing world. Coenen (2007), while studying the regional innovation system (RIS) problems in UK and Sweden, used semi-structured interviews for Scania and secondary sources for the north east, found that the regional innovation system (RIS) is strengthened due to the constructive contribution of the university.

Many studies in their research findings have agreed on the point that strong university-industry-government networks are the pre-requisites for a new knowledge economy and can help academia in the process of knowledge production. Etzkowitz and Dzisah's (2007) study based on library research, suggests that the African quest for innovation and development can only be achieved if the Triple Helix of university-industry-government interactions are established. Furthermore, university-industry-government strong linkages are also supported by the following research studies. These articles of Saad's (2004) study of an Algerian incubation centre, Razak and Saad (2007) (using 18 semi-structured interviews) on the commercialisation procedure within Malaysian universities; Henry Etzkowitz's (2002) article on science, technology and industrial policies worldwide; Marques et al. (2006), based on a discussion of case study of the University of Cambria, Portugal; Gunasekara's (2004) (102 semi-structured interviews) analysis of three non-metropolitan universities in Australia; Etzkowitz's (2007) study on USA, Europe, Canada, China, Soviet union; Leydesdorff and Deakin (2011) Canada and Montreal, emphasized the implantation of the Triple Helix model worldwide for innovation and growth. The studies suggested that to promote learning and human capital; overcoming commercialisation issues within universities and by formulating innovation policies for development, countries should establish tri-lateral networks based on Triple Helix's principles. Furthermore, Etzkowitz (2007) added that university-industry-government interaction not only helps in the development of knowledge-based industry but also facilitates the expansion of such industry. Thus, the Triple Helix network is a long-time activity which does not end with industrial development; rather inter-institutional ties are established to help in the industrial growth as well.

2.5.1 Analysis of Two Papers

Two papers chosen for detailed analysis about the role of Triple Helix in the innovation process, are by Asheim and Coenen (2005) and Li, X (2009). The first paper is about the developed European regions of Sweden, Denmark and Norway. Asheim and Coenen (2005) studied five Nordic projects on SMEs in these countries. Their results suggested that regional innovation requires a full understanding of region's industrial structure; institutional set up and knowledge base. To accomplish such understanding, region specific innovation policies are needed. Similar findings are reflected in a study by Li, X. (2009), using secondary data of thirty provincial level regions in China. His research confirmed that government support; the establishment of R&D institutes and the regional industry-specific innovation environment significantly determines innovation performance.

2.5.2 Implication for Peshawar, Pakistan

The innovation process as reflected in findings of both of the researches requires policy-level support; the establishment of R&D institutes; a full understanding of regional industrial demands and the designing of regional base innovation policies. Peshawar, which is a developing region, while setting up institutional set-up, needs to follow the guidelines provided by the results of the two papers. Firstly, it has to establish knowledge base and develop strong ties among all the spheres of Triple Helix. Government support in this regard is highly essential not only to ensure the Triple Helix and entrepreneurial culture in the region but also to understand the needs of the SME sector, on the basis of which R&D institutes can address industry specific problems.

2.6 Triple Helix and Economic Development

To promote innovation in the region, all the three helices are expected to develop and implement economic growth policies. In this new type of trilateral cooperation, the entrepreneurial university, in order to participate in the innovation process, needs to establish a research base with commercial potential; encourage new ventures; promote entrepreneurial ethos and enact policies for intellectual property ownership. These entrepreneurial activities on the part of the university help promote regional economic development (Etzkowitz and Zhou, 2007). To achieve mutually agreed motives of economic development and promote

innovation, academia, industry and government need to cooperate by eliminating their differences (Eriksson et al., 2002).

The Triple Helix model of university-industry-government relations is emerging as a common format that transcends national boundaries. Twelve research articles from THM and the Economic Development table (Table 3, Appendices) are reported here, that focused on such tendency and highlighted the significant contribution of Triple Helix in regional development. Etzkowitz and de Mello's (2003) study, based on discussion of conference and library paper, observed that Brazil is transforming from a top-down innovation system, as perceived by Sabato triangle, to an innovation system. Hence, the transition towards innovation in Brazil has taken place over the last two decades. Therefore, the Triple Helix format is practiced at municipal, regional, national and multinational level in Brazil. As such, new actors, especially universities and industrial associations are coming up with initiatives to strengthen the innovation process in Brazil. As university-industry-government collaboration is gradually acknowledged worldwide, the significant role of an intermediary organisation in Triple Helix cannot be ignored. Yuwawutto et al. (2010), from a case study on dried banana enterprise in Thailand, highlighted the active role of an intermediary agency such as the industrial technology assistance programme (ITAP) in the development of the said enterprise. Therefore, intermediary agency role in the SME sector in developing countries is strongly recommended by the study. Emphasis on an intermediary organisation in Triple Helix is again reflected in Eun et al.'s (2006) research on Chinese university-run enterprises. The study, using the theoretical framework, states that Chinese market reforms were announced to encourage universities to form their own start-up firms (URE's) for economic benefits. Since intermediary agencies in China were not fully developed, therefore Chinese universities were not inclined towards firm formation and economic gains.

The Triple Helix contribution in regional development is highlighted in Smith et al.'s (2010) research on the UK Oxfordshire's biotech sector. Results of the study derived from secondary data, found that the university role as compared to government's, along with other national organisations, is secondary in the development of science and technology especially in the biotech sector in Oxfordshire. However, the university's role is indirectly acknowledged by the industry because of the fact that industry talent is produced by the university. Due to special abilities in integrating organisational teaching, group research and collective entrepreneurship, university as an eminent source of firm formation is agreed by Etzkowitz and Klofsten (2005) in the comparative analysis of Sweden, USA and European universities.

The importance of the Triple Helix model is further reinforced by de Castro et al. (2000) in Portugal for the creative use of telematics. The study using secondary data, found that the Portuguese traditional economic sector, with low technological content, creates significant barriers both to the circulation of information and to the promotion of learning processes. In order to overcome barriers to the creative use of technology, the study recommended policy-level measures to strengthen university-industry-academic relations, at national and local level in Portugal. The same institutional level relations are essential for the high-tech development in other parts of the world, such as in the case of Lithuania, where Chlivickas et al. (2009) observed that the most successful Triple Helix model for high technologies development is the one where the highest degree of cooperation between authorities, industry and academic public is indicated. Therefore, the article establishes the implementation of the Triple Helix as a leading priority for high technologies development in Lithuania. Planned and structured cooperation is also recommended by Brundin et al.'s (2008) research, which employed surveys, interviews and questionnaires to study Triple Helix networks in a multicultural context in South Africa's Cape region. Results of the study found that no planned cooperation is found among all the helixes of the Triple Helix and a focus on the entrepreneur is missing. Therefore, the study recommended planned and structured cooperation among the three parties.

Many studies found that the true test of the Triple Helix model is when it is applied in the overall process of technological development and is not limited to single sector of technology industry. This was observed in the study of West Germany, where the government locus of interest is on high-tech industrial development. Leydesdorff et al. (2006), in comparison of 438 districts of Germany with Netherlands, found that medium-tech industry equally contribute to local knowledge-based economy of West Germany; therefore, a more holistic industrial policy is recommended that focuses on the development of both high-tech and medium-tech industry. Another essential element in the promotion of the technical industry is the presence of entrepreneurial culture in the country. This has been identified by Ramos-Maltés and Lorena (2010) in a comparative analysis of two case studies in Puerto Rico; the Techno Economic Corridor (PRTEC) and the Eastern Central Technological Initiative (INTECO). The study stated that the entrepreneurial culture and transparent local grant seeking process are the essential factors in the development of new knowledge-based economy in a country. As these factors were not developed in the country, the above two initiatives failed to developed knowledge-based economy in Puerto Rico despite the fact that

these initiatives did make progress in firm formation through incubators and the community outreach program.

2.6.1 Analysis of Two Papers

The first paper selected for critical evaluation here is by Mayer (2006). The study used 30 key informant interviews and a genealogy survey of a high-technology firm, which proposed that future studies should examine degrees of university-region engagement. The case of Portland and Washington DC, confirm the theory of the Triple Helix of university–industry–government partnerships. The study found increased dependence among universities-government and industry. Such dependence was found due to universities' desire to integrate with industry by addressing industrial needs in the region. Therefore, such integration is further encouraged by state and local government by creating research centres to ensure firms competitiveness and develop a viable economic environment in Portland and Washington DC region. Creation of these research centres guarantees a win-win game for all the three helixes. Academia gains financial help from the corporate sector for its research industry by outsourcing its research to academia; cut its in-house R&D expenditure and concentrates more on its core business. While the state gains a viable economic culture within the regions (Mayer, 2006).

In the second paper, Liefner and Schiller (2008) analysed five public sector universities in Thailand. Primary data are based on interviews with professors and administrators and secondary data is derived from Bureau of Budget and Higher Education. The study found that although Thailand has successfully achieved quantitative economic development, it is still behind in technological progress made at this level by the 1st generation of newly industrialised countries at a similar stage of economic development. Results found weak or less contribution of universities' capabilities into qualitative growth of Thailand. This is due to the fact that the Thai economy depends more on MNC subsidiaries' knowledge input rather than from local universities' knowledge. The study recommended that academic capabilities such as research, teaching, technology transfer and management should be used in the overall process of innovation and economic development (Liefner and Schiller, 2008).

2.6.2 Implication for Peshawar, Pakistan

Research by Mayer (2006) and Liefner and Schiller (2008) confirms that in regional economic development active and dynamic role of universities cannot be ignored. Policy

recommendations derived from this analysis is how to initiate cases of academic involvement in economic development in developing regions like Peshawar, Pakistan. On the one hand, a clearly defined structure for involving academia in economic growth needed to be outlined. From the two papers, I propose that policy makers in developing region like Peshawar promote the rise of academic capabilities in accordance with the changing needs of its industry. Higher education institutions should provide knowledge input in the form of graduates and publications; direct consultancy services and establish research centres that cater to needs of local SME's need. In this way, academia in the Peshawar region along with teaching and management will also be integrated within economic development research.

2.7 Triple Helix and Industry

An article search in this section touched upon the theme of how the Triple Helix contributes to industrial growth worldwide (Table 4, Appendices). Since the thirteen articles chosen for this section have conducted research in various countries, therefore one can come across diverse findings and suggestions. Some of the successful cases where Triple Helix contributed positively in transforming the regional industries are reported here. In the case of the electronic industry of Mexico, Guadalajara region, Vargas (2011), using interviews found that not only the specific Triple Helix model has addressed electronics cluster issues of Jalisco, it has transformed the entire region into a competitive electronic design niche. Godin and Gingras's (2000) research on university, industry, government and hospitals' collaboration in Canada using secondary data and 97 articles, found that over 15 years - except from hospitals - each sector has increased its collaboration with universities. Therefore, governments emphasised more on university-industry ties and industry now is involving academia in its R&D programs.

As industry is faced with international competitiveness, Butcher and David (2007) and Coenen and Asheim (2006), used both using secondary data in their respective research; agreed to the view that a dynamic Triple Helix set up is crucial to construct regional innovation system. The same network ties are demanded by Papagiannidis et al. (2009) on the 'Skill brokerage business model'. The study, using library sources for the research, suggested that to boost innovation and commercialisation beyond geographic boundaries, Triple Helix of university–government–industry interactions must be established. In the case of Brazil, where meta-innovation has resulted through hybrid institutions, Etzkowitz et al. (2005) feel

the role of tri-lateral network cannot be ignored. Findings from extensive interviews and focus group discussions acknowledged that the transformation of Brazilian incubators from high-tech focus to institutions' formation at various technological levels is possible because of the Triple Helix model. Another country where the tri-lateral network has performed well in the process of innovation is South Korea. Park et al. (2005) provides a comparative analysis of South Korea and the Netherlands derived from secondary sources; they found that South Korea enjoys the lead over Netherlands in knowledge-based dynamics, scientific and technological fields. Such development is possible due to the links that exist among all the spheres of Triple Helix.

As university-industry-government's contribution in the industry worldwide is confirmed by the above studies, Metcalfe (2010) further acknowledged the concept of intermediary organisations and Malo (2009) highlighted the role of public research organisation within the area of Triple Helix culture. Metcalfe's (2010) article after studying at the Ottawa Centre for Research and Innovation (OCRI) and at the Canada Arizona Business Council (CABC) employing secondary data, concluded that intermediating organisations are essential to understand how external organisations influence the compass code of conduct. While Malo (2009) after studying fifty-seven companies in USA and fifteen European countries using secondary data, surveys and questionnaires, emphasised upon the promotion of public research organisation. The study recommended that promoting public research would make the easy transfer of research findings to industry.

A unanimous opinion found in all of the above sections is the existence of effective tri-lateral networks on Triple Helix's principle for innovation and development. However, the importance of translational networks cannot be ignored especially when a large number of countries are focused on the research and development of specific technology. This was observed by Frenken (2000) in his study on the post-war aircraft industry of thirty-one countries, 8 markets, 9 technologies and 863 aircraft innovations. He reported that a pattern of specialization is emerging among these countries where the focus is on particular technology and the market. Such networks enable these countries to retain their competitive position in the international market on the one hand and make collective effort towards specific product development and innovation on the other hand. Henceforth, trans-national networks might become the new model of technology transfer worldwide.

The need for international networks is also found in Cantu (2010). This research focus was to "explore the role of spatial relationships to transform knowledge in a business-idea, beyond a geographic proximity". The study focus is Italy and the research techniques used are in-depth, 60 semi-structured interviews. The study reported that technological and cognitive proximities have emerged due to academic spin-off inclination towards extra-local and international firm linkages. Moreover, such international firm ties are formed to share technological experiences, interest, knowledge and profession. However, international linkages if faced with cultural and organisational barriers cannot be established easily. As in the case of Israel and Turkey, Goktepe (2003) found such barriers in Israel's and Turkey's magnet consortium. The reason why Turkey's innovation network could not be formed at national and international level was due to the lack of systematic and stable management strategies. Therefore, to form a successful international network, the collaborating partners must address these barriers first.

Fain et al. (2010), on new product development, suggested inter-institutional strategies in this regard. As Fain et al. (2010) reported after studying five European countries Academic Virtual Enterprise that the success of new product is determined by market demand. Therefore, institutions in the process of new product development should consider technology-push and market-pull strategies in order to make the product successful.

2.7.1 Analysis of Two Papers

Etzkowitz et al. (2005) was selected because of the research's relevance and the country where the research was conducted. To examine the role of the Triple Helix in Brazil, the study was based on an extensive analysis of Brazilian Incubator Association databases, documents and interviews. Interviews were conducted with incubator and industrial association officials; government science and technology Policy officials at the Federal, State and Municipal levels and Public and Private Venture Capitalists in Brazil. Focus groups were also conducted with faculty members involved in entrepreneurial education. The findings acknowledged that creation of hybrid entities are required in the process of meta-innovation; secondly, a democratic decentralized regime, with an organised civil society, is essential (Etzkowitz et al., 2005). In a third stage of development, joint ventures from multiple actors, belonging to different spheres are required. This is evident from the example of Science Park in Brazil that was initiated 30 years ago, being an isolated project failed to achieve its objectives. Now it is more like a cooperative project which is connected with non-linear

heterogeneous networks, such as incubators, research, entrepreneurship programs, branches of multi-national firms and local industry. Hence, the transformation of Brazilian incubators from high-tech focus to institutions formation at various technological levels is possible because of the Triple Helix model (Etzkowitz et al., 2005).

The second paper chosen for this was a case study of the Java Region (Irawati, 2007). This study examined six industrial clusters in the Java Region of Indonesia by employing semi-structured interviews, supported by the Triple Helix and the cluster approach. His results found that as the industrial clusters in Indonesia are scattered in various areas, universities and other institutions can help develop theses clusters by providing technical assistance to these clusters.

2.7.2 Implication for Peshawar, Pakistan

Activating areas of society that had been distant from innovation with the help of the Triple Helix model in the developing region of Peshawar is not an easy task. Incubation is a new and complex process for the region, where a proper organisational mechanism is required to facilitate such development. Keeping in mind the Triple Helix format, a more decentralised regime with organised civil society is needed in Peshawar, Pakistan. For incubators and science parks to take roots in Peshawar, Pakistan, academia has to get involved in industrial research; establish joint ventures with the industry and the government needs to support and initiate such science and technology policies which can help in the development of the incubation industry in the region. Cluster development and the incubation industry both depend on the active role of academia and government-friendly policies.

2.8 General Discussion

Studies by Ranga and Etzkowitz (2013); Steiber and Alänge (2013); Todeva (2013) can be used as a policy guideline for developing regions while adopting the Triple Helix model in their areas. Firstly, Ranga and Etzkowitz's (2013) concept of knowledge, innovation and consensus spaces are helpful in designing innovation strategies. While Steiber and Alänge's (2013) article of the Google case study is a guiding strategy in firm formation and growth stages involving U-I-G as key actors. Furthermore, Todeva's (2013) research on intermediaries in Triple Helix broadens the scope of the model. Relevant policy recommendations for developing regions are discussed in this section.

Ranga and Etzkowitz (2013) acknowledge the importance of innovation organisers, entrepreneurial scientists and creation of spaces in the regional innovation process. The authors suggested that Triple Helix policies in US or Europe cannot be copied or imitated exactly in the developing world due to their different cultural and environment settings. Therefore, worldwide attempts to copy Silicon Valley as a role model for sustainable growth and innovation is likely to fail because the model that worked in the greater Boston area cannot be replicated elsewhere. However, transforming the existing innovation and economic model according to region specific needs is an alternate option. Hence, developing regions need to design a policy framework for innovation and economic growth that seeks guidance from foreign experiences but are very much relevant to their cultural needs. Therefore, the developing regions can initiate the process of the Triple Helix model by supporting innovation organisers, entrepreneurial scientists or R&D and non-R&D bodies. These innovation organisers (individual or institution) with their knowledge-based vision convince the concerned institutions to collaborate for new economic model (Ranga and Etzkowitz, 2013). Instances of an innovation organiser are that of MIT President Compton who in 1930's New England successfully not only introduced Venture Capital but also gained supports for technologies produced by MIT for local development (Etzkowitz, 2002). Entrepreneurial scientists come from both academia and industry and are the ones who are constantly involved in knowledge creation that can be used for commercial purposes. It can either be published or for practical use such as the latest technology. Academic entrepreneurs can contribute by getting involved in firm formation or being involved in industry research. Business entrepreneurs are then involved in providing their expertise to new firms started by the academic entrepreneur. Hence, the innovation organiser and the entrepreneurial scientist can make developing regions' dreams of innovation and technological development a reality.

However, developing countries' technological development largely depends how well they develop their R&D and human resource potential. In this regards, they need to establish their own knowledge-base; develop innovative businesses and lower their dependence on MNCs and exogenous R&D practices. Therefore, to develop regional specific innovation strategies these regions should adopt Triple Helix systems' approach, i.e. the developing of knowledge, innovation and consensus spaces relevant to their environmental settings. For example, knowledge space can be created by relocating R&D resources to areas that are lacking in such facilities. Thus, the success of the relocation policy of research centres to less-research intensive area can help adopt an initial framework for national innovation policy for regional

development (Casas et al., 2000; Hamilton, 1966). Science-based universities that attract leading researchers with commercial potential should be established. Such entrepreneurial universities can create value for local assets by generating location specific knowledge with an aim to attract new investments. Government-level support for research consortium/centres country-wide can help develop such research proposals that not only develop new high growth industries in the region but also give new life to ailing industries (Svensson et al., 2011).

Innovation space can be created by establishing technological universities in areas where no such higher education existed before. Such universities can help improve existing technological levels or develop new technologies based in the region. For example, MIT, founded in 1862, not only helped Boston textile, leather and mechanical clusters with its technological breakthrough but also formed venture capital industry to finance new firms in the region (Etzkowitz, 2002). Furthermore, an integrated approach towards regional innovation network should be adopted, such as the hybrid organisations of U-I-G should be linked with each other. For example, a country-wide network of incubators, science parks, R&D, Venture Capitalist, spin-off firms should be formed (Debackere, 2000; Debackere and Veugelers, 2005). Attempts should be made to revitalise the ailing industry by establishing knowledge-based industries that attract local and international investors alike (Ranga and Etzkowitz, 2013).

Consensus can best be created through brainstorming, discussion forums and problem analysis forums through university-industry-government interaction sessions. In this regards, precedents of Pittsburgh High-Tech Council; the Petropolis Technopole in Rio de Janeiro state (Mello and Rocha, 2004) that after-hour New York clubs (Currid, 2007) are recommended guidelines for the developing regions. Moreover, support for new start-ups through access to financial and technical resources (Etzkowitz, 2002); timely and alternate solution for social-economic crises created by industrial failure (Etzkowitz et al., 2008) helps in consensus space creation.

However, the knowledge, innovation and consensus space creation is not an easy task. First of all the developing regions have to find out how well each sphere in Triple Helix is willing, motivated and excited to collaborate for joint ventures. To engage in a joint venture the helixes have to compromise on many of their values, organisational silos and individual

goals. Hence, the institutions involved have to come up with a common agenda and balance their individual objective with the collaborative goals. Therefore, the government is required to formulate policies that can overcome institutional inertia and integrate innovation practices at academic and industrial level. Moreover, creation of each space is subject to individual regional cases (Ranga and Etzkowitz, 2013). Innovation space created in the US might not work in developing region or a crises situation that created consensus space in Europe or Japan might not work in developing region. This is because crises of each country are different as well as the knowledge and innovation level of a developed country is different from that of a developing world. Therefore, Ranga and Etzkowitz (2013) suggest the comparative analysis of past and present circumstances under which these spaces were created in the US or in other parts of develop world (Etzkowitz, 2002). Solutions then derived from such analysis can help formulate regional specific policy guidelines for space creation.

Steiber and Alänge's (2013) research on the formation and growth of Google highlighted the specific roles played by industry-academia and government. The case study of Google can be used as a guiding strategy for developing countries in firm formation and growth stages. The study, adopting the case study and qualitative approach, confirmed that university not only provided talent to the industry but also assisted Silicon Valley and Google in the early stages of firm formation. While industry provided research funds to Stanford University, the computer science department helped Google to access funds in its early stages. The government role is that of facilitating U-I-G linkages and early start-up firms by making friendly regulations and funding academic start-up. Hence, U-I-G's formal and informal interaction provided a base for Google start-up and growth stages. As an inspiration for developing regions, there is a conscious need to encourage industry to provide research funds to universities. The government enact friendly policies; not only encourage U-I-G linkages but to accommodate hybrid organisations emerging due to such interaction. Todeva's (2013) study recommends the role of intermediaries such as financial or institutional in strengthening Triple Helix interaction. Hence, the intermediary role in Triple Helix in developing regions not only adds value to Triple Helix's performance but will also integrate the innovation process at different levels.

2.9 Conclusions

From the above discussion, one point is very clear that institutionalising the Triple Helix model in Peshawar, Pakistan, is not an easy task. As the concept is new to this developing region, activating Triple Helix and establishing industry-government and academia ties on one side and chalking out a proper mechanism for it to function will be a very complex process. Lessons from developed countries are very encouraging since they have almost overcome the barriers that came with the successful implementation of the Triple Helix model. Newly industrialised countries like Brazil and Mexico present a blend of success and failure pictures, while developing countries like Indonesia, Malaysia and China - though lagging far behind the developed and newly developed countries - are trying to address the barriers and make Triple Helix successful in their region. The reason for all three blocks of countries depending on the Triple Helix model for development and innovation is because all the three spheres, if working together towards the common goal of industrial growth, can achieve far-reaching results. However, the Triple Helix process in developing regions is different from that of the developed world; therefore, the recommended strategy is to adopt a region specific framework for innovation. Hence, Ranga and Etzkowitz's (2013) idea of space creation; innovation organiser and entrepreneurial scientists can initiate the process of innovation in these regions. While U-I-G interaction in the Google case can help in firm formation and growth stages (Steiber and Alänge, 2013). Weak communication and interaction among the three Helixes can be overcome by adding the role of intermediaries in the Triple Helix model (Todeva, 2013). However, a mere insight into the literature review cannot determine recommendations for U-I-G linkages in Peshawar, Pakistan. Instead, a detailed study of these linkages in the regions needs to be explored by adopting an effective research methodology. Guided by the literature review, a thorough research methodology is designed to gain insight information from agents involved in university-industry linkages in Peshawar. Chapter 3 provides a discussion on research methodology.

Chapter 3:

Research Methodology

The purpose of this research is to examine the position of industry-academic-government linkages in the Peshawar region in the context of the Triple Helix model. Therefore, the Triple Helix framework is used to understand and analyse U-I-G relationships in Peshawar, Pakistan. The study employed auto-biography and semi-structured interviews as an in-depth research technique to investigate the relationship among government, academia and the local industry. This chapter provides a rationale for the methodology adopted, followed by a discussion on research design (based on the research onion diagram); organisational profiles under study and an outline of data analysis (second to last paragraph) is provided. Finally, ethical consideration is given in the end of the chapter. Research objectives and questions are mentioned in the start of the chapter as a basis for the validity of the research design.

3.1 Research Objectives

1) To investigate U-I-G linkages in Peshawar, Pakistan.
2) To find applicable models and ways to improve the linkages in order to enhance industrial competitiveness.

3.2 Research Questions

- To what extent have U-I-G linkages been developed in the region?
- How a minimum level of linkages can be developed into a proper model for economic development.
- If any tri-lateral relationships have been established in the region; what is the nature of those ties?
- Whether these linkages have the potential for transforming them into proper a Triple Helix model in Peshawar region.
- How can EDC IMSciences be a part of this model?

- Whether local industry and EDC IMSciences possess the capabilities required for the Triple Helix model. If not, then what other measures can be adopted to make the model work in the region?
- Does U-I-G need any catalyst to strengthen their relationships?
- What policy guidelines are needed by all the three spheres to work on the model?

3.3 Research Methods

Conducting reliable, scholarly research is a complex, lengthy and challenging process. However, availability of the latest research technologies and various research philosophies (explained in the research onion diagram (Figure 4) helped in the selection of a suitable research methodology. Therefore, the research template 3.5, adopted from the onion diagram (Figure 4), helped unveil new discoveries and perspectives in my research domain. Furthermore, as a researcher, I was aware that research is a never-ending process where every discovery leads to new directions and new research questions (Saunders et al., 2011); therefore, I needed a well-designed research approach. However, the variety of research options made it difficult for me to decide on which research methods to adopt. Moreover, a selection of the appropriate research process was required to make the study more effective. Hence, a suitable research methodology adopted from the onion diagram was also determined by the research question of the study undertaken (Noor, 2008; Becker, 2008; Ulmer and Wilson, 2003). While conducting research, I had two main options, i.e. a qualitative inductive approach or a quantitative deductive approach. The former is termed as post-positivism while the latter is termed positivism (Noor, 2008; Gray, 2013); each has its own merits and demerits that have been debated for many years (Maines, 1993). Therefore, I had to explore the suitability of each approach for my research. As positivism is based on the natural sciences model and investigates social phenomena with the use of deductive logic (Noor, 2008; Gray, 2013; Horna, 1994), priority was given to the qualitative method. The reason is that quantitative approaches are employed to verify theory; test hypothesis and measure the reliability and validity of research question with the help of quantifiable statistical data. In contrast, the inductive approach (Creswell, 2013; Gray, 2013) is based on the assumption that reality is a social construct and is formed through social interaction and experience. Hence, social problems arising from social experiences should not be studied objectively. Therefore, my option was the qualitative post-positivism approach because its emphasis is on studying social phenomena from the participant and practitioner perspective (Cepeda and Martin, 2005) and does not use an objective lens that studies and measures how often certain patterns occur. It rather understands the subjective reality formed through social experiences (Easterby-Smith et al., 2012).

However, social and academic scientists value both the approaches for research. They believe that if both the approaches are combined can produce better results (Ulmer and Wilson, 2003) secondly, they can overcome each other weaknesses. However, quantitative research is useful

in the study of comparing a bigger sample size, such as "distributions, central tendencies, aggregate patterns, probabilities and correlations" are better explored through quantitative methods (Ulmer and Wilson, 2003). The quantitative approach as a precise science employs statistical analysis to measure the results (Patton, 1987:273); hence, empirical evidence is gathered through questionnaires and surveys (Skinner, Tagg and Holloway, 2000). In contrast, the qualitative approach holistically explores organisational behaviour (Skinner, Tagg and Holloway, 2000), structure, processes and social problems through interviews, observation, archival data, documents, physical artefacts (Yin, 2014) and focus group discussion. This approach demands critical analysis skills to interpret data without being biased (Strauss and Corbin, 1990). "Ethnography, grounded theory, ethno methodology, interpretive biography, and phenomenology" are a few of the research methods that fall into the interpretive domain (Harlos, Mallon, Stablein and Jones, 2003). A researcher must possess the basic research knowledge required for the research process while designing a research strategy. Both of the approaches follow step-by-step guidelines that begin with the purpose of the study; identifies the population to be investigated; research tools are selected; comprehensive research questions with sub-questions are finalised and the relevant research design is decided upon (Creswell, 2013).

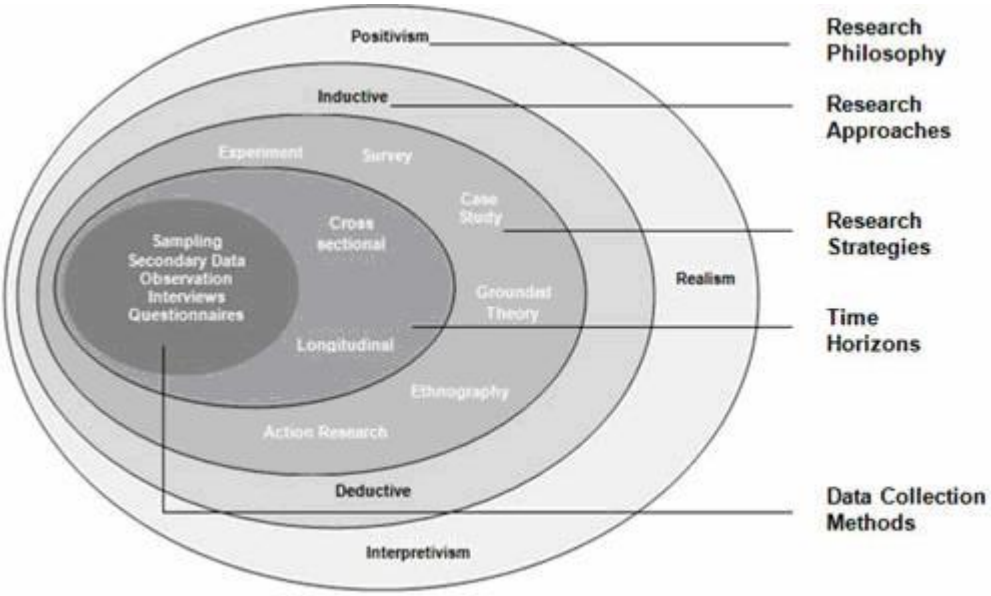


Figure 4: The Research Onion adopted from (Saunders *et al*.**,** 2009**)**

3.4 Data Collection Strategy

Although many scholars recommend both the approaches for in-depth understanding of social events and explaining social interaction (Creswell, 2013), I opted for the qualitative approach due to the preliminary exploratory study and small sample size. My research methodology is derived from researching the onion diagram (provided above) (Saunders et al., 2009). The reason for choosing an inductive approach (Creswell, 3013; Eisenhardt, 1989) is that it is built on understanding respondents' words and statements through interpretations and not by

using statistical tools for data analysis (Eisenhardt, 1989). Hence, this research is designed with the aim to derive relevant data that can precisely address the research question.

