

ABSTRACT

Recently the roles of universities in the US, Europe and Asia have changed from mode 1 to mode 2 knowledge acquisition. 'Mode 1' which is the production of theoretical knowledge to 'mode 2' which is research that results in practical knowledge (Fisher and Klien, 2003). 'Mode 2' research is associated with a more interdisciplinary, pluralistic, 'network' innovation systems in contrast to the previous system in which major corporations or academic institutions were less closely linked with other social institutions. These changes were due to several reasons: firstly, central governments reduced the amount of funding to their universities in real terms since the early 1980s (Bower, 1992; Etzkowitz, 2002). Universities have been encouraged by their governments to raise funding from third party sources. One of the effects of this policy is it has encouraged universities to review their R & D activities and aimed their efforts into increasing the exploitation of their intellectual properties through licensing to established companies or to new spin-off companies (Bower, 1992; Malecki, 1997; Lazzeroni and Piccaluga, 2003). Secondly, the modern mission of universities involves multiple roles and objectives (Lazzeroni and Piccaluga, 2003). They need to commit to quality teaching and research, but at the same time they need to be innovative and be involved in their local regional development (Young, 2004). Thirdly, many governments provide special funding programmes for specific purposes, such as incubator facilities for new local enterprises and introducing patenting laws such as the Bayh-Dole Act in the US universities and the devolution of the rights from the state-agency British Technology Group (BTG) to facilitate commercialisation process. The UK's University Challenge Funds and Scotland's Proof of Concept Fund are given to universities to develop inventions up to prototype level (Etzkowitz, 2000, 2002; Lambert 2003). In 1980, the US Supreme Court has allowed engineered micro organisms to be patented, resulting in an explosion of research activities in genetic engineering and biotechnology fields. These new laws also created a new phenomenon where universities got into patenting and commercialisation activities in a big way bringing them towards being entrepreneurial universities.