

## Chapter 3

# From vocational educational institutions to entrepreneurially-oriented higher education institutions: the case of the Finnish universities of applied sciences

Anu Lyytinen

### Introduction

The establishment of the Finnish polytechnic system<sup>1</sup> – which nowadays uses the English translation “university of applied sciences” (hereafter UAS) – was the largest reform of the Finnish higher education system during the 1990s (see Raivola et al. 2001). As in many other European countries, the Finnish universities of applied sciences were established alongside the science universities to represent the professional and practice oriented form of higher education aiming to meet the specific needs of the labour market and regional economies. (Kyvik 2008, 173; de Lourdes Machado et al. 2008, 251, 255; Salminen 1997, 312–325; Teichler 2008, 4.) In Finland, the

1. The Finnish *ammattikorkeakoulu* does not have an exact foreign role model in other countries. Accordingly the term *ammattikorkeakoulu* has no direct English translation. The term “polytechnic” was widely used in early stage and it has been the most established term and counterpart for the *ammattikorkeakoulu* in official parlance: e.g. Finnish Ministry of Education and Culture uses the term “polytechnic”. However, the term has pointed out to be problematic in international contexts because in other countries polytechnic nowadays generally refers to any vocational education, especially secondary level vocational education (The Universities of Applied Sciences Network for the Development of Internationalisation 2006). When several European countries, for example the Netherlands, Germany and Austria, decided to use the English translation of “University of Applied Sciences” for their equivalent professional higher education institutions, the Rectors’ Conference of Finnish Universities of Applied Sciences made a recommendation to Finnish AMKs in 9.12.2005 to use the term University of Applied Sciences. (The Rectors’ Conference of Universities of Applied Sciences 2007.) The term “University of Applied Sciences” is used in this article.

goal was specifically to respond to the new requirements for professional skills, to develop the quality and standard of education as well as to improve its international comparability, regional impact and the administrative capacity of education system. (Government bill 319/1994 and 206/2002; Salminen 1997, 312–325.)

The UAS system was constructed by merging and upgrading the former post-secondary and higher vocational level educational institutions into the system of universities of applied sciences which originally consisted of 29 UASs operating under the administration of the Finnish Ministry of Education. Nowadays the number of UASs has decreased to 25 due to mergers. The particular aim of the UAS reform as well as the later reforms of the legislation has been to strengthen the capacity of the UASs to flexibly respond to the needs and changes of the labour markets, the business sector and regional development. (Government bill 319/1994.)

During the 1990's also researchers became interested in understanding and redefining the changing role of the higher education institutions in the knowledge-based society (Miettinen & Tuunainen 2006, 16). The Triple Helix of university-industry-government relations (Etzkowitz & Leydesdorff 1997), the entrepreneurial and enterprise university models (e.g. Clark 1998, 2004; Marginson & Considine 2000) the concept of academic capitalism (Slaughter & Leslie 1997) as well as the Mode 1 - Mode 2 thesis (Gibbons et al. 1994) represent the best known conceptualisations to illuminate the rapprochement of the universities and the society from the different viewpoints (see also Miettinen & Tuunainen 2006). These conceptualisations have been further developed, complemented and applied in studying the changes, especially in universities and research in different countries. (e.g. Benner & Sandström 2000; Etzkowitz et al. 2000; Etzkowitz & Klofsten 2005; Kaukonen & Nieminen 1999; Nieminen 2005; Ylijoki et al. 2011.) However, there is less research applying these conceptualisations to investigating universities of applied sciences even if co-operation and close relationships with business and industry are, or should be, particularly characteristic of them. This article aims to fill this research gap. By way of three case examples it illustrates how the Finnish universities of applied sciences have built their capacities and transformed their practices to become regionally responsive higher education institutions. The organisational transformation dimensions of the entrepreneurial university (Clark 1998) are used as a framework for analysing and reflecting the senior institutional management and regional stakeholders' views of capacity building.

