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Frederik, J.A.; Hasanefendic, S.; van der Sijde, P.C.

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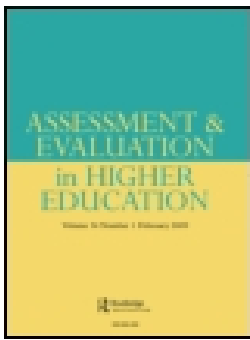
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Professional field in the accreditation process: examining information technology programmes at Dutch Universities of Applied Sciences

Hans Frederik^{*a}, Sandra Hasanefendic^{a,b,c} and Peter van der Sijde^a

^aVrije Universiteit Amsterdam, The Netherlands; ^bISCTE-IUL, School of Sociology and Public Policy, Lisbon, Portugal; ^cCenter for Innovation, Technology and Policy Research, IN+, Instituto Superior Técnico, Lisbon, Portugal

In this paper, we analyse 53 Dutch accreditation reports in the field of information technology to assess the mechanisms of the reported involvement of the professional field in the undergraduate programmes of universities of applied sciences. The results of qualitative content analysis reveal a coupling effect in reporting on mechanisms of interaction. Although the involvement of the professional field is tightly coupled with the undergraduate programmes at universities of applied sciences at the strategic level, there is an under-representation of university-industry interaction on an operational level, which suggests the need to explore the actual interaction taking place between the professional field and the programmes. Simultaneously, our results indicate that accreditation reports are not able to provide a holistic picture of professional field engagement in the curriculum of undergraduate programmes at the operational level, which questions their role in acknowledging the role of industry in shaping and achieving intended learning outcomes. Perhaps policymakers should consider introducing other tools or standards for addressing the outcome of the engagement and the responsiveness of the programmes at universities of applied sciences to the professional field.

Keywords: universities of applied sciences; accreditation; coupling; professional field; undergraduate programmes

Introduction

As a quality assurance mechanism, the accreditation process accounts for minimum threshold standards of quality in teaching and research (Blackmur 2007), and legitimises institutional operationality (Prøitz, Stensaker, and Harvey 2004). Within this context, the accreditation process usually addresses the views of the government and, to a certain extent, academia (Stensaker et al. 2011; Serap and Cress 2014), in terms of whether the institution qualifies for a certain status (Välilmaa 2004). Employers and students are rarely mentioned, despite their obvious role in the accountability and transparency of the process (Santiago et al. 2008). Recent policy initiatives have emphasised that both internal and external stakeholders should play

*Corresponding author. Email: j.a.frederik@vu.nl

Note: The names of the authors have been presented in alphabetical order. The first author was responsible for the idea for the paper, the data analysis and results, the second author contributed to the introduction, the theoretical framework, discussion and conclusion, whereas the third author was consulted on the overall text and discussion and literature.

a greater role in the process of accreditation. For example, the Bologna process specifies that students, as internal stakeholders, should impact the development of institutional strategy, policies and procedures (European Association for Quality Assurance in Higher Education 2005). Santiago et al. (2008) argue that their involvement in the ‘design and implementation of quality assurance activities is important from the perspective of accountability to society at large’ (281).

Although the role of students in quality assurance has been increasing, the professional field – which includes employers within a specific occupational field – still reportedly plays a minimal role in these processes in most countries around Europe (Santiago et al. 2008). The exceptions are professional accreditation schemes in the United Kingdom and Portugal, where the associations of employers are conditioning new entrants into professional practice (see Schwarz and Westerheijden 2004). At the same time, the involvement of the professional field in quality assurance, and the reported implications of industry collaboration in curriculum programmes, have been rather under-explored in the literature (Plewa, Galán-Muros, and Davey 2015). This goes against the attention that the interaction with industry has received in practice (e.g. Davey et al. 2011) and in research studies (e.g. Hasanefendic, Heitor, and Horta 2015; Plewa, Galán-Muros, and Davey 2015).

In the Netherlands, one of the formal requirements to receive accreditation of undergraduate and graduate programmes is to show that the programme meets the requirements of the professional field (NVAO 2011, 2014). The undergraduate programmes at the universities of applied sciences in the Netherlands take the professional field into account to a large extent (Leisyte et al. 2013; Kolster and Westerheijden 2014), as they participate in formulating ‘domain competencies’ for broad subject areas (NVAO 2008, 8). This greatly increases the transparency of the quality of programmes (Schwarz and Westerheijden 2004), but research is unclear on how and to what extent these external stakeholders actually participate in shaping learning outcomes (Santiago et al. 2008, 283). This leads us to our research question, which inquires about the mechanisms of engagement of the professional field in undergraduate programmes and its contribution in shaping intended learning outcomes.

