Supporting university–industry linkages

A case study of the relationship between the organizational and individual levels

Nisha Korff, Peter van der Sijde, Peter Groenewegen and Todd Davey

Abstract: The literature emphasizes the importance of ensuring that measures developed at the organizational level are transferable to the individual level. This is important not only for effective technology and knowledge transfer in general, but also and especially for university–industry linkages. This study reflects on support mechanisms identified by previous studies as important in the support and fostering of such linkages and examines their implementation through a case study of the Münster University of Applied Sciences. Using qualitative analysis, the authors demonstrate how the support mechanisms developed by the management of the university can be translated to the individual level and thereby can encourage and foster university–industry linkages.

Keywords: university–industry linkages; technology transfer; knowledge transfer; support mechanisms; organizational level; individual level

The need for universities to contribute to ‘innovation and social change’ (Gulbrandsen and Slipersaeter, 2007, p 112), through knowledge and technology transfer in cooperation and symbiosis with government and business, is putting them under increasing pressure (Etzkowitz and Leydesdorff, 2000). Whilst the university’s first and second missions of teaching and research have long been recognized, it is the more recent third mission of the university – interaction with and contribution to industry and society (Etzkowitz, 1998; Etzkowitz and Leydesdorff, 2000; Slaughter and Leslie, 1997) – that is now receiving greater attention. In this respect university–industry linkages (UILs) present a lucrative way to generate additional value for universities.¹ University management increasingly pursues the third mission by promoting and implementing strategies to encourage and support UIL activities (Gulbrandsen and Slipersaeter, 2007).

Much of the UIL literature refers predominantly to UILs as commercialization activities (patenting and licensing) and with regard to the creation of start-ups (Göktepe-Hulten and Mahagaonkar, 2009; D’Este and Patel, 2007). This present study does not limit UIL activities to these but refers to all types of UIL activities...
as identified in Davey, Baaken, Galán-Muros et al (2011, p 27): ‘collaboration in R&D, commercializing R&D results, mobility of students and staff, curriculum development and delivery, entrepreneurship, governance and lifelong learning’. In this manner, introducing UILs is considered as an institutional change process in the sense that internal logic and the external legitimation of universities are transformed. UILs can therefore be regarded as both a specific activity and as a type of an alliance between two parties, given the definition of the term alliance by Gulati (1998, p 293) – ‘a voluntary agreement between firms involving exchange, sharing, or co-development of products, technologies, or services, which can occur as a result of a wide range of motives and goals’. For the purposes of this paper the activities conducted within an alliance are subsumed under the term UILs, which thus refers to general collaboration between a university and industry partner. This choice is made because for any UIL activity to function a certain level of collaboration – alliance – between a university and an industry partner needs to be present. An alliance is therefore a prerequisite for any UIL activities.

UILs involve many different stakeholder groups and require a large amount of coordination (Siegel et al, 2003b). This is true not only for stakeholders external to the university but also for stakeholders within the university such as students, academics, the university itself, the management and other employees (Geissler et al, 2006; Siegel and Phan, 2005). Because each stakeholder group engages in UILs for different reasons and has different perspectives, it is even more important to have appropriate policies in place (Siegel and Phan, 2005). It is therefore the task of university management to develop and implement supporting mechanisms to encourage engagement, especially by academics, in these linkages (Geissler et al, 2006). Taking on the additional task of developing support mechanisms, and implementing them, requires the university to transform into an institution in which UIL activities are encouraged, supported and fostered for all relevant stakeholders (Ambos et al, 2008).

The approach of this paper extends that of research studies which suggest that, for a better understanding of knowledge transfer, three aspects need to be considered – institutional, organizational and individual (Phan and Siegel, 2006). Here, the institutional factor incorporates aspects such as policies and incentive systems; the organizational aspect refers to the legal status and information flows of the university; and the individual factor considers the characteristics of the individuals involved in KTT (Phan and Siegel, 2006). However, it should be noted that throughout the paper no distinction is made between the institutional and organizational factors; both are classified as organizational factors. With regard to the alignment of the organizational level and the individual level in UILs specifically, several discrepancies were identified. These discrepancies were especially visible in the strategies implemented by university managers and the perceptions of the managers of academic researchers, as well as in the motives at organizational and individual levels for engaging in UIL activities (Davey, Baaken, Galán-Muros et al, 2011). It seems that because much of UIL is anchored in and supported by the organizational bureaucracy this mismatch indicates a gap between the university management (organizational level) and academics (individual level). This supposition is supported by the work of Bromley and Powell (2012), who introduced the concept of decoupling. In the case of UILs, ‘means-end decoupling’ refers to the relationship between implemented policies and uncertain outcomes (Bromley and Powell, 2012). Means-end decoupling is therefore the most appropriate process to consider when discussing support mechanisms implemented at the organizational level but which do not lead to the intended outcome at the individual level, as is the case with UILs.

Adding to the difficulty of developing structures at the organizational level and implementing them at the individual level for driving UIL activities (Debackere and Veugelers, 2005; Friedman and Silberman, 2003; Geuna and Muscio, 2009; Markman et al, 2004) is the fact that although mechanisms for encouraging UILs are put in place at the organizational level, individuals may actually not be involved in UIL activities due to missing activities designed to change the culture in the university and at the individual level (Azagra-Caro et al, 2006). For this reason, there needs to be a greater understanding of individual attitudes and behaviours in achieving the university’s third mission. The tasks required of academics are frequently dealt with only implicitly in the changing role of universities (Coaldale and Stedman, 1999). They now have the additional responsibility of interacting with industry and commercialization: this implies that university management needs to establish structures that incorporate the change of roles on both levels and to implement structures that acknowledge the interrelationship of the levels.

Based on the above, we will now focus on how the organizational level – university management – can relate and operationalize mechanisms for encouraging and fostering UIL activities at the individual level. The current paper seeks to answer this question by reviewing the literature and providing a comprehensive analysis of one specific case.
The paper is structured as follows. First, the extant literature is reviewed, to establish a background on the support mechanisms that the university management implemented to encourage academic researchers to engage in UILs. Based on this review a framework is developed, to describe and analyse the case of Münster University of Applied Sciences (MUAS). A discussion of the case study and the literature follows; and the paper ends with conclusions, limitations and suggestions for further research.

Background

Relevance for establishing support mechanisms for UILs

In the last 30 years, the technology transfer industry has become established and, in particular in the USA, has grown as an outcome of legal changes arising from enactment of the Bayh–Dole Act which, in brief, gave universities ownership of their research outputs (D’Este and Perkmann, 2011). With potentially large sums of money at stake, university policymakers sought ways to support or encourage commercialization of knowledge and technologies. Research on support mechanisms for UILs has typically focused on mechanisms supporting the transfer of technologies, such as technology transfer offices (TTOs) and incubators (Plewa et al, 2006). However, with an understanding that there is latent value remaining untapped in other types of UILs, and on the basis of concepts such as the entrepreneurial university (Gibb and Hannon, 2005) and the engaged university (Holland, 2001; Chatterton and Goddard, 2000), increasing attention has been given, albeit still at relatively low levels, to how UILs can be supported (Plewa et al, 2006).

The literature shows that support mechanisms are designed to address a number of key areas of UILs. From a top-down perspective there should be favourable organizational UIL frameworks and conditions, provision of a suitable structure of incentives for universities and removal of barriers to UILs, complemented by highlighting how universities and businesses can better understand the challenges of UILs (Tornatzky et al, 2002). From a bottom-up perspective the mechanisms should seek to overcome barriers to UILs and enable the drivers of UILs, whilst also offering appropriate incentives to individual academics. In discussing the merits of the top-down and bottom-up approaches, Ponomariov (2008) and Ponomariov and Boardman (2008) contend that most policy efforts to facilitate collaboration are directed at institutions, aiming to formalize such interaction through boundary-spanning arrangements, rather than at individual academics. As a result, most efforts neglect the fact that UILs are supported and operated by people. These authors therefore argue that support mechanisms for individuals need to be developed, because it is interactions and exchanges between individuals that characterize UILs. Incorporating the individual in policy formulations can result in a focus on the desired behavioural changes in individuals that will benefit the UIL’s activities (Ponomariov, 2008). As such, it is even more important to implement support mechanisms targeted at both the institution and the individual and avoiding friction between the two. In doing so, both levels can be interlinked with each other and UILs can be strengthened. Adding to this observation, Henrekson and Rosenberg (2001) recognized that there is also a need to align support mechanisms with the type of collaboration. Potential support mechanisms addressing this point are covered below.