To capture knowledge from the practice-based problems faced by the practitioners (Gray, 2013) and document the real-life experiences of the people involved (Cepeda and Martin, 2005), a case study approach was used. The case study was adopted because it is the in-depth (Easterby-Smith et al., 2008, p. 97), holistic (Gummesson, 2000) inquiry of a contemporary event; social organisation; individual and social problems and does not focus on the entire organisation (Yin, 2014). It employs multiple data collection techniques, such as archives, interviews and questionnaires to investigate how and why social events take place and how that particular event is different from what happened (Eisenhardt, 1989). Case study research employs exploratory, descriptive and explanatory methods (Gray, 2013) to understand social interaction (Yin, 2014). Hence, a single case study from constructionist epistemology is undertaken (Easterby-Smith et al., 2008; 97). However, Hays argues that undertaking case study research is not an easy task. It requires a very careful and focused approach to study any social behaviour (Hays, 2004). Hence, it is not just conducting interviews and writing life stories, it employs a lot of hard work. Therefore, as a researcher, a lot of care was exercised in setting the research boundaries (Hays, 2004). In this regards, a specific problem or issue that needs to be explored in EDC IMSciences was identified. Moreover, to avoid distraction and bind myself to the specific case throughout the research (Yin, 1994), I developed an insightful research question through an extensive and systematic literature review. Once the research question was identified, a unit of analysis was then selected for data collection. As this case study is about EDC IMSciences, therefore concerned individuals (mentioned in Section 3.5 and 3.6) were the units of analysis. Special attention was given while collecting data so that distraction from the topic under study would not occur (Stake, 1995). Although the research question did guide the study, the evolving nature of case study could not be ignored. Therefore, the questions were not fixed and new questions relevant to the study were adjusted dynamically (Patton and Westby, 1992). Moreover, to make this case study finding more comprehensive, multiple methods were used, i.e. different data sources (detail of which is provided in the Annexure) were reviewed (Yin,1994). Data, such as documents and records - for example, EDC proposals, progress reports, grant applications, action plans, EDC plan, newsletters available on Internet, were studied and reviewed. All of these documents and records were written for a different audience and in a different time; therefore, for accuracy only, that information was selected which was documented officially and available in the archives of IMSciences and EDC (Hays, 2004; Yin, 1994). The archival data also helped in deciding upon the autobiography and interview approach. Yin (1994) states:

"Interviews are an essential source of case study evidence because most case studies are about human affairs. These human affairs should be reported and interpreted through the eyes of specific interviewees, and well-informed respondents can provide important insights into a situation. They can provide shortcuts to the prior history of the situation, helping you to identify other relevant sources of evidence" (p. 85).

Interviews are one of the richest and most important sources of data in a case study, therefore the interviews were conducted to gain information from a variety of perspectives.

Furthermore, semi-structured interviews instead of a semi-structured questionnaire were chosen in order to avoid superficial information (Easterby-Smith et al., 2008:144). Moreover, the study was first conducted by personal account, i.e. an autobiography of the researcher herself and then through semi-structure interviews; this approach helped understand different respondent's perspective on the same problem. This technique was selected with the aim to get as close to practitioners as possible (Gray, 3013; Schwartzman, 1993). The autobiography approach was adopted because like the quantitative approach it documents theory and empirical evidences. For example, qualitative research is both open and unstructured and studies the experiences and views of its population; therefore, autobiography is sharing the relevant personal experiences of the researcher. Furthermore, biographical research helps to understand major changes in society by interpreting individual, group and family social experiences (Roberts, 2002). This approach narrates the researcher's own voice or perspective emerging from his/her personal experiences. Moreover, autobiographic accounts are a rich source of information that educates its readers about an unfamiliar area directly from the lens of the researcher. It provides valuable knowledge to its audience by sharing his experiences; hence, the reader gets the view of an unknown culture from the researcher's perspective (Hamdan, 2012). However, as personal accounts of the researcher and the researched are accepted in qualitative research, one of the concerns is its reliability and validity.

I included my personal testimony as a source of knowledge that informs the reader about the phases EDC went through. As I was personally involved with the centre, therefore my autobiography would provide a valuable insight into how EDC was formed and how it grew. While attempting the autobiographic approach, I had to be fully aware of the issues involved in the process, such as how autobiography research is accused of self-advertisement (Day, 1993); it puts me in a more vulnerable position as compared to the traditional researcher who opt for other research methodologies. Hence, while attempting my part of the story, I was subject not only to academic criticism but also personal criticism. As a subject of self-examination, it was difficult to decide what part of my personal life to reveal and what to hide (Hamdan, 2012; Letherby, 2002). As a post graduate research student, my writing is for examiners, supervisors and future researchers; therefore, sharing my personal experiences is like exposing myself to potential threats of how my autobiography is perceived by my audience. Moreover, to avoid professional risks and personal criticism (Letherby, 2002), as well as to establish credibility (Robert, 2002), I had to be specific and list only those events that were relevant to my involvement with EDC. As Roberts argues, personal narratives can be checked against written or unwritten documents for authenticity (Robert, 2002); therefore, I have provided documental proves in the Annexure to make my story more credible.

A case study is an evolving process and new questions always come up while taking interviews, therefore to respond to emerging themes and unexpected outcomes, open ended interviews (Cresswell, 2013) were designed. However, the interview questions were designed and guided by research objectives and questions (Mongkhonvanit, 2008). To investigate further, broad questions followed by a series of sub-questions (Noor, 2008) were decided upon. Hence, a laddering technique such as "why" in interviews was employed to take the

questions upward so that respondents could reveal their inner thoughts well (Easterby-Smith et al., 2008:146). The interviews were conducted via Skype and tape recorded to avoid losing any data. Purposive sampling (Noor, 208) was used as it is more suitable for the case study approach (Tongco, 2007) where the sample size is very small. To avoid "bias basic, explanatory, focused and drawing out", probes were used (Easterby-smith et al., 2008: 147-148). Respondents were selected from industry, academia and government on the basis of being involved with U-I-G linkages one way or another. As a researcher, I believed that the experiences of each respondent from their respective organisation can provide in-depth information about U-I-G linkages in Peshawar, Pakistan. Along with primary data, secondary data was collected from IMSciences archives, i.e. IMSciences newsletter, EDC document, IMSciences website, newspaper cuttings, Women Chamber of Commerce Website and SMEDA's website.

The study required precise, descriptive data on the linkages between industry and university in the Peshawar region. Therefore, in-depth information from university and industry representatives on existing linkages and relationships in Peshawar was needed. The perspectives of the participants involved would then guide towards dynamics that could help in making appropriate recommendations for the region. Hence, the research undertaken seeks to fulfil two major objectives. Firstly, since no research has been done in the relationship between universities and industry within Peshawar region; therefore, initially U-I-G linkages and relationships are generally researched in the region. Hence, a general picture of the linkages and relationships is best obtained and understood through the use of the secondary data obtained from IMSciences archives. Secondly, the main objective of this research is to understand the perspectives, opinions and experiences of individuals involved in the relationship between universities and industry. Hence, a case study approach is adopted to further investigate the related issues, experiences and opinions on the relationship and to generate recommendations to bring about improvements. Furthermore, to better understand such relationships, I interviewed leaders of related institutes/organisations, i.e. EDC IMSciences, SMEDA and the Chamber to find their point of view on these linkages, as the Triple Helix model of U-I-G relations suggests (Etzkowitz and Leydesdorff, 2003). My personal account as EDC coordinator represents a narrative approach (Easterby-Smith et al., 2008: 95).

3.5 Research Template

Table 1

Epistemology	Approach	Research Strategy	Data Collection Techniques	Unit of Analysis	Tools employed	Data Analysis	Sample Size
Constructionist	Inductive	Case study and narrative base	Secondary data; archival. semi-structured interviews, narrative	Coordinators EDC IMSciences, SMEDA's regional Head and Vice President of/for Women Chamber of Commerce, Peshawar.	Skype and tape recorder	Manual	Four; Three respondents were interviewed, one response is narration-based

3.6 Population and the Sample

The units of analysis (Benbasat et al., 1987) of the study comprise of three groups; since it is a case study, from the academia Entrepreneurship Development Centre (EDC) IMSciences was selected to investigate how an entrepreneurship centre can contribute to regional economy under the framework of the Triple Helix model. Hence, EDC's first coordinator's personal account is considered while the second coordinator was selected for in-depth interview; vice president of Womrn Chamber of Commerce and Industry of Peshawar was selected from the industry and SMEDA's Regional Head in Peshawar was chosen as the third party who is actively involved in the process. The initial contact was made with the respondents through telephone calls and a request for informal interviews was made. The respondents agreed with the research objectives and its importance for the local economy was explained. Through a telephone conversation, the participants were informed about timescale; data collection technique and the ethical considerations of the study. Dates were agreed upon for the semi-structured interviews and written confirmation was sent.

3.6.1 Interview Dates

11th April 2012	13th April 1012	15th April 2012
Qazi Waheed EDC IMSciences	Javed Khatak SMEDA Regional Head, Peshawar	Shamama Arbab, Vice President Women Chamber of Commerce and Industry Peshawar, Director EURO foods Peshawar

3.7 Detail of Organisations Studied

Profile: Entrepreneurship Development Centre IMSciences Peshawar, Pakistan

Entrepreneurship Development Centre (EDC) (see EDC Appendices) was established in 2003 by the Institute of Management Sciences, Peshawar, Pakistan, with the help of the Small and Medium Enterprise Authority (SMEDA). The purpose for establishing such a centre in Peshawar was to develop an entrepreneurial community and enhance sector-wise productivity. Therefore, the centre is required to assist in bringing creativity and innovation in micro, small and medium enterprises in urban areas and encourage agribusiness in the rural areas. One such innovation in the field is to link up rural, urban youth and female communities with local, national, as well as international industries so as to develop an entrepreneurial culture and boost the local economy of Peshawar. The centre will assist the industry through R&D; human resource development; technical assistance; developing local industry networks and linkages with the global market; imparting entrepreneurship education and firm spin-offs through the Business Incubation Centre (BIC). EDC, since establishment, could not achieve any progress till 2008, as no practical support was provided by IMSciences and SMEDA, for to many reasons (discussed in the Primary Data section; page 4, paragraph 2). In 2008, the EDC re-inauguration ceremony was organised in which representatives from SMEDA, academia and industry (details mentioned in the Primary Data Coordinator Personal section, page 4, para 1) were invited. Since then, EDC established links with SMEDA; the Sarhad Chamber of Commerce for Men and Women Chamber of Commerce Peshawar, Pakistan. The EDC in 2008 established a Business Incubation Centre at the institute for student businesses and novice entrepreneurs; established skill development cell; organised a business plan competition in 2009 for which the centre secured £600 from USAID. These are a few of the achievements - while detailed list of EDC's achievements; its activity plans and monitoring and evaluation policy can be found in EDC Appendix.

3.8 Profile of Small and Medium Enterprise Authority (SMEDA)

SMEDA was established in 1998 by the Ministry of Industries, Pakistan, to develop small and medium enterprises (SME's) in the country. As the premier institution of the government of Pakistan, it provides a conducive environment to the SME sector for growth. It functions as an advisory body on SME to government and facilitates SME growth and global competitiveness through business support services. It also facilitates other stake holders that are working to develop SME sector in Pakistan. The main objectives of SMEDA are to formulate policies for SME development; provide business support to the SME sector; help and strengthen Chamber of Commerce and Industries and other associations working for SME's developing sector wise strategies for growth. Other activities include getting international certification for SME business; securing finances and donor help to develop the country-wide SME sector. SMEDA's head office is in Lahore and its branches are spread all over four provinces of Pakistan. It has established 18 offices all together, with the main offices in the metropolitan city of each province and its sub-offices in other parts of the provinces. For example, SMEDA's regional office is established in Peshawar and its sub-offices are in Abbotabad, Mingora, Dera Ismail Khan areas of Khyber Pakhtun Khwa province (KPK), Pakistan. Likewise, the other three provinces, i.e. Sind, Baluchistan and Punjab also host the regional office established in their metropolitan cities while its sub-branches are spread over three or four areas of each province **(http://www.smeda.org)**

3.9 Women Chamber of Commerce and Industry Peshawar Khyber Pakhtun Khwa (KPK)

Women Chamber of Commerce and Industry Peshawar (WCCIP) was setup in 2010 by the government to help female entrepreneurs in the Peshawar region start and grow their businesses. It aims at promoting women's businesses locally, nationally and internationally. Its main mission is to empower female entrepreneurs by making them economically developed; for this reason, the chamber regularly runs skills development workshops and seminars for women; conducts research for their businesses to grow; arranges exhibitions for their products in the region as well as train and develop them with the latest business skills and methodologies (http://www.wccip.org.pk).

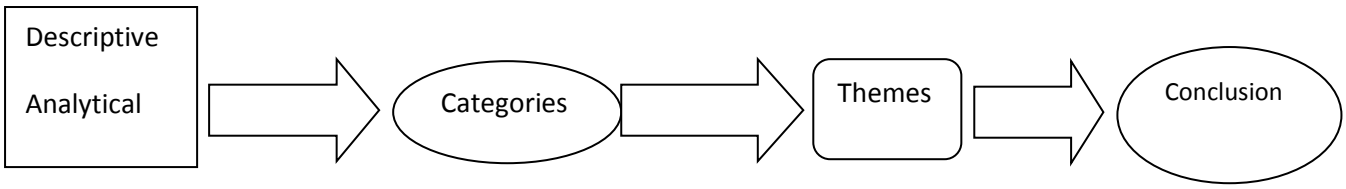
3.10 Data Analysis

As discussed above, a single case study was adopted to get information from practitioners, (Gray, 2013) and document the researcher's real life experience (Cepeda and Martin, 2005)

as EDC's first coordinator. This approach provided detailed (Smith et al., 2008, p.97), comprehensive (Gummesson, 2000) information about the centre and the individuals involved in university-industry-government (U-I-G) linkages in the Peshawar region (Yin, 2014). As the case study employs archives, interviews, narratives (Angrosino, 2007) and questionnaires as data collection techniques, (Eisenhardt, 1989) it helped in understanding how EDC was formed and linked with the local industry. Moreover, case study research employs exploratory, descriptive and explanatory methods (Gray, 2013) to understand social interaction (Yin, 2014); therefore, an initial exploratory study was conducted to inquire upon existing U-I-G linkages in the Peshawar region. As a researcher, I adopted a holistic and dialogic approach (Sangasubana, 2011) for case study over other methodologies because: first of all it suits an individual researcher to collect data from any place on a longitudinal basis; secondly, it doesn't treat the population as objects and helps gather a rich data base without applying expensive tools and equipment. Data is realistically collected in a more natural environment, due to which understanding respondents' inner self becomes easier (Wolcott, 1999). Hence, to explore first-hand accounts of the respondents involved, I employed in-depth semi-structured interviews (Kajornboon, 2005). However, the data collected from interviews was a challenging task to interpret. Initially, an inductive approach (Gray, 2013) was used to familiarize with the data collected (Roper and Shapir, 1999). As the data collected was based on written words, it needed to be coded in descriptive labels and then into analytical labels. Hence, the coding process started with marking the data that could potentially address the research question. At the second level of simplification, the data was minimised to a manageable size. In the third phase, categories were identified and once descriptive labels were grouped into smaller sets, themes were developed and finally a conclusion was drawn (Saldana, 2009). The process of data analysis is depicted in the following diagram:

Figure 5

Coding Process 1



Created by Author

Table 2: shows an example of how primary data was analysed

QUESTIONS	Descriptive coding	Analytical Coding	Category identified	Themes
Problems faced by EDC	1. Funds 2. Networking 3. T&D 4. Support 5. Recognition	1. Lack of funds 2. Weak linkage 3. No training provided 4. U-I-G level support for EDC 5. No recognition by other counterparts	1. Financial constraints 2. U-I-G Linkages 3. Capacity building 4. Policy level support 5. U-I-G recognition Of EDC potential	1. No financial support 2. Lack of formal procedure to develop U-I-G networking. 3. No formal training provided to EDC staff 4. Government and IMSciences never took EDC more seriously 5. Industry and government needs to develop trust in EDC's capabilities

3.11 Ethical Considerations

Ethical issues were considered at every step of the research conducted. To achieve the best results from the research as well as prioritising the well-being of the respondents (Kajornboon, 2005), McNamara's (1994) ethical principles were considered. First of all, the informed consent of the respondents was achieved by providing them with the details of the research study; hence, with the voluntary consent (Bosk, 2002) of the respondents, interviews were conducted. Before that, it was ensured that the respondents were fully aware of the purpose of the study. Secondly, voluntary consent (Bosk, 2002) of the respondents was

confirmed through telephones and detailed letters (Kajornboon, 2005). In the third stage, full attention was paid to the privacy rights of the respondents and no such questions were asked that would either threaten or embarrass the respondents. The fourth rule of ethical concern is the confidentiality (Kajornboon, 2005; Gray, 2013) of data and anonymity of the participants was dealt with by seeking the permission of using their identities in the document. Once they agreed upon disclosing their identities then their names were used in the study. Finally, in order to overcome personal bias, research methods and the results of the study are reported accurately (Angrosino, 2007; Neuman, 2003; Sangasubana, 2011).

3.12 Limitation of the study

The study is limited to a small sample size; therefore, employing a single ethnographic case study approach. Only three samples for semi-structured interviews were selected which provided a snapshot of the study. While one personal account (narration-based) was considered. The industry respondent was selected from Women Chamber of Commerce while men chamber was not included in the interviews. Moreover, academic respondents were taken from management schools only; it is recommended that, in future, respondents from an engineering university and Men's Chamber of Commerce and Industry should also be considered to have a more holistic view of industry-academic linkages in Peshawar.

3.13 Conclusions

The methodology adopted is confined to a qualitative approach due to the small sample size. A single case study approach employed for exploring U-I-G linkages in the Peshawar region was not found enough. Moreover, primary data collected was through semi-structured interviews and the personal account of EDC coordinator was considered. Therefore, a multi-case studies approach, including quantitative and qualitative approaches, is recommended for future studies.

Chapter 4

4.1 Data Presentation

This chapter documents secondary data and primary data about the Entrepreneurship Development Centre and IMSciences Peshawar, Pakistan. The secondary data derived from IMSciences' archives consists of EDC profile, while primary data collected from four different sources is documented. The purpose of the primary data is to give an in-depth background of the formative phase of entrepreneurship development centre at IMSciences Peshawar, Pakistan. EDC's formative phase and growth stages are discussed in the light of available documentedal proof. Documents details are provided in the end of the thesis as an Annexure; furthermore, the nature of each Annexure is also highlighted within the text. The Annexures are also briefly explained in a table form at the end of the researcher's personal account. Interviews of the people involved in the processes of EDC establishment and growth stages are also provided. The views and opinions of all of the interviewees are mentioned, so that past, present and future prospects of EDC can be highlighted. The data begins with my personal account as an EDC founder and coordinator. Secondly, an interview is taken from the current coordinator of EDC and his experiences and views are discussed in detail. In the third stage, the Small and Medium Enterprise Authority's (SMEDA) Regional Head, who initiated the centre at IMSciences, is interviewed and his efforts are outlined in depth. Finally, the Vice President of Women Chamber of Commerce's interview is discussed. In the end, analysis of interviews conducted is provided.

4.2 Responses from Academia

My personal account provides an autobiographical account of my life-long experiences that finally led to the establishment of an Entrepreneurship Development Centre at IMSciences, Peshawar. This section illustrates my dream of establishing my own business that I have cherished since I was a student myself. During my studies, I would think of running my own business rather than seeking a job after studies. Since I was born in a typical Pathan family,

running my own business was far from achievable. At that time, girls' early marriages, not later than grade 10 or 11, was a common norm. My family background was such where girls didn't have a choice of 'mate selection'; higher education and employment. In such circumstances, fulfilling my dream of higher education and starting my business was a big challenge for me. This would mean opposing family norms and taboos which at that time could lead to family chaos. Luckily, my mother supported me in completing my Master's Degree amidst of all family opposition. Once I finished my Masters in Political Science, my mother could not face anymore family pressure because my father had died by then. Being an eldest daughter of the family, my mother could not take any further family pressure and finally accepted a proposal for my wedding. I had to submit to elders' decision because it was a matter of family honour then. While detesting the practice of forced marriages, I decided to continue with my higher education after my marriage and then pursue my career as a business woman.

After marriage, I knew I could never start a business, since business women at that time were not accepted in respectable fields and that is why I had to compromise on my dreams and opt for the profession that was a 'bit' acceptable in the society. I had to decide on a teaching job which I never wanted throughout my student life. I was successful in convincing my husband to allow me to apply for a job at a girls' college. My husband was an educated person and was a lecturer at the Business Institute at Peshawar University; at that time, he could understand that it would be a waste of my degree and time if I didn't work. Therefore, he allowed me to work in a girls' college, as it would raise little concern from the family because it was not a co-educational institute. For me, teaching at the college was not a bad idea; therefore, I accepted a lecture post at Jinnah College for Women and worked there for two and a half years, but the ambition of starting my business was still stuck in my mind. While trying hard to do my job well, I could not get that level of satisfaction that I would have otherwise. Once my contract with the college was over, I was again stuck with the same feelings that all my talent was being wasted. During that time, I got call from Institute of Management Studies, which latter on changed to Institute of Management Sciences. It was a lifetime opportunity for me since it was a top business institute in Peshawar and teaching there was everyone's dream. As I have already compromised on my own business idea, teaching to graduated level students at the institute was good chance for me. As it was a co-educational place, convincing my husband and family for this job was not an easy task. After long discussions, my husband finally permitted me to work at IMSciences but with the

condition that I will only teach and would not participate in any extra-curricular activities. Finding the permission as an opening to my carrier, I promised to be confined to teaching and would not interact unnecessarily. This was the time that I had already got admission in MPHIL in political science at Peshawar University. It seemed that I had taken a step forward towards my career but at the same time I had to balance my family. Then I had twin daughters to look after as well as maintaining my household; keeping my social circle and performing well at my job. This was not an easy task for me but I had to overcome the challenges I faced in order to retain my employment.

During my eight years of teaching at the Business School, it developed my opinion that if engineering and medical colleges produce engineers and doctors, why does business school not produce student business? I started exploring the options of how IMSciences could work on producing employers rather than employees. Since the Peshawar economy consists of traditional family business; novice entrepreneurs, women especially face a lot of hurdles in their businesses. To study the Peshawar business environment in depth, I joined the Women Chamber of Commerce in 2008. While interacting with the women entrepreneurs in the Chamber I found out that 80% of women entrepreneurs were not properly trained to run their business. They were running their business on a trial and error basis and no proper expertise available for them to enhance their business skills. During discussion with women entrepreneurs, I felt a dire need for their training and development. Even the Chamber Vice President requested me to provide technical help for the women who were running their businesses. Due to these circumstances, I found the business environment very difficult for women, novices and student entrepreneurs. I decided to develop such a model where IMSciences could be used as a platform for all business solutions in the region. As I had already won my husband's confidence and with time our social mind-set was also changing towards women's education and work not only in my family but in the entire Peshawar region, now things were much easier for me. In these circumstances, the Internet came as a divine help for me, and I started exploring how academia worldwide is used to address industry problems. I found out that the model I was planning was already practiced in the USA, Europe and in rest of the world.

During my research on a viable model for university-industry linkages, higher education and the Government of Pakistan had already started working on it. My husband also went on an Entrepreneurship Post-Doctorate to Essex University for a year; taking advantage of this, I developed a Diploma in Entrepreneurship and send it to my husband to discuss it with his

supervisor. The diploma (see Annexure 1; is a one year diploma on entrepreneurship that imparts more practical education and skills to students) received positive comments from the Essex Business School Director, that encouraged me further in my initiative of establishing a Business Centre at IMSciences. Now my second attempt was to get my Director's approval for such a centre; therefore, I discussed the positive comments of Essex Business School Director on the Diploma and my plan of establishing the centre at the institute. The Director of IMScience, being a dynamic and very learned person, welcomed my decision. Initially, a name decided for the centre was the Student Entrepreneurship Centre. Where only student businesses would be established and entrepreneurship-related trainings would be given to the students. I formed a student's team who voluntarily helped me in making posters and a website for the centre. The centre's inauguration ceremony was decided on March 2008; people from Sarhad Chamber of Commerce and Industry; Women Chamber of Commerce and Industry (WCCI); media and SMEDA were invited. Since the Chambers Presidents and industrialists were never interested in academic activities and had not enough time while running their own business, it was expected that industry guests would not show up in the ceremony. While my main interest was to involve industry in the centre, I therefore made sure that they all come. Luckily, 80% of my industry guests (President Sarhad Chamber of Commerce Nouman Wazir and Women Chamber of Commerce, Sajda Zulfiqar, and other prominent local entrepreneurs) attended the ceremony which itself was a big achievement, since I wanted them to know about the centre's capabilities and potential that it can offer to the industry.

The inauguration ceremony was attended by IMSciences' male and female students from MBA, BBA and IT disciplines. During the ceremony, I presented my diploma for the students that I designed (see Annex 1). All commerce members and SMEDA's Regional Head appreciated the efforts. The Chamber of Commerce's President announced that to support the centre industry would provide internships to the students of IMSciences. Since SMEDA was already in the process of establishing Entrepreneurship Development Centres in Business Schools, one centre was earlier established at IMSciences in 2003 but it was only on paper. No further development was carried out from the platform of that centre because there was no staff and financial resources that could run the centre. SMEDA's Regional Head suggested that the centre should be combined with the existing entrepreneurship development centre. By doing so - with the students - the centre would offer its services to the broader

community. Once agreed, industry, SMEDA and IMSciences ensured me of their full-fledged support in strengthening the centre.

My efforts and hard work finally re-initiated the Entrepreneurship Development Centre at IMSciences, Peshawar, in 2008. My aim was to bridge the gap between industry and academia (Jones-Evans et al., 1999). Therefore, the centre would be used as a platform for providing consultancies; research assistance for innovation and product development as well as capacity building trainings for the entrepreneurs. It also aimed at establishing an Incubation Centre at the institute. As warmly welcomed by industry and academia alike, IMSciences offered office space, patronage and a coordinator salary. I was given an additional responsibility of being the centre's coordinator along with routine teaching. The institute provided me with a vehicle and some travel funds that I needed for the centre's promotion. I, as a Centre Head, confronted many challenges, due to which I could not activate the centre the way I planned. First of all, I needed proper training to run the centre. At senior management level, only the director and joint director of the institute supported me in promoting the centre at government and national level. Since the concept was new in academia, the rest of the management were neither interested nor aware of EDC importance; that's why their attitude towards EDC was not welcoming. Therefore, internally I faced a 'cold' environment. Gender was another issue - being a woman - working in a conservative environment like Peshawar where women are kept at home and are not allowed to mingle freely with men; I could not promote the centre that easily.

As the centre had many tasks at its agenda (outlined in Chapter 3), I needed funds to carry out those activities. Initially, I requested funds from the institute to carry out routine activities at the centre. Hence, I submitted a proposal for funds before the Executive Committee of Institute of Management Sciences. Unfortunately, the committee rejected the funding request with the comments that centre should generate its own funds to sustain itself. As no funds were approved by the institute, I approached funding agencies that were working on SME promotion in Peshawar. The first attempt was successful by getting funds of one lakh rupees (approximately £650) for a business plan competition from USAID (United States Agency for International Development) in 2009 (see Annex 2; the Annexure provides details of the business plan competition held at IMSciences in 2009 and funded by USAID). Receiving funds for a business plan competition from USAID created a hope for further such future partnerships with the donor. In this regard, I submitted project proposals for rural businesses and a recruiting agency to USAID in 2009 (see Annex 3; the Annexure outlines the proposal

submitted for creating rural businesses in the Peshawar region and establishing a recruiting agency for domestic help). Unfortunately, due to safety conditions in the Peshawar region the funds could not be approved. Hence, I submitted EDC proposals for funds before provincial government, GTZ (Germany agency) and multi-donor platforms (see Annex 4; the proposal outlines detail activities, departments and financial plan for EDC). As a Founder and Head of EDC, I explored all avenues that could possibly fund EDC. The proposals provided for EDC were highly appreciated on every forum but the funds were not provided.

However, I worked on the linkages of the centre with industry and government which did bear some fruit and an EDC consortium of ten universities was approved at the national level. Proposal for EDC consortium of six national universities was supposed to be funded by US government under the USAID project (see Annex 5; the Annexure is about six national universities forming a consortium that would work combinely for entrepreneurship development. It was supposed to be funded by USAID). All universities submitted funding proposals for different purposes to the Higher Education Commission (HEC), which once approved by HEC would be funded by the USAID project. In this regard, my institute submitted eight proposals; one was for the strengthening and promotion of EDC. As US interest was on the promotion of entrepreneurship, my proposal for EDC was selected at HEC level that would be sent to US for approval. My proposal was also taken as an EDC consortium of ten universities which would work together for entrepreneurial activities in the country. The consortium would coordinate and collaborate with each other in research and capacity building and would jointly address the industry specific problems (see Annex 5). IMSciences staff's general opinion was that EDC was the weakest project and would be less likely to be funded by USAID. HEC's and USAID's interest in EDC built-up my confidence level and ensured me that I was not wrong. It may be weak at the inception stage but potential does exist in the country for entrepreneurship. If the consortium was approved for funding, things would be much easier for me to run EDC. If the consortium was approved by HEC that would be a beginning of the Triple Helix model implanted in Pakistan for the first time. The proposal did reach Washington DC for funding but it failed to attract some funds. As a Head of EDC, I did not submit to the challenges and I focused on linkages which were cost free. For this reason, I linked the centre with TIE, i.e. the Industry Entrepreneurs and local Chamber of Commerce. Local Women and Men Chamber did show a meagre interest but no strong long-term relations could be established.

As Head of EDC, I only thought of exploring funding agencies and didn't think of offering short and long-term trainings to the industry which could have helped in raising some funds for EDC. As I was not properly trained, I could not promot the centre before the industry in the true sense, due to which confidence building measures could not be developed between the two sectors. Another shortcoming of EDC was the lack of permanent staff because the institute could not provide funds for it. To overcome this problem, EDC offered internships to the students so that some of its activities could be started. Tasks that were supposed to be performed by paid personnel were performed by unpaid internees for their work experience certificates (see Annex 6; list of student internees for EDC IMSciences). Due to the interns' hard work, some of EDC's activities did take place. With the help of interns, the EDC website (Imsciences.edu.pk/research centres) was made; exhibitions were arranged and seminar series and workshop on entrepreneurship were organised (details of all events are available in on the above website and see IMSciences newsletter; page 9 at: **imsciences**.edu.pk/files/IMS**Newsletter**-March_**2010**.pdf; This newsletter provides details about EDC arranging activities as discussed in the above paragraph). Hence, on a temporary basis, staff problems were addressed but still permanent staff in the longer run were needed by the centre.