We focus on the universities of applied sciences, where linkages with the professional field, although part and parcel of the institutional tissue, have been rather unexplored. These universities offer professional education (Huisman 2008; Jongbloed 2010), which is concentrated on regional and local labour markets. Their interaction with companies has intensified over the years, with the introduction of the official role of conducting research. In particular, there is evidence of pedagogical innovation, emphasising problem-based learning and short-term project-oriented research, and growing social and economic landscape entrenchment (Hasanefendic, Heitor, and Horta 2015). In this light, it is interesting to explore how the interaction with companies is structured and what are the implications for curricular programme development.

In order to address these issues, we analysed the reported interaction of information technology (IT) undergraduate programmes and the frequency of engagement with the professional field at both strategic and operational organisational levels (Weick 1976; Bromley and Powell 2012). The strategic level is related to the managerial or policy aspect of collaboration and refers to the extent to which the professional field participates in defining the learning outcomes of programmes, or the extent to which it is consulted in curriculum design and delivery (Davey et al. 2011). We define the operational level as activities related to the professional field

(e.g. companies) embedded in the curricular programme in teaching and research practice.

The majority of studies addressing the interaction between higher education institutions and the professional field (e.g. Davey 2015) examine the concrete outputs and implications of their relationship, rather than focusing on the interplay between the mechanism of interaction at both strategic and operational levels. The nature of the types of collaboration at the two levels (strategic and operational), and the mechanisms involved, presuppose a kind of ‘coupling’ (Weick 1976) with the professional field. It is the coupling between the professional field and the undergraduate programmes at the two levels, as discerned from accreditation reports, that is the central topic of this study.

Accreditation in the Netherlands: an overview of the formal procedure

Accreditation is a government policy mechanism regulating the quality of higher education institutions, programmes and modules of study in higher education. As such, it is one of many activities designed to evaluate, monitor and enhance the quality of higher education (Schwarz and Westerheijden 2004; Santiago et al. 2008). In certain European countries, accreditation is mandatory, and concerns both the evaluation and monitoring of the quality of the institution and its programmes (e.g. Norway, Portugal and Switzerland). For example, in the Netherlands periodical evaluations of programmes are organised by an independent Review and Assessment Agency (VBI), which are then accredited as official degrees by the Nederlands-Vlaamse Accreditatie Organisatie (NVAO), the Dutch-Flemish Accreditation Organisation (Scheele, Limbach, and de Rijcke 2006).

The current accreditation process in the Netherlands is undertaken around four standards on which sufficient judgement must be attained to be granted accreditation (NVAO 2014). These include: (a) intended learning outcomes, where the programmes need to show how they tie in with the international perspective of the requirements of the professional field; (b) teaching/learning environment, in which attention is paid to the content and structure of the curriculum, services and facilities provided by the institution that help in achieving learning objectives, as well as the quality of staff; (c) assessment, which shows whether the programme has a valid, reliable and transparent assessment scheme, and (d) achieved learning outcomes, which can be demonstrated by examining final projects, tests, performance of graduates in actual practice, etc. (Santiago et al. 2008; NVAO 2014).

These four standards answer the following three questions regarding the programme, which helps to evaluate its quality: (1) What is the aim of the programme? (2) How are the aims realised? (3) Have the objectives of the programme been achieved? However, the accreditation reports in this analysis are from the period before 2012, and they are based on three standards. Changes to the standards were introduced in 2014 and they concern the division of the standard ‘assessment’ into two separate standards, namely, ‘assessment’ and ‘achieved learning outcomes’.

The VBI forms an assessment panel composed of one student representative, one professional and one higher education representative, apart from the chairman and secretary positions (NVAO 2011, 2014). The panel drafts a report based on the documentation it receives from the programme (see Table 1) and the on-site visits to the institution. Accreditation reports are comprehensive evaluations of both the strategy the programme undertakes in educational provision, and practice in teaching and

Table 1. Overview of documents for accreditation.

