



Responding to environmental 'shocks' - Innovation and Rationalities in Higher Education

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Abstract

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108/100 words

Environmental 'shocks' in society come in many forms. A new challenge in Higher Professional Education is Industry 5.0, where the human collaborates with automated systems.

In Higher Professional Education, operational professionals in Education, Industry and Research cooperate with the managerial professionals in these communities. In our paper, we focus on organizational learning, affecting the way organizations act upon environmental 'shocks'.

Our research shows a compelling distinction in the prevailing institutional rationalities of the operational professional acting along Mannheim's functional institutional rationality and the managerial professional acting according to Mannheim's substantial institutional rationality.

We show how taking account of this distinction may support organizations in responding to environmental 'shocks'.

Figure 1-2 shows the common playing field for (i) the *education* community BAE (Education), (ii) the *research* community HanAR (Research) and (iii) the related domain of the *automotive industry*, the industry community (Industry). Here, the depicted professional⁴ (Professional) is either an operational (OP) or a managerial professional (MP), i.e., as expert, a member of either one of the communities:

- (OP) The education, industry and research communities, represented by a so-called adaptive learning triangle;
- (MP) The managerial community within:
 - The industry represented by “Corporate Management”;
 - Academia, here HAN University of Applied Sciences, represented by “Academic Management”.

Each of the communities in this common playing field is dominated by procedures and prevailing regulations to comply with. And each professional acts from his or her rationality - the coherent combination of an individual’s beliefs (values), wishes, perception of procedures (prevailing regulations) - within the common playing field shared with the other communities in Figure 1-2. In this paper we limit ourselves to the procedures and prevailing regulations, and refer to the ensemble of these as ‘institutional rationalities’.

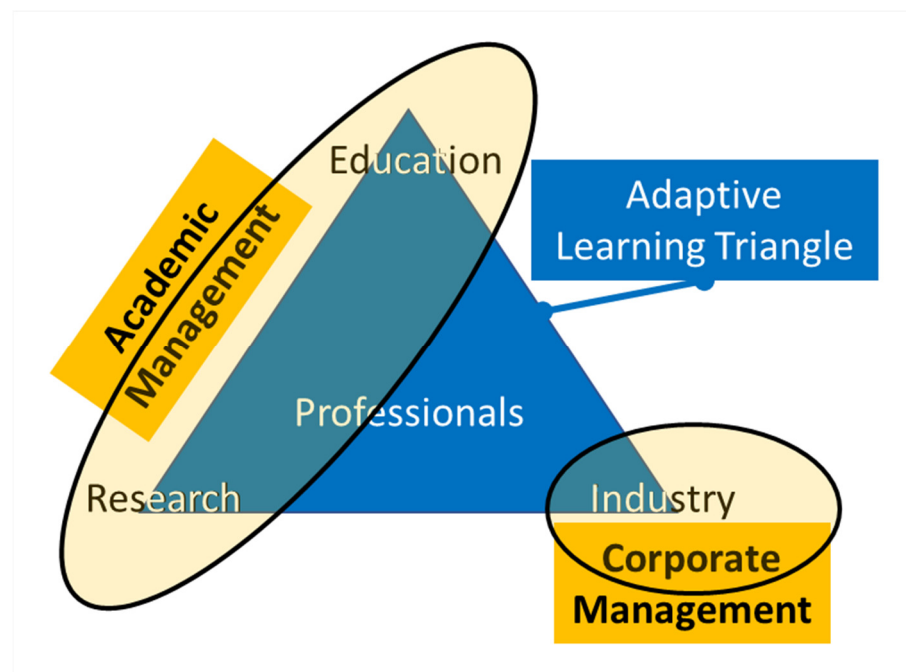


Figure 1-2 The intertwined playing field of the adaptive learning triangle, and corporate and academic management

In line with the foregoing, the research question we address in this paper is twofold: ‘What differences in perceived institutional rationalities can be observed: (i) between the operational professionals, (ii) between the group of operational and the group of managerial professionals?’.