Ambos et al (2008) suggest that in terms of policy implementation universities face tensions on the organizational and individual levels. Not only does the university need to manage the additional task of commercializing research results (besides academic research), but also the individual must balance the time needed for conducting pure academic activities and the time needed for entrepreneurial UIL activities. The tension on both levels presents university management with interest/priority conflicts and, as a result, problems in the formulation and development of appropriate structures and measures to be undertaken for strengthening UILs (Ambos et al, 2008). One way to overcome this is to implement a dual structure so that tensions can be reduced. In the case of UILs, TTOs are a suitable measure for minimizing the tension on both levels because the TTO assumes the task of commercializing research results and this creates a generic support mechanism.

Despite having to manage the balance between academic and entrepreneurial UIL activities, academics are increasingly interested in bridging the worlds of academia and business rather than concentrating primarily on basic research (D’Este and Perkmann, 2011). In this context the importance of having appropriate incentive systems for technology transfer has been noted, for instance by Link and Siegel (2005), with recognition that personal efforts by academics in creating opportunities for collaboration can have a significant positive effect in extending UILs. In reinforcing the importance of the individual in UILs, Tornatzky et al (2002, p 18) emphasize the need to create the appropriate culture for UILs to flourish, emphasizing that the behaviour of faculty, students and administrators is supported by the values, norms and reward systems of the institution. Given that cooperation with business is a discretionary activity for
academics (D’Este and Perkmann, 2011), it is contended that the individual and the surrounding culture, including individual rewards, are vitally important.

**Potential support mechanisms for UILs**

To implement UILs and foster a culture where such linkages are a large part of a university’s activities, it is necessary for university management to define a mission in which UILs play an integral part (Friedman and Silberman, 2003; Markman *et al*, 2005; Polt *et al*, 2001). University employees identify most strongly with the mission if university management demonstrates a top-down commitment to UILs and puts support mechanisms for academics in place. Taking a contrary view, Philpott *et al* (2011) argue that UIL activities originate from the individuals involved in the linkages and that a bottom-up approach is therefore more suitable. In this case, the implemented support mechanisms are formulated as a result of the activities already performed by individuals. This means that the support mechanisms at the individual level are now transferred to a higher level to support UIL practices on a broader scale. Because both university management and individuals are essential for UILs, a combination of a top-down and bottom-up approach is necessary. When seeking to expand a university’s UIL activities, university management is advised to set up long-term strategies and follow an overall strategic approach to UIL (Siegel and Phan, 2005). A culture for UIL has to be established and, more importantly, there needs to be effective linking of all levels to advance UIL through appropriate instruments (Rasmussen *et al*, 2006; Polt *et al*, 2001).

Establishing a technology transfer office (TTO) is one way of facilitating UIL activities in universities (Siegel and Phan, 2005; Siegel *et al*, 2003a; Festel, 2013; Geuna and Muscio, 2009; Göktepe-Hulten and Mahagaonkar, 2009; Geissler *et al*, 2006). A TTO’s activities can be wide ranging, to include, for instance, coaching, intellectual property management, service provision and development of industry relations and, as such, it serves as an intermediary between university and industry (Dotorre *et al*, 2010; Siegel and Phan, 2005). According to previous analysts, a TTO should be established in a decentralized manner (Debackere and Veugelers, 2005) and its personnel should have previous industry experience in key positions (Lubango and Pouris, 2007), to achieve better development of relationships with industry. Introducing a TTO at a university not only allows academics to continue with academic activities but also provides the possibility for academics to engage in commercialization activities where the TTO takes over the main responsibility (Ambos *et al*, 2008).

Incentives are well-documented mechanisms for supporting and enhancing UILs (Frey and Neckermann, 2008; Stephan, 2008; Siegel *et al*, 2004; Lam, 2011): a mixture of monetary and non-monetary incentives, such as additional resources (Siegel *et al*, 2003b) is suggested. Similarly, Göktepe-Hulten and Mahagaonkar (2009) identified that academics engage in UIL activities not so much for monetary reasons but rather for recognition. This is supported by Lam (2011) who argues that when formulating policies to motivate academics to engage in commercialization activities it should be acknowledged that individuals may be motivated by extrinsic and intrinsic rewards and that monetary aspects play only minor role. Further, van Rijnsoever and Hessels (2011) suggest distinguishing between incentives targeted at disciplinary and interdisciplinary research. A specific incentive relating to the reduction of the teaching load proved to be an effective measure for engaging academics in UIL activities (Arvanitis *et al*, 2008). Siegel *et al* (2007) and Polt *et al* (2001) proposed the incorporation of UIL activities into the promotion and remuneration system of a university. Conversely, it must be remembered that when setting up incentives aimed solely at publishing research results and writing research proposals this does not result in academics participating in UILs.

Thus, incentives should in practice include the applicability of research results (Fraser, 2004). This may be more pertinent with regard to conducting UIL activities at universities of applied sciences (UAS) in contrast to traditional universities. Benchmarking UIL measures across Europe and the US, Polt *et al* (2001) noted that several aspects need to be considered when implementing incentives to strengthen UILs. UILs vary according to different industry sectors and thus structures set up in one sector may not be effective in another. Furthermore, measures can span a wide variety of different incentives, organizational regulations and institutions which have differing effects on UILs – fostering, moderating or opposing each other. As such, incentives cannot be regarded in isolation from each other (Polt *et al*, 2001): they must be regarded in combination, with different mechanisms addressing different areas. In summary, there is no one incentive that will foster UIL activities in general; rather, different approaches are required at various levels and in differing degrees.

To operationalize a strategy for UILs effectively, Mitton *et al* (2007, p. 744) propose ‘face-to-face exchange between decision makers and researchers, education sessions for decision makers, networks and communities of practice, interactive, multidisciplinary
workshops, web-based information, electronic communications and steering committees’. Although Mitton’s study concerns UILs in the health sector, its applicability to UILs in general is evident. Thus, also with regard to effective communication, it is necessary to link the organizational and individual levels. The provision of support mechanisms for UILs that are internal to organizations only is insufficient. UIL activities should also be communicated to internal as well as external stakeholders, to recognize their roles and, potentially, inform others about opportunities available in the university (Siegel et al, 2003b; van der Sijde, 2012; Geissler et al, 2006).

Experience

Prior experience is a significant factor in determining an organization’s ability to strengthen and foster UILs (Sampson, 2007; Anand and Khanna, 2000; Hoang and Rothaermel, 2005; Kale et al 2000; Jiang et al, 2008). Again, such experience must be considered at both levels. For instance, Sampson (2005) points out that those organizations with experience in UILs are able to implement processes for managing collaborations more effectively; and it is not only the organization’s experience, but also that of individual academics, that is important (D’Este and Patel, 2007; Bercovitz and Feldman, 2008; Gomes et al, 2005; Bruneel et al, 2010). The UIL literature identifies individual experience as either experience gained in previous employment in industry (Lubango and Pouris, 2007; Lin and Bozeman, 2006; van Rijnsoever et al, 2008) or experience gained from conducting UILs in academia (D’Este and Patel, 2007). Both categories of experience are found to be advantageous for academic researchers with regard to UIL activities. Academics who scored higher on both categories were found to have higher levels of network activity (van Rijnsoever et al, 2008) and a heightened understanding of the requirements and needs of the partner (Plewa and Quester, 2008) and of the market (D’Este et al, 2012).