Basic data concerning the programme

- (1) Administrative data regarding the programme and the institution
- (2) Quantitative data regarding the programme

Required appendices to the critical reflection

- (1) Subject-specific reference framework and the learning outcomes of the programme
- (2) Overview of the curriculum in diagram form
- (3) Outline description of the curriculum components, stating learning outcomes, attainment targets, teaching method(s), assessment method, literature (mandatory/recommended), teacher and credits
- (4) Teaching and examination regulations
- (5) Overview of allocated staff with names, positions, scope of appointment, level and expertise
- (6) List of the last 25 final projects or the final projects of the past two years (or portfolios/projects demonstrating the exit levels attained by the students)
- (7) Overview of the contacts maintained with the professional field (if relevant)
- (8) Report on the institutional quality assurance assessment

Documents made available during the visit

- (1) Reports on consultations in relevant committees/bodies
 - (2) Test questions with corresponding assessment criteria and requirements (answer models) and a representative selection of actual tests administered (such as presentations, work placements, portfolio assessments) and assessments
 - (3) Representative selection of final projects, selected by the panel, of the past two years with corresponding assessment criteria and requirements
 - (4) Reference books and other learning materials
 - (5) Summary and analysis of recent evaluation results and relevant management information
 - (6) Documentation regarding teacher and student satisfaction
-

research. In other words, the input in the report on the engagement with the professional field is usually depicted in terms of a variety of strategic tasks, as well as in the form of concrete teaching and related research practices. For example, research partnerships and collaboration in education, research and promotional activities of the region are often mentioned. The report also elaborates on the outputs of this strategic collaboration by providing examples of student engagement in projects and their active participation in the professional field throughout their studies. This information facilitates the analysis of the interaction of the curricular programme with the professional field that is reported at the strategic level, and enables an observation of the interaction as it unfolds via multiple teaching and research practices at the operational level.

Coupling with the professional field: a higher education perspective

In order to delineate a set of conclusions on the nature of interaction reported on the strategic and operational level, we deploy the theoretical perspective of ‘loose’ coupling introduced by Weick (1976) and, more recently, Orton and Weick (1990). These authors refer to autonomous and independent units embedded within a larger

system as ‘loosely coupled’ systems. In loosely coupled systems, the actions of one unit may have little or no effect to the other unit or even the overall system. The basic underlying logic is that, unlike tight coupling which presupposes highly integrated and responsive systems, and decoupling which refers to the opposite alternative, ‘loose coupling’ indicates that the system is less robust and units are free to adjust accordingly to change without requiring a transformation to the entire system (Orton and Weick 1990). This theoretical concept gives us leeway to understand the extent to which the professional field is engaged in shaping learning outcomes at the strategic level, and how the interaction is represented at the operational level.

Literature has substantiated the existence of coupled systems, either within or outside organisations, creating interdependent partnerships where misalignments are present (Soh and Sia 2004; Bromley and Powell 2012). Such literature always emphasises the process of mutual adaptation towards some form of eventual alignment (see Berente 2009; also Fusarelli 2002). In the higher education literature, curricular programme alignments with the professional field are considered with caution, despite the increased interest in their relationship (Teichler 2007; Leisyte et al. 2013). For example, some scholars are rather critical regarding the new role of industry in higher education and its influences on higher education structures (Kauppinen 2012; Alajoutsijärvi, Juusola, and Siltaoja 2013), as well as the roles of academia in changed higher education settings that emphasise increased collaboration with companies (e.g. Hazelkorn and Moynihan 2010). On the other hand, the shift towards a market-oriented higher education and growing industrial stakeholder involvement does not have to imply that universities are forced to displace their traditional activities (see Ylijoki 2003). For example, industrial sponsorships are regarded as highly effective for enhancing the quality of education of students and enabling them to pursue their scientific interests (Mendoza and Berger 2008). Simultaneously, industry engagement in higher education systems has become crucial in shaping effective national innovation systems, which rest on the interaction between universities and companies and other institutions in the environment (Nelson 1993).

Existing literature testifies two things regarding the increased coupling between the professional field and higher education: (a) that it is destructive, thereby leading to the dissolution of traditional university structures (see Nickolai, Hoffman, and Trautner 2012); and (b) that it is instructive, or stimulates innovation for economic and scientific growth (see Etzkowitz and Leydesdorff 2000), but also enhances institutional growth, transformation or evolution (Marginson and Van der Wende 2007).