## Background

It has been characteristic of the higher education systems in Europe that the introduction of a social or entrepreneurial role for higher education institutions has been a top-down phenomenon in which the role of the European Union and national governments in steering the development has been essential (Etzkowitz 2003; Mowery & Sampat 2005). In Finland, the establishment of the system of universities of applied sciences was dated to the same point of time – 1990's – when the concept of national innovation system was adopted into the political agenda as the comprehensive tool for analysing and assessing the functions of higher education, science and technology systems by the Science and Technology Policy Council of Finland. It meant that the development of science and technology, but also of higher education, was adopted as the core of societal development and the social role of higher education institutions started to be analysed from the viewpoint of innovation systems. (Hakala et al. 2003, 32–33; Lemola 2001, 45; Miettinen 2002, 60–61, 68; Nieminen 2005, 13–14, 57; Science and Technology Policy Council 1990, 21–23.)

The regional dimension of the innovation policy strengthened in Finland during the 1990's, particularly as a consequence of the visible role of the European Union and its structural funds (Lemola 1999, 133–134). As in many other European countries, one of the essential justifications of the establishment of the Finnish universities of applied sciences was their expected contribution to social and economic development of the regions, especially as the partner of the small and medium-sized companies. (cf. de Lourdes Machado et al. 2008, 252; Government bill 319/1994.)

In order to create flexible frames through which to co-operate with companies and industry, the steering systems of the UASs have been reformed step by step (see Government bill 206/2002). The first Act on Polytechnic Studies (255/1995) was decreed in 1995. According to the Act the aim of the UAS studies was to provide necessary knowledge and skills, based on the requirements of the working life and its development, to work in professional tasks of an expert. Within the limits of the teaching task the act also allowed UASs to pursue research and development that serves UAS teaching and supports working life. The permanent status of the UASs – granted between 1996 and 2000 – strengthened their options for developing and directing activities and relationships with their environment (Maljojoki 2002, 216, 231). The legislative reform of 2003 further improved the operating options and regional responsibilities of the universities of applied sciences. The Polytechnics Act (351/2003) expanded the tasks of universities of applied sciences by elevating applied research and development to the same level as UAS's basic tasks, parallel with teaching. According to the Act, “the universities of applied sciences have to offer

teaching which responds to the demands of the working life and its development, as well as being based on research and artistic starting points leading to the professional tasks of an expert”. In addition, the task of the universities of applied sciences is “to carry out applied research and development that serves UAS education, supports the world of work and regional development, and takes the industrial structure of the region into account”. The Act also defines the relationships of the UASs with their environment and external stakeholders by decreeing that UASs have to co-operate with the representatives of business and working life, especially in their own region, as well as with the Finnish and foreign higher education institutions and other educational institutions.

The development goals of the UASs’ regional development and innovation activities have been specified in The Development Plan for Education and Research (2003–2008) by the government as well as the reviews of Science and Technology Policy Council (2000, 2003, 2006). Both of these emphasise the regional responsibility of the universities of applied sciences, particularly in supporting small and medium-sized enterprises by providing education and services to SMEs. They also highlight that UAS networks and interaction with different partners, especially universities and university consortia, have to be increased in regional innovation activities. (Ministry of Education 2004, 45–46, 55; Science and Technology Policy Council 2000, 24, 51; 2003, 21, 40; 2006, 47, 49.)

## Entrepreneurial transformation in higher education institutions

The transformation of higher education institutions in innovation systems has been increasingly examined from different viewpoints during the last two decades. Researchers have made numerous attempts to understand and explain how higher education institutions and science change as part of the knowledge-based society, national and regional innovation systems. (Miettinen & Tuunainen 2006, 16; Mowery & Sampat 2005.) The best known and most influential attempts to redefine and describe the new social or entrepreneurial role of higher education institutions and science include the conceptualisations of the Triple Helix thesis illustrating the institutional convergence among universities, industry and government (Etzkowitz & Leydesdorff 1997); the entrepreneurial and enterprise universities’ models which focus on changes in the organisation, management and governance of universities (e.g. Clark 1998, 2004; Marginson & Considine 2000); and the concept of academic capitalism, which refers to market-like behaviour of institutions and faculty

in the form of competition for external financial resources (Slaughter & Leslie 1997). The changes in science and research have been illustrated as the shift from Mode 1 disciplinary-based, basic research to more multidisciplinary, applied and problem-oriented Mode 2 type research (Gibbons et al. 1994). (see also Miettinen & Tuunainen 2006, 16.)