Based on the premise that experience plays an important role in providing insights into explaining and potentially advancingUIL activities, the present paper takes this into consideration by specifically addressing the role of experience.

In light of this discussion of the relevant literature, the following support mechanisms emerge as important: policy formulation and development; the execution of policies; incentives; and communication. Because experience is a characteristic of an organization or an individual, it cannot be regarded as a support mechanism. These four areas are the basis for the structure of the case study and are used to analyse the interplay between the organizational and individual levels. We connected these two levels and their identified toolkits, through our case study.

Method

Research design

We adopted an interpretivist perspective, which is recommended for the investigation of organizational behaviour (Saunders et al 2007). The data collection method for case studies can take different forms. In our case it is based on experience, which helps in understanding the interconnections; document analysis, which shows how processes and intentions are formulated and developed into instructions, regulations and incentive schemes; and in-depth interviews, which shed light on people’s experience of incentive schemes and on individual motivations. The added value of using in-depth interviews is the potential they offer for deeper insights into the connections between the different aspects of the topic (Malhotra and Birks, 2007).

Data collection and analysis

Münster University of Applied Sciences (MUAS) was selected for this case study. One of the authors is currently employed as a research assistant at this university and this was instrumental in gaining access to the presidential board and helped us to share experiences with other academics at the institution. The sample consisted of, first, five published documents about MUAS, describing structures and putting the strategies set by the university management into operation, and their implementation at the individual level; and, second, four additional documents – two University Development Plans, two Annual Reports, provided by MUAS – which completed the sample. In addition, the sources for the analysis of MUAS are based on the following publications and documents concerned with the University of Applied Sciences.


The documents were analysed using NVivo 10 digital coding software. The coding of topics was done by detecting different themes in the publications and
contrasting these with support mechanisms identified in the literature. To avoid subjectivity and bias, the data were cross-checked by all the authors.

For the in-depth interviews, the participants were chosen on the basis of purposeful (judgmental) sampling (Saunders et al., 2007; Malhotra and Birks, 2007), which allows the researcher to choose the sample according to their personal judgment and their estimation of whether the sample is able to answer best the overall research question (Saunders et al., 2007). The participants for the in-depth interviews comprised two distinct groups (see Table 1).

The first group included people who were either current or past holders of positions on the presidential board at MUAS and who were or had been involved in strategy development and implementation. Four people were interviewed. To grasp the operationalization of support mechanisms implemented by MUAS management, four academic researchers were interviewed.

The interviews were semi-structured: the researcher had an interview schedule, but was able to alter and change the direction according to the answers provided (Bryman and Bell, 2007; Saunders et al., 2007). This enabled different viewpoints and insights to be explored and recorded. The interviews, as well as the documents, focused on three major topics.

- What strategies developed at the organizational level exist at MUAS for supporting and strengthening UILs developed on the organizational level.
- How these strategies are operationalized at the individual level.
- How experience influences the operation of these mechanisms at the organizational as well as the individual level.

The interviews with the academic researchers continued until all the questions had been answered to such an extent that the objectives of the research were achieved (Saunders et al., 2007). It should be noted that the interviews served only as a supportive instrument in the actual analysis of the case study, providing for better communication and demonstration of the operationalization of strategies at the individual level. The quotations from the interviews provide a clear picture and underline how university management reaches the individual and how the support mechanisms are perceived by the academics.

Case study: Münster University of Applied Sciences

Background

Identified in the literature as a best-practice case for its innovative approach for knowledge transfer, Münster University of Applied Sciences (MUAS), founded in 1971, presents an interesting case. In 2007, MUAS was recognized by and won an award from the Initiative of Foundations for the German Sciences as a best practice case for working with industry; in addition it was acknowledged as an outstanding example, with regard to transfer activities, by ProTon Europe (the pan-European Association of Knowledge Transfer Offices) and the European University Association (Baaken et al., 2011). Currently (2013) the university has 650 employees, 257 professors, 328 research associates and approximately 11,000 students enrolled in 77 degree programmes spread over 12 faculties and 2 central scientific units in various locations – Münster, Steinfurt, Ahlen/Beckum/Oelde and Coesfeld (Fachhochschule Münster, 2013c). In addition to the faculties, MUAS has seven internal institutes and four associated institutes, each dedicated to a specific research area. The university focuses on research in six fields – Construction/Environment/Resources, Health/Life Sciences, Product and Process Development, Applied Social Sciences, Company and Services Management and Communication/Information (Fachhochschule Münster, 2013a). Researchers at MUAS contribute their knowledge to five competence platforms, which are well recognized and spread across Germany. In 2012 the amount of third-party funding generated was around €15.7 million, an increase of 0.8% on the amount generated in the previous year (Fachhochschule Münster, 2012, p 19).

The MUAS approach

At MUAS a ‘Triangle of Innovation’ was implemented, in which three distinct areas – strategic, analytic-scientific and operational – operate synergistically (Schröder et al., 2012) (see Figure 1). Each area is performed by different entities, each serving a specific

<table>
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<tr>
<th>Interviewees</th>
<th>Currently on presidential board</th>
<th>Formerly on presidential board</th>
<th>Current academic researcher</th>
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objective and concerned with a sub-strategy and sub-operational tasks. The university management embodies the strategic area, a research and development centre (Science Marketing) exemplifies the analytical–scientific area, and the Transfer Agency is responsible for the operational aspect of the triangle. Although the triangle is implemented by university management, each of the three areas follows certain mechanisms based on the organizational level of that entity, to be implemented on the individual level: thus all areas have both an organizational and an individual level. It should be noted that the Triangle of Innovation is designed specifically to enhance UIL activities and thus addresses neither research and transfer nor the development of strategic partnerships in general. This means that all types of UILs are addressed by continuous involvement of industry partners.3

The support mechanisms at MUAS relate to four different aspects – policy formulation and development; execution of policies; incentives; and communication (see Table 2). Although the formulation and development of policies is a key responsibility of the university management and is thus the strategic area of the triangle, the execution of the policies occurs through the remaining two entities: the Transfer Agency (operational area) and Science Marketing, the research and development centre (analytic–scientific). Whilst the support mechanisms ‘incentives’ and ‘communications’ are also formulated by the university management, there are distinct variations at the organizational and individual levels. As already noted, experience cannot be regarded as a support mechanism as such, but it does constitute a vital aspect and we need to understand the effect it has on the formulation of support mechanisms at organizational and individual levels. The organizational and individual levels are closely interlinked throughout all support mechanisms: in the specific case of experience, both generate and obtain certain experience levels that can be shared and thereby benefit both organizations and individuals in advancing UIL activities at MUAS.

The following paragraphs explain how the organizational level interacts with the individual level through specific instruments for each of the support mechanisms, plus experience, to strengthen and foster UIL activities at MUAS.

**Policy formulation and development**

This section outlines instruments related to the support mechanisms for policy formulation and development. To accomplish the university’s aim of maintaining its lead position among German Universities of Applied Sciences in the generation of third-party funding, the

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**Table 2. Alignment of organizational and individual levels.**

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<th>Level/ support mechanisms</th>
<th>Policy (formulation and development)</th>
<th>Execution of policies</th>
<th>Incentives</th>
<th>Communication</th>
<th>Experience</th>
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<tr>
<td>Organizational</td>
<td>UDP Academic Scorecard Strategic partnerships TTO Science marketing Open Space Event</td>
<td>Science Marketing Transfer Agency</td>
<td>Main actor in developing and implementing incentives</td>
<td>Internal/External communication</td>
<td>Experience of institution</td>
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<td>Individual</td>
<td>Open Space Event</td>
<td>Identifying research funding Administrative support Creating networks Supporting patent process Conducting research on UIL Dissemination</td>
<td>Reduction of teaching load Space allocation scheme Qualification positions State money Lisbon award Extra salary</td>
<td>Internal/External communication</td>
<td>Experience of individual academic researchers</td>
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presidential board implemented strategic options on the organizational and individual levels. We describe below how strategic decisions were implemented at the organizational level and how, at the same time, these are linked to the individual level.