Universities of applied sciences have typically been rather tightly coupled with the professional field. They originated with mergers of industry institutes and commercial institutes in the late 1970s and the 1980s (e.g. Portugal), as a result of a country’s transition from agricultural to industrial production (Baker, Boser, and Householder 1992). Some are more recent institutions, for example in Finland and Switzerland. Until now, their main task was to provide teaching activities for professional purposes, and yet some ten years ago research activities started playing an increasingly important role. Hasanefendic, Heitor, and Horta (2015) show that such training at these institutions involves a relatively high involvement of regional industry in skill building. For universities of applied sciences this is the goal, as they have positioned themselves closer to the (regional) labour markets and industry (Sandelin, Lahdeniemi, and Laine 2012), and responded swiftly to changes in them

(EU Skills Panorama 2014). Due to this knowledge we expect that the coupling with the professional field will be tight on both the strategic and operational level.

Methodology

Our analysis draws on a systematic comparison of accreditation reports drawn up by the accreditation panel on existing undergraduate programmes in IT at Dutch universities of applied sciences obtained in the period 2010–2012. This is the period in which the most recent evaluations of the IT curricula have taken place. This data collection is supplemented with our experiences and observations as either researchers or professionals in the field of higher education and quality assurance in the Dutch context. We have included our observations in the discussion of the results obtained and based our conclusions, apart from the findings, on experience from the field.

We used all of the accreditation reports from the 53 undergraduate IT programmes across 22 universities of applied sciences in the Netherlands. Since the IT field is divided on the basis of a particular curricular focus, the reports are evaluations of the information science undergraduate programmes ($n = 20$); business IT and management undergraduate programmes ($n = 18$); and (technical) computer science undergraduate programmes ($n = 15$). The choice to study the IT sector comes from its growing importance in the Dutch context in the past couple of decades (Cucchiari, Daelemans, and Strik 2001; den Adel, Blauw, and Entzinger 2003; Gillebaard et al. 2014), where the shortage in the number of people trained in the IT sector was often discussed (Centraal Bureau voor de Statistiek 2013; Frederik 2013).

We performed a qualitative content analysis (Hsieh and Shannon 2005), a technique which provides meaning to the content of text data and complies with the naturalistic paradigm. The naturalistic paradigm is a non-positivist approach to research, whereby one relies on subjective interpretations of reality (Lincoln and Guba 1985), or portrays reality as internally constructed by the researcher by identifying emergent themes and patterns. Further, generalisations from this study relate to the particular context under analysis; however, we also propose implications for the accreditation procedure.

In order to systematically interpret meaning from the accreditation reports, we developed categories for analysis (Hsieh and Shannon 2005), which served as reference during the process of content data synthesis. These have been developed from existing literature on university-business collaboration (see Davey et al. 2011), and then updated on the basis of the analysis we undertook on identifying the mechanisms of engagement of the professional field in undergraduate programmes. Here, our observations and experiences were crucial and provided clearer conceptualisation of the mechanisms of coupling. The categories are represented in Table 2 as strategic and operational mechanisms that govern the interaction of universities of applied sciences and the professional field.

We used trigger words (vocabulary on university-business collaboration; see Table 3) to allocate content to the selected category. Whenever a word was encountered in the content, it would be flagged and the relevant portion of the text was then allocated to the category. The work was done in Excel and the flags were manually checked for validity of the content allocated to categories.

By using pre-existing categories to classify our data, our approach to qualitative content analysis is considered as ‘directed’ (Hsieh and Shannon 2005, 1278). The goal of this approach in content analysis is to extend research by relying on a set of

Table 2. Overview of mechanisms by which universities of applied sciences and the professional field interact.

Mechanisms for coupling on the strategic level	Mission, vision, policy	Collaboration with IT industry is a part of policy and strategic agenda of the programme and the institution
	Governance	Professionals from IT industry field in Boards and Committees in universities of applied sciences
	Curriculum development and delivery	IT industry involvement in regular discussion on trends in the profession and strategic involvement in education and training
	Quality assurance/evaluation	IT industry involvement in regular (e.g. annual) evaluation of the curriculum (quality management)
Mechanisms for coupling on the operational level	Research partnerships	Developing joint research projects that include student participation
	Mobility	Exchange of teaching staff in collaboration with the industry; also includes the exchange of professionals
	Lifelong learning	Collaboration between IT industry partner and the UAS in training teaching staff
	Entrepreneurship	IT industry is involved in entrepreneurial activities, supporting spin off creation

Table 3. Trigger words used to analyse accreditation reports.