I achieved some success by helping the Engineering University of Peshawar in the establishment of a Technology and Business Incubation Centre (TBIC) ((www.imsciences.edu.pk) news-letter 2010; page 9; website mentioned above). My understanding with them was that EDC would provide the expertise and technical support to engineering university students in establishing their businesses while the engineering university in return would give space to our students in their incubation centre. While both the parties agreed on joint collaborations for the incubation centre, I developed a business plan for a technology and business incubation centre which was approved by the heads of both the institutes. For me, it was easy to settle my student business at TBIC because IMSciences could not provide space facilities for the incubates at that time. In 2009, MOU (see IMSciences newsletter; page 9 at: **imsciences**.edu.pk/files/IMS**Newsletter**-March_**2010**.pdf) between the two institutes were officially signed. When it came to practical implementation, I found that due too much bureaucratic process, long term collaboration with engineering university could not be established. Therefore, I decided to accommodate IMSciences' student businesses at the institute and I started with one student on an experimental basis, who wanted to start his business as a fashion designer with the name of

'Zain Rashid'. I succeeded in getting a big hall from the institute in May 2009, where I made my office as well as provided office space for the student incubates. As IMSciences is a co-education institute, the students' incubate received overwhelming support from the female students and within one year of time his business flourished well in the local community. He started getting dress designing orders from the female faculty and their families (see Zain Rashid design's Facebook page). Furthermore, I also arranged an exhibition of his products from EDC's platform (see Annex 7, page 9) at local and national level. Zain Rashid's success motivated more students towards joining the incubation centre at IMSciences.

To promote EDC, I arranged awareness seminars for the students about how to start their businesses with the support of SMEDA. A series of awareness seminars and lectures about EDC services were arranged with the help Of SMEDA at the institute (detail is available at imsciences.edu.pk/researchcentres/edc). Due to SMEDA's involvement in the seminars' series, students and the faculty began to take the EDC more seriously. Top business people such as the President of the Men's Chamber of Commerce, Nouman Wazir, in 2008 and the Director of Euro Sausages factory, Adeel kaka Kheil, were invited to the lecture series and they shared their businesses' successes and failures with the students. Due to these efforts, not only the institutes' staff and students' mind-set was changed towards the centre, one of the IT faculty approached me to help him to establishing his IT firm. Involving established entrepreneurs in the lecture series was a good-will gesture which was supposed lead towards more future linkages. Now this was the time when EDC had earned some reputation for itself. One of my deliberate attempts was to highlight EDC at local and national level; that's why whatever activities I conducted from the EDC platform were given to the newspapers and news channels. Due to these efforts, many people in Peshawar started learning about EDC. In May 2010, I went a step further and organised a handicraft business fair which was telecasted at local and national level on news channels (see IMSciences newsletter; page 9 at: **imsciences**.edu.pk/files/IMS**Newsletter**-March_**2010**.pdf); in the fair, students and female entrepreneurs exhibited their products which were highly appreciated by the industry and government. This fair also was a source of income generation activity, which generated funds from the stalls and marketing. My other achievement was being selected for capacity building by USAID project FIRMS: Supporting Institutions as Change agents "Fostering Women's Economic Empowerment". It was a two day workshop in Islamabad held in May 2010; I attended the workshop as a trainee and learned how to recruit, retain and grow my members in the absence of financial resources. I not only received training in the workshop but also

developed awareness about EDC and Business Incubation Centre among the participants. The participants in the workshop belonged to academia, financial institutions and industry; especially from Women Chambers of Commerce Islamabad, Karachi and Lahore. Vice Chancellor of Baluchistan Women University; the faculty member from Sukkur Institute of Business Administration Sind and Heads of Women Chamber of Commerce approached me for the establishment of such incubation centres at their premises. Representatives from Women Bank assured me of students' loans for the student businesses. That was the time when I was leaving for my MPhil studies for the UK and no further development took place by my successor.

The main success that I got was designing a year plan for the Women Chamber of Commerce to attract female students of Business Schools in Peshawar (details are available on Women Chamber of Commerce's Facebook page). According to the plan, initially female students who wanted to establish businesses in future or were already running their businesses will be given Chamber membership. They will have the status of Associate Members who would not vote for the Chamber election, but they will be included in all Chamber meetings and activities. For a year, their business skills will be polished and groomed through the Chamber and EDC platform and after that they will prepare their business plan and once accepted will be given office space in Women Business Development Centre to start their businesses. This was a more practical step towards bridging industry with academia. As I was about to implement my plans practically, I got admission to the University of Liverpool for my higher education and had to leave EDC to my Assistant Coordinator.

Table 3

Annexure Details

Annexure 1	One Year Diploma in Entrepreneurship	It is a one year diploma in entrepreneurship that imparts more practical education and skills to students
Annexure 2	Business Plan Competition	The Annexure provides details of the business plan competition held at IMSciences in 2009 and funded by USAID
Annexure 3	Proposal for	The Annexure outlines the proposal submitted for

	Rural Businesses and Recruiting Agency	creating rural businesses in the Peshawar region and establishing a recruiting agency for the domestic help
Annexure 4	EDC Proposal	The proposal outlines detailed activities, departments and financial plan for EDC
Annexure 5	NCEED National Entrepreneurship and Enterprise Development Program	The Annexure is about six national universities forming a consortium that would work combinely for entrepreneurship development. It was supposed to be funded by USAID
Annexure 6	Student Interns List	List of student internees for EDC IMSciences
Annexure 7	Interviews Summary	This Annexure provides a summary of semi-structured interviews conducted from the respondents

4.3 Responses from Present EDC Head of IMSciences: Qazi Waheed

A semi-structured interview conducted with current EDC coordinator identified the same loopholes that are mentioned above. He commented that:

> "*The centre is in its infancy stage at the moment and needs a lot of resources to start functioning. The centre itself is going through incubation process and need recognition in the market to perform its functions. Apart from this the industry need to fully recognise its potentials for addressing industrial problems*."

While discussing EDC's performance with the current coordinator after my departure, I did not find much progress in EDC's activities. It seemed as the centre had become static after I left. One of the problems I detected was that the coordinator himself was not fully aware of how to promote EDC. During the interview, he mentioned that the centre signed MOU with Gems and Jewellery for capacity building of the entrepreneurs of Peshawar. During the two years of his coordinatorship, he retained one more student incubate. This incubate started his business as an event management firm and has successfully completed some of the project. The coordinator further added that now the centre provides space facilities, fax and telephone

facilities as well as technical assistance to these incubates. It also helps them in promotion, using the centre's logo and name as well. The centre has a proper tenant agreement with these incubates.

While listing the problems, he commented that "the centre needs government and industry recognition and support". He said:

> "*As the government and industry are not aware of the centre's potentials and capabilities, therefore industry is not inclined towards the centre for outsourcing its research and consultancies. Neither the government has planned policies to facilitate university-industry collaboration*".

The coordinator at EDC also highlighted the same problems as were faced by me while working for EDC. "He said that main problem is lack of funds". To perform its activities and promote itself the centre needs funds which neither the industry is willing to offer nor the government has offered so far, even IMSciences cannot offer financial support to the centre for sustaining itself. Regarding incubates, the centre has taken incubates but due to lack of space it cannot offer the facility to many people.

To address the problems, he said:

> "*The centre is trying to promote itself by developing linkages with the funding agencies that are working for the growth of SME sector in Peshawar*".

It is also establishing links with SMEDA and the Chamber of Commerce for recognition. At national level, the Institute of Business Administration Karachi (IBA) has signed an MOU with IMSciences EDC for mutual research in SME sector. The centre has also submitted a proposal to SMEDA for mutual research collaboration on the local SME sector. At the moment, processes for EDC activities have started and it will take some time to activate in a full-fledged manner. As far as government support is concerned, SMEDA is a government organisation that is working for the SME sector, so the centre is working on strengthening linkages with it. The centre is also planning to hold talks with government officials, Chamber Heads in person to highlight the importance of university-industry-government linkages. At the moment, the centre operates as part of the Institute of Management Sciences and has not started any research or trainings. The centre needs government level support for getting actively involved with the industry. The industry, in return, need to develop full trust on the centre's capabilities for outsourcing its research needs.

The Head commented that the,

> "*Centre does not have fixed funds of its own and depends on funded projects for its survival. Therefore, the government can provide research grants for university-industry collaboration and can develop a policy for facilitating such collaboration*".

New development in centre's performance is seen in the form of research grants that it has requested from the Office for Research Innovation and Commercialisation (ORIC). ORIC is IMSciences' internal funding body, established by the Higher Education Commission (HEC), which gives research grants to the faculty and research centres. In this regard, EDC has submitted a proposal to ORIC for SME mapping in Peshawar and, once it is approved by ORIC's committee, the centre will start working on it. Government research grants (as mentioned above) and industry's willingness to seek paid consultancies, technical help and trainings from the centre can be a good start.

MOU with Gems and Jewellery Company have been recently signed and, once the process starts, EDC will provide paid capacity building trainings to gems and jewellery entrepreneurs. SMEDA is also willing to get some funds for EDC activities from other sources so that it can formally start functioning.

While commenting on the centre's capacity, he added that the,

> "*Centre has full potential for addressing industry related problems it only needs to be recognised by the industry and government alike*".

It can offer consultancies; trainings for the entrepreneurs and it can develop business plans for the new entrants. As far as practical performance is concerned, recognition and support from government and industry is needed. It is working hard on promoting itself by arranging awareness seminars; circulating talk shows; signing MOUS; trying to establish linkages with foreign research centres. The centre is also working on starting diploma courses for the entrepreneurs and students.

Concluding Answer:

The Head of EDC suggested that the Triple Helix as a very viable model for a region like Peshawar and, if implemented, the economy can compete in the national and international markets. He said that,

"*This can happen if the government and industry develop friendly policies for Triple Helix linkages. I think IMSciences EDC should be used as pilot project for institutionalising the Triple Helix model and if the model works then it can be implanted in other parts of the country*".

4.4 Responses from SMEDA regional head Peshawar: Javed Khatak

The SMEDA established the EDC due to the government's deliberate policy of promoting entrepreneurship for economic growth in Peshawar. The evolution and growth strategies of the centre were planned phase wise. The first phase of EDC was its awareness campaign that was done through seminars and workshops in academia and industry. In the second phase, EDC was established at IMSciences. In the third phase, EDC would be used as a resource centre by SMEDA for those who want to establish new businesses. In this regard, a novice entrepreneur would be trained from a business idea to all stages of business development and growth. The fourth stage would be to start diploma courses. Finally, the Incubation Centre at EDC IMSciences would be established. Initially, the EDC was established at IMSciences as a pilot project and, once successful, would be implemented into the other business schools of Peshawar. SMEDA also aimed at transferring entrepreneurship knowledge to the centre.

4.4.1 Issues in EDC

The main issue with EDC IMSciences was its financial sustainability; SMEDA, with the help of IMSciences submitted a proposal for EDC funding to the Higher Education Commission; that proposal is still in the processes and yet to be approved. Now SMEDA is planning to launch short-term and long-term diploma courses at EDC funded by the students themselves, which will be a source of income generation for the centre. Another issue of EDC is its permanent staff; the coordinator, who initiated the centre, left for higher studies right after its inception due to which SMEDA's and EDC's collaboration halted for some time – thus, disrupting its growth process. The third issue is the gap that exists between industry and academia. Not only is there less awareness about EDC's potential to address industry specific problems, lack of trust also exists between industry and academia. On future plans for EDC, he commented:

"*SME policy 2007 that aimed at promoting entrepreneurship countrywide is in the process of approval by the cabinet. Once this policy is approved, four Entrepreneurship Institutes will be established in Peshawar which will be linked with EDC and financial institutes*."

In this process, EDC will help in the capacity building of the new entrepreneurs while financial institutes will be providing seed funds for their businesses. SMEDA's Head said that funds can be arranged from donors; recently SMEDA has received funds from multi-donor trusts; it is a project for the economic revitalisation of Federally Administered Territory Areas (FATA) in Peshawar. He said "SMEDA has involved EDC IMSciences for the capacity building of the young student entrepreneurs belonging to FATA". Regarding more income generating activities, he commented:

"*SMEDA is also starting idea village from EDC platform. Students in this village will share their business ideas, potential business idea will be converted into business plans which will be commercialise to the private sector. Idea commercialisation will be a source of income for both students and EDC*."

As a concluding remark, SMEDA's Head responded:

"*The Triple Helix model is no doubt is a new concept in Peshawar, Pakistan.It has worked well in the developed world in countries within Europe and in the USA. Malaysia has also tested the model and the results are great. In terms of Peshawar the process for academic-industry linkages have started but need proper direction. The model can guide the three Helixes towards development in the region*".

4.5 Responses from Chamber of Commerce:

Vice President Women Chamber of Commerce; Shamama Arbab

As pointed out by EDC's Coordinators and SMEDA's Regional Head Chamber, the Vice President also mentioned that,

"*Industry is not fully aware of the services that are offered by the centre*".

EDC has failed to introduce itself to industry well, regarding its capabilities and services. As far as academia-industry linkages are concerned, the Chief Executive commented that,

"*Since the trend of linking industry with the university is a new concept in Peshawar Pakistan, no such policies exist at the moment but if more awareness is created about the reciprocal benefits, probably in future such policies can be made at government level*".

When asked about EDC's role in the industry, the respondent answered,

"*Since the local industry is run by traditional family businesses, EDC can provide help in innovative business ideas and technology transfer*".

The respondent further added that,

"*EDC can be used as a platform for idea commercialisation, research collaboration and entrepreneurship training programs for women entrepreneurs*".

She commented that, "As the Chamber is not aware of what EDC IMSciences offer to the industry, linkages and collaboration with the Centre are on minimum basis".

The respondent from industry stressed on more awareness programmes by EDC regarding the services it can offer to the industry, especially businesses run by female entrepreneurs and who are more or less uneducated and untrained. These entrepreneurs need proper training and novel, market driven business ideas. The EDC can be a good platform for the Chamber to utilise its potential for developing new businesses in the region. She said,

"*Most of the entrepreneurs usually come with traditional business ideas with no proper training and research due to which they end up in failure*".

The EDC can help the Chamber in needs assessment of the entrepreneurs on the basis of which tailor-made training can be offered to them. Hence, EDC can be a potential partner for the Chamber in capacity building of the entrepreneurs and the Chamber as well as in research collaboration. She said that the,

"*Need for EDC services do exist in the industry it only have to be identified by the government, academia and industry*."

While commenting on the government's role, she said:

"*The Government should provide funds for academia-industry joint projects on capacity building and research collaboration*".

While commenting on the Triple Helix model, the respondent said:

> "*If the model is implemented with Government support the local industry will have an avenue where it can seek help for its problems*."

4.6 Conclusions

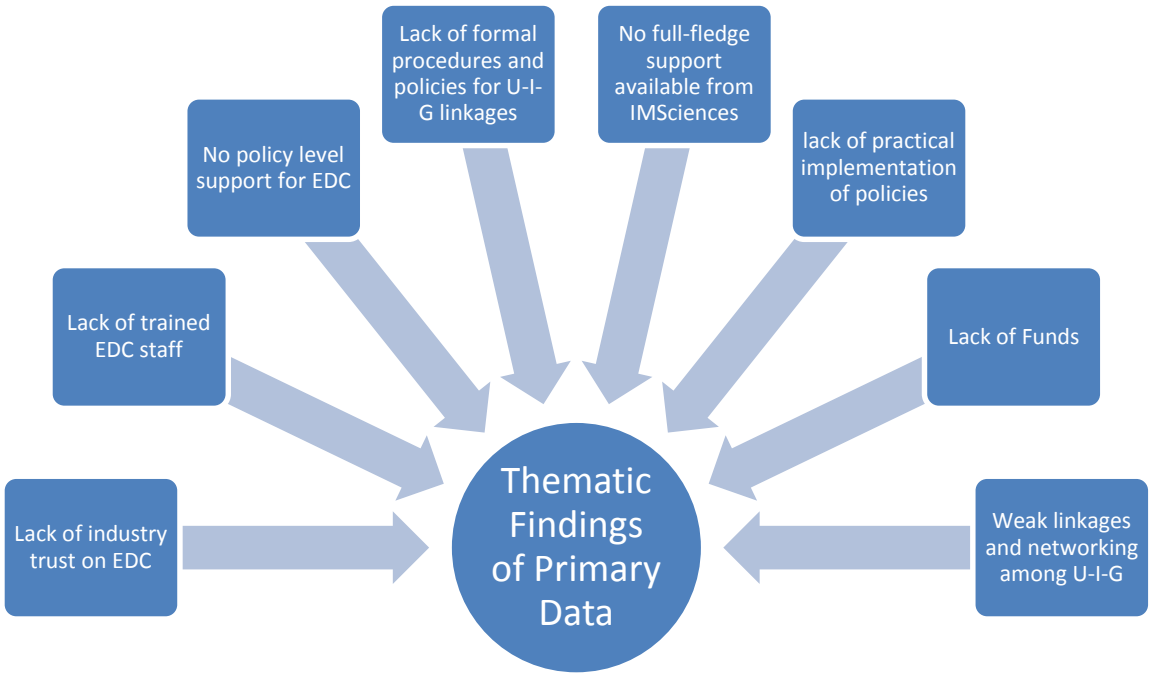
The above narrative and semi-structured interviews discusses the evolution and growth of the Entrepreneurship Development Centre (EDC) in IMSciences, Peshawar, which is a top business and management school in the province. The purpose of establishing such a centre was to bridge the gap between academia and industry (Jones-Evans et al., 1999) and to provide a common platform to all the stakeholders that could benefit from the business environment in Peshawar. As a founder of the EDC, I realised that in the conventional education system where old syllabus is the norm, implementation of dynamic ideas in education are always contained. Although my continuous efforts and hard work did bring some fruits in the form of the Women Chamber of Commerce realising the importance of EDC and its expertise, the need for proper awareness about EDC help for industry still exists. EDC's current coordinator needs to take a keen interest to develop such awareness about EDC in the industry and the government alike. When I established the centre, I was the only staff member working as a coordinator. During the two years, I raised its staff to ten student interns and one assistant coordinator. After I left for higher studies, no obvious development has taken place at EDC; this is because neither the coordinator nor the institute has shown any keen interest in its further growth. Furthermore, IMSciences EDC page doesn't provide any further events details apart from what I did in my coordinatorship.

During its founding stage, I developed EDC's website with the help of student interns, which is now visible on IMSciences' webpage. The link shows its events, members list and its different departments. EDC interns also developed its Facebook (**Entrepreneurship Development Center-EDC**) page as well, which is a source of information for the new members. This gives EDC at least a practical existence. Some progress in business incubation took place in the form of one student incubate raising his business as a fashion designer from EDC's platform. Business incubation could be used as a source of funds for the centre if it was utilised by its staff and IMSciences' management. Unfortunately, not much progress is made by the centre in this regard.

The main issues that were confronted by EDC in its initial stages were: networking with different stakeholders; a lack of funds, and government and industry's awareness about EDC potentials, permanent staff, growth and sustainability. Due to efforts put up in the initial stages of EDC, some of the problems were addressed; for example, SMEDA, Chambers of Commerce and Higher Education Commission started taking interest in EDC and there were then chances that in future SMEDA and the Women Chamber of Commerce would have joint collaboration with EDC in training entrepreneurs in business skills and business development. For this to materialised, EDC staff and IMSciences management needed to take the centre one step further, while it seems that current staff have lost interest in EDC. Funding problems can be addressed by promoting the purpose and benefits of the centre well before both government and industry. The centre can also explore donor agencies for funding the industrial projects as well. EDC can also generate funds for its activities by offering business plan workshops and trainings to entrepreneurs and students. Another potential capability of EDC is offering consultancies to industry by giving a business specific solution, since its faculty is highly qualified and foreign returning PhDs, it can capitalise on its faculty knowledge and research skills required by the industry.

During interviews with Javed Khatak; SMEDA's Regional Head and Shamama Arbab, Chief Executive Women Chamber of Commerce, I concluded that industry's need for academic and government linkages exist in the Peshawar region and EDC IMSciences can perform well in this situation (a summary of interviews is provided in the Table Annexure: 7). To conclude, thematic findings (see Figure 6) of the primary data research are: lack of funds; less support available at policy level; weak linkages among U-I-G; lack of trust between government and industry on EDC potential; no formal format or system exists for developing and strengthening these linkages; IMSciences' administrative support is lacking for EDC activities; training and development of EDC staff is required. Any development that has taken place so far in the shape policy formulation at EDC or SMEDA are just on paper and no practical steps have been taken to implement them practically.

Figure 6: Thematic Findings of Primary Data



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Chapter 5

5.1 Discussion

This chapter presents a detailed analysis of my MPhil research based on Etzkowitz's (1997) Triple Helix framework. The model is commonly perceived as a road towards innovation and economic development in the developed world. The purpose of the study was to search for a viable U-I-G model that could contribute to the economic growth of Peshawar, Pakistan. Initially, economic models, i.e. Porter's Diamond model, Mode 1 and 2 and the Triple Helix of university-industry-government (U-1-G) (Chapter 1) were explored. As academia's role was observed in the above approaches, therefore university's role from an evolutionary perspective was investigated; the purpose was to identify the factors that transformed the academic traditional role, i.e. teaching and scholarship into an entrepreneurial university. Hence, study of the university transformation revealed that academia's third mission, i.e. to generate new knowledge, emerged due to global tendencies towards knowledge-based economies. Therefore, the pursuit of innovative knowledge led the US Government to adopt Mode 1 since 1945 to 1988 and then Mode 2 (Etzkowitz and Leydesdorff, 2000) to achieve innovation in different sectors. Hence, the US Government funded basic academic research since 1945 until 1988 under Mode 1 and multi-disciplinary or trans-disciplinary research under Mode 2 in the early and late twentieth century (Etzkowitz, 1997). Mode 2 was a pluralistic approach involving a "networked" innovation system (Sampat and Mowery, 2004). Moreover, the academic crucial role in industry is also highlighted in Porter's model. It is because competitive advantage (Porter, 1998) is achieved due to new knowledge generation which is possible due to academic research capabilities. However, where the Porter model regards all factors involved in value chain equally important (Gulbrandson,1997; quoted in Etzkowitz and Leydesdorff, 1997), Etzkowitz's model focuses on industry-academia-government linkages for economic growth. As the focus of study was on U-I-G linkages in Peshawar region, therefore the Triple Helix model, which in fact is the further development of the Porter model, was considered for research.

Furthermore, the economic profile of Peshawar (discussed in Chapter 1) presents the current economic situation of the region. An economic overview of Peshawar confirms that its major economic sectors represent traditional small and medium enterprises. MNCs are nominal in Peshawar and exist either as franchises or branches. No official MNC headquarters have been established in Peshawar due to its law and order situation. In such scenarios, the chances for the economic growth of Peshawar can only be bright if an interactive institutional network approach is adopted. Therefore, Etzkowitz's thesis of university-industry-government was selected for systematic study (Tranfield et al., 2003) so that a more practical institutional set-up could be adopted for economic growth in Peshawar, Pakistan. A case study of the Entrepreneurship Development Centre; IMSciences Peshawar, Pakistan, is presented in a quest for a suitable academic partner that can collaborate with the local industry and government. To provide an in-depth view of the study, this chapter briefly discusses the Triple Helix model; the literature review findings and primary data results. The analysis of literature review discusses the success and issues of the Triple Helix model that are identified by empirical studies worldwide. The analysis of the primary data collected, presents a picture of how EDC IMSciences can contribute to economic development in the Peshawar industry. Since the focus of the study is Etzkowitz's Triple Helix model and its implications worldwide, an attempt was made to infer suitable measures from the model for Peshawar, Pakistan. In the end, conclusions are drawn from the theoretical and practical research conducted and recommendations are given.

The Triple Helix model (discussed in detail in Chapter 1), as envisaged by Etzkowitz, has emerged as a common thesis globally. This is due to the fact that countries and regions believe that innovative environment and entrepreneurial culture can only be attained if they opt for this specific model. These regions' common objective is to generate an academic spin-off with the help of university research groups and establish tri-lateral networks for economic development. Therefore, the underlying model regards the university as a significant partner in knowledge-based economy and entrepreneurship (Etzkowitz and Leydesdorff, 2000; Jones et al., 2014) because knowledge firm cannot be produced by a single entrepreneur due to the lack of technical expertise. Hence, the need for collective entrepreneurship, i.e. collaboration of individuals and related institutions emerges. This institutional collaboration for collective entrepreneurship takes place at three phases (Etzkowitz, 2001; 2007). In the first phase, university-industry-government collaborates for

innovation while retaining their traditional identity. Thus, when the three helixes enter into reciprocal relationships to enhance the performance of each other, the first step towards the Triple Helix is taken. For example, industry-academia-government initiates dialogue on improving the local economy and for this purpose the three helixes take their concern responsibilities, such as that university helps in producing graduates relevant for the industry; government supporting new plant construction as well as financing industry research, and industry may seek help from both the helixes in regard of starting a new cluster. In the second phase of Triple Helix, when the quest for intellectual capital becomes important, modification in the role and performance of university and other knowledge producing institutions gets priority (Etzkowitz, 2007). The more university R&D capabilities and training facilities are needed by industry, the more the influential role of academia emerges in the local economy superseding the dominance of industry and government laboratories. This is because university knowledge and research has a competitive advantage over other R&D institutions. In this phase, industry and governments get involved in establishing research centres and, in order to speed up academic research production, they provide additional funds and resources to academia (Etzkowitz, 2001; 2002). Once collaboration on a reciprocal basis is established among the three helixes for economic growth, while retaining their primary role and distinct identities, they take the role of each other to ensure innovation (Etzkowitz and Zhou, 2007). Such role-taking comes in the form of university transmitting education to youth as well as spinning new firms and doing industrial research - this was previously the task of industry.

Hence, today's model of innovation is different from its predecessors where statist models emphasised governments' dominating and controlling industry and academia or the three spheres working independent and separate of each other as in laissez faire (Figures 1 and 2 in Chapter 1; Etzkowitz, 2003). The new model of innovation evolves when interaction and interdependence among the three spheres is increased to the point that hybrid institutions, invention and innovation takes place (Dzisah and Etzkowitz, 2008). Therefore, the new Triple Helix in current industrial society is perceived as a spiral model (Figure 7) that is based on mutual and reciprocal public-private and academic partnership for knowledge economy.

Here, hybrid institutions results in the form of R&D, e.g. U-I-G research consortia; science parks; business incubators; financial support institutions, such as venture capital firms; angel networks seed funds and technology transfer offices (Etzkowitz, 2003).

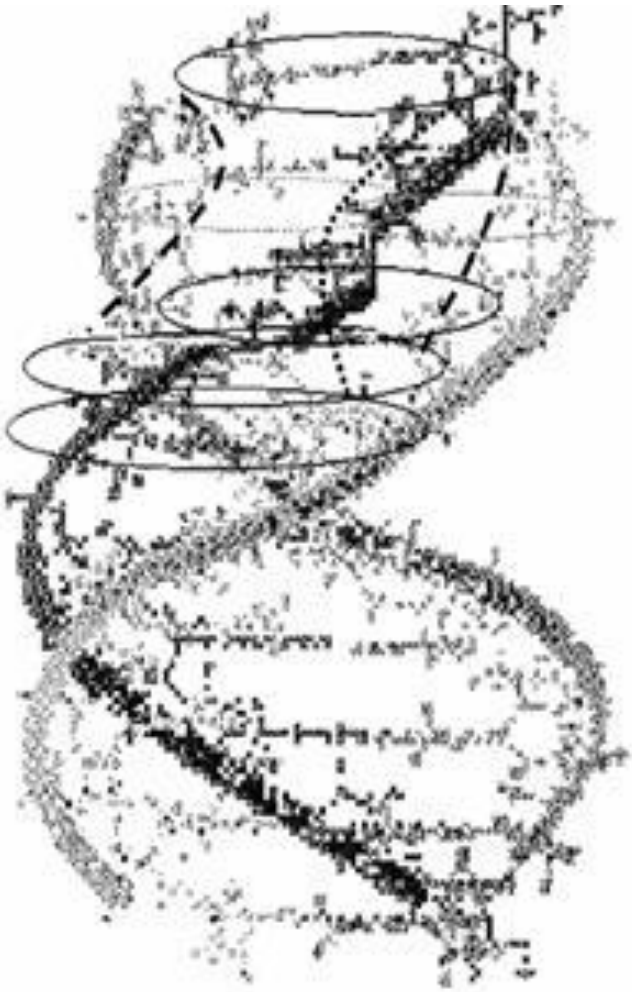

Figure 7: the spiral model of university-industry-government interaction for innovation

Source: Etzkowitz (2007)

http://ethiopiantriplehelixassociation.org

5.2 The Three Institutions in the Spiral Model

The new model of innovation evolves when interaction and interdependence among the three spheres is increased to the point that hybrid institutions, invention and innovation takes place (Dzisah and Etzkowitz, 2008). Therefore, the new Triple Helix in current industrial society is

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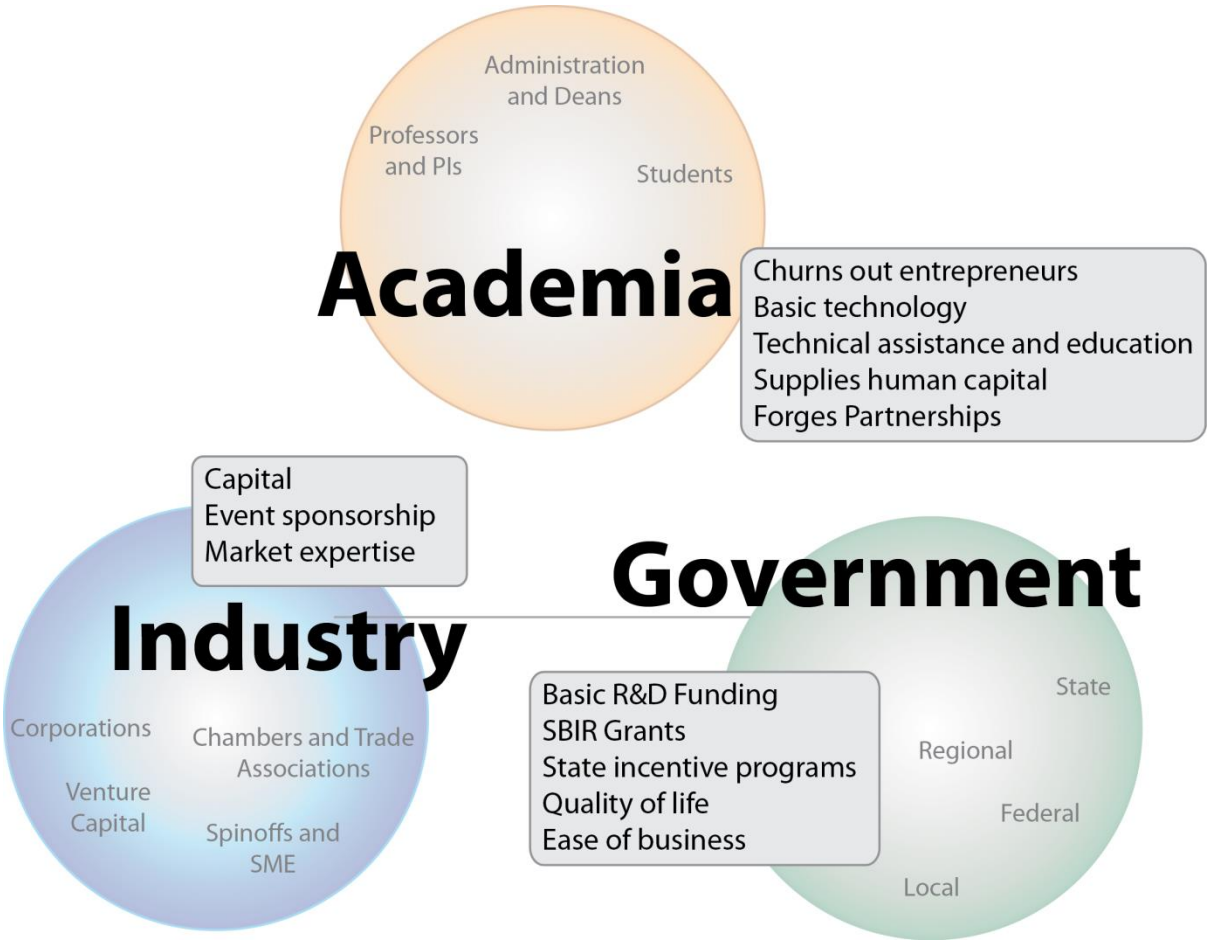
As discussed above, tri-lateral ties among academia-industry-government results in mutual benefits for each spiral (Figure 8). For example, Massachusetts Institute of Technology takes entrepreneurship as its academic mission for regional economic development, whereas the government acts as venture capital for academic spin-offs and finances industrial research centres at MIT. Furthermore, industry takes up the education role of academia when it gets involved in the training and development of its employees (Etzkowitz, 2002). Also, Swedish new universities and regional colleges have made knowledge creation as an important part of their academic program that has led to the creation of science parks; research centres; joint student training projects for firm formation and entrepreneurship training programs. Here, the Swedish Government act as a public venture capitalist that instigates and finances new firms based on new technology (Etzkowitz, 2007).