The literature on entrepreneurial universities offers one framework for analysing changes in organisation and governance of higher education institutions. One of the pioneering studies on entrepreneurial universities is Burton Clark's (1998) study *Creating Entrepreneurial Universities: Organizational Pathways of Transformation*. Since then, the number of studies in the field has increased and the conceptualisations of the enterprise university or the entrepreneurial university have been further elaborated and applied to studying changes in the organisation of universities (e.g. Clark 2004; Etzkowitz et al. 2000; Jacob et al. 2003; Marginson & Considine 2000; Shattock 2005; Williams 2003; Williams & Kitakaev 2005).

In Clark's (1998) study "entrepreneurial" refers to the characteristic of social system that is higher education institutions, faculties and schools. With the entrepreneurial university he refers to active efforts of higher education institutions/their units in institution-building and innovating that require taking risks. (Clark 1998, 3–4.) The basic assumption of Clark is that there is a growing imbalance between the environmental demands and the institutions' capacity to respond. Accordingly there is a need to transform the organisational elements of higher education institutions to strengthen their capacity to respond more flexibly and selectively to changes taking place both in the external environment and in the knowledge domain of higher education institutions. Clark studied the organisational pathways of universities in an entrepreneurial direction through five case studies of English, Dutch, Scottish, Swedish and Finnish universities. As a result of the case studies, he summarised five organisational elements that he concluded to be important in transforming universities for more entrepreneurial ways of action. These elements are the strengthened steering core, the expanded developmental periphery, the diversified funding base, the stimulated academic heartland and the integrated entrepreneurial culture. (Clark 1998.)

According to Clark (1998) 'strengthened steering core' refers to a higher education institution's efforts to strengthen and systematise its managerial capacities. Although the strengthened steering core may assume different forms, it is essential that it should include both central managerial and academic groups to reconcile the managerial values with traditional academic ones. It is also characteristic of the entrepreneurial university to create outreach units, programmes and other linkages that cross the traditional organisational boundaries to link up with external actors

and groups. Clark calls this the 'expanded developmental periphery'. These boundary structures mediate between academic departments and the external environment by promoting new competencies or generating income, for example. Respectively, 'a diversified funding base' can enhance the self-regulative capacities of higher education institutions and create opportunities to make moves. Clark emphasises particularly second and third stream funding sources, referring to funding from different external financiers. To initiate change, the essential question also is how the activities of the academic units – which are typically formed around disciplines or fields of education – are stimulated by reaching the external environment, for example with new relationships and attracting income from second and third-stream funding sources. As the integrative concept, Clark uses the 'integrated entrepreneurial culture' meaning that enterprising universities also develop a work culture that embraces change. (Clark 1998, 3–8.)

## Method and data

This article is based on the case studies of three<sup>2</sup> Finnish Universities of Applied Sciences: Seinäjoki UAS, Satakunta UAS, Jyväskylä UAS (Lyytinen 2011). All the case UASs have been operating as UAS for about the same length of time: they were granted the permanent operating licence either in 1996 or in 1997 (National Board of Education 2003, 137, 139, 146, 148). The UASs were medium-sized, multidisciplinary and regional higher education institutions, but they were located in different regional innovation environments, which meant that they provided differing and complementary perspectives on the research problem. (e.g. Yin 2004.)

The analysis of the article is based on empirical data collected between 2003–2005 by stakeholder analysis carried out in each region as well as the thematic interviews with the senior institutional management of the case UASs. The specific aim of the stakeholder analyses was to outline the interactive relations and activities that link universities of applied sciences to other actors and organisations of the regional innovation environment. The participants of the stakeholder analyses were the rectors of the case UASs, the directors of business development of the respective towns, the managing directors of the technology centres, the regional development directors of the Regional Councils, the heads of the technology units of the res-

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2. The study was originally based on the multiple-case study design in four UASs. However, Tampere University of Applied Sciences merged with Pirkanmaa University of Applied Sciences on 1.1.2010 after the data collection of the study. That means Tampere UAS does not exist anymore in its original form. To avoid misunderstandings Tampere UAS has been left out from the analysis of this article.

pective Employment and Economic Development centres as well as the research liaison officers or equivalent from the universities or university consortia (coded as SA4–SA15). These individuals bear the formal responsibility for participating in regional development. The thematic interviews concentrated more on the internal dynamics of capacity building (organising, management and governance) inside the case UASs. The interviewees were directors, development directors, research directors, education managers as well as research and development managers of the case UASs (coded as I3–I10). The documentary data, including regional co-operation strategies of higher education institutions and internal regulations of the case UASs, was used as the support material.