Dutch	English
missie	Mission
visie	Vision
beleid	Policy
onderzoek	Research
gast	Guest
ondernem ^a	Enterpr ^a
train	Train
werv ^a	Recruit ^a
project	Project
overheid	Govern ^a
minister	Minister
subsidie	Subsidy
sponsor	Sponsor
raad	Council
werkveld	Field
curricul ^a	Curricul ^a
kwaliteit	Quality

^aParts of words used.

already established variables and codes which may serve as the focal point for analysis. We relied on a pre-established set of categories to describe possible ways of interaction with the professional field, and discern whether this interaction was occurring at a strategic or operational level. After the initial classification of relevant text into categories, we verified the frequency of reporting of the interaction on both the strategic and operational levels; that is, we measured the degree of coupling. The degree of coupling can have several dimensions, and the looseness can be captured

by words such as ‘frequently’, ‘intensely’, ‘probably’ and ‘negligibly’ (Weick 1980, 5). We defined the mechanisms of interaction and the frequency of reporting on the interaction at both the strategic and operational levels.

Strategic level of coupling

Table 4 presents the results of qualitative content analysis of 53 accreditation reports and the mechanisms for coupling at the strategic level. Coupling at the strategic level implies that the professional field is highly represented in policy and strategic discourse, as well as given a prominent role in shaping learning outcomes.

We observe that the coupling with the professional field becomes visible and is reported frequently in four strategic mechanisms: (a) curriculum development and delivery; (b) governance, (c) mission, vision and policy; and (d) quality assurance/evaluation.

Curriculum development and delivery is the most frequently reported mechanism of coupling with the professional field. It relates to industry involvement in regular discussions on the trends in the profession, by a number of different outputs, and strategic involvement in education and training. For example, the majority of the programmes emphasise that they have made arrangements with some companies to incorporate guest lectures and seminars with professionals where student work is presented as a regular part of student training. Additionally, programmes refer to working visits by professionals and weekly colloquiums as a regular learning strategy. Other examples include agreements with companies to provide internships and regular training for students throughout the programme. Some programmes have even developed strategic partnerships with companies, which involves professional mentorships during the course of internship, exchange of professionals and students, and joint projects. Programmes also maintain their knowledge networks comprising professionals and companies in the field, which enables transfer of professional or field knowledge to the curriculum.

At the level of governance, the coupling between the professional field and undergraduate curricular programme is also very profound. Almost 90% of all the accredited programmes show governance as the main mechanism of interaction with the professional field. In other words, there is a strong presence of stakeholder representatives of the IT industry at managerial levels in universities of applied sciences in the Netherlands.

An example of this coupling is the inclusion of professionals from industry in advisory boards or councils, establishment of professional committees or boards of external experts, and groups which provide feedback on the choices made in the educational programme. For instance, one of the programmes reports that they keep up with the national developments in the IT industry by appointing professionals from the industry to the Advisory Council, Professional Committee, and the Board of External Experts. These professionals have a role in discussing current developments in the field and, if necessary, suggest their embedding in the curriculum. Our analysis suggests that one or two members of these bodies are former alumni. Similarly, other programmes rely on reports from the Professional Committee on the role of industry in education. In almost all the cases, the boards, councils and committees meet regularly three to four times a year.

Mission, vision and policy is a mechanism which is incorporated in almost all of the programmes. It involves drafting documents, such as strategic reports, technolog-

ical plans, and business plans, in consultation with professionals. For example, certain programmes conduct comprehensive regional, national and international studies to collect knowledge on latest developments in the field and the labour market. The documents provide input in the discussion regarding the position of the training and the update on final qualifications. There are also policies at programme level, which specify that certain programmes, being a part of concrete research clusters, must work closely with the professional field. Programmes also opt to incorporate the contacts of companies in their policy and market development plans, and urge teachers to foster liaisons with these companies.