Organizational level: university development plan. To achieve its strategic quality management requirements, MUAS systematically aligns its development activities in accordance with its University Development Plan (UDP) (Fachhochschule Münster, 2010). Comparing the UDPs for 2005–2010 and 2011–2015, a significant difference can be noted in the area of ‘research and transfer’. Thus, while the UDP for 2005–2010 proposed the ‘increase of publicly and privately funded R&D projects’ (Fachhochschule Münster, 2010, p 17) the current UDP states the more definite measure of ‘stabilizing of third-party funding by means of a systematic management for EU-projects’ (Fachhochschule Münster, 2010, p 17). A similar observation can be made with regard to the strategy of ‘development of strategic networks and alliances with companies, universities and communities’ (Fachhochschule Münster, 2010, p 17) and its specification for the ‘systematization of exchange processes between the university and its partners’ (Fachhochschule Münster, 2010, p 17). Both examples demonstrate the ability of MUAS to achieve its previously-defined strategic aims and the development of the strategies. Either the strategies developed in UDP during 2005–2010 were implemented successfully, or acceptance of these strategies increased and thus a more definite formulation could be established. It must be noted that the strategies, set by university management, are unable to succeed in the absence of appropriate instruments to support implementation. As a result, the remainder of the paper discusses specific instruments supporting the overall strategy of MUAS as set out in the University Development Plan.

Organizational level: academic scorecard. The University of Applied Sciences formulates its aims and strategies according to a so-called ‘Academic Scorecard’ which is incorporated into the UDP and is in accord with MUAS’s principle ‘to be at the service of society through offerings related to education and research activities’ (Fachhochschule Münster, 2010, p 6) as characterized by high performance, sustainability and acting inquisitively as well as proactively. Three areas comprise the central aspects of the Academic Scorecard – education, research (including transfer) and resources (personnel, infrastructure, finances, management) – which are applicable not only to the entire university but also to each faculty. Each of these areas is characterized by a strategic aim (developed by the university management), a specific aim (a specification/elaboration of the strategic aim) and activities undertaken to contribute to the realization of the strategic aim (Fachhochschule Münster, 2010).

While the Academic Scorecard for the entire university is more strategic in nature and focuses on aims and measures to be implemented on an organizational level, the aims and activities performed by the individuals are operational because they state precisely the actual activity to be undertaken (see Table 3) and therefore specifically connect the aims at the organizational level with actions undertaken at the individual level.

Although the strategic aim ‘...[to] strengthen research and transfer activities’ is one that university management wants to pursue, the activity ‘[to] find strategic partners for working on common topics’ is a responsibility specific to individuals. When monitoring attainment of the strategic aim, the actual result of the activity is also monitored.

Based on the activities undertaken by the faculty, the president of MUAS and the faculty together evaluate the strategic development. In the event that the specific aim was not achieved, alternative strategies for doing so are (re)defined:

‘The definition of these strategic goals and their operationalization occurs in a top-down and bottom-up approach, is an iterative process. So, the university managements sets the strategy ‘strengthen research’, then it goes to faculty level. Here, the individual researcher and faculty determine how the respective faculty can contribute to the strategy and which activities to perform. [...] So, the individual researcher has the opportunity to contribute input. This result is then formulated into a specific activity and this is communicated back to the university.
management. Then, the university management says yes, we agree with this or some areas need to be combined. That is the responsibility of the faculty and it should formulate a competence area. Thus, that is the iterative process, from top-to-bottom to the individual level and from bottom-to-top.’ (Interviewee 2)

The individual is an integral element and contributes significantly to the achievement of the overall strategic aim of MUAS. Three levels of MUAS internal stakeholders – university management, faculty and academic researcher – are involved in various stages of the process, thus ensuring a clear definition of roles and responsibilities. This demonstrates that MUAS is keen to engage with and involve numerous levels to encourage UILs on a wide scale. MUAS is thus following the suggestions proposed by Siegel et al. (2003b), Siegel and Phan (2005) as well as Geissler et al. (2006); that is, to consider stakeholders on different levels to drive and foster UILs.

Organizational level: strategic partnerships. MUAS intends to develop long-lasting relationships with industry partners able to complement and, equally, advance its research activities and thus drive UIL activities at the university (Baaken et al., 2011; Schröder et al., 2012). As such, MUAS has two strategic partnerships: one with BASF Coatings GmbH and the other with Merck KGaA. Both companies are involved in several study programmes and research activities in different faculties. These partnership agreements operate at the organizational and individual levels. While the university management and CEO of the company define potential research areas, it is the individual academic researchers who are actually engaged in specifying the topics to be researched and putting the research strategies into operation (Interview 1). Both partners interact on various levels and provide information about research progress and possible changes. The interaction may include the supervision of a Bachelor/Master’s thesis, temporary teaching positions, lifelong learning programmes and joint research and development projects (Schröder et al., 2012). The partnering approach of MUAS therefore follows a loop of interaction on strategic (organizational) and operational (individual) levels.

‘On a different level the skill related competences come together. The research management of the company and the deans of the respective faculties collaborate as regularly as the involved researchers. The latter one occurs case specific and probably numerous times a year. Besides that, the individuals, who on the one hand decide on the deployment of personnel, the deans and at the same time the head of department in the company come together. CEO and university management meet at least once a year to identify whether to correct something, whether to set different incentives etc. Basically a whole spectrum investigates the topic and defines the framework so that both parties benefit from it.’ (Interviewee 3)

By adopting a strategic partnership approach, MUAS demonstrates its dedication and commitment to drive UIL activities. This illustrates that MUAS is actively pursuing its strategy, as presented in the UDP, and putting it into operation through close interaction with partners on various levels.

Organizational level: Science Marketing. The foundations for increasing third-party financial income at MUAS were laid through the appointment in 1998 of a university professor with a marketing background as the Vice-Rector for Research Affairs and Technology Transfer (Davey, Baaken, Deery et al., 2011; Schröder et al., 2012). The philosophy was straightforward – if MUAS seeks to work more closely with industry partners, by offering research activities and requesting money for these activities, the university is part of a market. Therefore, as with any instance of offering products and services, marketing principles can and must also be applied to research activities (Davey, Baaken, Deery et al., 2011; Schröder et al., 2012). It became apparent that in order to advance in its UIL activities MUAS had to consider practices from other European countries. With this in mind, the ‘Science-to-Business Marketing Research Centre’ was established in 2002 with the sole responsibility of investigating science-to-business marketing further (Davey, Baaken, Deery et al., 2011; Schröder et al., 2012). This research centre has two purposes at MUAS: it serves as an instrument for the formulation and development of policies at MUAS; and it is one entity of the Triangle of Innovation executing the policies.

Organizational level: Transfer Agency. Set up as a GmbH, the Transfer Agency (TA) of MUAS is responsible for the operational processes of UILs (Schröder et al., 2012). The CEO of the TA is not only a member of the presidential board but is also the first contact person for academic researchers regarding transfer activities and UILs (Schröder et al., 2012). The TA is beneficial for MUAS and individual academic researchers, for two organizational reasons. First, the organizational format of a GmbH is very common and therefore companies regard the TA as a regular business partner (Schröder et al., 2012). This would not be the case if the transfer agency was a unit within the university structure: companies are generally more
reluctant to collaborate directly with universities. Second, the structure of the TA is advantageous for liability reasons (Schröder et al., 2012).

Organizational level: Open Space Event. In order to develop further the research areas at MUAS and extend potential research fields, an Open Space Event is organized every two years, to which all academic researchers are invited (Interview 2). During this event the research competence areas mentioned above were developed, on the basis of input from individual researchers. Academic researchers are encouraged to adopt an interdisciplinary mindset and hence engage with various faculties. In conducting such an event, university management collaborates with researchers who are experts in their field to promote and develop the University of Applied Sciences in its entirety. In the event that a large number of researchers collaborate with each other, an institute may be formed if, for instance, a prosperous research field is identified (Interview 2).