The organisational transformation dimensions – especially strengthening the steering core, extension of the outreach structures and stimulation of the academic activities – of the entrepreneurial university (Clark 1998) are used as the framework for analysing and reflecting the senior institutional management and regional stakeholders' views on how the Finnish universities of applied sciences have built their capacity and transformed their practices to become regionally responsive higher education institutions.

## Transformation in the case institutions

**Seinäjoki University of Applied Sciences** has been composed of ten previous post-secondary level vocational educational institutions (National Board of Education 2003, 148). It has profiled itself as a regional higher education institution that offers teaching and services in seven fields of education in six geographically dispersed localities in South Ostrobothnia which is a province in the western part of Finland. The licence holder of the Seinäjoki University of Applied Sciences is the Seinäjoki Joint Municipal Authority for Education which is owned by 14 municipalities. (I5; National Board of Education 2003, 148.)

The rector of the Seinäjoki UAS is the chair of the Joint Municipal Authority for Education, which administers both UAS and secondary level education that makes the rector's position strong. According to interviewee I5, by dividing its academic activities into two result areas: the teaching result area and the research and development result area, the UAS wanted to separate the traditional teaching activities (UAS degrees, UAS master's degrees, some professional specialisation studies) financed by first stream unit price funding of the Ministry of Education from research and the development and paid service activities that are financed mainly by external second

and third stream funding sources. A vice-rector is responsible for teaching result area and a research director was appointed to be part of the central administration and in charge of the research and development result area. (I5.)

It seems that, as it is typical in a multidisciplinary and geographically dispersed UAS, the challenge of Seinäjoki UAS is to seek balance between the centralised solutions and schools' freedom of choices (see Auvinen et al. 2005, 108). Interviewees I5 and I6 emphasised, that characteristic for the UAS is that the decision-making is decentralised and the schools have a lot of autonomy to decide on their own issues: The schools are responsibility centres and responsible for their own results and nowadays need even more to call attention to selecting their strengths and fields of expertise. According to interviewee I5, the senior institutional management wants to enable uniqueness and differences of the fields of education but interviewee also emphasised that it is important that the UAS has a certain level of target and that it shows itself as an integrated higher education institution. To build an integrated higher education institution and culture, the UAS increasingly aims at creating common administrative practices and internal policies. Governing bodies, such as the UAS Board and the Heads of Schools Meeting, have been according to interviewee I5 "ways through which the UAS aims at establishing cohesion".

It was noted by interviewee I5, that the good financial standing of the Joint Municipal Authority and the commitment and financial support of the owner municipalities have made it possible to generate surpluses for the Joint Municipal Authority for Education to add to the development fund. This has helped the UAS to build reserves which it has used to make investments in new technology infrastructure (e.g. Mediwest Health Technology Centre and Nikkarikeskus Development Centre), financing professorships of the South Ostrobothnian University Network EPANET in the research fields that are important for the purposes of the UAS' teaching activities as well as to stimulate its own academic capacity. It was evaluated by the representative of the UAS and regional actors SA11 and SA14 that through its activeness and the investments the UAS have had an influential role in building and reforming the regional innovation system. According to interviewee I5 the senior institutional management has aspired to manage so that senior lecturers would have connection to EPANET professors. Interviewees I5 and I6 highlighted that through the development fund the UAS has also allocated resources to fund staff members' study leave for undertaking postgraduate study. (SA14; see also Riukulehto 2007, 132, 138.)

As it is typical in higher education institutions each of the schools of the UAS has connections and orientation of its own to the environment and launching teaching, applied research and development activities in co-operation or to the needs of the



external customers vary between the schools and fields of education. The traditions of the previous vocational educational institutions still reflect in background. (I5; I7; see also Clark 1998, 141; Clark 1983; Marttila et al. 2005, 8.) According to interviewee I5, the adoption of new work culture and practices, such as new project-based educational methods, is often easier for younger teachers.