The involvement of industry in quality assurance/evaluation is the fourth mechanism of interaction with the professional field at strategic levels. 72% of the programmes use the interaction with the industry in compliance with formal requirements to evaluate the study programme (quality management). Our results show that certain programmes organise regular meetings with advisory boards or councils or similar bodies of professionals to discuss the results of evaluations by considering the (degree of) involvement of the professional field, while others use a (bi) annual survey for evaluation of the professional orientation of the course, or occasionally even both.

Operational level of coupling

Table 5 exemplifies the coupling of UAS with companies on operational levels. In other words, it provides examples of practice in IT undergraduate programmes where the output of strategic collaboration with companies is obvious. The mechanisms, which imply involvement with the professional field, are: (a) research partnerships, (b) mobility, (c) lifelong learning, and (d) entrepreneurship.

The results indicate a relatively low percentage of reporting on the outcomes of strategic arrangements for interaction with the professional field. Among the identified mechanisms, research partnership has the most significant result. Under research partnership we have grouped those examples that include research and development (R&D) projects between companies and the programme, as well as commercialization activities. Students actively participate in these projects and are assessed on their performance. For example, on average, 25% of all programmes report that they collaborate with companies in R&D. These collaborative efforts are usually described as contract research, R&D consulting, cooperation in innovation and joint academic publications. Additionally, as a best practice approach, one programme describes its collaboration with regional companies on external projects and local companies to produce IT services in healthcare, as well as with regional consultative bodies; it also emphasises its cooperation with the company Infosupport, which is renowned in the Netherlands for Microsoft Release Management. Student engagement and active participation in these projects is detailed as coursework and a part of one semester research assignment.

An example of active students' participation is also the participation in 'software factories', usually in the fifth semester of their undergraduate programme. Software factories are described as collaborative hubs between Dutch and German companies, where students work on a number of joint assignments and projects under teacher supervision. In this way, students are either involved in finding solutions for concrete company problems, or they work in a team with other students and teachers in fulfilling the obligations of a joint project. Students are reportedly

engaged in the professional field throughout their educational training, and especially in internships and graduation projects where interaction with the field is more pronounced.

With reference to company involvement in the commercialization of R&D results, just a few universities of applied sciences specify that the collaboration yields spin-offs, disclosure of inventions, patents or licences.

According to the accreditation reports, only 9% of the programmes use mobility to report their involvement with the professional field. Mobility refers to teacher career placements in companies, but it also includes the possibility of a professional teaching for a fixed period of time. Many programmes practice mobility between teachers and companies in order to reduce dependence on the labour market. For example, they regularly practice exchange of professionals where an employee of a selected company can opt to teach for a year in the programme. Simultaneously, one of the lecturers works for the same period in the company. Thus, new knowledge and new experiences benefit both parties.

Reports indicate that there is some cooperation with the professional field in life-long learning programmes as a form of providing continuing teacher (staff) education. For example, some programmes report that they allocate an annual budget for training of their teachers and staff. Training usually includes education seminars, participation in knowledge exchange networks, and internal and external workshops. External workshops are usually organised in companies in which the teacher specialises in a certain subject.

Promoting entrepreneurship is reported by only 9% of the programmes and involves the creation of a conducive culture. Entrepreneurship is stimulated by several programmes – for example, in one programme, students can choose to enter the contest entitled ‘Enter Prize’ and combine a regular IT programme activity with running their own business. In this manner, they are able to function as independent entrepreneurs and study simultaneously. Entrepreneurial activities are usually facilitated by external funding, and students are also supported by industry professionals from the field. There are programmes which organise entrepreneurship and innovation specialisation courses, where students’ progress is accompanied and evaluated by the representatives from the professional fields. Some students also get an opportunity to showcase their business ideas and get initial funding for their start-ups from the companies involved in the course. In such a scenario, students can do their final thesis on their start-ups or take their start-up as a case study for analysis.

Discussion

Tables 4 and 5 detail the coupling between the undergraduate programmes of universities of applied sciences and the professional field by specifying eight different mechanisms of interaction. These mechanisms exemplify the strategy of collaborating with the IT industry and the outputs of this collaboration in teaching and related research practice. The 53 programmes use different combinations of mechanisms to ensure the coupling, but the degree of coupling varies (Weick 1976; de Caluwé 2012) when we examine the levels closely. It shows that coupling is considerably tighter at the strategic level than at the operational level. In other words, coupling at the strategic level is reported by a majority of the programmes, which is sufficient to provide a minimum threshold of quality (NVAO 2011, 2014) and foster public legitimacy of the quality of the programmes.