Figure: 8 Each Spiral benefiting from U-I-G Linkages



Source; www.mattchwierut.com

From the above discussion, the new roles of academia, industry and government in the Triple Helix model are:

5.2.1 Government

The government not only accepts academic role in industry but also in finance and support research centres at academia. It acts as a venture capitalist to provide the seed funding for technology firms. Hence, it provides R&D funds to academia and establishes entrepreneurial universities in the region. Furthermore, it enacts mutually agreed policies on patent and research commercialisation; cultivates entrepreneurial culture in academia by funding

enterprise events and formulating enterprise friendly policies for graduates (Etzkowitz, 2007; 2003).

5.2.2 Academic

The academic role comes in the form of establishment of entrepreneurship research centres that produce knowledge based spin-offs and conduct industry specific research. The centres in return provide consultancies to industry; commercialise research and provide training and development facilities to industry. Furthermore, it acts as a help desk for industry; introduces entrepreneurship curriculum in education that produces industry specific graduates. Hence, these centres cultivate entrepreneurial culture; generates hybrid institutions (Etzkowitz and Ranga, 2010), such as technology and business incubators, science parks, R&D and mentors entrepreneurs (Etzkowitz, 2007).

5.2.3 Industry

Industry funds industry specific research centres at academia accepts and recognises academia's potential for industrial collaboration and designs patent laws agreed by academia. Moreover, industry benefits from academic research commercialisation; human resource development and academic expertise for industrial solutions. U-I-G linkages are mutually beneficial for all; therefore, industry accommodates academic spin-offs; collaborates with government to establish science parks and incubators at academia. It also mentors graduates on business issues; sharing their real life business stories with them; arranging talk shows, open discussions and seminars on business opportunities as well as giving internships to students at industry for practical exposure other industry contribution required by the model (Etzkowitz, 2007).

5.3 Institutional Theory and Spiral Model of Innovation

As the new spiral model is set up on institutional theory (mentioned in Chapter 1), reciprocal relationship (mentioned in Section 5.2) among the three institutions can only emerge if planned, structured and substantial plan for their cooperation is developed. Moreover, if institutional barriers, i.e. resistance to change exist among the three institutions, long term

cooperation among the three cannot be form (Brundin et al., 2008). Thus, hybrid institutions (mentioned above) cannot be developed. Furthermore, people from academia-industry and government require well-developed rules and regulations for routine activities. A proper feedback process should be developed that can put pressure on the three institutions to meet their mutual goals. The institutions involved need to synchronise their activities and identify their mutual objectives. For example, if government is only interested in policy formulation while ignoring implementation, industry doesn't show interest for mutual cooperation while academia research is not benefiting industry, Triple Helix is likely to fail. Institutional barriers, such as diverse organisational goals and objectives; structure and resistance to change might hamper the process of economic growth and innovation (Brundin et al., 2008). Furthermore, the three institutions are subject to mimetic, coercive and normative pressure; Triple Helix from an institutional perspective cannot foster economic growth and innovation (DiMaggio and Powell, 1983; Brundin et al., 2008). University, industry and government in the Triple Helix model are forced to resemble each other in their institutional set-up; hence, the model leads to isomorphism (DiMaggio and Powell, 1983). However, academia and government are subject to institutional isomorphism, while industry is forced to competitive isomorphism (DiMaggio and Powell, 1983; Brundin et al., 2008). In this regards, when taking the role of each other in the new spiral model of innovation, the three institutions are required to adopt new beliefs, goals and objectives as well as accept new environment pressure, i.e. technical and institutional control (mentioned in Figure 3: Chapter 1) (Scott and Mayer, 1991; Brundin et al., 2008). For example, academia which is not subject to competitive isomorphism has to compete in the new institutional set-up by taking advantage of its research capabilities. The government can utilise its regulatory pressure on the two institutions to meet their set goals. The industry, controlled by technical pressure, should comply with institutional pressure as well to foster economic growth and innovation (Brundin et al., 2008).

Hence, all the helices in the model have common areas that they can mutually develop and strengthen by collaborating with each other without compromising on their independent domain. Therefore, they have to recognise their mutual interests and design policies that can ensure their long term collaboration for economic growth. Even though the three spheres have a common interest and have a valid reason to integrate and support each other, there are still issues involved that create barriers in bringing academia, government and industry to a platform from where they can materialise the true nature of Triple Helix model. These issues

were identified during the systematic literature review that was conducted to check the practical implications or validity of the Triple Helix model in Peshawar, Pakistan. The literature review (Chapter 2) explored in-depth academia-industry-government collaboration in factor-driven (developing); innovation-driven (highly developed) and efficiency-driven (newly developed) countries (Jones et al., 2014). A total seventy-two research articles on the Triple Helix model, published during 2000-2012, were selected for the literature review on the basis of their research rigour. Finally, four themes derived from the tables made (see Appendices 1, 2, 3, 4) were: Triple Helix and R&D; Triple Helix and innovation; Triple Helix and economic development, Triple Helix and industrial growth.

Analysis of systematic literature review revealed that due to academic R&D potential, industry and government has benefited in innovation, industrial and economic growth worldwide. However, research found that issues do exist in regions where Triple Helix is not practiced in its true sense. The main issues confronted worldwide (Figure 9) while practicing the Triple Helix model are:

5.4 Thematic Analysis of Literature Review

5.4.1 External Funding:

Financial grants are essential for academic R&D activities (Acosta et al., 2009); therefore, the government is required to develop a mechanism where the universities can receive research grants without any vested interest. Because research funds received from external sources by academic research councils come with strings attached, this affects research practices in the developing and developed world alike. For example, in the US, Etzkowitz (2003) and Sweden's (Banner and Sandstrom, 2000) external research funds directly affect norms of their research councils and influenced research as a whole. Hence, the government is required to allocate industrial-academia research funds through fiscal budgets and on a continuous basis without any pre-determined consequences so that unbiased results can be attained.

5.4.2 Policy Level Support:

Countries where political and economic conditions (Nwagwu, 2008) are not stable, such as Nigeria or policy level support is not provided (Langford et al., 2006); the innovation process is either slow or cannot take place. Policy-level support includes governments providing R&D funds to academics; establishing research centres (Shapiro, 2007; Boardman and Corley, 2008; Boardman, 2009); strengthening inter-institutional linkages between academia and industry; design clear, flexible and consistent policies for R&D activities in their regions. Research found that countries, which do not meet these basic requirements of the Triple Helix model, the process of innovation and industrial growth is slow in their regions. For example, Malaysia, due to inflexible, rigid, vague and inconsistent government policies, Razak and Saad (2007), and Nigeria's (Nwagwu, 2008) unstable economic conditions, institutional linkages for economic growth cannot be developed. The countries which want to achieve innovation and economic growth need to follow the precedents of the US; Mexico (electronic cluster) (Vargas, 2011) and West Germany (Muller, 2005) where high-tech cluster development is possible because their governments have sincerely supported the integration of academia and industry. Whereas, Portuguese progress on the creative use of technology (de Castro et al., 2000) and Lithuanian high-tech development (Chlivickas et al., 2009) is slow because government support is not present in these regions.

5.4.3 Foreign Research Collaboration:

The countries where there is less trust in local academic research expertise, means there are chances that the local industry and government will turn towards foreign research collaborations. In such circumstances, universities' expertise is not employed in local industrial research. For example, Japan (Sun and Negishi, 2010); Thailand (Liefner and Schiller, 2008) and Malaysian industry (Razak and Saad, 2007) trust in foreign research or MNC's expertise for quick industrial solutions has weakened academic role in industrial research. Unless regional governments and their industries recognise local academic capabilities, such as research, teaching and technology transfer potential, academia cannot play a strong role in innovation and economic development.

5.4.4 Industry and Academia's Willingness for Innovation:

Innovation largely depends on industry and academia's willingness to collaborate. Hence, if industry is willing to collaborate with academia (Acosta et al., 2009) innovation-based research can be carried out. Whereas countries where industry or academia show a lack of interest in innovation or are reluctant to collaborate cannot achieve success. For example, due to Hungarian (Annamária, 2004), Malaysian (Razak and Saad, 2007) and Australian (Gunasekara, 2006) industries' lack of willingness for technological innovation, strong and effective university-industry interaction could not be developed in these regions. However, the US's leading position in the bio-tech sector; information technology and new media is possible because of the active contributions of academia in the knowledge economy. The reason why the US achieves this success in these sectors is: 1) Government support for involving academia in the innovation process of the country; 2) A strong academic desire for industrial collaboration (Mayer, 2006). Hence, these factors have led to the establishment of research centres in Portland and Washington. Once industry, academia and government realise the mutual gains by collaborating with each other, there are chances that each Helix will happily support each other in R&D, innovation and economic growth. The industry needs to realise that by integrating with academia it can save time and money on in-house R&D and will focus more on business while academia can gain financial help from industry and the state can achieve economic growth and a competitive edge.

5.4.5 Research Commercialisation and Patent Rights:

Research commercialisation, intellectual property rights and patent policies are not clearly designed in the developed and developing world. Due to which, confusion over ownership exists between research partners or innovation groups. These common issues are found in Finnish universities and industry (Tuunainen, 2002); Argentinian public research organisations and firms (Arza and Lopaz, 2011); European universities (Acosta et al., 2009) and Malaysian universities and industry (Razak and Saad, 2007). To overcome such issues, a more conscious approach by the government is required while designing commercialisation and patent policies and procedures in these regions.

5.4.6 Other:

In developing countries, especially Malaysia (Razak and Saad, 2007), universities lack industry specific research expertise and equipment; timely solutions to industry problems by academia, i.e. academic staff's full-time research commitment for industry problems and the Malaysian Government's inflexible, rigid, vague and inconsistent policies creates barriers for successfully implementing the Triple Helix model. In European regions, Triple Helix cannot take roots due to the absence of a homogeneous legal system that protects industry and university property rights (Acosta et al., 2009).

Figure 9: Thematic findings of the Literature Review

Diagram created by Auther

5.5 Validity of the Model in Peshawar

The Triple Helix model, which is considered a suitable conceptual framework for regional development (Etzkowitz and Ranga, 2010) needs structural changes to make it work in a

developing region like Peshawar (Dzisah and Etzkowitz, 2008). The original spiral model of innovation (Figure 6, above) worked well in the developed world because that industry hosts multi-nationals that can afford industry-academia joint ventures. Their governments not only facilitated interactive networks but also designed such policies' frameworks that supported high growth firms (HGFs) (Mason and Brown, 2013). These HGFs not only speed up productivity growth but also create new jobs; increase innovation and promote business internationalization (Mason and Brown, 2013). Peshawar is not only a traditional and developing economy but also a war and crisis-ridden region, due to which it cannot attract multi-nationals headquarters. Therefore, it has to depend on its natural resources and local talent or human capital to develop its economy. Once Peshawar's local industry starts developing, it will ultimately lead to innovation and increased productivity (Reinert, 2007). As economic and political conditions do not fit Triple Helix's requirements, it is suggested that the model should be modified to fit the local sub-dynamics (Dzisah and Etzkowitz, 2008). The modified model of innovation is provided in Figure 8.

Furthermore, one of the common platforms that industry, academia and government can utilise to develop strong R&D and knowledge base is research centres. As recommended above in the policy level measures, research centres can promote innovation and knowledge transfer through R&D activities. Therefore, the role of the Entrepreneurship Development Centre's (EDC) IMSciences Peshawar, Pakistan (secondary data, Chapter 4, part 1), is taken as a case study for industry-academia linkages for economic growth in the local economy. Chapter 4, part 1, illustrates the formation of the centre; its basic features and the services it has rendered so far. The centre, established in 2008, was meant to perform the same functions as reflected in the USA and UK enterprise research centres. Unlike the Centre for Enterprise; the Business School of Manchester Metropolitan University and Enterprise Centres worldwide (Jones et al., 2008), EDC IMSciences could not pursue its goal of industry-academia integration due to the lack of funds. MMUBS Centre for Enterprise, established in March 2001, secured funds from external sources, such as European Regional Development Funds (ERDF); ESRC (£364,000) and soft structural European funds (Jones et al., 2008), while EDC IMSciences could not find such avenues to secure funds. Hence, in its initial stage it could not perform activities that were performed by enterprise centres in the developed world. Again, MMUBS Enterprise Centre bids for funding were a team effort that involved the Director and external project expertise (Jones et al., 2008) whilst the EDC Head had no other expertise available that could provide expertise for securing funds.

Other problems identified by primary data collected through semi-structured interviews (Chapter 4, part 2) from SMEDA Head's current EDC coordinator; the Vice-President of the Women Chamber of Commerce Peshawar and from the founder of EDC personal account, was the lack of institutional context (Jones et al., 2008) and policy level support for the Triple Helix model in the Peshawar region. A personal account from the EDC coordinator revealed that it was never taken seriously by industry-academics and government. A policy-level support was absent which made the centre ineffective to perform its activities properly. Although the coordinator was successful in convincing the Director and the joint Director to establish EDC, no further support was provided to her in the shape of R&D funds and training and the development of EDC staff. Unfortunately, EDC could not generate income to meet its expenses due to an availability of funding agencies, such as ESRC and European Regional Development Funds (ERDF) (Jones et al., 2007). Unlike the Centre for Enterprise, at Manchester Metropolitan University where they have generated £9m since 2001, from regional development funds and other sources (Jones et al., 2008), EDC could not explore such avenues because such funding agencies were not present in Peshawar. However, one recent development regarding securing funds is that EDC can seek funds from ORIC (Office for Research Innovation and Commercialisation) which were recently established by HEC (Higher Education Commission) at IMSciences for giving research funds to its internal research centres. Earlier, the only support EDC received from its own institute was in the shape of student internees; coordinator allowances; separate offices; some funds for refreshments during awareness sessions and seminars arranged at the institute, and travelling allowances for networking. In such circumstances, materialising the Triple Helix model in the region was far from reality. It needed a lot of effort to bring the three helixes to one platform; convince them to collaborate as well as retain their independence in their own sphere.

Interviews with the Chamber of Commerce and Industry and SMEDA's Head, equally show the need of EDC's role in economic development because the local industry of Peshawar is based on traditional businesses that are not technology and innovation driven and the industry is full of uneducated business people who lack proper business skills and expertise. The poor conditions of the local economy demand an institutional approach towards economic growth. Firstly, because local businesses are established with no proper market research; secondly, the business community, especially female entrepreneurs lack business know-how and have no knowledge about innovation and knowledge firms, which exist nationally and internationally. They have no avenue to look for proper advice and business support help.

Most of the business community has no proper direction and lack government and institutional support for starting and developing their businesses. Apart from a few entrepreneurs who are educated or are running family businesses, the rest of the industry is ignorant of the international market trends – while, if trained properly, the existing businesses can be taken at international level.

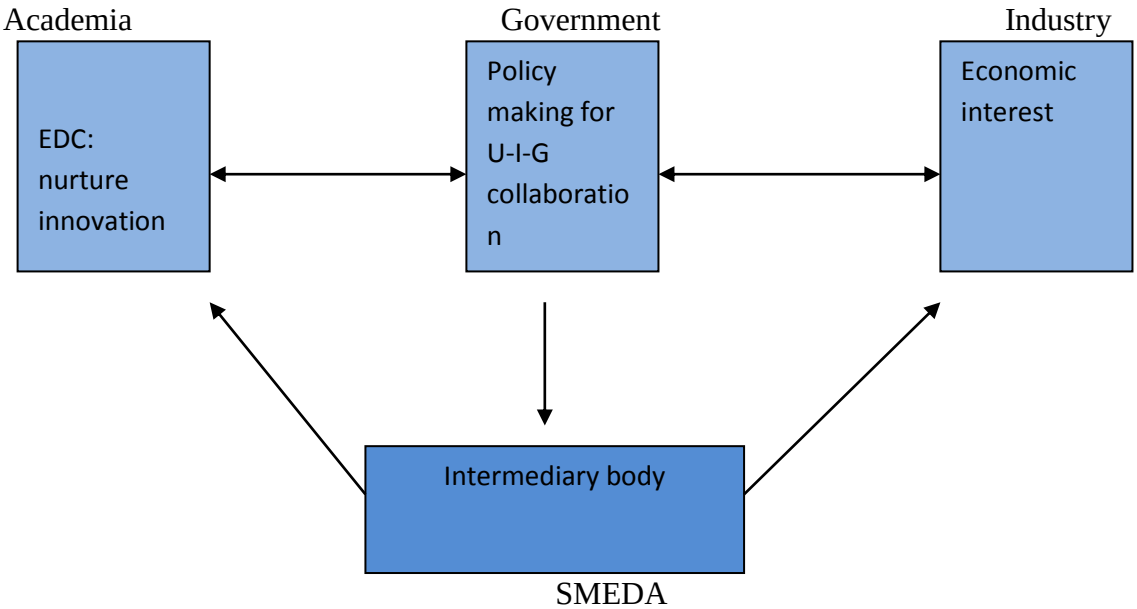
5.5 Enhanced Role of SMEDA in Peshawar, Pakistan

The above discussion of the literature review and the primary data found that local industry in Peshawar, Pakistan, needs academic help to grow. Since SMEDA has linkages with industry and is actively involved with local Chambers of Commerce (industry), it can act as an intermediary party (Todeva, s2013) by integrating industry and EDC on the one hand and convincing government to support this integration on the other hand. One of SMEDA's tasks is to provide entrepreneurial trainings and consultancies to new entrepreneurs; it can outsource this activity to EDC; by doing so, industry can get to know the potential of the centre. This will establish a long-lasting collaboration between industry and EDC for research and training. As SMEDA already has strong relationships with financial institutions and donor agencies, it can introduce EDC to these institutions for research funds. It can also bridge the gap between the government and EDC by convincing government to fix research funds for the centre in the budget. One of EDC's achievements is the establishment of the incubation centre because innovation and academic spin-offs in Peshawar are only possible if a technology and business incubation system is established. However, incubation is a new and complex process in this region and requires a proper organisational mechanism. EDC can involve SMEDA in getting seed funds for technology spin-offs from government and other financial institutions. For incubators and science parks (Etzkowitz et al., 2005; Jones at al., 2014) to take roots in Peshawar, Pakistan, academia has to get involved in industrial research; establish joint ventures with the industry. The government need to support and initiate such science and technology policies which can help in the development of the incubation industry in the region. The innovation process, as reflected in the research findings, requires policy-level support, i.e. establishment of R&D institutes (Li,X, 2009; Asheim and Coenen, 2005); a full understanding of regional industrial demands and the designing of regional base innovation policies. Therefore, government support in this regard is highly essential not only to ensure the Triple Helix and the entrepreneurial culture in Peshawar but also to understand

the needs of the SME sector, so that R&D institutes can address industry specific problems. Therefore, SMEDA which already is involved with local SME's can assist EDC in getting the required information.

Since universities have an important role in the economic development of any region (Mayer, 2006; Liefner and Schiller, 2008) a well-defined framework for academia-industry engagement in economic growth should be outlined. From the empirical study, I propose that SMEDA can involve the policy makers in Peshawar to promote the rise of academic capabilities, i.e. entrepreneurial training and education (Jones et al., 2014) in accordance with the changing needs of its industry. Higher education institutions should provide knowledge input in the form of graduates and publications; direct consultancy services and establish research centres that cater to needs of local SME's. As discussed above, Triple Helix cannot be replicated in Peshawar in its original form; therefore, a modified form of the model (see Figure 10) should consist of SMEDA as an intermediary body that will act as a bridge among the three helixes for economic growth.

Figure 10: SMEDA as an intermediary body among U-I-G Linkages



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As responses from the primary data confirmed that for an uneducated person to establish a knowledge base firm is not an easy task; therefore, SMEDA can utilise EDC's potential for the training and development of the novice entrepreneur. EDC, while utilising PHD staff's expertise of IMSciences for industrial research and consultancies, can address industrial needs. All the three institutes if integrated can develop a conducive environment for knowledge economy by producing knowledge firms in Peshawar. Thus, such institutional collaboration will result in the Triple Helix model that started in the US and in the rest of the developed world. Due to successful results of the model, it is gradually spreading in the developing world as well. Since IMSciences Peshawar has the potential for developing economy, first it has a highly educated faculty specialising in business education; secondly, it has EDC on its credit. Under the model, governments can provide funds for industrial research to the centre. With funds, the centre can offer business specific trainings to potential and existing entrepreneurs. The centre, with the help of SMEDA, can do sector mapping of all the businesses in Peshawar; identify their problems and needs and then can offer consultancies and business specific solutions to the industry.

5.6 Conclusion

The quest for a viable and valid economic model guided the research towards a systematic literature review of the Triple Helix model; however, the study found that although the model is practical in the West, it cannot achieve the same results in the developing region of Peshawar. Therefore, it is suggested that the model should be modified to make it valid and viable for the region (Tveit, 2011). Hence, the model should be extended to include an intermediary body (Todeva, 2013), i.e. SMEDA in the Peshawar case (as shown in Figure 10, above) which will link EDC (academia) with the local industry and government, to pool-in their common resources for economic growth in the region.

As evident from the primary data, EDC since inception to-date has always involved SMEDA to bring government officials and industry to its activities whether it was a business plan competition; an inauguration ceremony; seminars or university-industry discussion forums (Chapter 4). This was because EDC could not involve industry and government in such activities without SMEDA's help. The reason was that previously neither industry nor

governments were aware that EDC could be their common and equal partner in the economic development of the region. Whereas, SMEDA already had close linkages with government and industry; therefore, it can bring industry-academia and government to the negotiating table where the three can initiate dialogues for local economic growth; design a policy framework for their mutual collaboration. Moreover, EDC's initial collaboration with an engineering university for a Technology and Business Incubation Centre (mentioned in Chapter 4) could contribute towards a techno-firm-like formation by involving engineering university students and EDC expertise. As there is a demand for academic expertise in the local industry, EDC can initiate an engineering university and IMSciences students' ventures in idea commercialisation and knowledge production. Moreover, university-industry linkage processes have already started through EDC and SMEDA: it only needs a proper mechanistic and network approach to be successful. In this regard, EDC's proposal (Annex 5) can be a good start to develop a country-wide consortium for EDC's and industry for adopting common practices for U-I-G linkages.

Chapter: 6

6.1 Conclusion and Recommendations

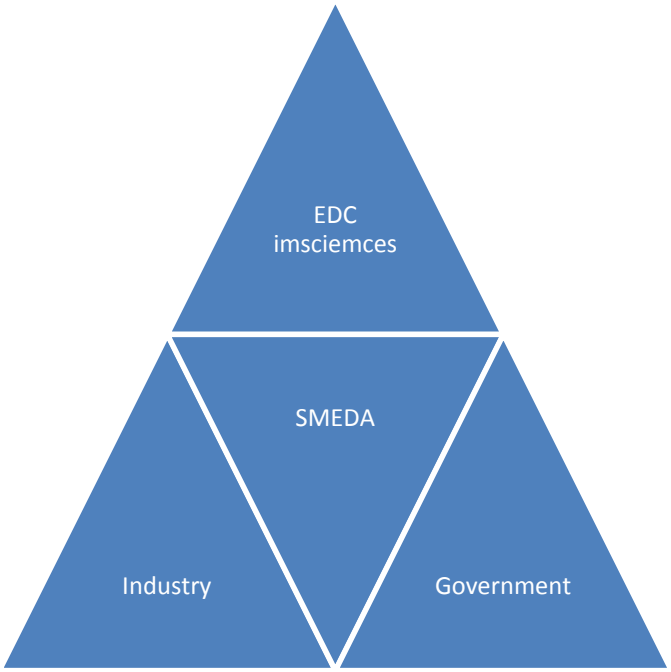
This chapter presents conclusions and recommendations derived from the study conducted for a viable economic model for Peshawar, Pakistan. In this regards, the study features the case of EDC for university-industry-government collaboration.

The Discussion Chapter provided an overview of introduction and the evolution of Triple Helix model and research methodology adopted for the study. Furthermore, analysis of both the systematic literature review on the Triple Helix model; secondary and primary data collected guided the research towards new concepts, i.e. a modified form of the Triple Helix model. The new extended model suggested the inclusion of SMEDA (Figure 10) as an intermediary body (Todeva, 2013) for linking university-industry-government for economic growth. The purpose of the entire study was to examine the level U-I-G linkages and collaboration in Peshawar, Pakistan. In this regard, the focus of the research was:

- To what extent have U-I-G linkages been developed in the region?
- How that minimum level of linkages can be developed into proper model for economic development?
- If any tri-lateral relationships have been established in the region, what is the nature of those ties?
- Whether these linkages have the potential for transforming them into a proper Triple Helix model in the Peshawar region?
- How EDC IMSciences can be a part of this model.
- Whether local industry and EDC IMSciences possess the capabilities required for the Triple Helix model. If not, then what other measures can be adopted to make the model work in the region?
- Does U-I-G need any catalyst to strengthen their relationships?
- What policy guidelines are needed by all of the three spheres to work on the model?

The thematic findings of literature review revealed that although common issues, such as research funds, patent and research commercialisation issues; lack of policy level support from the government are faced by the developing and the developed world alike, still the model is designed to suit the developed societies. This is because the model works well where the government recognises and trusts academia's crucial role in the industry, as in the US and Europe. (Etzkowitz, 2002, 2007) Whilst, industry in the developing world is neither willing to collaborate with academia nor is innovation driven. Hence, academia in a developing region like Peshawar is also expected to act as "learning systems" where its industrial role is skill development, i.e. human capital development (Methews, 2001; Viotti, 2002). Furthermore, most of the funds required for high growth firms and research comes from MNCs in the developed societies (Mason and Brown, 2014); while Peshawar does not host or headquarter any MNC, due to its political-economic instability. Therefore, it is recommended to modify the model to make it suitable for the local economic, academic and political demands. Furthermore, academia needs to have complete knowledge and information about the local industry and have the potential to spin-off such innovation based knowledge firms that guarantee economic growth and internationalisation of business; hence, developing such industries that can compete at local and international level and create jobs in the region (ibid). Therefore, academia and industry needs a catalyst that can initiate dialogues between the two and guide them towards possible collaboration. Hence, the in this regards is identified that catalyst/coordinator which is already working for the development and strengthening of the industry and the possess industry specific knowledge required by academia (see Figure 11).

Figure 11: Describe SMEDA as coordinator among the three helixes



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Research found a common trend in the US and European countries for the creation and funding of research centres at academia (Li, X, 2009; Asheim and Coenen, 2005; Etzkowitz, 2002) and the Centre for Enterprise MMUBS (Jones et al., 2008) by the government to generate a knowledge economy. Therefore, EDC IMSciences Peshawar, Pakistan, was chosen as a case study to find out whether EDC collaboration with local industry and government will produce the same results as found in the developed world. The results, however, presented a different story; first the high-tech industry headquartered by MNC's is missing from the scene. The types of SMEs present in Peshawar are not innovative SMEs; therefore, there is less desire for innovation and high-tech firms in the region. The type of traditional businesses in manufacturing, retail and trading (mentioned in the Discussion Chapter) are family-owned or lack knowledge firms. There is less or no competition in the industry locally. Since Peshawar is strategically located in a hostile environment, there are no chances for MNC's to risk establishing headquarters in the region. If MNC's once join the local industry, the chances are that they will need academic expertise for Human Resource

development and in exploiting natural resources. But due to crises, such chances are almost nil. Therefore, the main actor in the model is missing, e.g. MNCs.

Furthermore, an interview with SMEDA's Chief revealed that until a date is reached when governments overcome that they are unaware of the academic role in the economic development there is an issue; therefore, no deliberate policies have ever been developed at local and national level that will promote and facilitate industry-academia collaboration. However, the government now want to include academia by establishing entrepreneurship development centres at academia for training and industry research. Therefore, the chances are that once the process of U-I-G interaction starts, EDC IMSciences which already exist (inspired by the UK; the USA and the European model to contribute to the local economy) will be taken as a pilot project. Hence, once successful, can be replicated in other parts of the country for economic growth. One positive outcome of interviews with the SMEDA Head and Women Chamber of Commerce Vice President was that both industry and government badly need academic expertise for industrial research; training and development of entrepreneurs and industrial specific Human Resources. Hence, if the original model cannot be replicated in Peshawar, Pakistan, due to the absence of MNCs and high-tech firms as the main actors, there are still chances that the model can be modified to suit the local dynamics. Figure 8, in the Discussion Chapter, shows that industry actors are MNCs; the Chamber of Commerce; venture capital and SME spin-offs; academia actors are faculty, students and administration while government means local and federal. Industry and government provide research funds and sponsor events like trade fares, business ideas, etc., these two also act as Venture Capitals for academic spin-offs. In return, academia churns out entrepreneurs; produces industry specific graduates; generates knowledge firms and trains Human Resource professionals for industry (Etzkowitz, 2003; 2007). Such U-I-G collaboration in Peshawar has yet to take roots despite the fact that EDC staff have really worked hard to initiate the processes of such linkages. The reasons for poor collaboration and the gaps identified during primary data analysis are mentioned in the following table (4):

Table 4: Gaps Identified in U-I-G Collaboration in Peshawar, Pakistan

Academia	Industry	Government
• Low level university-industry interaction exists in the region. • Academia-industry mutual trust is lacking. • No formal framework based on clear goals and objectives for mutual collaboration is designed for EDC-industry collaboration. • U-I-G mutual benefits in monetary term need to be identified • No mutual projects have been taken up by both. • No R&D funds have been provided to academia. • No government recognition of EDC's potential for industrial role exists. • EDC and industry needs a catalyst/coordinator for bridging the two.	• Industry needs academic help for consultancies, skill and capacity building and business ideas. • Industry needs a framework to collaborate with academia. • No formal linkages have been developed between industry and academia. • Industry needs to identify its benefits in developing linkages with academia. • No joint research ventures between industry and academia have started. • Industry need to collaborate with EDC Economic growth in the region.	• The government never took EDC's crucial role in industry seriously. • No R&D funds were ever planned in the fiscal budget for EDC. • No industry-academia joint venture ever funded. • Not aware of the importance of hybrid institutions. • Needs a catalyst/coordinator to bridge U-I-G.

• EDC hybrid institutions, i.e. incubators need government support.		