⁴ Professional: a member of a profession (de Jonge, 2015, p. 6). Doing the best for clients and society, acting in integer ways in uncertain and complex situations, actively connecting with the newest insights in theories, daring to look critically and reflectively towards one’s own practice, and contributing to the development of the profession and fellow professionals. (Simons & Ruijters, 2014, p. 696).

Previous research on the topic of cooperation of OP in the adaptive learning triangle is dominated by university-industry cooperation. Typically, in these institutions the underlying idea is that educational activities sustain the research process. In line with Bouw et al. (2021) “...*little is known from the perspective of representatives of work practice*”, we include the perception of the Industry in our research. This may bring a new perspective to elaborate on the cooperation (i) between the operational professionals and (ii) between the groups of operational and the group of managerial professionals. This perspective may be helpful in coping with the challenges of environmental ‘shocks’.

2 Background

Addressing organizational learning may strengthen the ability to meet the challenges of environmental ‘shocks’, or (disruptive) innovations (Schwab, 2015, 2016). As Rothman’s literature review (Rothman et al., 2019) points out, organizational learning influences the way organizations - in our research we focus on academia cooperating with industry - respond to environmental changes. Understanding the other professionals’ perception of institutional rationalities, may be facilitated by the ability to step into ‘the other world’. Without the presumption to be exhaustive, four models that elaborate on the interrelationship between two (mental) realities, may be: (1) boundary crossing (Bakker & Akkerman, 2014), (2) flexible expertise (Birney et al., 2012), (3) cross functional integration (Baunsgaard & Clegg, 2013) and (4) absorptive capacity (Lane & Lubatkin, 1998).

Applied research at Universities of Applied Sciences can be considered as an investment in the cooperation between education and industry. Applied research activities generate knowledge which can be directly translated into new industrial products and solutions, thereby strengthening economic resilience (PwC, 2021). Applied research also contributes to curriculum-innovation and ‘pre-sorts’ students towards sprouting innovations in industry. Therefore, disruptive innovations (Schwab, 2015, 2016) like industry 5.0 (Cotta et al., 2021; Nahavandi, 2019) should have their impact on the curriculum design rationales in higher professional education.

To meet the challenges of disruptive innovations entering the environment of research-active professionals in higher professional education, one may envision a changing role for these professionals. An individualistic role fulfilment as a professional may be hard to maintain due to increasing complexity of society ever since – one may argue – the second industrial revolution. This increasing complexity induced a new role fulfillment for professionals: the ability to ‘play chess on a multilevel board’. The disruptive innovations will put pressure on the role of the professionals, e.g., they will have to act in the perspective of a network professional (de Vijlder, 2015), enhancing the connection higher professional education - industry. Schuiling et al. (2011) and Winkel et al. (2017, p. 7) have elaborated on the variations of a ‘complete’ academic identity, linked to areas in academics’ working lives. Understanding the complexity of the role of the professional may lead to a better compliance with roles required in higher professional education when acting in the adaptive learning triangle.

As mentioned in the introduction, professionals working in either of the communities depicted in Figure 1-2, have to deal with different institutional rationalities. Short reprise: institutional rationalities are procedures, prevailing regulations, common in the communities of education, industry and research. The concept of institutional rationality goes back as far as Karl Mannheim (1893-1947). Karl Mannheim defined institutional rationalities at two levels (Mannheim, 1935, 1940; Tromp, 2001), substantial and functional:

- 1) substantial: consciously acting from a holistic insight into the coherence of the events, and

- 2) functional: every action has a functional role in the realization of a given goal, with the help of consistent and objectively reducible means.

Though developed in the late nineteenth, early twentieth century, the ideas of Mannheim still seem relevant and representative (Wilson, 2002). Mannheim explains substantial rationality as “... *act of thought which reveals intelligent insight into the inter-relations of events in a given situation*” (Mannheim cited in Tromp (2001, p. 248). On the same page Mannheim explains functional rationality as “...*series of actions organized in such a way that it leads to a previously defined goal, every element in this series of actions receiving a functional position and role.*” One may argue that the role of MP leans more to the substantial rationality, having a focus on the intertwined consequences of mid- and long-term events in society. On the other hand, the role of the OP in the adaptive learning triangle is directly affected by the short-term aspects of the daily operation and leans more towards the functional institutional rationality.