Table 4. Mechanisms of coupling on the strategic level and percentage of reporting in total and by field of the IT programme.

Mechanisms for coupling on the strategic level	Total		Information science		Business IT & management		Computer science	
	N = 53		N = 20		N = 18		N = 15	
Mission, vision, policy	40	75%	16	80%	12	67%	12	80%
Governance	47	89%	18	90%	16	89%	13	87%
Curriculum development and delivery	49	92%	18	90%	16	89%	15	100%
Quality assurance/evaluation	38	72%	14	70%	12	67%	12	80%

Table 5. Mechanisms of coupling on the operational level and percentage of reporting in total and by field of the IT programme.

Mechanisms for coupling on the operational level	Total		Information science		Business IT & management		Computer science	
	N = 53		N = 20		N = 18		N = 15	
Research partnerships	13	25%	6	30%	4	22%	3	20%
Mobility	5	9%	2	10%	2	11%	1	7%
Lifelong learning	5	9%	3	15%	1	6%	1	7%
Entrepreneurship	5	9%	3	15%	1	6%	1	7%

On the other hand, the dynamic interplay between the professional field and the programmes at is not succinctly acknowledged at the operational level. Interactions at the operational level, in projects and internships, are of importance but only reported as ‘evaluative practice’ (Bromley and Powell 2012) of formal policy engagements.

An acceptable level of quality is not only defined at strategic levels but concerns the activities that take place at operational levels. For example, accreditation reports address the content and structure of the curriculum and, in contrast, achieved learning outcomes, by examining final projects or the involvement and performance of graduates in actual practice. These insights provide both inputs and outputs of intended learning strategies, and from our analysis it is evident that the professional field is involved in shaping the strategy for teaching and research; however, the outputs of collaboration with the professional field are obscure. In addition, the mechanisms of interaction at the operational level are merely shown as best practice or exemplary cases of collaboration with the professional field. The operational level of coupling as discerned from the accreditation reports is loose, and we question whether the coupling is actually tighter.

One explanation for this difference in coupling is found in the type of documentation provided to the accreditation panel by the programme during the process. The documentation in Table 1 contains considerably more information that is pertinent to the strategic level. The difference in coupling may also be explained by the accreditation procedure that the panel has to follow. The panel evaluates the overall learning objectives of the programme, then identifies the methods by which the objectives are incorporated in the programme, and finally verifies the results of the methods in achieving learning objectives. Usually, the results are only exemplary cases of the methods undertaken, or, in our case, the strategic arrangements of collaboration with the professional field.

These issues also relate to the question of effectiveness of accreditation and its impact on institutional structures (Stensaker et al. 2011; Cardoso, Rosa, and Stensaker, 2015). Our research has shown that the accreditation procedure is unable to capture the full dynamics of the process that underpins learning in an undergraduate programme and in relation to the involvement of the professional field. This suggests that the outputs of accreditation are not a complete representation of the activities underlying the undergraduate programme. In part, we have seen that the practical activities which signal collaboration with the professional field are not extensively elaborated. On the other hand, there have been many developments in the UAS in the Netherlands which have fostered and incentivized a research culture which is strongly inclusive of social and economic stakeholders (see Hasanefendic, Heitor, and Horta 2015).

For example, the Netherlands has stimulated regional research collaboration with small and medium enterprises by establishing the position of lectors as intermediaries between the external and internal world of the universities (Huisman 2008). The RAAK programme is an initiative by the Dutch Ministry of Education which grants funding to projects and networking between universities of applied sciences and regional companies in the public and private sectors (OECD 2014). More recently, the government has been supporting collaboration by allocating funding from newly opened Centres of Expertise (since 2011) (Deuten 2013). Based on this, we expect that the engagement of the professional field at the operational level will become more prominent rather than merely illustrative. Simultaneously, and reflect-

ing on the socio-economic relevance of universities of applied sciences as institutions providing specialised training in collaboration with local or regional external stakeholders (Hasanefendic, Heitor, and Horta 2015), the accreditation process does not emphasise professional field engagement in shaping and achieving learning outcomes. Currently, the accreditation procedure does not provide a realistic picture of the developments in training and education provided in undergraduate programmes, and it is due to this under-representation of the professional field in practice.