The School of Health Care and Social Work as well as the School of Agriculture and Forestry were mentioned by interviewee I5 as the examples of the units that have been actively involved in long-term development of their expertise and collaboration with external partners. In the early stage the UAS also had a separate Social and Health Care Research and Development Centre, which was located in Mediwest Health Technology Centre and specialised in providing research, development, education and consultancy services to external clients and partners in co-operation. However, interviewees I5 and I7 noted that the problem with such units were that they were too loosely linked to academic units (see also Marttila et al. 2005, 32–33). According to interviewee I6, the separate units were also under pressure to be economically effective: they should achieve at least a “plus minus zero” situation even if they do not generate income. The role of the School of Agriculture and Forestry had been especially important in a situation in which the region, with its long agricultural tradition, had tried to adapt to the challenges posed by the European Union and its regional policy. (I5; SA14; see also Riukulehto 2007, 81.) The field of technology has a long tradition of co-operation with companies. According to interviewee I7, the establishment of the degree programmes of the School of Engineering had been based on the needs of the companies and corresponded to the industries represented in the region.

**Satakunta University of Applied Sciences** comprised 13 previous post-secondary level vocational educational institutions which nowadays form a multidisciplinary UAS with three faculties offering teaching in five fields of education in five municipalities in the Satakunta which is the province in south-western Finland. The licence holder of the UAS is the City of Pori. (National Board of Education 2003, 137.)

The operation principle of the Satakunta UAS is to serve the region. According to interviewee I8, the UAS was willing to take an active role as a regional developer in a situation where it was the first and only higher education institution in Satakunta province and companies needed research and product development expertise. It was argued by interviewee SA9 that to respond to the local needs the UAS has developed its structures from the beginning: the common O’Sata Research and Development was established in 1997 as the unit to sell contract research and development services to the business sector. It served as the intermediary in transferring the knowledge

and expertise of the UAS to the companies and business life. In addition to O'Sata unit, the evaluation of the representative of the UAS's and regional actors' SA7, SA8 and SA9 was that the important services and knowledge mediation mechanism of Satakunta UAS to other regional actors mainly take the shape of an O'Sata Enterprise Accelerator, a research and development environments, and an expertise exchange.

It can be said that in the administrative sense the O'Sata increased the unity and promoted an integrated administrative culture within the new multidisciplinary UAS by creating a common channel for academic services as well as bringing operating principles to the whole organisation. Interviewee SA9 noted that this was particularly important in the initial situation when each educational unit had its own culture and traditions as an individual educational institution. Accordingly, the funding applications of the different units could have overlapped and funding decisions might have been in conflict with the UAS's common strategic and operating principles.

As interviewee I8 argued, the educational units have traditionally been strong in Satakunta UAS but through the strategic steering the position of the faculties has been strengthened. This means that the Faculties of Business and Culture, Social Sciences and Health Care, and Technology and Maritime Management are accountable basic units. The full-time deans were appointed to faculties in 1999. As the heads of these basic units, deans have become responsible for budgets and academic activities in their fields. They are direct subordinates of the rector of the UAS. (Malinen et al. 2009, 14–15; Satakunnan ammattikorkeakoulu 2005; Satakunnan ammattikorkeakoulu 2000.) The deans also participate in decision-making in central governing bodies: management group and research council. It seems that these governing bodies have had an important role in building a shared administrative culture and collective choices. One dean characterised decision-making in research council as “collegial and democratic approach that ensures that others' issues are approved and that people are committed to these issues”. Another interviewee I9 considered it as important that several people – the rector, development director, financial director, deans and the director of continuing education – participate in decision-making in the management group because in that case they are not so vulnerable to environmental pressures.

It was argued by interviewee I9 that in present situation the strategy controls the activities of the faculties more than in earlier times. The strategies were formulated by using the same frames in all faculties. In addition to the common focus areas of the UAS, each faculty has profiled and chosen its focus areas. The idea is, for example, that the search for partners in co-operation and external funding sources is concentrated in these areas. However, as it is typical in higher education institutions, the faculties and fields of education are in different development path in terms of

their attitudes to and involvement in external relationships (see also Clark 1988, 141–142). According to interviewees SA9 and I9, the field of technology has the longest tradition in contracting and working on joint projects with individual business and industry customers as well as academic co-operation with the corresponding university unit. Instead, the challenge of the social services and health care sector had traditionally been in seeking external clients able to pay for their services even though the funding prospects had improved in recent years. (I8; I9; SA9; see also Slaughter & Leslie 1997.)