‘[...] Every two years, we conduct an Open-Space-Event, where we invite all researchers to participate and to discuss topics in workshops. [...] The topics in the workshops are democratically elected and are compared to the know-how present in the university and on the other hand which obstacles and social challenges exist or which requirements on behalf of the industry exist. All this is documented and summarized in areas where interdisciplinary teams can work together. Basically the results are areas with common competence.’ (Interviewee 2)

In organizing this event with the aim of developing future research areas, MUAS makes use of current internal resources. This means that in order to advance on an organizational level MUAS engages the individual level. Setting up this specific measure of internal collaboration demonstrates the linkage of both levels at MUAS.

Individual level: Open Space Event. The Open Space Event can be addressed at the individual as well as the organizational level. Because this event is open to every academic from MUAS, it provides good opportunities for them to interact with the organizational level and engage collaboratively in discussions about their research fields and potential future developments. Incorporating academic researchers in such fundamental activities demonstrates to them that their expertise is highly valued by university management. For the individual academics the event is regarded as valuable not only to promote the university but also to learn more about other research areas and to identify potential synergies. However, despite the benefits, some of those interviewed mentioned that because of heavy workloads academics were unable to find time to attend the event.

‘[...] I would like to participate. This is a very valuable event. [...] I was never able to attend – I have a relatively high third-party-quota so I am extremely busy. [...] However, I always was aware of the event and that it is taking place.’ (Interviewee 6)

Given that this is the case for many academic researchers, we interpret this to mean that while the event is highly valued and appreciated, at both the organizational and the individual level, the time needed to participate actively is rarely available. This is not to say that the level of involvement of academics in UIL activities is low: in fact, the opposite is the case. University management must therefore ensure that although a number of academics are active in UILs, both levels need to be involved, and especially these academics because they are aware of current market trends and needs.

As demonstrated above, MUAS university management is effective in aligning both levels with regard to the policy formulation and development support mechanism. This mechanism is a strategic matter that is firmly based in the responsibilities of the university management. While the majority of strategic decisions – such as the implementation of the University Development Plan, the establishment of strategic partnerships and creation of two entities dedicated to support UIL activities – are set up on the organizational level, the individual level is still closely linked to it.

Execution of policies

At MUAS two entities of the Triangle of Innovation are responsible for the execution of policies formulated by the university management – namely the research and development centre, Science Marketing, and the Transfer Agency. The following sets out the interplay of the organizational and individual levels in each entity for fostering UIL activities at MUAS.

Organizational level: Science Marketing. The research and development centre ‘Science-to-Business Marketing Research Centre’ (S2BMRRC) was established in 2002 with the stated purpose of applying marketing principles to research markets in order to drive and encourage UILs at MUAS (Kliewe et al. 2012; Schröder et al., 2012). The strategic logic behind the establishment of S2BMRRC is to support university management and the Transfer Agency in the decision-making processes by providing them with up-to-date information of how to
market research competences, results and performances of a university (Kliewe et al., 2012).

‘One of our roles is to develop general models based on what we have tested, developed and validated at MUAS, so that one can benefit and valorize from what exists in the university. [...] The other role is to develop and combine the models and adapt them to the framework at MUAS so decision makers on the strategic and operational level can basically improve strategies and instruments here.’ (Interviewee 5)

Three strategically positioned research activities are worth mentioning in particular. One, a survey, is dedicated to identifying what customers (companies) of research institutions expect from the research provider (university) and how these success factors are actually operationalized at the university (Schröder et al., 2012; Dotorre et al., 2010). The reasoning behind the study is twofold: it is necessary not only to understand, address and cater for the needs of customers but also, at the same time, to monitor one’s own activities and thereby identify gaps. Using these research results provides S2BMRC and MUAS with insights about areas for improvement. This study is being conducted on an international level in order to be able to compare with and learn from other practices (Schröder et al., 2012; Kliewe et al., 2012).

The second research study addresses the image of MUAS, with potential customers being asked about their perceived image of the university and the responses being compared to the image MUAS wants to convey (Kliewe et al., 2012). Strategically this is an important tool for strengthening awareness of MUAS.

Lastly, internal analyses are carried out in order to identify the requirements of researchers so that UILs can be better managed at MUAS (Kliewe et al., 2012). This study is especially helpful for advancing further the structures and policies for UILs. In addition, the study is enabling a comparison to be made between academic researchers’ perceptions of their performance and the perceptions of companies and thus provide indicators about which areas academic researchers need to improve.

The analytical–scientific purpose of the research centre can be extended to more activities such as conducting various research projects for governmental institutions, companies and other universities or research organizations. PhD studies, publicly-funded research projects as well as self-funded projects serve to advance the topic of science-to-business marketing in general (Kliewe et al., 2012).

The fact that MUAS bases its decisions regarding future UIL activities on scientific research results demonstrates the willingness to constantly improve the UIL management at the institution by learning from other practices. Integrating an analytical–science component into the development and fostering of UILs activities at a university is beneficial with regard to shaping and maintaining UIL activities generally.

Organisational level: Transfer Agency. The operational side of the Triangle of Innovation is administered by the Transfer Agency (TA) of the University of Applied Sciences (Fachhochschule Münster, 2004) which is based in the university: the CEO of the Agency is a member of the presidential board. The main task of the TA is to make contact and maintain existing relationships with companies in the region and act as an interface for individual academic researchers and industry partners. One significant aspect in this respect is that the position of CEO was filled by a person with knowledge of managing projects with industry and willing to promote and develop UILs (Interview 1).

With regard to the advancement and generation of third-party funding, the TA engages in numerous strategic initiatives. One example is the transfer project ‘Train’ which was launched in 2001, with the county of Steinfurt, to strengthen the region’s innovation potential (Fachhochschule Münster, 2004; Schröder et al., 2012). One outcome was the establishment of a ‘Founder and Innovation Park’ (GRIPS) close to the university’s engineering related faculties.

One strategy that proved successful was the transformation of a traditional transfer unit to a transfer agency which proactively accompanies partnerships from beginning to end.

‘[...] In the last years we continuously developed from a university transfer unit to an innovation and project development agency. This means that we take up, for instance, project ideas from our researchers and requests from industry and support the actual realization in close cooperation with the respective project participants. Also, we try to give impulses to the region.’ (Interviewee 7)

The close connection of the transfer agency with industry provides for additional projects to emerge, further to those that individual academics may initiate. As suggested by Ambos et al. (2008), the establishment of a TTO at MUAS gives university management and individual academics the opportunity to focus on their main responsibilities of teaching and conducting research.
Individual level: Science Marketing. Altering the framework conditions at MUAS for UILs (Interview 5) has provided the means for communicating research results to individual academic researchers at the university. An intended side-effect of all research projects is the development of tools and instruments to support UIL activities (Interview 5). Currently the toolbox comprises more than 80 tools, addressing different needs and categorized as both generating short, medium and long-term effects and as being strategic and operational. One tool of particular interest is the ‘Partnership Stairway Model’ (Davey, Baaken, Deery et al, 2011) which was used by MUAS management to enable it to implement its strategy of developing long-term partnerships with companies.

The dissemination of research results is not limited to MUAS; it also extends – nationally and internationally – to other universities, academic researchers, industry and society. This is achieved through many channels – for instance, conferences, lectures, seminars, workshops and publications. A conference dealing specifically with Science Marketing is held every 2 years to promote the research centre and, indirectly, MUAS itself in fostering UIL activities further (Interview 5).

Individual level: Transfer Agency. The TA reaches individual academic researchers at MUAS in various ways. Its principal tasks include consulting and supporting activities, as well as establishing networks (Schröder et al, 2012). As a first step the TA seeks to highlight research activities for the benefit of external interest groups, by identifying competence areas and defining the research directory and representing MUAS at fairs (Fachhochschule Münster, 2004). In addition, the TA provides support in identifying appropriate research funding and offers administrative support for writing EU proposals. Once the projects with a business partner are operational, academic researchers gain from the experience of the management of finances (Schröder et al, 2012). Another key responsibility is support in applying for patents. An additional service is the organization of events to which industry representatives are invited to learn about the latest research results and insights. These provide academics with opportunities to make contact directly with potential industry partners.