Conclusions and implications

This study examined the engagement of the professional field in undergraduate IT programmes at Dutch universities of applied sciences, and their role in shaping learning outcomes. Our research has shown that the intakes of external stakeholders, which should be addressed by the accreditation process (Cullen et al. 2003), are well exemplified at the strategic level but illustrative at the operational level. This implies that, although the professional field participates in shaping learning outcomes, we cannot address the extent to which the agreed-upon learning outcomes have been achieved. Future studies should address the in-depth interaction with companies at more practical levels to compare these findings and suggest improvements of existing quality assurance mechanisms.

Ultimately, as quality assurance mechanisms, accreditation reports are not able to provide a holistic picture of the outcomes of ties that the programme forges with the professional field, which leads us to question the contribution of the interaction with the professional field to the overall quality of the programme. Perhaps policymakers should consider introducing other complementary tools for addressing the quality of the programmes in relation to their engagement and responsiveness to the professional field, using current accreditation procedures solely as an administrative mechanism to ensure that agreed-upon elements for higher education programmes have been met. Introduction of new mechanisms seems necessary if the diversity in the Dutch higher education sector is to be maintained.

In a society where massification of higher education has been occurring at an unprecedented rate, and where labour markets are becoming increasingly global and turbulent, there is a need for quality assurance mechanisms to address the changing demands for training and education. As a consequence, accreditation increases in importance. It should control for quality in the higher education landscape, while at the same time promoting its diversity and acknowledging new trends, or complementing the practices in higher education institutions, which may fall out of the focus of the established standards of accreditation. Our study shows that current accreditation procedure does not account for the diversity of the Dutch higher education sector as it does not acknowledge, to its full extent, the industrial stakeholder engagement at universities of applied sciences, despite the tradition of these institutions in collaborating with industry in providing specialised training.

While our study provided some relevant findings, we are also aware of several limitations. First, this study is only concerned with the undergraduate programmes of universities of applied sciences in the Netherlands. Future research should compare the evaluation of programmes at universities to assess whether the engagement of the professional field in the undergraduate programmes at universities of applied sciences is more explicit and more embedded in the curriculum. These findings can contribute to understanding the diversity between the two higher education struc-

tures, particularly when boundaries between the two are becoming blurred (Huisman and Kaiser 2001).

Second, we only used the accreditation reports prepared by the panel to understand the relationship between the professional field and IT programmes. These reports are prepared on the basis of the documentation in Table 1. Undergraduate programmes in the Netherlands also prepare self-evaluation reports and these might provide additional valuable information on the coupling of the programme with the professional field. Ultimately, a more qualitative focus to researching this phenomenon should be adopted. Interviews and focus groups are optimal methodological approaches for a more in-depth exploration of the complexity underlying the interactions. They are commonly used when insufficient information is obtained regarding the study phenomenon or where more detailed insights are required (Gill et al. 2008), such as it seems to be the case in understanding the engagement of the professional field in programmes at universities of applied sciences.

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No potential conflict of interest was reported by the authors.

Notes on contributors

Hans Frederik is chairman of examination at the Amsterdam University of Applied Sciences and a researcher in the Department of Organization Sciences at the Vrije Universiteit Amsterdam, the Netherlands. His research focuses on understanding how does the interaction with the professional field contribute to the quality of the programs at universities of applied sciences.

Sandra Hasanefendic is a PhD student at ISCTE-IUL in Lisbon and at the Department of Organization Sciences at the Vrije Universiteit Amsterdam, the Netherlands, as well as a researcher at the Center for Innovation, Technology and Policy Research at Technical University in Lisbon, Portugal. Her thesis focuses on the training provided at technical and vocational tertiary education in Europe in a comparative perspective. She incorporates concepts from organisational science theory and institutional theory to understand the complexity behind the phenomena under investigation. Her research interests vary from innovation in higher education in teaching and research, agency in higher education settings to studying complexity in higher education organisations.

Peter van der Sijde is a professor of Organization, Entrepreneurship & Technology in the Faculties of Science and Social Sciences at the Vrije Universiteit Amsterdam, the Netherlands. His research interest concern (academic) entrepreneurship, adoption of technology and the interaction between the world of work and higher education.

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