**Jyväskylä University of Applied Sciences** expanded in several stages by the extension of its operating licence (Suosara 2007, 132). In its entirety UAS has been composed of 12 previous post-secondary level vocational educational institutions which nowadays form a multidisciplinary UAS that offers teaching in seven fields of education in eight schools and operates in three localities in Central Finland (National Board of Education 2003, 146). In contrast to the other case UASs, Jyväskylä UAS is a privately owned higher education institution. Its licence holder is Jyväskylä University of Applied Sciences Ltd. whose ownership is divided between the City of Jyväskylä and three Joint Municipal Authorities for Education. In spite of the form of the maintaining organisation, the owners of the limited company are public organisations and the public funding from state budget is the main funding source of the Jyväskylä UAS as well as other Finnish UASs (see also Kohtamäki 2009, 41).

In the limited company, the rector has a strong position: He is the rector of the UAS as well as the chief executive officer of the limited company. According to interviewee I3, the management style of Jyväskylä UAS is based essentially on line authority between the rector, the heads of schools and the research and development managers and education managers of schools: The schools are the responsibility centres and the heads of the schools are responsible for the strategy and resources of the unit. They report and relate directly to the rector through the performance negotiation mechanism: meaning that the rector and the head of each school negotiate annually about the targets and the results of the school. Regional engagement is part of the research and development and education processes under evaluation. As the example of the recent organisational transformation interviewee I3 mentioned the appointment of the full-time and part-time research and development managers to each school in subordination of the head of the school to be responsible for co-ordination of research and regional development, managing project portfolio as well as stakeholder and customer relations. (I3; I10; see also Jyväskylän ammattikorkeakoulu 2005.)

The representative of the UAS and the regional actors SA4, SA5 and SA6 evaluated that the linkages of the Jyväskylä UAS to other regional actors take the diverse forms of relationships and co-operation with companies and public organisations. The schools and fields of education also had different practices of looking for outreach (see also Tulkki & Lyytinen 2001, 50). However, the UAS had also encountered several challenges: both the representative of the UAS and the regional actors evaluated that the strategic challenge has been how to reflect the impacts of the activities of the UAS on the whole province and how to obtain information about regional needs and enter into contracts with new company groups that do not know UAS. Establishing a provincial learning place network with the University of Jyväskylä, the Vocational Institute, VTT Technical Research Centre of Finland, and the Technology Centre has been one outreach response to share and obtain information, especially about the needs of the small and medium-sized companies and to increase interaction between education institutions and companies. The major internal challenges have been – according to interviewee I3 – how the operation culture which has its origins in traditions and practices of educational institution accepts change and what kind of incentive systems ought to be developed in the UAS context.

The representatives of the UAS and regional actors characterised that, the School of Technology had a long tradition in co-operation with companies: It had specialised particularly in applied research and the development of companies' processes, while the orientations of the other fields of education were more on incremental development of working life. The Institute of Natural Resources as well as the School of Social and Health Care were mentioned as the examples – by interviewees I3 and SA6 – of the units which had actively and purposefully been involved in external relationships. The Institute of Natural Resources had profiled itself particularly on regional development work and projects which constituted a large share of its activities and generated about half of the institute's income. According to interviewee SA6, the School of Social and Health Care is actively involved in co-operative ventures particularly with public organisations, especially with the Central Finland Health Care District, which was its main customer. The interviewee also noted that because the social and health care markets were more focused on public sector co-operation and development projects, the school had had challenges to find external financiers and therefore it had used mainly student labour force. The UAS's School of Business Administration had been involved in the *Tiimiakatemia* entrepreneurship programme specialising in entrepreneurship education whereas the School of Tourism, Catering and Domestic Services had participated in two national network centres of expertise: the Centre of Expertise in

the Food Industry in Central Finland and the Centre of Expertise for Tourism being in charge of Wellbeing Tourism. (SA5; SA6; I3; I10; see also Jyväskylän yliopisto ja Jyväskylän ammattikorkeakoulu 2002, 18–21; Suosara 2007, 132.)

## Conclusions and discussion

This chapter discusses – in the light of the case examples – how the organisational transformation dimensions of entrepreneurial university (Clark 1998) illustrate the capacity building of the Finnish UASs for regional engagement and what kind of challenges the UASs have encountered on their way from the vocational educational institutions to regionally responsive higher education institutions.