‘[. . .] Well, the basic support, the billing, personnel administration, travel expense administration is perfect. And I make use of it. [. . .] the Transfer Agency is not so much involved in smaller projects but you can transact smaller projects with it, in case one wants to bill one’s own research performances separately.’ (Interviewee 3) ‘[. . .] The important thing about the Transfer Agency is the supraregional networking. Meaning, based on their connections they know what is available and of interest. And the personal conversations are much more valuable than researching the internet or downloading flyers for information. They give you a direct opinion and tell you, for example, that’s not worth applying for because many people apply for this funding or this has potential.’ (Interviewee 8)

On the basis of the responses in the interviews, it is clear that the academics value highly the activities and support provided by the TA, suggesting that the TA is successful at operationalizing its strategies and thus reaching the individuals effectively.

Each of the entities of the Triangle of Innovation responsible for the execution of policies links the organizational level with the individual level, on numerous occasions. On the organizational level the research and development centre Science Marketing provides the scientific background by conducting international research studies and thereby supports university management in integrating the results into the procedures at MUAS. On the individual level, the research centre reaches individual academics by making the research results accessible, either through publications or by using tools that support collaborative work. The TA acts as a direct link between the individual academic and the university. In organizational terms this entity serves to manage the collaborations – and even initiate them – with regional partners on the organizational level. Individual academics benefit from its expertise in managing administrative tasks related to UILs activities. It is here that the TA transfers its organizational strengths to the individual level.

Incentives
Incentives at MUAS play a crucial role in encouraging individual academics to engage in UILs. Whilst the incentives are targeted mainly at academics, the organizational level is still an important component in the overall remuneration system. The interplay of the two levels relating to the incentives as a support mechanism is outlined below.

Organizational level. As illustrated in Figure 2, the individual academics at MUAS report their third-party funding to the respective faculty, which then informs the university management. University management documents all third-party income from each faculty and forwards this information to the state. Based on the performance of MUAS, the state allocates money to the university and the university retains a certain small
percentage to support and encourage those individuals not currently engaged in research. The larger percentage of the state funding is distributed to the faculties proportionally according to the amount of their third party funds as reported to the university management. Each faculty, at its own discretion, allocates this money to individual academics engaged in UILs. The main actors in this process are university management, involved with formulating incentives, and the individuals – both those already active in UILs and those who are not – who are the principal and only recipients of the measures implemented for engagement in UIL activities. The state and the faculties play no more than minor roles in the organization of incentives because university management seeks only to motivate the individual academics. The money from the state retained by university management is also invested in incentives targeted at individual academics. There are no incentives specifically targeted at the organizational level: it is a support mechanism implemented by university management and operationalized through various instruments which serve to encourage individuals. The interplay of the organizational and individual levels of this support mechanism is very close and cannot be easily separated because all of the incentives originate from the organizational level. The relationship of the two levels can thus be described as a ‘means to an end’ relationship.

**Individual level.** MUAS targets individual academics in formulating and implementing incentives. The incentives initially consisted of 12 building blocks (Davey, Baaken, Deery *et al*, 2011): the most effective of these are presented here.

Because lecturing is a significant and time-consuming activity at Universities of Applied Sciences, academics active in UIL programmes can benefit from a reduction in lecturing workloads (Baaken *et al*, 2011). However, one interviewee (Interviewee 2) pointed out that reduction of teaching load needs to be considered with caution, because the mission of teaching cannot be neglected.

Another incentive involves the allocation of physical space, whereby an academic is entitled to receive a certain amount of additional space – 23 square meters – for each £35,000 of third-party money raised (Davey, Baaken, Deery *et al*, 2011; Baaken *et al*, 2011). The amount of funding to be procured for the award of (extra) space depends on the type of faculty: not every faculty provides opportunities for extensive UIL activities.

In addition to secured third-party funding, academics are provided with money from the state in exchange for delivering outstanding third-party finance: this is allocated to each faculty at the university and, eventually, to the individuals concerned (Interviews 1, 2, 5, 6). Because the extra money distributed is an incentive from the state and is allocated to the individual – and thus the faculty/university benefits only indirectly – this incentive could be regarded to be applicable both on the organizational and individual level.

Another resource-oriented incentive is the opportunity for academic researchers who have been employed at MUAS for less than 2 years to apply for a so-called ‘qualification position’ (Interview 2). This incentive is targeted at young academics in particular and is intended to support a specific research area, which may be in the form of a PhD. The supervisors at MUAS of such PhD candidates benefit by having exposure to UILs without being directly engaged themselves in UILs.

The Lisbon award, valued at £1,000, is awarded to individuals with exceptionally outstanding transfer and research performances (Interview 2). It must be remembered that the key aspect for academics of the incentive is not the actual money but, rather, the formal recognition of the academic by the university that it represents.

Incentive payments are divided according to different performance levels. As such, the individual benefits in various ways. Academics categorized in a certain salary group are entitled to generate extra salary when active in UILs. Furthermore, individuals can be eligible to receive an extra payment when billing the TA for certain projects with company involvement. Salaries at MUAS relate to academics’ UIL performances: academics who are active in conducting UIL activities therefore receive a higher salary (Interviews 5 and 6).
It is interesting to note that it became apparent during the interviews that both the university management and academic researchers did not regard the incentives as the driving force behind encouraging UIL activities; the principal impetus was individual motivation, in fact. The incentives then serve to facilitate participation in UIL activities. As two interviewees stated:

‘[. . .] Well, when talking for me and I think that’s true for a number of other colleagues, it’s basically vanity. Meaning, that when I do a project the end result are publications, conference presentations, seminars and that gives me a personal feedback and recognition from experts of my area. And that’s basically what keeps us going.’ (Interviewee 4)

‘[. . .] The incentives are not relevant for altering my behaviour. I have a clear picture of what I want to do.’ (Interviewee 3)

In addition, recognition and acknowledgment of research activities is highly valued. As noted, the Lisbon award is an incentive that demonstrates appreciation of researchers’ work.

The link between the organizational and individual levels with regard to the support mechanism ‘incentives’ can be described as codependent. While the approach of MUAS in addressing individual academics to engage in UIL activities is comprehensive and incorporates monetary and non-monetary incentives, the organizational level depends on the individual activities in order to be able to receive state money – which is then allocated for the benefit of the individual.

Communication

The last mechanism supporting UILs activities at MUAS relates to the aspect of communication. Here, MUAS also effectively links the organizational level with the individual level through instruments aiming to strengthen UIL activities.

Organizational level. MUAS actively and continuously informs its internal and external stakeholders about developments and up-to-date activities across faculties. The university uses many channels and thus ensures dissemination to the wide audience of the university’s employees. For example, pamphlets are used, with each one addressing a specific topic and collating current activities undertaken by academic researchers related to the topic (Interview 2). In addition, the pamphlet ‘Ausgezeichnet’ is designed to inform stakeholders about awards won by MUAS and individual academic researchers (Fachhochschule Münster, 2013b; Fachhochschule Münster 2012).

‘[Communication is. . .] mainly via emails. But also via paper, but mainly via emails and via intranet of the university and the website of the transfer agency. I receive all of that and it’s not that I don’t take note of it. I have to say, they handle it professionally.’ (Interviewee 6)

Another medium is the Internet, where MUAS actively promotes itself via informative content. The MUAS website features a research directory which enables internal and external interested parties to view the profiles of academic researchers and their research areas. This research directory is linked to the six research competences and thus provides a helpful overview of up to 70 different research fields (Fachhochschule Münster, 2013b). Displaying this type of information gives greater transparency to UIL activities at MUAS, with open communication with internal and external stakeholder groups providing informative content and, at the same time, acknowledging the work of individual academic researchers.