3 Methodology

This paper is based on results of a case study on professionals’ perception on institutional rationalities in the HAN-UAS, embracing BAE (education community), HANAR (research community) and the Automotive Domain (industry community). To answer the research question, semi-structured interviewing (Bryman, 2012) is used, with 18 operational professionals (six lecturers, six researchers, six professional practitioners) and four managerial professionals (two from academia and two from industry). The themes addressed during the semi-structured interviews are the six institutional rationalities emerging from in previous research (Buning et al., 2021); Table 3-1 shows an overview.

Table 3-1 – Six institutional rationalities used for semi-structured interviewing (Buning et al., 2021)

Institutional Rationality	Description of Themes
Economy	Economical aspects, like return on investment or cost coverage, are relevant topics in cooperation between parties involved in mutually beneficial activities. Exchange of staff and the subsequent financial issues can be an important enabler.
Education	Educational procedures are driving forces throughout a student’s degree program. Assessing competences, developed or acquired during a semester, is relevant to evaluating students’ progress towards the end of the semester.
Organization	The way an organization can be characterized, or identified, can be important when it comes to cooperation. Understanding each other’s specific requirements can be relevant to consider when setting up a collaboration.
Policy and Law	Acting in the triangle is bound to policy, procedures and regulations. Some of these only relate to the University of Applied Sciences, while others are embedded in law (Higher Education and Research Act). In cooperation with industry, non-disclosure agreements (NDAs) may be used, which can be embedded in public law, etc.
Project management	The concept of project management refers to a generic term for coordinated activities in a specific community in the adaptive learning triangle comprising the education, industry and research communities. Relevant terms include ‘definitions’, ‘requirements’, ‘activities’, ‘location’ and ‘results’, describing the actions/activities related to project management.
Research	Research encompasses the coordinated and specific activities to support the problem owner, ranging from ‘getting an answer to a specific problem’ to ‘developing knowledge’. It also includes supporting the education community in providing knowledge and practice-based research in projects with real-life clients.

During the interviews, we followed Keeney's method of appreciative enquiry (Keeney, 1994, 2008) to obtain the data required. Two approaches were used to perform the interviews: 1) in person, and 2) online using Microsoft Teams (Bryman, 2012; Lo Iacono et al., 2016).

The qualitative analysis was conducted with Atlas.TI (ATLAS.ti, 2020) and interview data, and unfolded in several steps. First, directly during the interview, observing the actor's performance in situ, we arrived at a holistic observation of an interviewee's perception of a theme. Secondly, the interviews were transcribed verbatim. Thirdly, we defined theme-based codes and subsequent criteria to select pieces of data from the interview transcriptions. Finally, in a first round of holistic coding (Saldaña, 2016, p. 119) we selected pieces of text from the transcriptions. This allows us to extract the perception of the professional as influenced by institutional rationalities. The data presented in this paper is based on intermediate results.

4 Results

Emerging from a first holistic analysis, an interesting distinction may be observed in institutional rationalities. Next, we present for each institutional rationality mentioned in Table 3-1, the intermediate results.

Economical perspective

A clear distinction emerges between the communities in the adaptive learning triangle: the community of education focusses on costs, spending hours is the adage. The OP in the research and industry community share the focus on costs, whereas the Industry emphasizes the return of investment. The overall perspective of the MP is entrepreneurialism, in terms of having, as well as stimulating to have an open attitude towards opportunities. An interesting difference can be observed between the academic MP and the corporate MP; the latter perceives entrepreneurialism in terms of viable business and the academic MP perceives this in wordings like: "long-term commitment".