Although there were differences between the universities of applied sciences, the results of the study showed that, all the UASs have built their capacities for regional engagement in ways that reflect the intensification of entrepreneurial modes of action. The UASs have strengthened their managerial capacities: The position and task specialisation of the senior institutional management and middle-management has been strengthened and new managerial positions have been established the task of which increasingly include responsibilities for arranging external funding and managing stakeholder and customer relationships. The UASs have also passed the responsibilities down to schools in which the deans or the heads of the schools have a central position. (cf. also Clark 1998; Marginson & Considine 2000; Marttila et al. 2005.) At the same time, the central governing boards – consisting of the representatives of the senior institutional management, schools and units – have acted as the important forums for preparing collective choices and building a shared culture and common practices for the whole higher education institution (cf. Clark 1998; Schein 1992). This has been particularly important in the situation in which most of the Finnish UASs are multi-campus institutions which have been composed of several previous post-secondary level vocational educational institutions with their own histories and traditions.

It seems that the regional responsibilities have even encouraged the schools to search for their diversified profiles and fields of know-how, raise additional funds and establish linkages to other actors yet the strategies and targets direct the activities more than in earlier times. It can be said that 'the expanded developmental peripheries' are mainly blended in with 'the academic heartlands' of the UASs. The research results revealed that the established outreach structures and linkages – R&D units, research and development environments, enterprise accelerator, expert

exchange, technology infrastructure, learning place network, centres of expertises – intermediated and transferred knowledge and information as well as facilitated mutual learning between the UAS and the environment.

Nevertheless, as it is typical for higher education institutions and observed also in other studies mainly in university context (e.g. Clark 1983; Clark 1998, 141–142; Slaughter & Leslie 1997; Lyytinen et al. 2008, 62–63; Ylijoki et al. 2011), the fields of education differ from each other in terms of how close they are to the external environment and how easy and characteristic it is for them to adopt entrepreneurial behaviour in the form of contracting with the external partners or acquiring third and second stream funding sources. However, regardless of the field of education, purposeful and persevering orientation was considered to be the common denominator behind the successful units. The special challenge of the UASs has also been that alongside with establishing linkages to business life, they have built their capacity and transformed their practices originating from the traditions of the teaching only vocational educational institutions towards the practices of higher education institutions which also conduct applied research and are involved in development work. This has encouraged the teaching staff of the UASs to strengthen their relationships with universities and pursue postgraduate studies. The challenge for the senior institutional management of the UAS has been to develop organisational frameworks, e.g. personnel policy and incentives that support the realisation of the research work.

Even if Clark's transformation elements are challenges which have been faced by Finnish universities of applied sciences in one way or another, and even though the universities of applied sciences have been given a pronounced role as regionally responsive higher education institutions, there are some limitations to the applicability of Clark's concepts to UAS institutions.

First of all, the history of the Finnish universities of applied sciences as multidisciplinary higher education institutions is still short. They have been operating on a permanent basis only since 2000 and the new tasks were confirmed in August 2003. Thus, the UASs are still seeking their 'shape'.

Secondly, Clark's concepts were developed and applied in the university context; however, the mission, tasks and history of the universities of applied sciences are somehow different. Even if the steering and governance of the Finnish universities of applied sciences have moved closer to the university sector in recent years, the UASs lack the traditions of academic authority and the scientific basis enjoyed by universities. It is argued that instead of academic values, the Finnish universities of applied sciences are driven more by political and entrepreneurial values (Larsen et al. 2009, 52). It can be said that in the context of the Finnish universities of app-

lied sciences the question is not so much about the transformation from academic institution to a more entrepreneurially-oriented institution but rather about a large transformation from being vocational educational institutions to multidisciplinary and entrepreneurially-oriented higher education institutions. The process towards an entrepreneurial institution is still under way. The central goal of the present UAS reform 2011–2012 is to strengthen the preconditions of the UASs to respond – through their teaching, research and development – more independently and flexibly to the changing development needs of working life, society and regions (Ministry of Education and Culture 2012).

Thirdly, although the governance model of the Finnish higher education institutions is moved closer to the enterprise sector, the universities of applied sciences and other higher education institutions have had and continue to have a strong public mission in Finland compared to the higher education institutions closest to Clark, such as the United States and the United Kingdom. In those countries, entrepreneurship has emerged bottom-up due to a lack of centralised control. In Finland entrepreneurship is rather a top-down phenomenon and has come as a result of central government regulation (cf. Mowery & Sampat 2005; Etzkowitz 2003). Therefore, the challenge for the Finnish universities of applied sciences can be set to build entrepreneurial modes of action that are appropriate to Finnish culture and society as well as the needs of their respective regions.

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