The study found that initial linear linkages that can be established between EDC and industry can be service-oriented (Schiller, 2006). That would include consultancies; training of human capital and technical expertise. Producing industry specific graduates; providing interns and joint research activities can be another service provided by EDC to the industry. However, to cultivate suitable grounds for the modified model, and develop linear modes among the three, SMEDA needs to bring the three helixes to the negotiating table for possible collaboration in the region. This process is not radical rather evolution-based (see Figure 12), e.g. in the first phase SMEDA will introduce the three helices to each other and EDC's potential for local economy will be acknowledged by industry and government. In the second phase, SMEDA will initiate and facilitate dialogues among the three spheres for local economic growth. At this stage, common grounds for mutual relationships and collaboration will be established. In the third stage, SMEDA's role as facilitator and coordinator will be acknowledged and a formal policy framework for future collaboration among the four partners will be designed. Finally, an action plan for reciprocal relationships will be agreed. Hence, SMEDA will act as an initiator, coordinator and enhancer (Figure 13) of trio linkages. Initially, mutual dialogues will focus on the uplift of the traditional SME sector; then gradually all the helixes will design policies for high-tech research and knowledge firms that ultimately leads to innovative SMEs. Once the model is developed and starts functioning, it will have the following implications for all the partners:

6.2 Implication of Triple Helix Model for the Government of Peshawar

The government until now was depending on SMEDA for industrial development in the region, while SMEDA lacked expertise that could train and guide the local entrepreneurs towards innovative businesses. Furthermore, SMEDA had not enough time and resources to

conduct business specific research and provide solution to the local economy. Therefore, EDC's expertise can lessen SMEDA's burden to some extent and can play an important role in the growth of local economy. The government by providing research funds to EDC will not only identify industrial problems and solve them but also can minimise the business failure rate; therefore, successful businesses can result from academia-government collaboration. Industrial research by EDC will help the government to grow and flourish the traditional businesses in a more modern and innovative manner with which these businesses can be promoted at international level. EDC IMSciences with the help of SMEDA will establish an 'idea village', which will generate innovative business ideas that can help the local economy to develop more knowledge base firms. Moreover, government should patronise EDC for incubation and science parks that results in technology-based local businesses. The government should assistance in bridging the gap between academia and industry (Jones-Evans et al., 1999) will begin a new phase of economic development where more confidence between the two will be developed. Hence, the Triple Helix model taking charge of the local economy will enable governments to focus more on the law and order situation and will be relieved from focusing on the industrial problems. In short, the model will not only contribute to local economic development but will generate new jobs. The government, in this regards, will have less worries for accommodating fresh graduates.

6.3 Implications of Triple Helix Model for the Industry

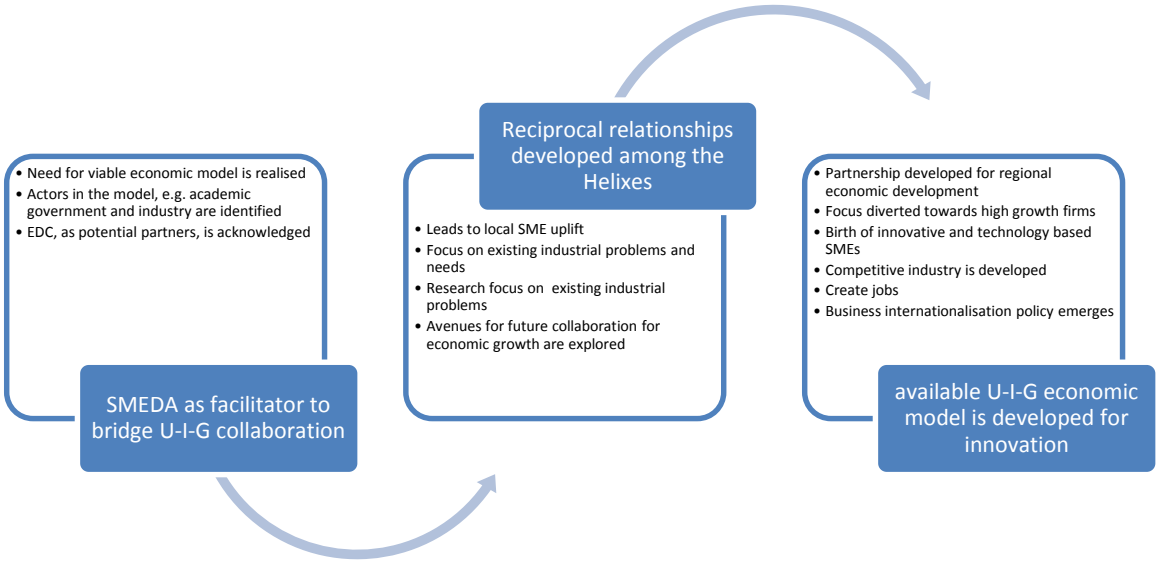
The model will not only overcome institutional differences in the region but will help industry to address its problems through EDC's platform. EDC will train new business entrants in the region by teaching them business specific skills. As new businesses will be research based, this will encourage innovative businesses to sprout up in Peshawar. EDC consultancies' services will assist industry to overcome its hurdles in start-up and growth stages. EDC training and development and R&D capabilities can help industry to save its R&D budget. Hence, the industry will have more time for developing its businesses and will be relieved from financial burdens.

6.4 Implications for Academia Especially EDC IMSciences:

U-I-G linkages will not only enhance EDC's role in Peshawar's economic development but will also increase its earnings through research funds and entrepreneurial trainings. Moreover, EDC's image at government and industry level will be boosted on the basis of its research and staff capabilities. Therefore, it can be a pioneer in new knowledge creation in the region as well as from its incubation centre and new firms will spin-off.

Figure 12: Presents the three phases of evolution of U-I-G collaboration in Peshawar Pakistan

Figure 13: Illustrates phase-wise development of the local economy by Triple Helix and SMEDA as the facilitator.



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6.5 Recommendations

In order to be more effective, proper U-I-G mechanisms are needed that can create more confidence, mutual trust and common interest among the three partners (Mongkhonvanit 2008). Because the study shows that due to the lack of such mechanisms, a low level of cooperation exists among the partners. Therefore, SMEDA needs to develop that mechanism which promotes effective collaboration among the partners. Hence, the following recommendations are provided for a fruitful U-I-G partnership in Peshawar, Pakistan:

6.5.1 EDC IMSciences can collaborate with industry in the following areas:

1) Produce quality graduates relevant to industrial and social needs.
2) EDC should get involved in research, knowledge creation and innovation.
3) Strengthen its incubation services.
4) Technology transfer services.
5) Provide solutions to industry problems/challenges.

6) Provide management consultancy and entrepreneurial training.
7) With the help of SMEDA, identify industrial problems and provide solution for it.
8) Initiate entrepreneurial trainings and education at the institute.
9) Encourage teachers and students to initiate new ventures with intellectual, commercial and conjoint characteristics.
10) Develop reward-based incentives for faculty and students who are involved in industrial research.
11) Initiate student PhD research on industry specific projects that have direct implications on the industry.

6.5.2 EDC requires the support and collaboration from both government and industry for an effective service towards industry in the following areas:

1) Financial support for research funds and sustenance.
2) Governments should develop an enterprise strategy to transform IMSciences in an entrepreneurial university in the long run.
4) Collaboration with local firms for internship, cooperative programme and laboratories.
6.5.3 SMEDA as a bridge among U-I-G linkages:

1. SMEDA should educate EDC about local industry problems.
2. Introduce EDC to local Chambers of Commerce; donor agencies; regional government.
3. Work closely with the government on policy making for U-I-G collaboration.
4. Link industry with academia for solving problems.
5. Initiate dialogue among EDC, industry and government for possible collaboration and cooperation.

6.5.4 Government:

1. It should accept SMEDA as an intermediary organisation that coordinates and enhances U-I-G linkages and provide more support to this central body for facilitating such collaboration in the region.
2. Frame industrial policies based on SMEDA's recommendations that promote higher productivity level.

3. Include EDC as a crucial partner in the growth of local industry. Therefore, giving more autonomy and support for EDC contribution.
4. Support EDC by providing research funds and financial support for sustenance.

6.5.5 Industry

1. Local industry needs to develop trust on EDC potential and acknowledge its supportive role in the economy on equal footings.
2. Provide internships to EDC students and become more open in problem sharing.
3. Seek EDC help in research and development.
4. Get expert help on management consultancies.
5. Hire EDC services for Human Resources' development.

6.6 Conclusion:

This research acknowledges the challenges and difficulties in bridging the gap among university-industry-academia (Jones-Evans et al., 1999) in Peshawar, Pakistan, for economic growth. The study has shown that there is no awareness among the three helixes about the possible collaboration that can result in the economic uplift of the region. The government role as a venture capitalist (Etzkowitz, 2003) and facilitator of the U-I-G linkages has not taken roots. Industry is not aware, neither willing to accept academia's new role in the economy. The EDC needs governments and IMSciences to provide funds for research and its routine activities. One of the main issues identified during primary data was that EDC's staff are not well-equipped with the latest trends, information and knowledge required for strong U-I-G collaboration. Hence, EDC staff requires capacity building to run the centre; therefore, the institute and government should arrange for the training and development of EDC staff locally and internationally. This will update EDC staff with latest methodologies and knowledge that is practiced worldwide in U-I-G linkages. Furthermore, training and development of the staff will enable them to respond to industrial needs more effectively, because local industry needs university services for R&D; technical assistance; training and development and innovative ideas for high growth businesses in the region. Hence, the Human Resource development of EDC is strongly recommended by the study. Furthermore, in future research, the scope should be extended to engineering universities and other management colleges in the region so that these institutes' policies towards industry-academic linkages should be

investigated. This will enable future researchers to be able to adopt a more holistic view of the linkages which exist in Peshawar in the light of which the Triple Helix model can be materialised in the region.

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Appendices 1:Triple Helix and R&D Table

Paper	Author	Journal /year	Country	Sample Size	Research Approach	Main Findings
1.The Triple Helix Paradigm in Korea: A test for new forms of capital.	Shapiro R&D	IJTM & SD/2007	Korea	108-Directors research centres and managers of funded projects	Questionnaire and KORTAI R&D DATA SET	new forms of capital based on Triple Helix model can only be materialised if Government facilitate public-private research collaboration.

2. Subsidy and networking: The effects of direct and indirect support programs of the cluster policy	Nishimura and Okamura	Research Policy ,2011	Japan	Industrial Cluster Project (ICP) in Japan. 13 clusters of Japan	Survey; Questionnaires	Their findings reported that not only clusters belong to different technological fields; they also differ in numbers, size and support programmes. The study supported the positive role of R&D consortium in biotechnology and found that the University has a significant role in invention and commercial success of this cluster. While this effect was not found in the overall results covering all technological clusters that were different in budget size, technological fields and support programmes

3. Exploring the Knowledge Filter: How Entrepreneurship and University-Industry Relations Drive Economic Growth	Muller et al.	2005 Research policy	German y	326 west Germany districts	Secondary Sources	technological progress and new firm formation activity is higher in regions where University-Industry research collaboration exists. Therefore, findings of the study emphasized upon research partnership between Academia and industry in order to generate new knowledge and ensure higher growth rates
4. The role of research in regional innovation systems: new models meeting knowledge economy demands	Philip Cooke	Int. J. Technology Management, 2004	Denmark, UK, Ireland, Sweden Finland, Germany	6 European regions/ countries	Library sources	linked the weak nature of research collaboration between the two sectors to the cumbersome bureaucratic procedures and lack of Entrepreneurial innovation links from research to commercialisation

5. Government centrality to university–industry interactions: University research centers and the industry involvement of academic researcher	P.Craig Boardman	Research Policy 2009	US	Scientific and Technical human capital	Secondary data collected from National Survey of academic researchers in the US	agreed on the crucial role of research centres in developing University-Industry linkages on one hand, and their contribution to different academic careers on the other hand. Therefore suggested policy level support for the establishment of research centres
6. Universities and industrially relevant science: Towards measurement models and indicators of entrepreneurial orientation	Tijssen	Research policy 2006	European Universities	University – industry interaction	Research papers	Analysing European universities' role in the field of immunology research, suggest that nature of University–industry interactions and (the potential for) entrepreneurial orientation is determined by many factors
7.Academic careers, patents, and productivity: industry experience as scientific and technical human capital	Dietz and Bozeman b	Research policy 2005	USA	1200 CVS of research scientists and engineers	Secondary sources. patent and CV data	Research centres has resulted in strong ties between industry and academia.

8. University research centers and the composition of research collaborations	Boardman and Corley	Research Policy 2008	US	Individual level and Center level data of US universities	national survey of university scientists	Suggested areas for future research and implications for the design and management of university research centers.

9. The evolution of university–industry–government relationships during transition	Inzelt	Research Policy 2004	Hungary	Innovation survey, R&D statistics ,administrative sources	4 pilot innovation servey	found that along with the Government support for linking public sector research with private sector expectations, the interest of Industry in establishing an innovation network is also required. As in the case of Hungarian business, where the lack of interest in innovation has made progress mainly in experimental development and design, in trials and in the tooling-up process only. Although Government programmes tries to promote interaction in national innovation system, however, such interaction is still limited in the move towards a knowledge-based economy. Thus the Knowledge Economy is generated if industry hunger for innovation exists

10. Indicators and outcomes of Canadian university research: Proxies becoming goals?	LangFord et al	Research Policy 2006	Canada	Case study of university of Calgary	Secondary	Results supported a conscious approach towards research with the reason that with such approach Universities and firms can avoid counterproductive activities and true nature of innovation, based on Triple Helix ideals can be determined.

11. Reconsidering the Mode 2 and the Triple Helix**:** A Critical Comment Based on a Case Study	Tuunainen	Science Studies 2/2002	Finland	acase study of a plant-biotechnology research group, which operated in a major Finnish university	Critical review	Critical analysis of the case study reveals that research commercialisation of public funded Universities is controversial due to three main reasons. First Intellectual Property rights policy is not very clearly designed which led to confusion about ownership of the group invention exist. Secondly, the University-Industry relationships are not strongly developed because of which consumers are reluctant to use agri-biotechnological product. Finally hybrid entities and spin-off company created by academic research was not feasible

12. Longitudinal trends in networks of university–industry–government relations in South Korea: The role of programmatic incentives	Han Woo Park , Loet Leydesdorff	Research policy ,2010	South Korea	*Science Citation Index* (SCI) and its counter parts in the social sciences (SSCI) and the arts and humanities (A&HCI)	Longitudinal study, research papers data base	They concluded that the reason why Korean national research capacity could not be improved was because of new Korean national science and technology research policy. Since the policy neglected the network effects in science, technology and industry, inter-institutional collaboration among academic, private and public domain could not be strengthened. Therefore, a country's national research capacity can only be improved if strong networks are developed among academic, industry and government.

13. Institutionalizing the triple helix: research funding and norms in the academic system	Mats Benner, Ulf Sandstro¨	Research Policy .2000	Sweden	3 research councils of Sweden i.e NUTEK, TFRSSF	Empirical analysis	While analysing the research performance of three research councils in Sweden, their findings confirmed that external funds change the norms system of the research councils and thus influences research on the whole
14. The production of university technological knowledge in European regions: evidence from patent data	Acosta et al	Regional studies 2009	European regions	panel data set of 4,580 European university patents from 1998 to 2004	Research papers and secondary sources	The study added that patent activities in the region are affected by variations in regional research and development (R&D). results stated that every country legal framework is different from others which create differences in University patents. Therefore, all European regions should adopt a homogeneous legal system for industrial property in the University

15. Forms of research organisation and their responsiveness to external goal setting	Wilts	Research policy 2000	Germany	23 non university researchers, 17 university professors	Interviews	observed that research organisations should organise large scale research activities on Triple Helix principle and suggested routine alliance between Academic-Industry researchers to ensures U-I-G research collaboration
16. Research groups as 'quasi-firms': the invention of the entrepreneurial university	Henry Etzkowitz	Research Policy 2003	USA, Europe, Latin America	USA, European and Latin American universities	Secondary data from Archival research at Stanford university ,interviews conducted during 1980-1990, and case studies of Latin American and European universities	USA where research is funded from external sources, universities have to compete for these funds. High competition among universities to access research funds in return influences research groups' behaviour formed within academia. Therefore, these groups develop firm like characteristics as hence quasi-firms are formed within academia prior to their engagement in entrepreneurial activities

17. Managing university research in the triple helix	Ernø-Kjølhede et al	Science and Policy 2001	Denmark	Research management at Danish universities	Library research	suggest a more conscious approach on part of the Universities to manage the routine research practice
18. Firms' linkages with public research organisations in Argentina: Drivers, perceptions and behaviours	Arza, V (Arza, Valeria)[1]; Lopez, A (Lopez, Andres) R&D	TECHNOVATION Volume. 2011	Argentina	Argentinean manufacturing sector (2055 firms	original firm database constructed from a representative survey with information for linked and unlinked firms for year 2005 in Argentina	firm linkages with public research organisations in Argentina do not exploit their knowledge potentials. Despite the fact that firms in Argentina do benefit from public research organisations (PRO's) research output, linked firms have tendency towards patenting.

19. Measuring the relationships among university, industry and other sectors in Japan's national innovation system: a comparison of new approaches with mutual information indicators	Sun, Y (Sun, Yuan)[1]; Negishi, M (Negishi, Masamitsu)	SCIENTOMETRICS ,2010	Japan	1,277,823 articles (research papers	Secondary	This study revealed that until 2000 not only University-Industry-Academia had strong ties, Academia also enjoyed inevitable role in national publication system. The University not only bridged Industry and Government but also linked foreign researchers with these national sectors. Since centre of Japanese research network and members of U-I-G have become more foreign oriented by seeking foreign collaboration, now the University role and U-I-G network have grown weaker

20. The role of universities in the evolution of the Triple Helix culture of innovation network: The case of Malaysia	Razak, Azley Abd· Saad, Mohammed.	International Journal of Technology Management & Sustainable Development; 2007, Vol. 6 Issue 3, p211-225, 15p, 1 Diagram, 1 Chart	Malysia	case study Malysian universities-Industry-Academia	Qualitative: 18 Semi-structured interviews	The issues identified were technological factors, procedures and processes within Universities, Commercialisation issues, Relationship/interaction issues, Work culture, IP issues, and Government policies.

Appendices 2: Triple Helix and Innovation Table

Paper	Author	Journal /year	Country	Sample Size	Research Approach	Main Findings
1.Pathways to the entrepreneurial university: towards a global convergence	Henry Etzkowitz et al	Science and Public policy 2008	US, Sweden, Japan and Brazil	State Universities of US, Sweden, Japan and Brazil	Secondary sources	The study found that global trend is towards the emergence of Entrepreneurial Universities. These Universities have taken a central position in knowledge based economy that moves beyond etatism and pure market relations to an intermediate position within a Triple Helix regime.

2, Rethinking development: circulation in the triple helix	Henry Etzkowitz* and James Dzisah	*Technology Analysis & Strategic Management* 2008	Developed and developing regions	Discussion on Entrepreneurial Universities of developed and developing countries	Library research: research papers	suggest that Government and international agencies should facilitate the growth of Entrepreneurial Universities with a broad inter-disciplinary scope and mission, and support the birth of an entrepreneurial scientist who integrates knowledge and innovation
3. The role of universities in the regional innovation systems of the North East of England and Scania, Sweden: providing missing links?	Lars Coenen	Environment and Planning C: Government and Policy 2007,	UK and Sweden	Comparative analysis of Scania Sweden and North East region of UK regarding RIS Problems	Emperical Study: secondary data for North East, primary data,semi structured interviews for Scania	found that regional innovation system (RIS) is strengthened due to the constructive contribution of the University.

4.Technology Transfer in European Regions Introduction to the Theme Issue	Leydesdorff et al	The Journal of Technology, 2005	European union and US	Review of papers about US and European regions	Library sources	US A Universities contributions in the knowledge economy is highly facilitated by the Government, therefore USA enjoys leading position in innovation especially in biotechnology, Information Technology and new media sectors. To be a par with US innovation level, suggest that the European Union should also utilise its university capabilities to generate new knowledge economy
5. How can university–industry–government interactions change the innovation scenario in Portugal?—the case of the University of Coimbra.	Marques ,J.P. C.[1] Caraça, J.M. G.[2] Diz, H.[3]	Technovation; Apr2006	Portugal	Case study of University of Coimbra, Portugal	Discussion on results of case study	Analysis of this case confirms that the model is relevant to the region and university can play an important role in establishing networks and linkages.

6..The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm	Etzkowitz et al	Research Policy 2000	USA,UK Latin America, Asia, Europe	Case studies of US, Japan, Italy, Germany, UK, Brazil	Comparative analysis from library sources.	Comparative analysis of US, European, Latin American and Asian regions found that a common trend towards entrepreneurial university is emerging due to increased demand of knowledge production.
7. Reframing the Role of Universities in the Development of Regional Innovation Systems .	Gunasekara, Chrys	The Journal of Technology Transfer (2006	Australia	Case studies of three metropolitan universities, Comparative analysis	Over 100 semistructured interviews and document reviews	Results revealed that although senior management modified their institutions to meet the regional needs, Universities were reluctant to act like the state and industry. Due to the reluctant behaviour of the Australian Universities innovation process could not take off

8. Knowledge bases and regional innovation systems: Comparing Nordic clusters	Asheim & Coenen	Research policy 2005	Sweden, Denmark ,Norwey	5 Nordic comparative projects on SME's	Comparative analysis of five case studies	Their results suggested that regional innovation requires full understanding of region's industrial structure, institutional set up and knowledge base. To accomplish such understanding region specific innovation policies are needed

9.The Third Role of Australian Universities in Human Capital Formation	Chrys Gunasekara	Journal of Higher Education Policy and Management. 2004	Australia	Three case studies of non core-metropolitan universities peri-urban region (University of Westem Sydney (UWS)), a provincial city (University of Wollongong (UOW)) and a rural region (Charles Sturt University, Riverina campus).	Secondary data and primary data:102 semi-structured interviws	The study found that universities are playing effective role in developing human capital in the region.

10. The Triple Helix of Innovation: Towards a University-Led Development Strategy for Africa	Henry Etzkowitz and Dzisah	ATDF Journal 2007	Africa	African Universities	Library research	suggest that African quest for innovation and development can only be achieved if Triple Helix of University-Industry-Government interactions are established
11. The triple helix model of innovation(NF)	Etzkowitz	TECHMONITOR 2007	USA, Europe ,Canada, China and Soviet union	US, European, Canadian, China and Soviet models	Library and secondary data	Triple helix of university-industry-government can help in the development and expansion of knowledge-industry in the region.
12. China's regional innovation capacity in transition: An empirical approach	Xiao Li	Research Policy 2009	China	30 provincial level regions	secondary	His research confirmed that Government support, establishment of R&D institutes, and the regional industry-specific innovation environment significantly determines innovation performance.

13.The Nigerian university and the triple helix model of innovation systems: adjusting the wellhead *	Nwagwu	Technology Analysis & Strategic Management, 2008	African region	Case study of University of Nigeria	Research papers	Triple helix ideals are not practiced in that country. This is because Inter-institutional collaboration in Nigerian economy is not encouraged by the economic and political circumstances of the country. Therefore academia's significant presence in economy is not found in Nigeria.
14.The Triple-Helix Model of Smart Cities: A Neo-Evolutionary Perspective	Loet Leydesdorff & Mark Deakin	Journal of Urban Technology. 2011	Canada, Glasgow	Montreal, Edinburgh	Secondary	The study found that smart cities can be created due to intellectual capital of academia, industry and democratic government
15. Issues and challenges arising from the application of innovation strategies based on the triple helix culture.	Saad, Mohammed[1]	International Journal of Technology Management & Sustainable Development; 2004,	Algeria	Algerian incubation system	Library sources: discussion	The study suggested strong and effective cctriple helix linkages in Algeria to promote learning and innovation.

16. Networks of Innovation: Science, Technology and Development in the Triple Helix Era	Henry Etzkowitz	International Journal of Technology Management & Sustainable Development , 2002	Several countries	1st ,2nd,,3rd worlds analaysis	Library sources	First, Second, and Third Worlds, have formulated innovation strategies based upon the deliberate elaboration of university – industry relations through reflexive science, technology, and industrial policies
17. Innovation and entrepreneurship in Brazilian universities	Almeida	International Journal of Technology Management & Sustainable Development ,2008	Brazil	*Three university case studies*	Exploratory: Semi-structured interviews, Discussions, and secondary data	found that different structures have emerged in Brazilian Universities in order to stimulate innovation and entrepreneurial activities. It further observed that although Brazilian Government does support these initiatives at the federal, regional and local levels, but due to differences that exist among the three spheres of the Triple Helix, the dream of Entrepreneurial University in Brazil cannot be

						materialised.

Appendices 3: Triple Helix Model and Economic Development

paper	Author	Journal/Year	Country	Sample Size	Research Approach	Main Findings
1.A Triple Helix Strategy for Promoting SME Development: The Case of a Dried Banana Community Enterprise in Thailand	Yuwawutto et al	Industry and Higher Education,2010	Thailand	Case study of community enterprise of dreied bananas	exploratory	intermediary agency role in SME's sector in developing countries is strongly recommended by the study
2.What is the Role of Universities in High-tech Economic Development? The Case of Portland, Oregon, and Washington, DC	HEIKE MAYER	Local Economy, 2006	USA	High-tech manufacturing industry Portland's Silicon Forest is compared to IT service Washington, DC.	empirical study 30 key informant interviews Genealogy survey of high-technology firms. Secondary data	The study found increase dependence among Universities - Government and Industry. Such dependence was found due to Universities desire to integrate with industry by addressing industrial needs in the

						region.
3.Explaining the "University-run enterprises" in China: A theoretical framework for university–industry relationship in developing countries and its application to China	Eun et al	Research Policy 2006	China	University run entriprises(U-R-E)	Theorotical frame work	states that Chinese market reforms were announced to encourage Universities to form their own start-up firms (URE's) for economic benefits. Since intermediary agencies in China were not fully developed, therefore Chinese Universities were not inclined towards firm formation and economic gains.
4.TRIPLE HELIX NETWORKS IN A MULTI CULTU	Brundin *et al*	Journal of Developmental Entrepreneurship; Mar2008	Western Cape region South Africa	three longitudinal case studies in cape region	survey , questionnaires and interview	Results of the study found that no planned cooperation is found among all the Helixes

RAL CONTEXT:: TRIGGERS AND BARRIERS FOR FOSTERING GROWTH AND SUSTAINABILITY						of Triple helix and a focus on the entrepreneur is missing. Therefore, the study recommended for planned and structured cooperation among the three parties.
5. The rise of a triple helix culture Innovation in Brazilian economic and social development	Henry Etzkowitz and Jose Manoel Carvalho de Mello	International Journal of Technology Management & Sustainable Development 2003	Brazil	Research articles	Discussion on conference papers and library research	Brazil is transforming from a top-down innovation system, as perceived by Sa'bato triangle, to an innovation system. Hence, transition towards innovation in Brazil is taking place for the last two decades. Therefore, Triple Helix format is practiced at municipal, regional, national and multinational level in Brazil. As such, new actors, especially Universities

						and industrial associations are coming up with initiatives to strengthen innovation process in Brazil.
6. The triple helix model as a motor for the creative use of telematics	Castro et al	Research Policy,2000	Portugal	Portugues economy	Theoretical framework and secondary data	found that Portuguese traditional economic sector, with low technological content, creates significant barriers both to the circulation of information and to the promotion of learning processes. In order to overcome barriers to the creative use of technology, the study recommended policy level measures to strengthen University-Industry-Academic relations, at national and local level in Portugal.
7. The innovatin	Henry Etzkow	R & D managemen	Sweden ,Euorpe	Comparativ	Semi structur	Due to special

g region: toward a theory of knowledge-based regional development	itz1 and Magnus Klofsten	t 2005	and USA	e analysis of the case study of Swedish universities, Europe and USA	ed interviews and research papers	abilities in integrating organizational teaching, group research and collective entrepreneurship, University as an eminent source of firm formation is agreed
8.The implementation of the triple helix model of industry-university-government relations in Puerto Rico to promote knowledge-based regional economic development	Ramos-Maltés, Ana Lorena	Massachusetts Institute of Technology, 2010	Puerto Rico	Comparative analysis of two case studies: Puerto Rico TechnoEconomic Corridor (PRTEC) and the Eastern Central Technological Initiative (INTECO)	Secondary and primary data	The study stated that entrepreneurial culture and transparent local grant seeking process are the essential factors in the development of new knowledge-base economy in a country. As these factors were not developed in the country, the above two initiatives failed to developed knowledge-

						base economy in Puerto Rico despite the fact that these initiatives did make progress in firm formation through incubators and community outreach program.
9.Academic capabilities in developing countries—A conceptual framework with empirical illustrations from Thailand	Liefner and Schiller	Research Policy 2008	Thailand	5 public sector universities	Primary data: interviews and secondary data:Bureau of budget and Hgher education	**.** The study found that although Thailand has successfully achieved quantitative economic development, it is still behind in technological progress made at this level by 1st generation of Newly Industrialised Countries at a similar stage of economic development. Results found weak or less contribution of

						Universities capabilities into qualitative growth of Thailand.
10. LEADING PRIORITIES FOR DEVELOPMENT OF THE HIGH TECHNOLOGIES MARKET	Chlivickas et al	Journal of Business Economics and Management. 2009	Lithuania.	High technologies in Lithuania	Qualitative analysis and scientific literature	observed that the most successful 'Triple Helix' model for high technologies development is the one where the highest degree of cooperation between authorities, industry and academic public is indicated. Therefore, the article establishes the implementation of the 'Triple Helix' as a leading priority for high technologies development in Lithuania.
11.Triple helix and regional development: a perspecti	Smith, Helen Lawton; Bagchi-Sen,	Technology Analysis & Strategic Management; 2010	UK	biotechnology sector in Oxfor	Secondary data: published reports,	found that the University role as compare to Government

ve from Oxfordshire in the UK	Sharmistha			dshire (UK)	primary data: Three surveys by Oxfordshire Bioscience network (OBN)	's along with other national organisations is secondary in the development of science and technology especially in the biotech sector in Oxfordshire. However, the University's role is indirectly acknowledged by the industry because of the fact that industry talent is produced by the University
12. Measuring the knowledge base of regional innovation systems in Germany in terms of a Triple Helix dynamics	Loet Leydesdorff et al.	Research Policy/2006	Germany/ Netherland	438 districts of Germany/ Netherland	Secondary sources	found that Medium-tech industry equally contribute to local knowledge-base economy of West Germany , therefore a more holistic industrial policy is recommended that

						focuses on the development of both high-tech and medium-tech industry. Another essential element in the promotion of technical industry is the presence of entrepreneurial culture in the country

Appendices 4: Triple Helix and Industry Table

Article	Author	Journal And year of publication	Countries	Sample size	Research Approach	Findings
1.A complexity approach to innovation networks. The case of the aircraft industry (1909–1997)	Koen Frenken	Research Policy 2000	31 countries	8 markets, 31 countries,9 technologies,863 aircrafts innovation	secondary	He reported that pattern of specialization is emerging among these countries where focus is on particular technology and market. Such networks enable these countries to retain their

						competitive position in the international market on one hand and make collective effort towards specific product development and innovation on the other hand. Henceforth, trans-national networks might become the new model of technology transfer worldwide.
2.Examining the Trilateral Networks of the Triple Helix: Intermediating Organizations and Academy-Industry-Government Relations	Amy Scott Metcalfe	Critical Sociology.2010	North America and Canada	Ottawa Centre for Research and Innovation (OCRI) and the Canada Arizona Business Council (CABC	Secondary data	acknowledged the concept of intermediary organisations