Educational perspective

The education community acknowledges a lacking compliance with state of the art in the industry community. In addition to this, there is a dominancy in the focus of the OP in the education community, students and student related processes have absolute priority. Both industry and research comply with the state of the art and maintain an open focus on connecting to the education community. Additionally, the OP in the industry community experiences a protective attitude towards students, whereas the OP in the research community experiences lecturers to show a lack of interest in research. The overall perspective of the MP is social accountability: adapt and embrace the state of the art in society.

Organizational perspective

It may be conceived as striking, nevertheless the OP in the education community acknowledges a weak connection to research groups. And perceives that the OP in the research community considers students as 'helping hands in research'. For OP in the industry, the cooperation with all parties is important; they keep an open attitude towards all parties involved. Pragmatism is dominant and the HAN-UAS is seen as a single entity, no difference between education and research communities is considered. It may be interesting to learn that OP in the industry perceive manpower, including participating students, as an advantage of cooperating with HAN-UAS. The research community is open to both communities – education and industry. One may observe a search for pragmatism versus methodological rigorism in deploying their activities. The MP in the industry or academia, preaches entrepreneurialism, and focusses on opportunities.

The MP in academic management shows awareness of being an administrative organization.

Policy & Law perspective

Policy and Law are in this research translated as: procedures and regulations. Important to the OP in the education community are procedures and regulations like OS-OER⁵ and Body of Knowledge and Skills (BOKS). However, OP in the educational community emphasize not to consider them as a primary concern. Nevertheless, they do express: "...always working within legal framework". The OP in the industry is quite clear when it comes to policy and regulations: compliance with regulations is obligatory and standards relevant to the industry are known and acted upon. The OP in the research community shows awareness when it comes to policy and regulations. In their daily operation, the professional claims to act from the perspective of the professional's conscience. The academic MP considers the procedures and regulations as a framework to be interpreted by the institute itself, whereas the corporate MP embeds relevant procedures and regulations in quality procedures.

Project Management perspective

Project management for the OP in the education community is mainly perceived in a theoretical and dogmatic approach. This goes as well for real-life projects in the adaptive learning triangle. The OP in the industry, uses project management as a toolbox for achieving goals and assessing progress. The OP in the research community acts pragmatically on project management. It is considered as a means to achieve cooperation, goals and results agreed upon. However, it is not considered to be a goal. The MP (academic and corporate) considers project management as a tool for professional communication and process control.

Research perspective

The OP in the education community perceives the research community as a different world. Nevertheless, this OP occasionally experiences a positive exchange of results: "...obviously these research projects bring added value to the students' development." For the OP in the industry community, research is a means to gain added value to the product of the company by innovation. Ultimately, it is an additional way to achieve profit. When it comes to research, it may be observed that the OP in the research community keeps a certain distance to education community. Their research is driven by the state of the art in the industry community and driven by the industry demand. Research and publishing in professional journals, is a logical connection in the research community. However, one may observe publishing is not considered as a primary motivation to deploy research. To the MP it may show to be of primary concern that research must or should have impact on society. Academic MP perceives no difference between the education and research community, which in their perception obviously (should have to) interact. Whereas, MP in corporate management just sees one institute.

5 Discussion

Sometimes it is helpful to mention the obvious. In our research it could be obvious that managerial professionals and operational professionals in the adaptive learning triangle perceive different perspectives on institutional rationalities. However, to adapt to environmental 'shocks' it may help the involved

⁵ OS = Opleidingsstatuut, or **Education Statute**. OS/OER the formalized regulations for the organization of the education and examinations

OER = Onderwijs en Examenregeling, or **Education and Examination Regulations**.

professionals to understand either perception towards (individual) perceived rationalities. In this perspective, understanding the differences in perceived rationalities may enhance the ability of organizations to act upon perceived environmental ‘shocks’ and strengthen the resilience of the organization towards disruptive innovations, such as those in the domain of the automotive industry addressed in our research.