Individual level. Individual academics at MUAS receive public exposure by being named in several pamphlets – and are thus recognized by the university management. In addition, it was noted that academic researchers felt that they were kept well informed about measures implemented by university management to strengthen UILs.

‘Well, I feel very well informed about the supporting mechanisms and about what MUAS is doing.’ (Interviewee 8)

This demonstrates again how individual academic researchers are reached and interact with measures implemented on the organizational level. This is valued highly by academics, although it is not definitive in its coverage of their UIL activities.

Installing appropriate and visible communication structures on both levels supports a continuing and overarching MUAS strategy to inform and appraise UIL activities. The effectiveness of the communication measures must be regarded with some caution, however, because it is not a measure for determining the extent of UIL activities: rather, it is intended to express appreciation of the value of UIL activities.

Experience

Although not recognized as a support mechanism per se, experience remains an important factor to be considered with regard to explaining and promoting UIL activities at MUAS. We will elaborate on how
Experience on the organizational level and individual level supports engagement in UILs.

**Experience: organizational level.** In general, MUAS has been active in ‘stimulating, moderating and professionalizing’ (Schröder et al., 2012, p 76) UIL activities with industry partners for some 20 years. As such, the University of Applied Sciences can call upon and use a great deal of experience in initiating, managing and expanding UILs, illustrated in two ways.

First, the support of the Transfer Agency was developed in a step-by-step process where service processes were defined and restructured in order to be most efficient and effective.

‘[. . .] Since the founding in 2004, we verified all transfer areas, such as business start-ups, exploitation, consulting regarding funding etc., and optimized the processes. This means consequently that we reduced selected activities from the old transfer agency. A good example is the science marketing via exhibitions.’ (Interviewee 7)

This approach proved to be successful, with one interviewee describing the development thus:

‘[. . .] Since the founding in 2004, we verified all transfer areas, such as business start-ups, exploitation, consulting regarding funding etc., and optimized the processes. This means consequently that we reduced selected activities from the old transfer agency. A good example is the science marketing via exhibitions.’ (Interviewee 7)

This demonstrates that individual academic researchers take note of developments and activities pursued by university management to strengthen and foster UILs.

**Experience: individual level.** As the second illustration of using experience, that of working with industry partners and conducting UILs in general is rooted in each individual academic researcher (Interview 5). It is therefore of major importance that this knowledge and experience is used and made available to others; and the first steps are already being made in this regard. As such, and in line with its strategic intention to increase UIL activities, MUAS operationalizes the focus on industry partnerships at an early stage. MUAS communicates this in its job applications where individuals with a particular interest in participating in UILs are sought (Davey, Baaken, Deery et al., 2011).

As required by German regulations, academics employed at Universities of Applied Sciences need to have worked in industry or industry-related organizations prior to their academic career (Interviews 1, 2, 4, 6, 8). As such the in-depth interviews revealed that prior experience in industry contributed significantly to the effectiveness and management of R&D projects with businesses. It was noted that academics with industry experience by definition already had contacts in industry and were better informed about potential areas of relevant applied research.

‘[. . .] It eases the interaction with companies a lot because academics know companies and know how they work [. . .].’ (Interviewee 2)

‘[. . .] At the time they are appointed they possess a great understanding of their industry sector as well as their work environment and generally a very good professional network [. . .].’ (Interviewee 7)

‘[. . .] For one, they bring contacts with them. This is obvious, when working for a company that company is again connected to others. And when I apply at the university I can manage to keep the contact with the persons and discuss potential projects.’ (Interviewee 8)

‘[. . .] And that is where the experience in collaborating with industry or experience from industry is valuable. Very valuable. It helps especially because they speak the same language, they have a network and their contacts, they have projects or bring them directly with them from industry. They are much more linked with companies, in industry, or projects and do are not afraid, which is a very good prerequisite for university–industry linkages.’ (Interviewee 5)

One outcome of the in-depth interviews was the finding that newly appointed academics in particular were highly motivated to conduct collaborative R&D projects with industry. A specific instrument to encourage recruitment of such academics is used at MUAS: the individuals concerned are invited to an event at which university management presents itself and the different functions of various departments, and sets out the benefits of engaging in UILs (Interview 2; Fachhochschule Münster, 2004). As noted by several interviewees (Interviews 4, 5, 8), it is difficult to incentivize those academics having been at MUAS for a long time and not having been engaged in UIL activities. It was therefore especially important to support the newly-appointed academics as early as possible, to establish a cohort of people conducting UILs. In this respect MUAS has room for development, specifically by implementing incentives to encourage those not active in UILs to consider doing so.
Discussion of results

The support mechanisms at MUAS relate to four main areas – policy formulation and development, policy execution, incentives, and communication. The transfer of support mechanisms to develop and foster UIL activities at MUAS from the organizational level to the individual level occurs through a number of ways. The basis for all activities is the Triangle of Innovation through which MUAS demonstrates a clear division of responsibilities and activities. The three entities (university management, Science Marketing, Transfer Agency) of the Triangle of Innovation act separately. While policy formulation and development, incentives and communication are the responsibility of the university management, the Transfer Agency and Science Marketing, the research and development centre, are responsible for implementing these policies. Each of the support mechanisms has an organizational and individual aspect, with each aspect closely linked to the other.

With regard to formulation and development of policy, the organizational level addresses strategic issues in promoting UIL activities and incorporates specific instruments such as the University Development Plan, Academic Scorecard, Strategic Partnerships and the establishment of the two entities – Science Marketing and Transfer Agency – as well as the organization of an Open Space Event. MUAS addresses both the top-down and bottom-up perspective of support mechanisms, as proposed by Tornatzky et al (2002). The university management of MUAS integrates the furtherance of UILs in its mission (Markman et al, 2005; Friedman and Silberman, 2003) and actively engages in long-term strategies (Siegel and Phan, 2005), as demonstrated through the establishment of the Triangle of Innovation. The Academic Scorecard is a monitoring tool which helps MUAS in developing and fostering UIL activities. While the general direction of development is provided by university management, individual academic researchers are involved in establishing the aims and setting up specific activities to achieve them. The policy formulation and development support mechanism is present predominantly on the organizational level, but is being operationalized and thereby transferred to the individual level through the Open Space event, at which future research areas are identified and developed. It is the know-how and competence of the individual academics which jointly determine the direction of research, with university management using their input as a driver for continuously advancing UILs. Both approaches demonstrate an exchange between the two levels which functions well and thus strengthens and fosters UILs.

The interrelationship of the organizational and individual levels is also visible in the execution of policies at MUAS, which occurs through two bodies – the Transfer Agency (TA) and Science Marketing – which act as tools for the task. The TA of MUAS, implemented to reduce the tension between the need for academics to commercialize their research results but not neglect their teaching obligations (Ambos et al, 2008; Coaldrake and Stedman, 1999), is an ideal unit for supporting academics in various fields. The TA is proactive and covers all aspects, from identifying appropriate research funding opportunities and incorporating suitable partners to managing the administrative aspect of UILs, supporting individual academics who engage in UIL activities. In addition, the TA personnel are well qualified and possess experience of working with industry, as promoted by Lubango and Pouris (2007). The research and development centre, Science Marketing, provides university management with international research data on UILs; and the information is also made available for individual academics at MUAS. By disseminating research results and holding workshops/seminars to educate and share insights, the organizational level of the research centre is closely linked with the individual level.

With reference to Siegel et al (2003b) and Göktepe-Hulten and Mahagaonkar (2009), MUAS engages in a wide variety of monetary and non-monetary incentives to strengthen and foster UILs. While all incentives are developed by the university management of MUAS, the incentives are predominantly implemented to encourage individual academics. Thus the interplay of the organizational and individual levels is again very close. In accordance with the recommendation by Polt et al (2001) that support mechanisms for incentivizing academics should not be considered separately, MUAS has established a variety of possible incentives and university management is thus able to address and target individual researchers as appropriate.