3. Government Influence and Foreign Direct Investment: Organizational Learning in an Electronics Cluster	María Isabel Rivera Vargas	Critical Sociology. 2010	Mexico	9 engineering dept and 13 foriegn corporation in electronics industry in Guadalajara, 3 indeginious firms	Qualitative,exploratorycase study, interviews	found that not only specific Triple Helix model have addressed electronics cluster issues of Jalisco, it has transformed the entire region into competitive electronic design niche
4.The contribution of (not so) public research to commercial innovations in the field of combinatorial chemistry	**Stéphane Malo (Malo,S)**	Reseach policy; 2009	US and EU-15 countries	Data of 57 companies	Secondary and primary data; Survey questionnaires	highlighted the role of public research organisation within the area of Triple Helix culture
4. Exploring the role of spatial relationships to transform knowledge in a business idea - Beyond a geographic proximit	Cantu, C (Cantu, Chiara) [1]	INDUSTRIAL MARKETING MANAGEMEN 2010	Italy	Case study; Petroceramics, POINT, Kilometro Rosso and R&D orgn Delta Moulds, Elchi, CNR-IDPA,	Secondry and primary data;60 indedepth semi-structured interviwes	The study reported that technological and cognitive proximities have emerged due to academic spin-off inclination towards extra-local and international firm linkages. Moreover,

y				Milan University		such international firm ties are formed to share technological experiences, interest, knowledge and profession
5.Entrepreneurial networks: A Triple Helix approach for brokering human and social capital	Papagiannidis et al	J INT ENTR 2009	general	Skill brokerage business model and e-business	library	. research suggested, to boost innovation and commercialisation beyond geographic boundaries, Triple Helix of University–Government–Industry interactions must be established
6. A comparison of the knowledge-based innovation systems in the economies of South Korea and the Netherlands using Triple Helix indicators	PARK et al	Scientometrics, 2005	South Korea, Netherland	Comparative analysis of knowledge base of U-I-G in S.Korea and Netherlands	Secondary	found that South Korea enjoys lead over Netherlands in knowledge-base Dynamics, scientific and technological fields. Such development is possible due to the links that exist among all the spheres of

						Triple Helix.
7.Towards "meta-innovation" in Brazil: The evolution of the incubator and the emergence of a triple helix	Etzkowitz et al	Research policy, 2005	brazil	Brazilian Incubator Association databases, documents and interviews	Extensive analysis: interviews and focus groups	Findings from extensive interviews and focus group discussions acknowledged that the transformation of Brazilian incubators from high-tech focus to institutions formation at various technological levels is possible because of Triple Helix model
8.The Triple Helix as a model to analyze Israeli Magnet Program and lessons for late-developing countries like Turkey	DEVRIM GOKTEPE	Scientometrics 2003	Israel , Turkey	ninety-two magnet Consortium Board of Managers	Survey: Questionnaire secondary data	found that such barriers in Israel and Turkey magnet consortium. The reason why Turkey innovation network could not be formed at national and international level was due to the lack of systematic and stable management strategies. Therefore, to

						form successful international network, the collaborating partners must address these barriers first.
9.A review of triple helix linkages in New Zealand earthquake engineering networks and comparison with the Australian cooperative research centre model	Butcher, Peter and Thorpe, David	Triple Helix VI (2007	New Zealand and Australia	Case study and Comparative analysis of earthquake engineering industry Newzealand. Cooperative Research Centres (CRC) in Australia	Secondary sources	agreed to the view that a dynamic Triple Helix set up is crucial to construct regional innovation system
10.The Role of the User and the Society in New Product Development	Nusa Fain" - Niels Moes" - Joze Duhovnik	Journal of Mechanical Engineering.2010	5 European countries	Case study of Academic Virtual Enterpriseinvolving five *European universi*	"quasijudicial" method	reported after studying five European countries Academic Virtual Enterprise that the success of new product is determined

				ties		by market demand. Therefore, institutions in the process of new product development should consider technology-push and market-pull strategies in order to make the product successful.
11.The place of universities in the system of knowledge production	Godin and Gingras	Research Policy 2000	Canada	Four sectors, university, government, industry and hospitals	Canadian bibliograghic data base:1980-97. Articles, notes and reviews	found that over 15 years except from Hospitals, each sector has increased its collaboration with Universities. Therefore Governments emphasised more on University-Industry ties and Industry now is involving academia in its R&D programs.
12.Strengthening Cluster	DESSYIRAWATI	2007	Indonessia	Case study of 6	Qualitative/primary and	results found that as the industrial

Building in Developing Country alongside the Triple Helix: Challenge for Indonesian Clusters - A Case Study of the Java Region				industrial cluster in Java region, semi structured interviews with the employees of the selected industrial clusters and 6 universities	secondary data	clusters in Indonesia are scattered in various areas. Universities and other institutions can help develop theses clusters by providing technical assistance to these clusters.
13.Constructing regional advantage at the northern edge	Coenen and Asheim	2006		Regional development in the knowledge economy	Secondary data	dynamic Triple Helix set up is crucial to construct regional innovation system

Appendices 5: General discussion Table

Article	Author	Journal/ Year	General discussion
1.Triple Helix systems: an analytical framewo	Ranga and Etzkowitz	Industry and Higher education/ 2013	Generally discussed

rk for innovation policy and practice in the Knowledge Society			
2. Industry and Higher education/ 2013	Steiber and Alanga	Industry and Higher education/ 2013	Generally discussed
3. Governance of innovation and intermediation in Triple Helix interactions	Todeva	Industry and Higher education/ 2013	Generally discussed

Annexure 1:

STUDENT ENTREPRENEURSHIP CENTER

INTRODUCTION:

As the trend moves on and the business sectors are taking steps in order to maximize the level of output to the extend they can, they are now coming up with a lot of new ideas by which they can easily link themselves with the students of business studies so as not only to get a competitive force out of them to work for them in the betterment of their businesses but also in return giving a platform to those students. Different institutions have been trying to develop this launching pad for its student so that along with their studies they get the right kind of practical exposure which would in return help them either to run the organizations they are working for in a better manner or it would indeed also help them a great deal in establishing their own small businesses for this Institute of Management Sciences has been working for quite some time now to establish such kind of center which would not only be benefiting to its own student but they can also help out those who are really interested in knowing the modern ways and means to get their businesses a work in a more effective manner.All this work has now being formulated in the form of Student Entrepreneurship Center that was inaugurated on the 23rd February, 2008.the basic aim for establishing this center was the same as stated in the earlier paragraph that it would enable the students of IM|Sciences on how to start their small businesses but would also give them a perfect platform for nourishing their skills in a better and practical environment.

OVERVIEW:

Entrepreneurship and innovation are vital for economic growth and social transformation. Both have emerged as critical to student understanding of economic and social change. It should be considered important by businesses, government, policy makers, researchers & educators in Pakistan in order to combat globalization, this does not mean that in any sense that the globalization is to be resisted in this part but by it simply means that the level of progress being made at the global level should be easily brought to the local level or else wise the adverse effect would be that we'd lack behind in many different field as our the global development marches on. This consortium will enable the students to acquire essential knowledge, relevant contemporary skills, competencies, and critical awareness necessary for making careers in the business environment. The need is to create potential young entrepreneurs & enable them to manage & sustain their own enterprise. There is a need of practical exposure of the students towards entrepreneurship training and through this consortium they would be given that opportunity.

OBJECTIVES:

The main objectives that we at Student Entrepreneurship Center have set for ourselves and would be striving hard to our maximum capabilities to get them done are:

- ✓ *To develop young entrepreneurs so that they can establish their own businesses in the future.*
- ✓ *To increase competitiveness of the students.*
- ✓ *To polish the innovative abilities of the students.*
- ✓ *Establishing student business incubations.*
- ✓ *Policy development for entrepreneurs and economic development.*
- ✓ *To internationalize small and medium business.*

GAINS FOR THE STUDENTS:

The Student Entrepreneurship Center or SEC is an ideal platform for those entire students who aim to develop their own businesses in the future or who have their own businesses and want them to flourish to the next best possible level. The diploma outline has also been designed in such a manner than it would be benefiting to all those who would be studying in it.

The major gains that the students would be taking out of the this diploma program are;

- ✓ *Direct contact & exposure to the local & international entrepreneur & SME's.*
- ✓ *Networking with the local & international business clusters.*
- ✓ *Knowledge of country & region specific business conducts.*
- ✓ *Access to R&D, information, & training support programs.*

- ✓ *Technical and financial assistance and support of SMEDA.*

- ✓ *Developing potential & innovation based on new products & service development in new market through collaboration & competition.*

GAINS FOR IM/SCIENCES:

Along with all the gains that the student would be taking from this diploma program IM|Sciences in return would also be gaining something out of this program and that would be;

- ✓ *Developing an international profile by working with industries & support agencies in & outside the country.*

- ✓ *Developing a business network at national and international level.*

- ✓ *Development of entrepreneurship based R&D department.*

- ✓ *Linkages of academia and industry will be developed.*

ADMISSION CRITERIA FOR TRAINING COURSE:

50 students will be offered admission in this training; admission will be based on aptitude test, innovative business ideas and some financial background of the students.In these 50 students 10 students will be given admission in manufacturing industry, 10 students will be given admission in trading industry, 10 students will be given admission in service industry, 10 students will be given admission in agri-businesses i.e. farmer entrepreneurs (men and women), establishing cottage industries in rural areas based on craft businesses the idea is to develop human resource in the rural areas and 10 students will be given admission to take one sick unit as a project to work on it in a group and to reopen it on partnership basis.Among these students in every category 5 students will be taken who already have their businesses in the above sectors but want to internationalize their businesses and 5 students will be the beginners who have some business ideas but lack that practical training.

STUDENT BUSINESS INCUBATORS:

Student Business incubation center will be established at a commercial area (i.e. Deens Trade Center) the students who want to establish their business with minimum resources i.e. photo studio, net cafes, fast food, floral shop etc businesses starting from few thousand to one or two lac rupees. Will be given tow months training and after their training they will present their business plans based on market research and in the end they would handed over the shops in the incubation center for one year. The institute will give them full fledged marketing exposure, technical and expert help and will link them to the chamber of commerce and will provide them all type of opportunities to establish themselves as young entrepreneurs. After one year the student will vacate the incubation center and will be given to another batch of young entrepreneurs with the same approach. In this incubation center female entrepreneurs will be encouraged on equal basis.

ENTREPRENEURSHIP TRAINING COURSE:

One year entrepreneurship training would be based on 4 levels; each level would have three months. In the first two levels the students will be involved in the research activities, they will be doing research on their concerned business idea and those researches will be then published as their research papers in the journal "the young entrepreneur", which will be reviewed by Center's experts' panel and international editorial board as well. In the last two levels their practical exposure will take place with their concerned industry, they'll have discussion forms with the local and international entrepreneurs, seminars will be arranged for them and they will be linked with their concerned business industry for internships locally and internationally for two months each.In the final stage they will present their business plans in front of experts from the academia and industry, they will also be linked with the financial institutions for financial support to start the businesses.

ELIGIBILITY:

Initially the students of IM|Sciences will be considered for incubation centers and one year entrepreneurship training for small business. Later on it will be offered to the market and who ever will be interested will be offered this training and incubation centers.

THE YOUNG ENTREPRENEUR JOURNAL & EDITORIAL BOARD:

Student conducting research in the first two levels of the training will be published in the journal, for those researches we will have research mentors on the campus plus we'll have international referees from North West Michigan College and Essex school of entrepreneurship & Business who have also agreed to be our international editorial board for the journal.

NATIONAL AND INTERNATIONAL LINKAGES:

1. *Sarhad Chamber of Commerce.*
2. *SMEDA.*
3. *JE- Austin.*

4. *Industrial Association Sarhad.*

5. *North-West Michigan College USA.*
6. *Essex School of Entrepreneurship & Business, South end Campus, UK.*

WORKING ON:

1. *Lahore University of Management Sciences (LUMS).*

2. *Indian & Chinese Business Clusters.*

3. *First Women Bank (For Finances).*

4. *Rural Development Organizations.*

5. *Agri-business related organization.*

COLLABORATIONS FROM YOUR SIDE:

The collaborations that we are expecting from your side are:

1. *To be part of our international editorial board.*

2. *To act as a think tank for the center.*

3. *Visiting us for the discussion forums, seminars and conferences.*

4. *Linking us with your concerned universities, working on the same project.*

5. *Linking us to your chamber of commerce, financial institutions (who are interested in establishing small enterprises by involving young and female entrepreneurs),*

industrial associations, export promotion bureau, service industry and business clusters, organizations working on agri-businesses and craft businesses or skill development.

6. *Accommodating our students for two months in the small businesses, in the categories that we are training them and inviting them for two weeks visit of the concerned industry.*

Annexure 2:

LIVELIHOOD DEVELOPMENT PROGRAM

REPORT ON

FATA Students Business Plan Competition 2009

(Inter-University FATA students Business Plan Competition, Peshawar)

DATE: **4th JUNE2009**

VENUE: **Institute of Management Sciences,**

Peshawar

COMPILED BY: **The Enterprise Development Section**

Outcome -3

(Acknowledgement: The business plan was conducted at institute of Management Sciences, while report was made "LIVELIHOOD DEVELOPMENT PROGRAM" USAID)

INTRODUCTION:

There are a number of FATA students studying in business schools in Peshawar. After completion of studies most of them however end up searching for jobs rather than going for establishing their own business enterprises. Even though some have brilliant business ideas and entrepreneurial ability, they often do not have the opportunity or know the way forward to transform these ideas into viable businesses that can help develop the FATA region with legitimate business activities.

Upper FATA LDP ED team saw this opportunity and had the resources to provide these students an experiential learning opportunity. It immediately picked up on this opportunity and for the first time in the history of the province the Enterprise Development team together with the Institute of Management Sciences decided to host the first ever FATA STUDENTS BUSINESS PLAN COMPETITION, at the Institute of Management Sciences campus, Peshawar. The event was officially hosted by the Institute of Management Sciences, officially sponsored by SMEDA and financed through Upper FATA LDP. All this was done in conjunction with a number of universities. In total 6 universities participated and young FATA students were provided an opportunity to develop their business learning skills into action plans and present them to a panel of judges.

The main theme or purpose of designing such an event/ activity was that if successful, it could become a high lighted event, and benefit the youth especially the young women of FATA. Students, who won the competition, aside from winning cash prizes that could be used for start-up capital on the newly designed enterprises, would have the opportunity to be incubated at the different kinds of technical and practical business development centers.

This activity would be an optimal way of tapping the right kind of entrepreneurial talent rather than only relying on the FATA communities to identify people that should pursue business development. After all, these are youth from FATA who have had exposure, are educated and can contribute much to their community. These can be the people essential to bring about a change to the mindsets of the FATA communities and lead them on a positive path. This would not only lead to developing enterprises, but would lead to a great deal of employment generation and the development of FATA by the youth of FATA.

AIMS AND OBJECTIVES:

The aims and objectives of conducting such an activity:

- Fresh minds come up with viable business ideas. That is the path forward in a free society. This opportunity would make fresh minds brainstorm and develop new visions and dimensions for commerce and business development in the FATA region.

- Viable business ideas properly presented and promoted could be picked up and supported by people who like to invest in new viable business ventures. Most FATA business students do not have the start-up capital but they have the creativity and tenacity to overcome current constraints to business development in FATA. This activity could lead to a win-win combination for Pakistani venture capitalist and FATA entrepreneurs.

- This activity would enable LDP to establish business relationships, a data bank of viable entrepreneurs, as well as potential candidates for further business development either through enhanced business advisory services and/or grants. This activity will enable LDP to judge and select future micro enterprise and SME candidates that could be provided start-up capital for licit and viable business activity in the FATA region.

- This activity was connected to business promotion for FATA youth, especially women while developing an entrepreneurial culture among male and female youth of FATA.

- Subsequently, awardees could be given an opportunity to establish their businesses in incubation centers at PCSIR, University of Engineering and Technology and SMEDA's incubation centre for women entrepreneurs. This would be the first time an INCUBATION activity would be done specifically for FATA students.

- This activity would also lead to the development and increased success of the business incubation centers that the above-mentioned organizations have established. It would also serve as a model for other institutions and would encourage others to expand their programs for gifted FATA entrepreneurs.

- This activity would provide a lot of exposure to students of FATA as this would be the first kind of such an activity to be held in the entire province for the FATA students.

- This activity and idea could be adopted by many other business schools and become a banner pilot for many business institutions. It could also expose the youth of FATA to the business and commerce world within Pakistan and beyond while emboldening and encouraging them.

- This activity would initiate a business culture in FATA, a region blessed with abundant natural resources that remain untapped. It would also encourage people to seek business opportunities in FATA; thus carving the path for the merger of FATA into the rest of Pakistan.

ROLES AND RESPONSIBILITIES OF VARIOUS STAKE HOLDERS

The business plan competition for FATA students was hosted by IM/Sciences Entrepreneurship Development Centre in collaboration with SMEDA and LDP. The event was organized and hosted by IM Sciences, sponsored by SMEDA, and financed by LDP.

INSTITITE OF MANAGEMENT SCIENCES

There are approximately 407 FATA students currently studying at IM Sciences. The Institute of Management Sciences (IM Sciences) is the leading management school of the NWFP. Its campus is situated in Hayatabad, Peshawar, and its recognition and good reputation has been extending beyond the Frontier. The institute has also opened up incubation centers which could be utilized by the students who won the competition (s).

SMALL AND MEDIUM ENTERPRISE DEVELOPMENT AUTHORITY

Small and Medium Enterprise Development Authority (SMEDA) is a neutral governmental body which acts as an advisory cell to all types of businesses in the province. It also helps in linkages and facilitation in which ever area needed. SMEDA has also launched Women Incubation Cells, which could be used by any women students who win the competition, as well as others that are interested in further incubation of their business plans.

LDP, ENTERPRISE DEVELOPMENT TEAM

The LDP ED team - Outcome 3, is tasked with the identification and conceptual as well as practical steps for the development of entrepreneurship be it existing businesses or new initiatives.

In the absence of any current data base coupled with the current security situation in FATA that forbids traveling and/or conducting reliable surveys, the best route left was to discover the raw talent from amongst FATA students at Peshawar.

NEW INITIATIVE AND INCENTIVE:

The incubation cells will be fully furnished offices, charging very nominal rent. They will also have display centers and a board room which the entrepreneurs could utilize. It would be a one window operation system where a legal, taxation, and marketing representative, etc would be available to guide these fresh entrepreneurs at all times.

Successive exhibitions could be arranged to encourage future competition participants thereby ever increasing the capacity of this system. This would be an innovative opportunity for FATA youth to venture forward with minimum risk involved……allowing them to tread the waters first, make their pathway, and become steadfast on their path to running a successful business.

Criteria for Participant Eligibility

Rules for Participation

Requirements for Teams

- MBA BBA Honors Students
- A number of four students could join to form a team.
- The FATA student(s) needs to be a substantive member of the founding team, and must have the opportunity to pursue the contemplated venture and participate in the equity pool in a manner consistent with their contribution, role and position.

Requirements for the Business Idea

The objective of the Business Plan Contest is to provide a meaningful learning experience for students who are interested in pursuing an entrepreneurial opportunity at some point in their careers. As such, most ideas entered in the competition will be ideas for a new business.
In addition to that ideas on following themes were welcomed:

- Agribusiness
- FATA Natural Resources
- Human Resource Development
- ICT Businesses

Any viable business idea for the local development of FATA region was given preference.

METHODOLOGY

The time frame given was:

1. Registration for Competition (May 15)
2. Orientation Workshop on Business Plan Preparation (May 20)
3. Deadline for Submission of Business Plans (May 25)
4. Judges Review (May 30)
5. Final Presentation and Award Ceremony (June 4)

The final date was delayed to 4th June due to the current security situation in the area.

The total number of universities that participated was 6 as a lot of universities had shut down due to the security situation.

The total number of business plans submitted was 11.

The competition was arranged in the following stages:

Stage 1: Call for nominations

A total seven universities sent twelve nominations for the competitions, their names are as follows;

1. Institute of Management Sciences (IM Sciences)
2. Institute of Management Studies , Peshawar University
3. Institute of Business Management Studies, NWFP Agricultural University
4. Iqra University
5. Islamia College University
6. CECOS University
7. City University

Stage 2: Orientation/Training to participating students on business plan preparation

An orientation workshop of participating business schools was called at IM Sciences on May 20, 2009 to teach students on how to prepare and present their business plans. Thirty eight students from seven universities participated in the preparatory phase, including twenty three FATA students. A technical expert helped in facilitating and fine tuning the students' business plans for the final presentation.

Stage 3: Judges Review

In stage 3, students prepared their business plans and submitted them to the following panel of judges for review and marking.

1. Mr Javed Khattak Provincial Chief Small and Medium Enterprises Development Authority
2. Mr Nauman Wazir President Industrialist Association Peshawar
3. Mr Tariq Mashwani C.E.O, Pakistan Hunting and Sports Arm Manufacturing Company
4. Mr Naeem Banagash Chief Manager Bank Albaraka, Peshawar

Judges had to mark the detailed business plans according to following criteria:

- **Viability** - Is the opportunity reasonable and supported by a sound execution strategy?
- **Realism** - Have the assumptions behind the plan been tested in the market to determine a need for the solution being proposed? Does the plan allow for Contingency measures?
- **Competitiveness** - Have you identified competitors and enumerated your competitive advantages? Can the business successfully resist competitive pressures?
- **Maturity** - Do the plan authors understand the nature of the business they are proposing, and are their assumptions, projections, and solutions realistic?

The above mentioned criteria had 80% marks while judges had to give marks for presentation on the spot at the final presentation ceremony. Presentation part was allotted 20% marks.

Stage 4: Final Presentation and Certificate Distribution Ceremony

The final presentation ceremony was held on June 4th at IM Sciences Campus Hall. A total of eleven groups presented their business plans to the judges and audiences.

The following business plans' presentations were evaluated by the panel of judges:

1. "Funckcessories", by Institute of Management Studies Peshawar
2. "Fata Weapon Development Agency", Institute of Management Studies Peshawar
3. "Karwanda (Go Green) Farming", IM Sciences Group 1
4. "Mohmand Marble Mosaic", IM Sciences Group 2
5. "CORA Consultanting Agency", City University
6. "Sasky", (Drip) Irrigation, City University
7. "Computerization of Khyber Schools Company", CECOS University
8. "South Waziristan Cottage Industries", CECOS University
9. "Brick Kiln", Islamia College University
10. "Brioler Poultry", Islamia College University
11. "Shining Marble Mosaic", IBMS NWFP Agricultural University

All groups managed to present their presentations before lunch break. Following is the summary of the Judges Markings.

Judges Rating Sheets Summary							
			Judges Names and Marking				
S.No	**Business Plan Name**	**University Name**	**Nauman Wazir**	**Javed Khattak**	**Tariq Mashwani**	**Naeem Bangash**	**Total Marks**
1	CORA Consultants	City University	6	21	16	25	68
2	Karwanda (Go Green)	IM Sciences	6	19	21	27	73
3	Shining Marble	Agricultural University	5	14	9	13	41
4	Brioler Poultry	Islamia College University	5	17	16	19	57
5	Brick Kiln	Islamia College University	5	17	25	28	75
6	Computerizatio	CECOS	5	18	11	9	43

	n of Schools	University					
7	Mohmand Marble Mosaic	IM Sciences	5	20	11	13	49
8	Funksessories	Peshawar University	7	12	9	8	36
9	FWDA	Peshawar University	6	13	10	22	51
10	Sasky Irrigation Systems	City University	4	28	14	27	73
11	S. Waziristan CottagesIndustries	CECOS University	4	24	28	23	79

"Funckcessories", an all-girls group from Peshawar University **won the first prize**, Shining Marble Business Plan by IBMS NWFP Agricultural University secured second position and Computerization of Khyber Private School got third Position.

Mr Nasser Ali Khan presented certificates to all participating students and winners. He also distributed certificates amongst students' organizers who belonged to FATA and were involved in facilitating the ceremony. Ms Lubna, Director Enterprise Development, congratulated IM Sciences for organizing a very good event. She appreciated the judges' patience that were sitting throughout the event and took great interest in the presentation.

Stage 5:

From the beginning Governer NWFP, Mr Awais Ahmad Ghani, who is also administrator of FATA by constitution, had taken interest in arranging a business Plan competition for FATA students.

The final award ceremony for the finalists would be held at the Governors House. The Governor would be asked to award cash prizes and shields to the top position holders.

The top three positions would be getting 'Cash Prizes' and 'Shields'

1st prize – Rs 50,000/

2nd prize – Rs 35,000/

3rd prize – Rs 25,000/

CONCLUSION:

This was an extremely fruitful and practical exercise and not only encouraged the FATA students but at the same time helped in identifying potential for entrepreneurship in FATA.

The future entrepreneurs identified can be helped with grants / loans, incubations and market linkages and assisstance.

Even though this was a humble beginning but certainly not the last one; as SMEDA has agreed to carry on this exercise on a bi annual basis.

Over all the LDP ED team has successfully provided a platform and an opportunity to bring academia, industry, intelligentia, and future entrepreneurs of FATA to gather under one roof and interact fruitfully.

Annexure 3 (a): Recruiting Agency

BUSNIESS PLAN

ON

Recruiting agency

Executive Summary

Requiting agency is a totally new concept of providing the house maids, security guards, janitorial staff, shop keepers and labors to different organizations in Peshawar that caters to the high class and middle class community. As our name suggest our focus is to provide quality service at door step and trustworthy lower level staff, and position ourselves as the top-servicing this particular market.Our intentions are to obtain 80% market share and to become a hub of shopping activity for the local high class and middle class people, Industrial estate manufacturing plants, shopping malls and any organization looking for lower level staff.Initially the agency will address the bajure refugees (IDP) living in the Katcha Gari Camp near hayatabad.

Data was collected from this Camp in order to place the refugees for lower staff and develop their skills to make them economically independent and when the go back to their home town they carry those skills along with them . On the basis of data collected, we arrived at the conclusion that they need immediate work placement after a little training to overcome their economic crises and to bring them out of that tense environment. The response of the refugees was very much positive and they were more then willing to work .The type of work for which they were suitable was of manual and unskilled work. Therefore they were fit for was the labore, janitorial, lower staff, maids and labor. The details are attached at the end of the proposal.Recruiting agency has centralized itself directly in position to the residential location and social activities of our target market. We believe that this is critical to our initial success and long-term growth.

Goals and Objectives

- To provide employment opportunities to the bajure refugees (IDP's) in the initial stage
- To have a crystal clear screening system as compared to the competitors
- To train the refugees in the relevant skills
- To expand our services to different targeted segments of Peshawar.
- To make Bajure refugees (IDP's) economically independent.

- To meet the market demand for the relevant staff on competitive basis
- To generate employment opportunities
- To help in combating poverty in the region

1 Company Summary

2 Vision

To eliminate poverty by making maximum use of our human resource.

3 Mission Statement

To provide quality service to the customers by building our trust and acquiring customer satisfaction.

PACKAGES PROVIDED BY THE FIRM

Service Package 1

- Security Guards

Service Package 2:

- Maids
- House Maids and maids for Professional Organizations (cleaning, washing, ironing, cooking)
- Baby sitting (house, Schools, Day care centers)

Service Package 3:

- Janitorial Services
- Sweepers
- Peons

Service Package 4:

- Shop keepers
- Labor for the production and service oriented industry

CHARACTERISTICS OF THE FIRM

1. Security
   The organization would provide security of the employees who have been provided to any work place by issuing them proper identity cards with bar code so that they can be easily tracked down in case of any incident.

2. Background Checking
   The organization would conduct proper background investigation of the employees so as to make sure that they are not involved in any illegal activities or criminal activities in the past. Along with the background investigation of the employee, the background checking of the customer would also be carried out in order to make sure that the person is not sent to the wrong place. This will provide a sense of security to both the parties.

   Hygiene
   The organization would conduct different types of tests of the employees (servants) so as to confirm that they are physically fit and not suffering from any sort of contagious disease.

3. Time Punctuality
   The organization would strictly observe the punctuality of the employees.

4. Contract
   The organization would sign a contact to bind both the parties to the terms and conditions of the organization.

5. Value Added Service
   The organization getting successful within the first year of its operations, would extend its services to the local people and other areas and introducing different kinds of servant packages with wide range of services for the customers.

Organizational Plan of R.A

1 Business Details

This business will start out as a project of LDP, owned by its founders. The founders will be responsible for the effective implementation of the project and will make sure that the funds authorized are being properly utilized.

2 Management Summary

R.A will be managed by all its founders, and ensure the smooth running of the business. Their educational background is diverse and professional knowledge makes up for a dynamic management team.

The receptionist may be male or female but must have at least 2-3 years of education and must be fluent in Pashtu, English and Urdu. Special emphasis will be placed on preparing the receptionist on dealing with customers.

The R.A will also try to provide some fringe benefits to all its employees, in order to make the job more attractive and to retain

good and talented people.

All legal problems and legal guidance will be sought from the attorney of law Peshawar for professional guidance.

6 Pre-operating Activities

Before the business starts operating, it must carry out certain tasks to ensure that the venture starts in the right direction. The foremost task is to register the Recruiting agency along with its founders. This activity will take a little bit of processing and the documentation necessary for the registration will be completed. The menu and business stationery will be sent for printing. It is estimated that once finances have been harnessed for the business.

7 Pre-operating Expenses

All pre-operating activities will definitely cost some amount and it is imperative that the business has some cash in hand when it offers its services to the community. An estimate has been made of how much shall be spent on each expense account and a separate account has been established for contingencies. Table 1 describes the pre-operating budget as set by the management team.

Expense Account	Expense Limit
Registration	
Vehicles	

Advertising
Recruitment and Training
Printing of Menu & Stationery
Staff Salaries
Contingencies

Vehicle training expenditure and Staff salaries

Marketing Strategy for Service Oriented Organization

When it comes to marketing a service it can at times be more challenging than marketing a product. You are not selling something that is tangible; you are in fact selling the invisible.

When selling a service to the customer; experience is extremely important to closing the deal and marketing effectively. The experience has an impact on the perceived value of the service.

A service cannot be returned. If a service is purchased, but does not live up to the consumers expectation they cannot return it for a new product. By keeping in mind that "service can't be returned", our main focus will be ensuring to provide quality services to our customers form each and every aspect. So, for marketing a service company we have found that traditional four P's of marketing is not only important to consider but the below three important P's also need to be considered.

1. People**:**

- All people involved either directly or indirectly of the consumption of a service is important.

- People can add a significant value to a service offering.

2. Physical Evidence:

- Since we are creating an intangible experience so communication and documentation is the only physical evidence that we can share it with our customers.

3. Process:

- Procedure and flow of activities of how services are consumed is an important element to consider.

- We have to make sure that everything must run smoothly to keep the trust of our customers.

Since at the moment we are the only one that will be providing this kind of a service, so our main focus will be on **COST-PLUS PRICING** strategy. In this strategy we will simply be charging our customers by giving quality service with complete safety.

4. Promotional Strategy:

Essentially the Advertising and Promotion section of the marketing plan describes how you're going to deliver your services to the market and to develop awareness.

Advertising - The best approach to advertising is to think of it in terms of media as to which media will be most effective in reaching your target market. Then you can make decisions about how much of your annual advertising budget you're going to spend on each medium.

Since we are providing our services to local market, so our main focus will be advertise on local mediums that could be:

- TV Cable.
- Newspaper.
- Local Magazines.
- Banners.
- Flyers.
- Broachers.
- Pamphlets.
- And Finally the Word Of Mouth.

Future Plans

- Expanding our services to the local people in 2nd phase.
- In 3rd phase we will be capturing city areas
- Introducing more services packages, like Middle level and upper level staff.

STRENGHTS:

Following are the strengths of the agency which is going to be set-up

- Providing trained staff to the customers for their convenience.
- Issuing them proper identity cards and computerized pass cards to keep track record of the employees.
- Preferring married employees to the customer upon their demand.
- Giving customers different packages upon their request and special discounts would be given to the customers.
- Introducing different types of services.
- Giving employees pick and drop service to their designated workplace.
- Providing servants with proper background check, conducting their proper health tests.

