

9 Conclusions

“Technology is a gift of God. After the gift of life it is perhaps the greatest of God’s gifts.”

FREEMAN DYSON (1923–)

9.1 Introduction

Technology-based entrepreneurship has become ever more important over recent decades and has an important role for economic growth and industrial renewal, especially with new technologies and fast growth knowledge based sectors. The focus on technology-based entrepreneurship has consequently arisen from the importance of technology and entrepreneurship within this context (Dahlstrand, 2007).

Interest and research into technology-based entrepreneurship originated in the United States of America (USA) and following this it has become important in Europe in the last twenty five years (Dahlstrand, 2007).

Technology Transfer Policy

Policy makers have a clear agenda as to what technological innovation and entrepreneurship mean. This may adversely affect the effectiveness of economic regeneration if the wrong agenda is followed. For these strategies to be more effective they need to be developed by improving access to innovation and technology support by making services demand led rather than supply led. There needs to be the devolution of financial decision making for the financing of technology. Policy makers should create a positive climate for support including indigenous support. Awareness training should be delivered for technology-based firms (TBFs) so that they are made aware of technology transfer services. The creation of an innovation culture can influence economic regeneration in a systematic way and methods can be set up to cascade technologies and undertake new ventures.

Diffusion of Innovations into Technology-Based Firms

Although there are variables which appear to be the most important influences on technology diffusion into TBFs there will also be a multiplicity of influences that accelerate or alleviate the rate of diffusion. This spectrum of influences on diffusion rates broadens when considering technology transfer among the various different TBFs in multi-tiered networks. An extension of the hypothetical example of diffusion is the diffusion of technology into TBFs through multi-tiered networks. In these TBFs’ sociological forces will have an important role to play. The rate of adoption of a new technology will be faster if it is compatible with the previous experience and present normative values of TBFs. Other influences on the speed of diffusion include the complexity of the new technology and random influences. Successful diffusion of a new technology involves considerably more than technical competence. Many complementary factors will be prominent and a TBF may be retarded in its acquisition of technology by other firms who are slow to adopt. The rapid diffusion of a technology will be facilitated by a willingness of TBFs to make adjustments.

Technology Clusters

A technology cluster will have a local production network which exists around companies. An extensive knowledge network will be built around the firms facilitated by senior staff movement between them. Competition within the group will be intense and formal collaboration rare, and international concerns and relationships will be of importance resulting in well developed global production facilities, suppliers, customers, partners and competitors, and contradictions exist between perceptions of members and the reality of linkages within the cluster. A cluster may be local to a region but part of a wider international industry cluster with simultaneous importance of local cluster effects and extensive international links.

University Technology Small Firms

University-based technology small firms (UTSFs) are companies whose activities are based on technologies developed as a result of academic research programmes. Such companies are significant in a local economic development context, since they are likely to lead to the commercialisation of research in fairly close proximity to the higher education institution (HEI) involved. This has benefit for both the local economy and the HEI itself. Risks and problems in forming and growing UTSFs must not be underestimated, and it is important to recognise that they represent a significant route to the commercial exploitation of new ideas and technologies. In appropriate circumstances they can make an important contribution to regional and national prosperity. A critical challenge for HEIs is to ensure that where a firm is an appropriate vehicle, it is properly managed and there are structures to enable its true potential to be realised.

University Business Collaboration

With regard to the nature of the management of the university/business inter-organisational relationship a number of typologies have been developed to express the diversity of relationships that may be employed in the collaborative process. Freeman (1991) distinguishes between the following: joint ventures and research corporations; joint R&D agreements; technology exchange agreements; direct investment motivated by technology factors; licensing and second-sourcing agreements; sub-contracting, production-sharing and supplier networks; government-sponsored joint research programmes; computerised data-banks for technical and scientific interchange; and informal or personal networks. Although there have been many studies indicating the importance of formal relationships for the transfer of technology, a number of recent investigations have also highlighted the key role played by informal relationships as a means for sourcing ideas and information during the development process (Kreiner and Schulz, 1993; Shaw, 1993).

University Business Partnership and Models of Technology Transfer Offices

For university business partnerships to be successful there is a need for expertise and commitment by university senior managers to support and build partnerships who need to understand academia and industry technology/knowledge transfer dynamics (as noted by Tang (2008) in relation to findings from a study of university TTOs' exploitation of intellectual property in the UK). Research and Knowledge Transfer Services can make greater use of the services of university business schools, and the identification of university business partnerships can have greater assistance provided by the research offices. The three phases of (i) opportunity recognition, (ii) opportunity development, and (iii) opportunity exploitation need to be practiced (Tang, 2008). The key proxies for university commercialisation activities of spin outs, licences and patents need to be recognised as a major part of business related activities of a university. Good relationships need to be built between a university and industry to underpin successful operation of university industry partnerships. Existing university business relationships can be strengthened through networks and they offer the possibility for new relationships to be developed with consequent increased benefits.



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Growth of a Technology Concept: A Case Study

The case study of the Technium concept is an example of an integrated support network for small technology-based businesses. Techniums provide 'state-of-the-art' premises for these companies which may vary from straight forward 'spinouts' to global start-ups. Types of support include tailor-made specialist and technical support. The key to success is the link with research and development (R&D) and training at centres of excellence. This is reinforced by good working relationships with sector forums and underpinned by Broadband connection. Follow-on is catered for by the provision of appropriate accommodation for enterprises that require larger premises for expansion. The study reported was conducted at a time of considerable development for the Technium 'concept' on the Internet. Results of the study show the importance of facilities and the main types of support services provided by the techniums.

References

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