As suggested by the literature (Siegel et al, 2003b; van der Sijde, 2012; Geissler et al, 2006; Mitton et al, 2007) effective communication needs to take place not only in the university but also with external stakeholders. MUAS addresses this by being active in print and using online-based tools, thus reaching a large audience. Because the recognition and acknowledgment of work seems to be a key driver for academics to engage in UILs, the communication strategy implemented by MUAS emphasizes this by disseminating information on the activities of academics. In accordance with Mitton et al (2007), MUAS engages in face-to-face exchanges between decision makers and researchers by means of defining
and discussing the individual contributions to the overarching strategy of the university in terms of strengthening UILs. The Open Space Event is also an opportunity for individual academic researchers to make contact with decision makers, to promote their research areas of interest. The communication methods used by MUAS provide benefits on the organizational and individual levels. By engaging with each other through open dialogues, both levels can share and enhance UIL activities at MUAS.

Whilst the role of experience cannot be regarded as a support mechanism for UILs per se, it does apply to both the organizational and individual levels. With regard to the well-established approach of MUAS for professionalizing UIL activities, it must be noted that the experiences of the institution and of the individuals play an integral part. The fact that newly appointed academics in particular are motivated to participate in UILs, and the prerequisite for them to have industry work experience, may be regarded in combination or, rather, as an outcome. Coming from industry, such individuals already have a network of industry partners and a better understanding of market and research needs (van Rijnsoever et al, 2008; Plewa and Quester, 2008; D’Este et al, 2012). Thus, being better equipped with skills, knowledge and competence enables such newly appointed academics to be prepared for participation in UILs. However, choosing such participation remains an individual decision and it may therefore not be pursued by every person: this is why some academic researchers decide to focus solely on their teaching obligations, even though the incentives are targeted at all academics. This demands a differentiated strategy, on behalf of the university management, for attracting these academics to participate in UIL activities. In general, the experience factor holds significant potential for MUAS in its desire to expand its UIL activities. By means of seminars and workshops, individual experiences can be shared, with resulting learning benefits for academics and others. The findings of Wakkee et al (2010) suggest a positive relationship exists between managers training their employees to be entrepreneurial and the employees’ entrepreneurial activity. While these findings were generated in large service organizations in the financial sector, with the aim of investigating how to enhance employees’ entrepreneurial behaviour, a similar development might be observed with regard to entrepreneurial UIL activities. While these findings were generated in large service organizations in the financial sector, with the aim of investigating how to enhance employees’ entrepreneurial behaviour, a similar development might be observed with regard to entrepreneurial UIL activities. While these findings were generated in large service organizations in the financial sector, with the aim of investigating how to enhance employees’ entrepreneurial behaviour, a similar development might be observed with regard to entrepreneurial UIL activities. Experienced individuals can share their knowledge with newly appointed academics, to encourage participation of the latter in entrepreneurial UIL activities. Learning from other practices and benefitting from their experience provides MUAS with the opportunity to expand and enhance its UIL activities.

Taking all support mechanisms into account and considering the challenges of means–end decoupling (Bromley and Powell, 2012), MUAS may benefit from the experience gained, both on the organizational and individual level, to be even more successful in generating UIL activities. In order to be continuously successful in engaging in UIL activities, university management should spend time on analysing and interpreting UIL successes and failures by constantly monitoring UIL activities at the institution. Through constant monitoring and learning from experience MUAS can benefit on the organizational and individual levels in institutionalizing UIL activities.

Conclusions, limitations and future research

Reflecting on the case study, we can say that MUAS is an interesting case with regard to understanding the interrelations between the organizational and individual levels through the creation of a comprehensive system of support mechanisms for UIL. Its approach of implementing the Triangle of Innovation is beneficial because each unit not only focuses on its expertise but also cross-fertilizes with the others to provide an appropriate structure for UIL (see Figure 1). Most support mechanisms for strengthening UIL activities, as identified by other researchers and reported in the literature, are used by MUAS and, to a certain extent, are developed further in innovative ways; but the most important factor is the combination of these instruments. Referring to the fact that UILs undergo different evolutionary stages (Plewa et al, 2013), it will be worthwhile to investigate the different stages universities go through in developing and implementing structures to encourage and foster UILs on the individual level.

Experience is important and relevant on both the organizational and individual levels. Constant exchanges of experience, and the resultant learning, should be addressed by university management to ensure effective transfer of experience between both levels. Because the experience gained on the individual level is stored within the respective person it is even more important to share their experience more widely and to make this experience available for others.

While the case study presents insights into how the organizational and the individual levels can be brought closer to each other, the limitations of the research need to be considered. With regard to the industry experience of newly appointed academics at University of Applied Sciences and the value of this to UILs, it may be different for ‘traditional’ (research-based) universities, where industry experience is not mandated. Thus, differences in institutional history are important and...
pertinent. Whereas the focus of research institutes such as MUAS is on the applicability of research results, other universities are concerned primarily with fundamental research. Universities of Applied Sciences may offer only a limited range of subject areas compared to traditional universities and, as a result, attract academics with strong reputations. Thus the support mechanisms used by MUAS might not be as effective in a traditional university setting. Referring to the differences between traditional universities and Universities of Applied Sciences, it would be of interest to determine whether they differ in their approaches for engaging academics in UIL activities. In addition, the interrelationship of the organizational and individual levels might be an interesting aspect to consider. In this respect a comparison of practices in different countries would also be of value, not only to detect differences but also to learn from the alternative practices. Because academics teaching at Universities of Applied Sciences need – in Germany, at least – to have spent time working in industry, the aspect of prior experience should be regarded in a different light. The learning effects of academics with experience in industry could be analysed further, to advance the understanding and better development and implementation of structures to reach the individual level.

Another limitation of this study lies in the selection of academic researchers. The opinions outlined in this paper are essentially one-sided because only academics who were very active in conducting research projects were selected, as opposed to newly appointed academics or academics new to MUAS. In addition, while it was shown how the organizational level can translate supporting measures to the individual level, the effectiveness of those incentives was not analysed. Despite the fact that third-party funding has increased consistently at MUAS, it cannot be concluded that this is due to the incentives that were implemented.

One aspect that also needs to be stressed is the fact that it is the configuration of specific instruments, rather than a single support mechanism, that is most beneficial with regard to the overall performance of a UIL. Developing the proposal to analyse the effectiveness of incentives, future research could elaborate on the relationship between incentives used and the amount of third-party funding received during the year. With reference to the development potential of MUAS to motivate those academics who have been with the university for a long time but are not active in UIL activities, future research should investigate incentives, specifically addressing such individuals. In doing so, differentiations between incentives might be revealed.

Notes

1The term UIL is used as a synonym for knowledge and technology transfer in this paper due to the following explanation. Reams (1986) defines knowledge transfer as ‘a variety of processes emphasizing on-going personal interactions and are often a necessary foundation for stimulating larger scale cooperative university–industry research programs’. Technology transfer is defined by the NSF (1982) as ‘programs capitalizing on joint industry-university research and aiming to integrate university-driven research into applied initiatives for the development and commercialization of new technologies’. Both statements imply that UIIs are a result of knowledge and technology transfer.

2In this context defined as ‘the drafting and implementation of cross-functional strategic decisions by a higher education institution that will enable it to achieve its long-term objectives with respect to UBC’, Davey, Baaken, Galán-Muros et al (2011, p 30).

3Collaboration in R&D, commercializing R&D results, mobility of students and staff, curriculum development and delivery, entrepreneurship, governance and lifelong learning according to Davey, Baaken, Galán-Muros et al (2011, p 27).

4Academics not engaging in research activities can collect third-party funding received during the year. With respect to UBC, Davey, Baaken, Galán-Muros et al (2011, p 30).

The name for the award is based on the decision, made in Lisbon, of European countries to make Europe the biggest and strongest research and transfer area (Interviewee #2).

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