WEAKNESSES:

- Financial constraints would be the biggest weakness for are organization.
- Not providing servants without conducting their background checks.
- Providing unskilled staff to the customers
- Not undergoing contract with the employee and with the customers for security purposes.
- Not providing servants to the customers especially on holidays, events and different occasions.
- No time limitations defined.

OPPURTUNITIES:

- Town: means that for the coming year the target of our organization would be to extend its services to Local people of Peshawar
- Trained Staff; means that our organization in the coming year will also focus on provided trained Employees
- Offering more value added services

- We could be leading servant providers to Government e.g. army/air force

THREATS:

- Any local competitor can be a threat

- Servant union

- Economic conditions / political instability.

To create our business socially accepted our organization would not just focus on profit generation but also working for the society.

Annexure 3(b):

Rural Business development

It will be a unique Center in the region as it has diversified its activities and planning to take them a step forward. This Center will also conduct research work in the industrial and corporate sector. By utilizing rural creative talents & thorough research work they will come up with and suggest necessary changes required in the business methodologies to improve the quality & quantity of rural products & services.Entrepreneurship & innovation go side by side for the economic growth & social transformation of a country. Its importance should be realized by the Govt. policy makers, corporate sector, researchers & academia of Pakistan in order to combat the challenges of globalization. It means that progress made at the rural level should be brought at par with those of global progresses otherwise we would lag behind in the field of economic development & its effects on the economy would be drastic. Already our economy is in recession. Therefore, it is high time that we start giving it a serious thought.

Environment

Due to rising inflation, unemployment and extremely competitive environment where only the fittest can survive, the marginally qualified people are forced out of the competition and left to the mercy of the market forces. Even if they lucky enough to get a job after quite some

time it might not be according to their perceived talents, attitudes and aptitude. This leads to infinite problems later in their careers. People who got a formal degree in business education rarely get entry in organization of their choice and caliber. These graduates have to be well versed and fully acquainted with entrepreneurial culture that exists in the market.Same is the case with the female population not only in the region but through out the country. Female community is only considered fit for soft jobs like teaching, medicine etc. Only a slight fraction is actually employed in doing useful activities for the society in terms of economic development. The rural woman is totally alienated form entrepreneurship and entrepreneurial culture ending up as a burden on the economy of the society.

Majority people are just sustaining their livelihood, very few are in a position to extend employment opportunities to others. Realizing the magnitude of the problem centre will play its role of mobilizing training and developing the rural youth and rural woman to play an economically productive role in the economy NWFP.Which will be a part of its mission –that is uplifting the social and economic status of the people thus fulfilling its social responsibility. Be it a meager effort but it is a step towards the betterment of the people. Businesses in order to develop properly need the transfer of knowledge training, linkages and capital. The centre will ensure that all the relevant facilities are provided to the rural entrepreneurs in this regards. The Centre will be committed and will aim to produce employers and employees. . The Centre will provide opportunities to the rural youth and women through proper guidance, mentoring and coaching in the right direction.

Activities of the centre

- Encourage agribusinesses
- Hydro Ponic(kitchen gardening)
- Honey businesses
- Loom industry
- Gems and jewelry industry
- ICT businesses
- Training center
- Vegetables and food processing plants
- Establishing market zones for these businesses
- Horticulture businesses
- Fisheries etc
- Dairy and poultry business
- Mushroom industry
- Leather industry
- Flora industry
- Handicrafts

Infra structure needed for the centre

- Market place for the economic zones i.e. at least thirty shops in each zone
- Training centers
- Ict related centers and shops
- Food processing plants
- High breed seeds distribution and its relevant training
- Staff (permanent and contract basis)
- Transport
- Incubators for micro businesses and manufacturing businesses.
- Land for market ,training and processing plants

Implementation

Research

The centre will choose one region for the pilot project and will conduct the survey to find out about the population strength of the area and the type of businesses that are suitable for the region keeping in mind the raw material available to them.

The activity will involve the native people the area which will generate income for them.

Training and development

The local people will be trained as master trainers which will further train the common people in businesses.

ICT Center

Ict related center will be established for the youth and women to learn ICT skills and become a source of ict businesses in the region .These people will then make the database of there business community, develop networking with rest of the country and abroad. develop website for the business community .this activity one hand will generate employment, the local people be involve in the database activity on the other hand .this ict centre will also offer basic computer training to the local people of the area.

Agribusinesses

New improved hybrid seeds will be providing to the farmers in vegetables, food etc will be link to the concerned industry.

Incubators

In economic zones land will either be bought or leased to construct the market of thirty shops which will be given on reasonable rent to the tenants for five years to flourish their business.

Manufacturing incubators will also be provided to the local people on the same ground for the purpose of food processing plants etc.

Challenges:

- The main challenge in this regard is the finance. As finance is the life blood for such activities.
- Another challenge is unstable economic conditions of the region in specific and country in general, where people power of spending has decreased to a greater extent. So establishing this counter on one side of the picture/coin, the other side is that we have motivate and encourage our people to establish their small business in these incubators and also to mobilize the community to encourage and support these incubators in any possible way they can.
- Yet another and even greater challenge is mobilizing the female community in by attracting them towards these incubators. As females are kept suppressed and docile in the region, their equal participation has to be ensured, they need to be empowered through participation in business practices. We have to make sure the equal participation of females in these incubators and this no doubt will require untiring efforts by the staff of the centre.
- Another challenge is that it is not just enough that the incubates are encouraged to come and invest in these incubators but they have to sustain themselves for one whole year. Still bigger tasks ahead of us is by the time these incubates leave these incubators they should have established enough links with the outside world so that they can pursue their own business in future and this is how they will beat unemployment or at least decrease it to a certain extent in the region.

Opportunities

- The main opportunity is that the idea of such a Center is unique to the region. Prior to this no organization or individual has given a serious thought to such an idea. So there are very few or almost no competitors in the market.
- These incubators because of their uniqueness can generate innumerable creative ideas as the incubates will be given a free hand in these incubators but with the mentoring and coaching of experts in the business field.
- The staff which is involved in the overall supervision of these incubators has already been involved in different projects of diverse nature so they have a know how of how to fully establish and sustain this Center.
- The team has got the willpower to work for the development of NWFP.

Management Team

The management team will consist of the staff which will be specialist.

Strategies and Approach

Management has already chalked out the major plan for running the Centre and associated incubators .The team member will actually work with a team spirit by collaborating and supplementing each other thus creating a synergetic affect.The duties, responsibilities and authorities are delegated to the members in accordance with their titles and roles.The main strategy of the management and all other functional departments are aligned with the objectives of the Centre such as to develop the entrepreneurial skills of the people so that in

future they can financially become independent and self sufficient. All plans, strategies and activities are directed towards achieving the objectives of the Center.

Objectives:

The Center will enable the rural youth and female community and the potential entrepreneurs to acquire essential knowledge, relevant contemporary skills, competencies, and critical awareness necessary for making careers by imparting practical entrepreneurial skills through carefully designed training programs in the corporate sector. The need is to create potential young entrepreneurs & enable them to manage & sustain their own enterprise.

The main objectives of the **" Centre for research and enterprise development"** are as follows:

7. To develop rural youth and women entrepreneurs so that they can establish their own businesses in the future.

8. To increase competitiveness of the entrepreneurial community.

9. To polish the innovative abilities of the same.

10. Establishing business incubations for micro enterprises and manufacturing plants.

11. Policy development for entrepreneurs and economic development.

12. To encourage micro, small and medium business in the rural areas.

13. Help develop agri industrial parks in the future.

14. Encourage more employment in the rural areas.

Some of the major benefits to the business community are:

1 Direct contact & exposure to the local & international entrepreneur & SME's.
2 Networking with the local & international business clusters.
3 Knowledge of the business conducts through out the region.
4 Access to R&D, information, & training support programs
5 Technical and financial assistance and support of SMEDA
6 Developing potential & innovation based on new products & services development in new market through collaboration & competition.

Activities of the Center

The main activities of the Center will be:

1. Conducting Trainings
2. Establishing and maintaining business incubators
3. Entrepreneurship Journal
4. Conducting Seminars, conferences and workshops
5. National and International Linkages
6. Establishing Business Hub

Annexure 4:

Entrepreneurship Development Centre (EDC)

PROJECT PROPOSAL

Enterprise development and promotional programme

Introduction

Enterprise development and promotional programme will be implemented through entrepreneurship development centre (EDC) and Technology incubation centre(TBIC).EDC was inaugurated in 2008 while TBIC was established on 20th march 2009.The purpose behind the centers were to bridge the gap between industry and academia and to develop an entrepreneurial environment. Following are the thematic areas of EDC:

- Research and Development
- HRD

- Technical Assistance (Consultancy)
- Networking and Linkages Development
- Enterprise development through capacity building
- Entrepreneurship education

Thematic areas of TBIC

As TIBC is a component of EDC therefore all the thematic areas of TIBC will be considered as the secondary thematic areas of EDC whereas the thematic areas of EDC will be of considered as primary ones.

Thematic areas of TIBC

- Developing the business basics in the people
- Establishing a network of new ventures in the region
- Networking
- Marketing assistance
- Help with accounting/financial management
- Access to bank loans, loan funds and guarantee programs
- Links to higher education resources
- Links to strategic partners
- Access to angel investors or venture capital
- Comprehensive business training programs
- Advisory boards and mentors
- Management team identification
- Help with business etiquette
- Technology commercialization assistance
- Help with regulatory compliance
- Intellectual property management

Rationale

With the dynamic environment in the business market the corporate sector is taking steps to keep pace with the changing trends. For this purpose there is a need to develop rural communities, women, youth and Fata to make best uses of there energies leisure time and local resources to enhance productivity and to become an economic asset for the country rather then to be burden on the economy. Since Pakistan economy is based on agriculture sector as well as is rich in natural resources at same time is overpopulated as well .This is the high time to utilize our population for economic development by training them educated and uneducated alike for the best utilization of our agriproducts by developing agribusinesses and best utilization of our natural resources and developing entrepreneurial community in these sectors .This developmental project will try its level best to enhance productivity by bringing creativity & innovation in micro small and medium enterprises in NWFP and in agriculture sector by encouraging agribusiness in the rural areas. One such innovation in the field is to link up rural youth and female and Fata ,PATA communities with local, national, well as international industries so as to develop an entrepreneurial culture and awareness among them. This will not only inculcate the principles of business in them but would provide them

a platform to establish their businesses in future. The infusion of the business spirit will be beneficial to the industrial sector as well as to the youth and female community who can contribute some what to the economy of the country be running their own businesses in the distant future.

Goals of EDC and TBIC

Poverty alleviation and economic development of NWFP by involving the local communities PATA and FATA people in enterprise development.

Main objectives are as follows:

1. Identity issues and assess needs of micro and small enterprise sector in NWFP & FATA;
2. Promote entrepreneurial culture in the society;
3. Motivate entrepreneurs and help them in creating enterprises especially in agriculture sector
4. Build capacity of service seekers and business development service providers
5. Provide technical assistance, Staff development
6. Research and Development in entrepreneurship special focus on agribusinesses
7. Produce trained entrepreneur manager by providing Entrepreneurship Education
8. Linking, sourcing, and networking

Background

Entrepreneurship development Center and Technology Incubation center

Enterprise development and promotional programme will be implemented through entrepreneurship development centre (EDC) and Technology incubation centre(TBIC).EDC was inaugurated in 2003 while TBIC was established on 20th march 2009.The purpose behind the centers were to bridge the gap between industry and academia and to develop an entrepreneurial environment.

Collaborative history

EDC

EDC was established in collaboration with Small and medium enterprise development authority (SMEDA)

Technology and Business Incubation Center (TBIC)

TBIC is the First joint venture of EDC with UET engineering university of Peshawar.In these centers other collaborations were that of Sarhad chamber of commerce, Women chambers of commerce.The history of IM/Sciences is enriched with several projects which are done or are being done with the collaboration of local, national and international agencies.M/Sciences have also successfully undertaken several projects in the educational sector as well as other sectors for the uplift of not only the local community but for the people

of FATA region. These projects were completed in a very professional manner seeking acknowledgement and appreciation form the government, national; and international agencies and donor agencies.

These above mentioned agencies have full trust and confidence in the competence level of the management, staff and faculty members of IM/Sciences

Experiences

- EDC established student entrepreneurship center in 2008 for the purpose to expose students to the practical environment of business
- Established IMCreative to impart necessary skills to the student community which they can letter utilize for their income generation. Short courses in this regard were arrange for the students i.e. photography,beautician,fashion designing etc
- Four days Workshop on business plan was arranged in June 2008 for the students
- Seminars on Business Ideas ,Corporate social responsibility, and on entrepreneurship was arranged from time to time for the students in 2008
- Organised a Business plan competition for Fata students in collaboration with LDP on 4th June 2009 in which an agribusiness plan with the name of Karwanda farming agency in Janikhail Waziristan got constellation prize. The team for the said plan was prepared by the EDC staff for the competition.
- Negotiations are under way with north west Michigan college USA to help develop agri-industry in NWFP in the near future in collaboration with IM/sciences from the platform of EDC.

Linkages

- SMEDA
  Small and medium enterprise development authority helped in establishing EDC and promised to support all type of entrepreneurial activities and research on entrepreneurship.

- Sarhad Chamber of commerce
- AGBA (in process)

The Academy for Global Business Advancement (**not-for-profit organization**) is a worldwide network of professionals committed to facilitating dissemination of scholarly research findings in the field of global business and global entrepreneurship. The main purpose of AGBA is to provide ongoing open forums to discuss and analyze global business and global entrepreneurship from different perspectives and viewpoints, in order to improve understanding of underlying forces that

(1) Have an impact on global developments and

(2) Shape the destiny of developing countries in the contemporary globalize economy.

AGBA bridges geographic, cultural, disciplinary, and professional gaps by integrating the business disciplines while actively enhancing practitioner-academician interaction on a global basis.

- LDP: Upper FATA lively hood development project (LDP) has agreed to sign an MOU with EDC in the near future to collaborate in FATA enterprise development. In this regard FATA Students Business Plan competition is already organized by EDC in June 2009 with the support of LDP. A requiting Agency Plan for Fata refugees is also in Process with LDP, Where funds will be provided by LDP and services will be provided by EDC and TBIC.

  Essex Business school(in process)

- Engineering university Peshawar NWFP(UET)
  With UET an MOU has been signed to establish technology incubation center ,where Fata people students from rural and local areas , faculty and potential women entrepreneurs will be helped out in there businesses

- Women chamber of commerce NWFP
- North West Michigan College USA (in process)

Existing Gaps

- Unstable economic conditions of the region as well as worldwide recession

- Unstable political and social conditions in the region that's why access to the FATA areas are difficult in this case FATA students studying in Peshawar academic institutions will be involve in the FATA enterprise Development

- Mobilizing the local and especially the FATA community towards entrepreneurial activities

- No information about international market and businesses that will be overcome by establishing links with the outside world and business community

- Seed finance for the entrepreneurs

- Lack of entrepreneurial culture which will be developed through FGD's, workshops and awareness programmes.

- Lack of information on enterprise development, which will be developed through education and training of the students and service seekers.

Project Implementation

Objective One

Sector Mapping

Activity

Sector mapping will be done in the first year to identify needs and issues of Small and Medium enterprises in NWFP and FATA.

Objective Two

Activity

The Research & Development department at EDC will be rigorously engaged in different research and development activities of enterprise development in the region. Research areas would aim at improving the current entrepreneurial activities in the FATA, PATA, rural and local region in and around NWFP. It will also strive to identify viable business ideas and potential resources which could be exploited to further the objectives of enterprise development in the region.

.**Activities:**

- Through R & D activities in the above mentioned areas the first step would be the revival of one sick unit per year in the region (FATA, PATA, Rural and urban areas) .
- Collaborative measures will be taken with the local people and business experts as to how these sick units can be made re functional so as to rescue the capital which has already been invested in them.
- Efforts will be directed towards strengthening the (MSME's) Micro Small and Medium Enterprises in FATA, PATA, rural and local region.
- Special attention will be paid on how to involve the female community in enterprise development in this region.
- Research will also be conducted in how new Enterprises will be introduced and fostered in the above mentioned areas.
- Special research will be conducted for the development of agri-industry

Objective Three

Training and development

Enterprise development in FATA, rural areas, youth and women entrepreneurs. Helping out any service seeker and the local industry

Activity

4 Tot's will be conducted each year and 12 trainings will be conducted for entrepreneurial community each year. By the end of 5th year20 TOT's and 60 entrepreneurial trainings will be conducted for the service seekers

Objective Four

Seminars, Conferences, Workshops and Discussion forums.

Activity

The Center will arrange national and international seminars, workshops, and conferences for updating the people with new methodologies and concepts in entrepreneurship.

- Two Seminars, Conferences and Discussion Forums bi monthly.
- Knowledge Sharing and Idea generating activities quarterly basis.
- Industry Visits quarterly within the country

Objective Five

Staff development

Under this activity the staff of EDC and TBIC will be sent for further development to foreign universities for courses to update themselves with new methodologies and concepts. Furthermore staff will have regular visits abroad and country wide to attend the seminars, workshops, conferences, trainings and any other allied activity.

Activity

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- PHD; Three staff members of EDC and TBIC will be sent for PhD's ,Two for MS and one for diploma to foreign university to equip them with the latest knowledge and concepts of enterprise development, which on their return can be utilized foe the development of the centers .

- Two certificate courses per year of three months each will be offer to EDC and TBIC staff.
- EDC and TBIC staff will be sent for two exposure visits nationally and one internationally per year

Objective Six

Promotion

Activity

1. EDC Publications

    - Research Journal annually
    - News letters quarterly
    - Broacher

2. TBIC Promotion and publication

- TBIC Advertisement through media(print and electronic media)
- Broachers
- Newsletters
- Research journal

Objective Seven

Entrepreneurial Education

Activity

The Center will contribute to the discipline of entrepreneurship in the following ways

- Short courses(Certificate)
- Diploma in entrepreneurship and related topics
- Masters in enterprise development
- Masters in entrepreneurship
- Honors leading masters and PHD level.
- Curriculum development for school colleges and universities
- Introducing entrepreneurship as a discipline in different universities
- customize Training Programme quarterly
- Summer schools annually
- School and colleges workshops on entrepreneurship quarterly
- Short trainings on entrepreneurial related topics
- Working on the establishment of Entrepreneurship University.
- Correspondence education of entrepreneurship for distance people(certificate,diploma,masters,need base education for service seekers)
- To encourage entrepreneurship education five scholarships will be awarded each year to the students seeking degrees in entrepreneurships.

Project Beneficiaries

Who will benefit from the project?

- Poor and needy people of the Local and rural community, specially the youth of the community.
- Providing opportunities to the people of FATA and PATA to utilize their resources which are available in their specific region.
- Providing opportunity to the female community who other wise due to our cultural constraints finds it very difficult to establish their new venture although they might have the necessary skills and resources.
- Student community
- NWFP
- Academic institutions by introducing entrepreneurship education in their institutions
- Im/Sciences Staff
- Policy Makers
- Local ,agri-industry,PATA and Fata industry
- Business community
- Allied organization working on the uplift of the industry

How will they benefit

- Consultancy services for the local industry start up businesses, Fata MSME's and Female entrepreneurs in their business issues.
- Students from FATA, Rural areas and women will be trained through EDC and TBIC to encourage enterprises in their region.
- Potential entrepreneurs will be helped out in their businesses through Technical assistance
- Entrepreneurial education will be encouraged through Awareness programmes in school, colleges and universities
- Staff of EDC and TBIC will be sent for further development to foreign universities for courses to update themselves with new methodologies and concepts.
- EDC staff in collaboration with Pakistan and USA Partner universities will be involve in combine research and combine policy making for the project to achieve a national and international level result for the project.

How will they be involved?

1. Students from Fata, Pata and rural communities will be given incubators for the term of two years where they will be groom enough to strengthen and retain their businesses. Here they will get technical assistance from business experts. After spending some time in these incubators the incubates will be able to establish their own businesses after vacating the incubators. Thus they become self employed by properly growing their ventures.

2. R & D will involve staff and student communities to conduct research based on sector needs to strengthen and develop them as well as to setup new enterprises which are viable and market pull not only nationally but internationally making best uses of the locally available recourses.
3. It will further take over assignments along with the students and in collaboration with SMEDA and all other allied organizations on revitalization of sick units.
4. R & D will encourage academic spin offs based on faculty and students researches.
5. Need Assessment
6. Fata and Rural students be will involve in research to conduct survey of their respective areas and identify the type ventures that can be encourage in their regions .Such surveys will include the data base of skills, human resource,agriproducts,craft businesses and natural resources of their area. This survey will help them develop best business plan for opportunities available at the local level and bringing them at par with the international standards.

Promotion

1. The Center will have its website through which the outcomes will be available

2. through Publications

3. Quarterly Newsletter

4. Research Papers

5. Journals

6. Seminars

7. Media

Results

TBIC

Through TBIC 30 incubates will be develop their small business in different sectors. This will include 10 students from FATA, 10 women entrepreneurs, 5 PATA entrepreneurs, 5 student entrepreneurs and 5 students from rural areas agribusinesses.

1. Training and Development

4 TOT's will be conducted each year and 12 trainings will be conducted for entrepreneurial community each year. By the end of 5th year20 TOT's and 60 entrepreneurial trainings will be conducted for the service seekers.

2. **Research**
   Every year 3 research studies will be conducted. One on sick unit, one on promotion and development of the existing enterprises and one on development of new venture in agribusinesses. By the end of 5th year 5 sick units will be revived, 5 existing enterprises will be developed and promoted and 5 new agribusiness will be established.

3. **Research Publications**
   5 research journals will be published by the end of fifth year, such as 1 per year. 4 news letter will be published on quarterly basis which means 20 news letter will be published in a period of 5 years.

4. **Workshops**
   6 workshops, 4 conferences, 4 seminars, 4 idea generating activates for creating new business will be conducted every year. By the end of 5 years the Center will conduct 30 workshops, 20 seminars and conferences and idea generation activities related to entrepreneurship and enterprise development.

5. **Staff Development**
   By the end of 5 year EDC and TBIC will have 3 PhD's , 2 MS, 1 Diplomas, 6 short courses from abroad along with 5 international and 10 national visits.

6. **Education**
   1 Master degree in entrepreneurship and enterprise development at IM/Sciences will be started. Introduction of entrepreneurship education through higher education including curriculum development and promotion of entrepreneurship countrywide will be conducted.

M & E Plan

- Management has already chalked out the major plan for running the Centre and associated incubators.
- The duties and responsibilities have been divided amongst the team members and the hierarchy in itself will act as a monitoring system for the Centre as well as the incubators
- The main strategy of the management has been aligned with the objectives of the Centre
- All the strategies, plans and objectives of the project has been directed towards achieving the objectives of the Centre
- EDC-IMSciences will prepare a monitoring and evaluation mechanism and present it to concerned quarter for approval after signing of the contract. This mechanism will be subject to amendments/changes as per the requirements. However the following proposed M&E mechanism will be followed:
- Project Director (PD), on behalf of the Institute (Consulting Agency), will be responsible for monitoring of the agreed work plans and deliverables. He will

coordinate with donors and other stakeholders for logistic and reporting arrangements. Every consultant/resource person/trainer will prepare activity report, monthly status report, against the agreed objectives and time frame.

- For output/outcome, the Project Director will review these reports before submission to donors/concerned quarters.
- For process monitoring, the coordinator will make field visits, if any. The reports will be furnished to donors/concerned quarters, if and when required.
- Two page summarized progress report will be furnished by the consulting firm to the donors/concerned quarters besides other reports.
- PD will be responsible for overall monitoring of the project. M&E of the programme will be developed in three phases:

Process Monitoring

- Every consultant/trainer will submit a fortnightly work plan to the PD
- After review of PD, it will be sent to the relevant donors/concerned quarters
- The consultant will hold a fortnightly meeting with PD to review the progress.
- The PD will arrange a monthly meeting with key stakeholders and executing donors/concerned quarters to share the progress

Means of Verification

- Activity Reports (Inception, individual training/workshop etc)
- Monthly Progress Reports
- Minutes of meetings

Output Monitoring

- Project Director will submit a monthly report.
- The report will provide the achievements against the agreed outputs

Performance sheet will be shared with team leader and relevant donors/concerned quarters, when and where required

Technical Approach and Methodology

Technology and Business Incubation center will adopt the following approach.

- Due to limited number of incubators the incubates will be selected through the selection committee (comprising of experts) according to a fixed criteria, which includes the most viable business ideas.

- Once an entrepreneur has been selected by the selection committee s/he will be given an incubator for a period of two years.
- The incubators will be provided to the entrepreneurs against some sort of collateral or security to make sure that they take full care of the space and facilities which will be provided to him/her for their new venture.

- After their entry into the incubators the entrepreneur will give necessary legal and technical guidance by experts on need basis.

- Necessary trainings and workshops will be arranged by the Center's staff to equip them with the latest business know how and learning the tricks of the trade.
- These entrepreneurs will be in regular contact will the business associations like SMEDA and Sarhad Chamber of Commerce for their exposure to the business community that will be an additional help in not establishing but growing their businesses.
- The center can be used as platform for advertisement of their products/services, which could have otherwise been a very difficult task for an entrepreneur.
- After completing a period of two years the incubates would be required to vacate the incubators and hand them over safely to the Center's authority.
- The center can be used as platform for advertisement of their products/services, which could have otherwise been a very difficult task for an entrepreneur.
- After an entrepreneur has vacated the incubators and shifted his business safely to some place in the market, the Center will keep a track of their business success by keeping in contact with them and maintaining the necessary information.
- The information of the entrepreneurs will be stored in a computerized data base which can be used by the authorities if and when required. This information will keep secure and provided to any one who requires only with the due permission of the concerned authorities.
- The entrepreneurs after establishing their businesses will become the future mentors of anyone who wants to step in the business world and aspires to start a new venture

Networking

The networking component of EDC will try to establish linkages with the agencies operating at the local, national and international levels as well as those if any are operating in the FATA and PATA region.

- Arrangements will be made for exchange of information between the Center and these outside agencies to keep the Centre aware of any new developments with regard to enterprise development in and outside the region.
- International linkages will be developed with foreign universities for the purpose of student development in enterprise development.
- Research exchange programs will aimed at with the international universities. Initial communication has already been started in this regard with ESSEX Business School for student and faculty exchange program as well as collaboration in research activities.
- Joint ventures will established between the local community and national and international agencies in order to bring economic stability in the area.
- The Center will also be affiliate with foreign universities working in enterprise development to make it more credible.

Besides the above mentioned activities routine visits will be arranged by the Center where the students and people of these communities as well as the members of the Centre can visits foreign countries to study the systems and models of enterprise development and later with necessary adjustments the same can be applied in our local businesses.

R & D

- Students from FATA, PATA, Rural and local areas along with people from other concern organization will be involved in research and sector mapping
- A collaborative approach will be adopted towards the identification and evaluation of opportunities for starting new ventures in the region. In this regard the local people of that region, SMEDA and the Centre will give their joint inputs. Preference will be given to those opportunities that will utilize the local resources so as to reduce business cost.
- Special research will be conducted to see how linkages can be developed between entrepreneurship and other disciplines. As innovation is the requisite for future survival in any sector so how through entrepreneurial activities innovation can be brought in other sectors of the society. Thus, entrepreneurship can play a vial role in any other disciplines and not just business sector. This will further require introduction of entrepreneurship courses in other fields by making it a part and parcel of their

Continuation of the project after the funds are spent

- The Centre will establish its own endowment fund over a period of time.
- Consultancy services will be provided to the entrepreneurs.
- Other tailor based trainings will be given to those who need it.
- Entrepreneurial degree will already be started which will help in generating the revenues.
- Technology and business incubation center will be continues source of revenues
- Collaboration with other organizations like LDP on enterprise development can also help.

What information you will collect and how?

- Information regarding viable opportunities will be collected form SMEDA and Sarhad Chamber of Commerce. These professional bodies will not only help in opportunity identification but will also evaluate these opportunities in terms of cost benefit analysis. The window of opportunity will also be considered in this regard.
- This information will be shared with any one seeking it.
- Special information regarding the resource availability as well as potential business areas in the FATA region will also be generated by the professional associations.
- Independent surveys will be undertaken to see market demand and size for different opportunities.
- Information form the venture capitalist will also be collected to see their areas of interest where they are willing to invest.

- This information will link up venture capitalist with entrepreneurs, providing them essential financial assistance in establishing their businesses.
- A follow up of the incubates will be kept by the authorities. This feedback is necessary for knowing about the gaps in project which will be removed in the future so as to avoid any past mistakes from being repeated in the future.
- For this purpose the team members will visit the entrepreneurs and collect information from them which will be stored in a computerized data base of the Centre.

Potential Funds and Strategic Partners:

- The United States Department of State
- The United States Department of Education
- Key Members and Staff of the US Congress
- Important Corporate and Private Foundations
- Influential Organizations and Individuals with a significant interest in Pakistan
- The Council for the Advancement and Support of Education (CASE)
- The National Association of Financial Aid Administrators
- The Indiana University Center for Philanthropy (Indianapolis)

- Inter American Development Bank
- United Nations Foundation
- Selected Public and Private Universities such as
  1. Princeton University
  2. Harvard University
  3. Yale University
  4. Stanford University
  5. University of Pennsylvania
  6. California Institute of Technology
  7. Massachusetts Institute of Technology
  8. Duke University
  9. Columbia University
  10. University of Chicago

Annexure 5: NCEED

Project Proposal

On

National Entrepreneurship and Enterprise Development Program:

A Consortium of Six Pakistani Universities[1]

Sponsoring Agency: HEC-FAD

National Entrepreneurship and Enterprise Development Program:

A Consortium of Six Pakistani Universities

Executive Summary

National prosperity is an outcome of a balanced and equitable growth of all segments of society including Women, which is possible through the proliferation of entrepreneurs across the country. Entrepreneurship and Enterprise development can be a powerful source of socio-economic development in Pakistan, in rural and urban context alike, where 44.65% of workforce is engaged in agricultural sector[2]. There is ample opportunity of mobilizing men and women towards agro based processing, manufacturing trading and servicing through entrepreneurship development. This will be two folds advantageous for the economy of Pakistan: **a**. increased businesses and employment opportunities, and **b.** the conversion of the agricultural products into the value added items for the local and international market. Both outcomes will be supporting the Government and donor agencies initiatives for socio-economic development in Pakistan. Further, the enterprise

[1] 1. University of Agriculture Faisalabad, 2. NWFP Agricultural University, 3. Balochistan University of Information Technology and Engineering (BUITE), 4. Sulkkur IBA, 5. Institute of Management Sciences (NWFP) 6. SZABIST, Karachi

[2] Federal Bureau of Statistics, Govt. of Pakistan, Report 2007/8

Acknowledgment: NCEED document is prepared by all the stakeholders involved.

promotion and development can meet the two major challenges that Pakistan is facing at the moment, which are: sustainable economic growth and people's empowerment. Therefore, by promoting entrepreneurship with practical approach, a vast potentials of Pakistani men and women can be channeled to meet the above two challenges.

Starting entrepreneurship for poverty alleviation and getting greater social impact in all the four provinces of Pakistan is a challenging task which is possible by a planned collaboration of academia, NGOs, business, government institutions and funding agencies. For the desired results, besides, a good plan and availability of finances to the enterprising people, a complete package of skills, supportive environment, networking with Government, business and NGOs, and close supervision is needed to mobilize people to the entrepreneurship and enterprise development of their own. For the purpose, establishment of Entrepreneurship and Enterprise Development Centers in each partner University and a National center for Entrepreneurship and Enterprise Development Program at the central level in Sindh for identifying, training, funding and enterprise development will be the positive step for the poverty alleviation. The center will be planned initially for five years with an objective to finally establish 5,000 Enterprises in all the four provinces through which 25,000 men and women will get employment and 125,000 will be benefited as the family members of those employed people. As this program has been planned on the principle of sustainability, after five years, the respective Universities will further escalate the programs for next five years without any donors' funding.

SZABIST and its five other partners have sufficient capacity to undertake the prospective projects as the majority of the partner Universities are already in the business of product development or having the entrepreneurship development centers at their campuses. Dr. Mustaghis-ur-Rahman, The Director University Development, SZABIST who is the architect of the program at the central level has a PhD degree in NGO management with a decade's experience of research, teaching, training and consulting with corporate, non-profits and micro enterprises. The other representatives of partner Universities are also involved in the development field for years. The consortium of six partner Universities has multiplied their strengths which culminated into a strong network of the professionals belonging to the Government, business and non-governmental organizations and support of dedicated team of social organizers and researchers all across Pakistan. For establishing "National Entrepreneurship and Enterprise Development Program" at SZABIST and Entrepreneurship and Enterprise Development Centers in each of the Six Universities will require about 28 million USD. This amount will be used for area mapping, identification of 5,000 men and women, their training, seed money distribution @ Rs100,000 to each entrepreneur and management of the whole project for five years. Besides the funds will also be used for establishing business incubation centers and Executive Development Centers (EDCs)

1. Need Statement

Pakistan is one of the resource constrained countries of the world where the prevailing poverty rate is above 17 % at one USD earning a day per person standard and further it is on the verge of increasing due to high food inflation recorded in 2008/9.[3] The people living below the poverty

[3] World Bank Report 2007-2008

rate as per international standard i.e two USD a day are about 60% of the total population. One of the reasons for the increased level of poverty is unemployment which is 7.4% which further aggravates by the substantial under employment of the employed persons.[4] Pakistan has been struggling to come out the poverty trap but due to numerous geo-political situations, the initiatives have not so far borne the fruit; continued war on terror has further damaged Pakistan's economy. In the past, various governments, non-governmental organizations (NGO's) and academic institutions have been focusing the poverty through poverty alleviation programs. However these programs could not bring significant change in the lives of people due to lack of sustenance of models tested which are usually based on subsidies and grants. Where as entrepreneurship development based on "skill" and "business" is the need of hour in Pakistan for the profitability, people's empowerment and sustainable growth.

In Pakistan like country, enterprising of society can be an important economic development strategy for rural and urban areas alike. The importance of micro enterprise development in economically disadvantaged and agricultural countries like Pakistan increases manifold as public sector employment is available in quite limited numbers. Whereas the corporate sector, due to its limited capacity, is also unable to provide jobs to the majority of the job seekers in the country. Therefore, agro-based micro enterprise development becomes a ray of hope for the people of Pakistan and also a channel for increasing economic activities in the country. The ripple effect of this increased economic activity, through micro enterprises proliferation, will further move the national economic cycle as increased employment, increased earning, increased consumption, increased production and again increased employment and so on…... This will further have positive impact on the socio-economic development and empowerment initiatives being undertaken by the Government of Pakistan and other non-governmental organizations.

In Pakistan, the agro-based micro enterprise development is considered the most suitable for enterprising the society as Pakistan's strength and weaknesses both comes from the dominance of agriculture on its economy. The idea here is to turn the weaknesses in the strength by changing the basic agricultural products into value added agro-based products through business incubators, entrepreneurship and micro enterprise development across the country.

Being the most experienced and adequately manned sector, agriculture employs 45 per cent of the labor force and contributes 21-22 per cent of the GDP. In Pakistan, this is the only sector which has adequate infrastructure and support system, such as: quality human resource; large network of irrigation system; fertile land; developed fertilizer industry; and ready local and foreign markets.[5] In the above backdrop, there is ample opportunity of mobilizing men and women towards agro based processing, manufacturing trading and servicing through entrepreneurship development. Therefore, development of agro based small and micro enterprise is a prerequisite and a principal vehicle for alleviating rural and urban poverty in this country.

Entrepreneurship and micro enterprise based approach has also proved an effective method of social development by many developed and developing countries of the world. Notable examples

Acknowledgement: This document have been created by all the university partners involved in consortium.

[4] 2009 CIA World Fact Book

[5] Article "Triangular deal model for corporate farming" By Dr Mustaghis-ur-Rahman, EBR, Daily Dawn, Karachi

in this regard include: Center of Entrepreneurship, Canada; Center for Entrepreneurship, University of Florida, USA; The Sri Lanka Agro Enterprise Development Project; The Non-Traditional Agricultural Export Support (PROEXAG) Project in Central America; Investment in Developing Export Agriculture (IDEA) in Uganda; The Export Industry Technology Support Project (EXITOS) in Central America and Panama; The Morocco Agribusiness Promotion (MAP) Project; and The Non-Traditional Agricultural Export (PROEXANT) Project in Ecuador. Although most of these projects were primarily concerned with the food chain per se, in parallel they also worked to develop rural non-farm services such as private agricultural extension, input supply, transport and storage services.

Given the importance of small and micro- agro-enterprises in the poverty alleviation in Pakistan, SZABIST and other five partner Universities seek to establish an "Entrepreneurship and Enterprise Development Program" in Karachi and similar centers in the premises of each partner Universities in four provinces for the poverty alleviation and people's empowerment by nurturing entrepreneurial skills and managing micro-enterprises.

2. Program Description

"National Entrepreneurship and Enterprise Development Program" is basically a consortium of six Universities of Pakistan **(Conceptual framework Annexure 1).** SZABIST, Karachi being in the lead role where this program's office will be situated, while each partner University will have their own centers of entrepreneurship under different names and their activities of capacity building for entrepreneurship, enterprise development and operating agro-based product incubators. The main idea behind this consortium have a strong network of the Universities who are already in entrepreneurial education or activities to combine their efforts to enhance their outreach without having geographical barriers and technical expertise in enterprising the society all across Pakistan. The individual entrepreneurial centers in the respective Universities and the main program at the center level seek to nurture entrepreneurial skills in the stakeholders through imparting training for running and managing micro-enterprises on modern lines with a macro objective of poverty alleviation in Pakistan. The interaction between these universities will result not only in the replication of successful experiences but also contribute significantly towards the socio-economic development of the country.

The main program at the center (Karachi, Sindh) and individual Universities will also develop a network of US Universities for the mutual learning from each others' experiences. This network will provide a coordinated vehicle through which participating members would collaborate and communicate on the specific issues and challenges confronting university-based entrepreneurship centers. In the long run, the program and centers will develop into self sustaining entity which will continue imparting education, training and research and enterprise development.

2.1. Significance of the Program

The significance of this program is that it starts from where others terminate, such as; SMEDA has recently launched a combo of small medium enterprise training program (Secretarial, Beautician and Entrepreneurship) for six hundred women all over Pakistan but could not found the right aspirants as it was stipend based and was also focused on skill development for the job

seekers instead enterprise development. Besides, the selection process was without research in theses programs (through ads in the News paper). Other programs in past also were not much different from SMEDA's as the writer of this concept had opportunities to look at these programs closely being part of those in various consultative capacities. One more significant reason of their failure is, if the credits were extended, exorbitant rate of interest that the borrowers were charged. Having the significance of the program, there is a possibility of a partnership with the US Universities for technical areas of the project. Some ground works has already been undertaken as the consent of 12 American Universities in this reference has also been received by the consortium partners. The main significant features of this program are as follows:

This program is different from the other micro credit and small enterprise programs in the aspects that it is:

a) A complete package of joint enterpreunal program from identification, to the operations of a business

b) Product development and marketing through business incubation

c) Training and Education through Executive Development Centers

b) Interest free loan; recoverable in easy installments

c) No outsourcing

d) Sustainable; recycling of the seed money

e) Replicable at large scale all over Pakistan.

2.2. Program Design

(Year 1)

Steps	Projects and Activities	Duration
Step 1	1. Project planning 2. Survey of 60 districts by the partner Universities in four provinces (in the respective areas of each University) 3. Planning of agro-business incubator centers by the aspiring Universities/University	3 months
Step 2	1. Identification of 1100 persons (gender balanced) for training for entrepreneurship and enterprise development in the four provinces the partner Universities from the districts Surveyed)	2 months

	Note: 100 *extra women have been selected as there is a possibility of* *(10% dropout rate)* 2. Establishment of Agro-based business incubators by the aspiring Universities/University	
Step 3	1. Five training modules of four weeks each. 2. Accounts opening 3. Operations of Agro-based business incubator center by the aspirin Universities/University	6 months
Step 4	1. Loan disbursement to 1000 trained entrepreneurs to start 1000 terprises @ Rs. 100,000 each by the partner Universities (Entrepreneurs will contribute 10% of Rs. 100, 000 to each enterpr advance through pay order which will be used for the program stainability or cover the default rate).[6] 2. Firm/enterprise registration 3. Continuing Agro-based business incubators by the aspiring Universities/University	1 month
Step 5	1. Supervision and Monitoring to the entrepreneurs 2. Monthly 5% recovery of the disbursed loan without interest after two months of business start	After the delivery o loan

The similar steps of activities will be carried on for the year 2, 3, 4, and 5. After fifth years the program will be evaluated and in the light of the lessons learned, the program will be further planned without seeking any fund from local or international donors. The next five year program will be funded by the savings of the 10% taken in advance from the borrowers.

2.3. Expected Outcomes

[6] The same financial disbursement policy will be repeated for the year 2, 3 and 4 for 100 joint enterprises each year. To keep into the loop the left over potential entrepreneurs in the year 1 and 2 will be attached with the enterprises which are in operation in the year 1 till they get loan.

At the end of five years following are the expected outcomes of "Entrepreneurship and Enterprise Development Program":

i. About 5,500 entrepreneurs developed
ii. 5,000 micro enterprises developed in the four provinces of Pakistan
iii. 10 thousand persons employed (@ 5 (1 Borrower+4 employees) persons employed in each micro enterprises)
iv. 25,000 persons will be benefited by these enterprises as family members
v. Six multi dimensional centers of entrepreneurship established
vi. Increased economic activities in the provinces
vii. Increased exports of value added products
viii. Increased foreign exchange earnings
ix. Alleviated socio-economic conditions of the target groups in the identified districts

2.4. Capabilities and Resources of the Consortium

SZABIST, and other partner Universities have sufficient capacity to run the existing programs on entrepreneurship or develop new programs building upon their experiences of teaching and training or enterprise development. Each University's human and physical infrastructures are given below:

i. SZABIST, Karachi (Lead University)

SZABIST is a chartered University with its campuses in Karachi, Islamabad, Dubai and Larkana, SZABIST Karachi has sufficient capacity to lead the consortium of partner Universities in developing and managing the "National Entrepreneurship and Enterprise Development Program" as SZABIST is known for its excellent physical infrastructure, intellectual and field resources all over Pakistan. Dr. Mustaghis-ur-Rahman, the architect and coordinator of the program, with a PhD degree in NGO management, has experience of research, teaching, training and consulting with corporate, non-profits and micro enterprises. He has a strong network of the professionals belonging to the Government, business and non-governmental organizations and enjoys a support of dedicated team of social organizers and researchers all across Pakistan**.**

SZABIST is using its already existing contacts with the US Universities for collaboration with this consortium of entrepreneurship. As soon as the clear collaboration guidelines are received from HEC-FAD, SZABIST will materialize the collaboration accordingly with the below mentioned US Universities.

a. Research and Economic Development
George Mason University
Fairfax, VA 22030 - USA, George Mason University,

b. Economics Self Reliance Center

Brighum University

Utah, USA

c. Arthur Black Center for Entrepreneurship,

Babson College, USA

ii. University of Agriculture, Faisalabad (Punjab)

The University of Agriculture, Faisalabad has a long history of serving the nation by producing high quality graduates at par with the international standard in the field of agriculture, agricultural engineering, veterinary sciences, animal husbandry and basic sciences to cater the needs of the country. The University has highly qualified staff, who have got their Ph.Ds from international universities of high repute. Based on the achievements in the field of teaching, research and outreach activities, the University have been ranked as No. 1 University of the country, among Agricultural Universities, by the Higher Education Commission of Pakistan. Currently the University has 500 Ph.Ds who are imparting technical knowledge, conducting research to boost the agricultural production and transferring the latest technologies to the farmers. The University is running about 150 research projects and 100 development projects at several national campuses. The University has laboratories furnished with the latest equipments to find solution facing the agriculture sector. The University has developed linkages with 150 institutions/Universities at the national and international level to play an effective role in capacity building for facing the future challenges and to cater the needs of the skilled manpower for the developmental projects.

Bases on strength and absorptive capacity of the faculty members, the University of Agriculture, Faisalabad, is fully committed to provide guidelines to the farmers to make their agriculture profitable for improving their livelihood by establishing Entrepreneurship Centre for Agribusiness and Rural Development at the University campus.

iii. NWFP Agricultural University, (NWFP)

NWFP Agricultural University, Peshawar Established in 1981, the NWFP Agricultural University (NWFP AUP) has been playing a vital role in imparting quality agricultural education by undertaking applied research in the field of agriculture and allied sciences for ensuring sustainable development in the sector. The University has five faculties; viz-a-viz Crop Production Sciences, Crop Protection Sciences, Human Nutrition Sciences, Rural Social Sciences, Animal Husbandry and Veterinary Sciences, all containing 24 Departments and three Institutes, i.e. Biotechnology & Genetic Engineering, Management/Computer Sciences and Development Studies & Rural Development. The University contains a total of 189 faculty, out of which 104 are Ph.Ds mostly from the technologically advanced countries of the world including USA. All of these faculty members are contributing in enhancing the knowledge base of our students by facilitating them in attaining their postgraduate and Ph.D

degrees and directly culminating towards production of highly skilled man power in this important field of our economy.

The University has initiated the Ph.D. programme in 1997, 55 faculty of the University completed their Ph.D. and more than 200 students are pursuing their Ph.D programme in the AUP. The University has prepared its Vision 2020 for pursuing its future plans in a strategic manner. This guiding plan provides a road map not only to enhance our teaching and research capabilities but also to translate global development into our curricula and technological advancement in the province.

The efforts made in the development of sustainable agriculture have made NWFP Agricultural University as a Centre of Excellence and a pivot of development in the region. It has strategic linkages with the agrobased private sector enterprises and the farming community and who are provided guidance and patronage in various R&D programmes. Keeping in view the success during the past few decades there is a need to further build on the lessons learnt and replicate the knowledge for the betterment of the sector at large.

iv. BUITEMS (Balochistan)

BUITEMS is the first public sector IT university of Pakistan. It started functioning in 2002 with two faculties and 90 students admitted in three bachelor programs. Within a period of six years the university has evolved into a premier institution with five faculties comprising seventeen departments and over 3200 students admitted in 28 programs including MS and PhD. We at BUITEMS are ideally based and determined to bring about social change in the region on the universal education goals of enlightenment, balance and global integration. Though still in the process of capacity building, the university has earned a repute of premier seat of learning at national level. BUITEMS has been given the status of an engineering university as well by Pakistan Engineering Council, and offers brilliant promise of meeting the human resource demands of the whole region.BUITEMS, with its three campuses, state-of-the-art labs and more than 200 highly qualified faculty members has got the capacity to pursue this program. Its location in the heart of Balochistan also puts it at an advantage to deliver the required facilities to the clients involved.

v. Sukkur IBA (Sindh)

Sukkur IBA is a prestigious institution in interior Sindh, which is basically dedicated towards open merit and excellence in Education. Sukkur IBA was established in 1994 in two hired rooms of Public School Sukkur. IBA has made its market appreciation in farfetched areas of Pakistan; it is now having recognized degree awarding status by Education department, Government of Sindh and Higher Education Commission (HEC) Islamabad. In a period of 12 years Sukkur IBA has taken strides and grown into a center of excellence, with a beautiful building and enviable academic standards. Sukkur IBA philosophy is driven by the belief of providing quality education through modern teaching styles, based on market oriented curriculum at an affordable cost. The core competence of Sukkur IBA is its students and high caliber professional faculty which assists not only the students but also the organizations by providing them facility in the field of research and consultancy. The dream of "**Merit,** Quality & Excellence in Education" is not only for the people of interior Sindh but also for

whole Pakistan. At Sukkur IBA a relationship has been formed between mission and sprit, form and function, dedication and resources. Its distinctive culture reflects punctuality, regularity, discipline, integrity, creativity and competitiveness.

vi. Institute of Management Sciences (NWFP)

The Institute of Management Sciences (IMSciences) is the foremost management school of the NWFP, and increasingly its recognition has been extending beyond the Frontier. As a public sector Institute it is markedly different from others because it is fully autonomous and self governing. This enables it to respond quickly to all new developments in the world of academia and meet the requirements of employers. IMSciences operates with a view to foster growth in students' know how and professional skills and enable them to remain competitive in a tight labor market and over time we have expanded our functions. Today IMSciences offers degree programmes for business administration, management, information technology and public health. These are all similarly tied knowledge bases that help create synergy and foster the cross fertilization of knowledge. The current position of the IMSciences as a forerunner in education provision has come about as a unique case of self sustained development. This was made possible by a dedicated staff that had the creativity to grow beyond the narrow confines of state provided education. Most of the universities in Pakistan have been in stasis for decades now, but the IMSciences has been one of the few examples of successful growth in academia, one that has become a benchmark of quality for others.

The growth and development of this University in last 14 years reflect by the establishment of 10 centers, including Center for Entrepreneurship and Center of Micro finances. Majority of these centers are related to sustainable socio-economic development programs. Besides, the institute has a wide range of partnership and networking with the public and private organizations. The list of such networking and partnership activities are as follows:

- Civil Secretariat NWFP
- Planning & Development Department NWFP
- Swiss Agency for Development and Cooperation (SDC)
- Financial Sector Strengthening Program (FSSP) – SDC
- European Union (EU)
- Gender Mainstreaming Project, UNDP
- Supporting Democratic Electoral Process, UNDP
- Election Commission of Pakistan
- Small and Medium Enterprise Development Authority (SMEDA)
- GTZ
- British Council Peshawar
- Central Board of Revenue
- Institute of Bankers in Pakistan, Karachi
- Social Enterprise Management Program (SEMP), Lahore University of Management Sciences (LUMS)
- Pakistan Institute of Community Ophthalmology (PICO)

- Women Health Project (ADB)
- Sarhad Chamber of Commerce and Industry
- The World Bank

2.5. Monitoring and Control through LFA

Goal	OVIs	MoVs	Assumptions
Poverty alleviation and socio economic development in Pakistan	1. 5000 households poverty reduced	1. project reports	1. Continued funding and Political stability
Project Objectives			
Entrepreneurships and enterprise development	1. 5,500 persons trained in entrepreneurship development 2. Centers of Entrepreneurship established (6)	Same as above	Same as above
Output			
1. Entrepreneurship centers	6	Same as above	Same as above
2. Capacity building	5,500 trained entrepreneurs	Same as above	Same as above
3. Incubation centers	4		
4. Enterprise development/ launching	5000 enterprises launched	Registration certificates	Same as above
5. Linkages and Networking	Universities, Industries and Financial Institutions	MoUs/Agreements	Same as above
Research and Development	10 Product innovations	Patents registered	Same as above
Activities (Centers establishment)			
1. consultative workshops for need assessment	5 Workshops conducted	Workshop reports	Same as above

2. identification of venues	6 Venues for centers identified 4 Incubators identified	reports	Same as above
3. up gradation of existing centers (need identification)	3 existing centers identified for up gradation	reports	Same as above
4. collaboration with national and international universities	5 Pakistani partner universities; 10 international collaboration established	MoUs	Same as above
5. implementation (workshops)	5	Workshop reports	Same as above
6. recruitment and project staff development	10 (average)x5 = 50	Reports	Same as above
Capacity Building			
1. curriculum development	1 curriculum sets printed	Reports	Same as above
2. training module design	5 modules designed and developed	Reports	Same as above
3. resource person	5 (for 3 months/12 weeks) x 6 centers = 90	Training reports	Same as above
4. course delivery	5 modules x 4 quarters x 6 universities x 5 years = 600	Training reports	Same as above
Incubation centers			
1. constitution of advisory board	5 boards	Reports	Same as above
2. identification of thematic areas	10	Reports	Same as above
3. conceptualization of ideas	10	Reports	Same as above
4. product development	5 – 10	Reports	Same as above
Enterprise Operation	5000 enterprises established	Business plans/reports	Same as above

Linkages and Networking			
1. inter academia national and international	6 Pakistani partners and 10 US universities	Agreements/MoUs with USAID partner Pakistani universities	Same as above
2. industry	Network established with 6 trade associations and chambers	Agreements/MoUs with TAs and Chambers	Same as above
3. financial institutions	Linkages with 5 Banks and MFIs	Agreements/MoUs with Banks/MFIs.	Same as above

3. Roles and Responsibilities of the Consortium Partners

The program will be carried out by the partner Universities all over Pakistan led by SZABIST, Karachi in collaboration with the American Universities funded by HEC – FAD (USAID). The broad roles and responsibilities of the partner universities are being outlined as follows:

3.1. SZABIST, Karachi (Lead University)

SZABIST will be responsible for the following in collaborations of the consortium partners:

i. Establishing a "National Entrepreneurship and Enterprise Development Program" in its Karachi campus
ii. Program conceptualization and planning in consultation with the partners
iii. Development of program protocols
iv. Program operation guidelines and LFA
v. Monitoring and Supervision through a team of experts
vi. Data collection through partner Universities and reporting

3.2. Consortium Partners' responsibilities

The consortium partners will be responsible in collaboration with the lead institution for the following functions:

i. Setting up centers in each partner University
ii. Providing support to the lead University in protocol development
iii. Taking lead in their identified project development and implementation
iv. Managing Finances in their specified geographical areas project activities
v. Providing periodic report on their activities to the lead University
vi. Sharing their progress with the consortium partners on periodic or milestone basis
vii. Provide support in managing consortium and its functions

4. Financial Projection for five Years Yearly Basis[7]

National Entrepreneurship & Enterprises Development Program

Consolidated Financial Projection-Yearly Basis

Universities	Year-01 $ million	Year-02 $ million	Year-03 $ million	Year-04 $ million	Year-05 $ million	**Total** $ million
SZABIST Centre for Entrepreneurship & Enterprises Development	0.683	0.654	0.654	0.654	0.654	3.300
University of Agriculture-Faisalabad **(ECARD)**	1.879	1.214	0.484	0.484	0.484	4.545
N.W.F.P Agricultural University-Peshawar **(Technology Parks/Business Incubators)**						3.957
BUITEMS **(Entrepreneurship Teaching and Training Center)**						2.130

[7] The individual partner University's budgets are given in annexure 3, 4, 5,6, 7 & 8

IBA-Sukkur a.**(Agriculture business proposal)** b. **(Women entrepreneurship)**	0.518 0.518	0.550 0.550	0.540 0.540	0.555 0.555	0.545 0.545	2.708 2.708
Institute of Management Sciences-N.W.F.P **(Enterpreneurship Development and Incubation Center)**	1.778	1.289	1.547	1.510	1.813	7.937
National Entrepreneurship & Enterprises Development Program Office	0.039	0.039	0.039	0.039	0.039	0.195
Total	5.415	4.296	3.804	3.797	4.08	27.48

Note: All $ million workings based on Rs.80 per dollar. Variations in rates for dollar rupee exchange will be calculated on the date of disbursements.

5. Conclusion

Pakistan being an agricultural country, it has huge potentials for the agro-based industries. There are small number of big and small size industries which are incapable in providing employment to the masses. Especially the disadvantaged segment of society who live in the rural and urban areas of the countries have limited accesses to the education, training and financial resources. About 60% of the population falls in this segment in Pakistan. For this segment of society, the tried development models in past has not proved effective. A participatory development model based on agro industries and proliferation of micro enterprises will be the solution to the problems of socio-economic development that Pakistan is facing.

For poverty alleviation, under the support of HEC-FAD, a consortium of six Universities from all over Pakistan is being established to promote entrepreneurship, and develop micro enterprises for those disadvantaged groups of population joining hands in the struggle of their prosperity. For the purpose, innovative idea of micro enterprises and entrepreneurship development through this project is suggested.

Under this program 5,000 men and women will get trained and will be disbursed loans for enterprise establishment, which will provide jobs to 25, 000 people and the indirect beneficiary will be about 125,000 persons in five years time. Under this program, the partner Universities will also be developing their business incubators and capacity building centers for the identified men and women in their respective areas. This program also has a robust mechanism of monitoring and evaluation through LFA. Besides the program has inbuilt concept of sustainability. It is expected that this program can bring some relief for the people in need and also provide a support to the government of Pakistan's other initiatives of poverty alleviation.

Annexure 6: List of Student Internees

List of Teams of EDC Internees

Organizer's Team

Adnan Dawood

Tayab Rauf

Arsalan Majeed

Syed naveed

Syed Zohaib Ali

Sarmad Tariq

Marketing Team

Mian Adnan Gul

M.Abdullah

Shahbaz.M

Umar

Taimur shareef

Promotion Team

Khizar

Ishtiaq

Sanam

Wagma

Sadia

Report Wrtting

Afzaal

Linkages and Networking

Adnan Gohar

S.M.Haider Ali

Wajeeha Iqbal

Farzine Naseem Sethi

Faryal khan

Sourcing

Zarjan

Fazle Amin

Shabib

Afzaal

M.Abdullah

Research

Zia

Rashid

Azmat

Samiullah

Annexure 7: Interview Summary

Responses to questions	Coordinators personal account	Current Coordinator	Regional head of SMEDA	Vice president of Women chamber of commerce Peshawar
Main Reasons for establishing EDC	The aim was to bridge the gap between industry and academia, expose students to the practical business environment, help students to become self-employed by developing their own businesses, cultivate entrepreneurial culture in Peshawar, link students to financial institutions and local market.	I took over as the successor of previous coordinator and was fully aware of the aims and objectives of EDC.	Regional head commented that SMEDA interest in establishing EDC at imsciences were the same as outlined in EDC document and explained by coordinators personal account.	Vic president of Women chamber of commerce was not fully informed of EDC aims and objectives and was little aware of its activities in the region
EDC performance	Once EDC was merged with student entrepreneurship development centre in 2008, it started working on linkages with industry, involved SMEDA in linkage process. Arranged seminars and workshops on entrepreneurship at the institute, arrange student trips to industrial clusters. Resieved funding for business plan competition in 2009 from	EDC didn't achieve much after the first coordinator left. Two main achievements made were signing of MOU with Gems and Jewellery for capacity building of the entrepreneurs of Peshawar. Second achievement was one more student business in event management established from business incubation platform. More	SMEDA role in the entire EDC performance is always as a facilitator whether it was the launching ceremony of EDC, Conducting seminars and awareness workshop or doing business plan competition at EDC. In fact SMEDA has always supported EDC activities.	The chamber knows very less about EDC performance except from the launching ceremony and business plan competition that chamber representatives attended, they don't know what other activities are run from EDC platform. In short the chamber don't have clear idea how EDC can help the industry

	USAID. Established business incubation centre which helped imsciences student Zain Rashid start his fashion designing business.	facilities were then added for student businesses such as space facilities, fax and telephone, technical assistance and promotion to these incubates. Tenancy agreement between EDC incubation centre and the student incubate was formalised.		
Main Problems Faced by EDC	As a coordinator EDC main problem faced by EDC were full-fledged support from imsciences, lack of funds to run the centre, lack of expert staff, recognition from industry and government. Networking with local, national and international industry was difficult to develop. As a head of EDC I needed proper training and development which was not provided to me.	The coordinator faced the same problems as faced by the previous coordinator and no special efforts were done so far to over comes financial and linkages issues.	As SMEDA was always in the forefront of EDC establishment, it is working on possibilities of receiving funds from sources like higher education commission, donor agencies. But all these efforts are still in the process and no significant development has taken place so far.	The chamber is neither aware of EDC facing issues nor has any close links so far to work on these issue together. One problem identified by the vice president was that the industry is not aware how EDC can help the industry. Hence EDC is not promoted before the industry very well.
Government support towards EDC	As head of EDC I could not involve the government directly but SMEDA which	The coordinator commented that although the centre needs government support in U-I	Government "SME policy 2007" aims at promoting entrepreneurship countrywide.	Government support in the form of financial and favourable policy is needed

	is a government body for enterprise development in Pakistan was involved in every phase of EDC. Therefore, at the time of establishment and during my time no formal policies were made by the government that would include EDC in industrial development.	linkages and financial help, however no such help is provided to EDC as yet. The centre still is in its infancy stage and the government needs to recognise EDC potential. One development is that EDC has submitted joint research venture on local SME with SMEDA. It is still in the process and further development ha taken place.	Once approved four entrepreneurship institutes will be established in Peshawar which will be linked with EDC and financial institutes." In this process, EDC will help in the capacity building of the new entrepreneurs while financial institutes will be providing seed funds for their businesses. Funds can be arranged from donors like recently SMEDA has received funds from multi donor trust ;it's a project for economic revitalisation of federally administered territory areas (FATA) Peshawar. He said "SMEDA has involved EDC imsciences for the capacity building of the young student entrepreneurs belonging to FATA". Regarding more income generating activities he said "SMEDA is also starting idea village from EDC platform. Students in this village will	for EDC but these needs are suppose to be promoted before the government.

			share their business ideas, potential business idea will be converted into business plans which will be commercialise to the private sector. Idea commercialisation will be a source of income for both students and EDC."	
EDC potential for industrial development	Although EDC was meant to assist industry and help student businesses at start up and growth stage, It lacked expertise many areas. First its coordinator needed essential skills training to run the centre. Secondly it needed highly qualified expertise that as a team could offer need-base consultancies to industry. The centre needed proper training and development of its staff at national and international level in enterprise development. Main potential of EDC was	During my time no further development took place regarding capacity building of EDC staff. Imsciences staff which is foreign qualified can be an asset in offering need-base consultancies to the industry. The students could used as doing research projects on industrial problems that could provide practical solutions to the problems.	EDC potential can only be strengthen if it overcomes its human resource issues. There is a inconsistencies in its activities due to frequent turnover of its staff. Due to lack of trust on EDC potential industry ties with the centre is affected.	As an entrepreneur and vice president of women chamber of commerce and industry Peshawar I personally think that EDC services are needed by the industry. Women entrepreneurs come from uneducated background and they need technical support and new business ideas that result in high growth businesses in the region. In this regard EDC staff can help them develop a more viable business as well as help them in all stages of business

	imsciences faculty and students that could be used for industrial research.			development. Therefore I belief that EDC does posses potential for industrial development but it needs to promote itself before the industry more actively
Validity of triple helix model in Peshawar Pakistan	The centre at establishment didn't have triple helix model in mind. It was an attempt to bridge the gap between industry and academia. In the meanwhile attempt was to explore a viable model that can help U-I-G linkages be more effective in economic development of the region. While at this stage triple helix is not possible yet can be implemented phase wise. First a more systematic approach should be developed in the form of policy formulation for U-I-G collaboration.	The model at the moment is the need of the region for development but must be implemented in a more mechanistic manner.	The model is no doubt an answer to economic development but as there is no formal procedure present at the moment it cannot be implemented in its true sense. However it doesn't mean that the model is not valid just need to be modified to fit the developing region like Pakistan.	The model needs more homework before it is implemented in Peshawar.