Organizational learning influences the way organizations - in our research we focus on academia cooperating with industry - respond to environmental changes (Rothman et al., 2019). The MP-academic or corporate - behavior may lead to higher levels of performance. Research showed inspiring results for scholars, policy makers and practitioners where involvement of management resulted in increase of professionals’ perceptions of the organizational learning climate (Daniëls et al., 2021). Following Daniëls et al. (2021), the MP and OP understanding each other on the same institutional rationalities may enhance the organizational learning capacity and hence, strengthen the ability to cope with environmental ‘shocks’.

As emphasized by the study of PricewaterhouseCoopers (2021), applied research at Universities of Applied Sciences is an investment in the cooperation between education and industry. The research community should have their impact on the curriculum design rationales in higher professional education. But the study also emphasized the vice versa interaction; it is just not a one-way initiative. Colliding institutional rationalities may hinder this interaction for both, OP and MP. One may argue that a professional operating in the complex environment of the adaptive learning triangle may benefit from reconsidering his own role perception. An important step is made by Schuiling et al. (2011) and Winkel et al. (2017, p. 7). Their research leads to the identification of academic identities, linked to areas in academics’ working lives. This may help the professionals in the UAS to get a clear understanding of their role in their working environment. Additionally, we argue that adapting the role of both MP and OP towards the network professional (de Vijlder, 2015), enhances the connection higher professional education – industry.

Table 5-1 provides a summary of the intermediate results of our PhD-research, based on the institutional rationalities as they emerged from the qualitative data acquired in the case study (see Section 4 Results). For brevity of exposition, we merged the observed rationalities of corporate management and academic management (see Figure 1-2) into one umbrella term ‘management’. Table 5-1 is organized as follows. The first column, headed by the phrase ‘Institutional Rationality’, refers to the themes used in the interviews and analysis, while columns two to five refer to the communities depicted in Figure 1-2.

Table 5-1 Results – Summary of intermediate results on Institutional Rationalities

Institutional Rationality	Community			
	Education	Industry	Research	Management
Economy	Costs are not an issue; covering costs is the adage.	Return on investment and maximum profit.	Cost coverage, no significant pressure on profit.	Entrepreneurialism – in terms of viable business and long-term continuation.
Education	Pressure on compliance with state of the art in industry.	Experience protective attitude towards students.	Experience that lecturers lack interest in research.	Complying with social accountability, hybrid learning communities.
Organization	Weak connection to research groups.	Cooperation with all parties is important.	Open to inside and outside worlds,	Entrepreneurialism - opportunities. UAS as

	Research groups consider students to be laborers.	Pragmatism is dominant. Advantage: students as manpower.	pragmatism versus methodological rigorism.	administrative Organization.
Policy & Law	Procedures and regulations are not a primary concern, though always working within legal framework.	Compliance with regulations is obligatory. Relevant standards are known and acted upon.	Acts upon the professional's conscience.	Procedures and regulations are a framework to be interpreted by the institute.
Project Management	Mainly theoretical and dogmatic approach.	Used for achieving goals and assessing progress.	Pragmatic on project management means to achieve cooperation, and is certainly not a goal.	Project management is professional communication and process control.
Research	Though considered to be a different world, occasionally positive result exchange.	Research is a means to achieve profit.	Research driven by industry demand, publishing in professional journals.	Impact on society, education and research obviously interact.

Table 5-1 shows interesting differences in the perceived institutional rationalities. Next to these differences, we argue that the wordings used by the managerial professional, e.g. “entrepreneurialism”, “social accountability”, “impact on society”, (see Table 5-1, column “Management”), may be connected to Mannheim’s substantial rationality (Mannheim, 1935, 1940; Tromp, 2001), having a focus on the intertwined consequences of mid- and long-term events in society. By contrast, the wordings of the professional working in the adaptive learning triangle are more aligned with events of the daily reality: “achieve profit”, “pragmatic”, “costs” (see Table 5-1, columns “Education”, “Industry”, and “Research”). This, we may argue, leans more towards Mannheim’s functional institutional rationality. These two different worldly views in institutional rationalities, next to the sometimes-colliding institutional rationalities of the OP may affect the organizational learning, and thus may lead to difficulties in responding to environmental ‘shocks’.

In this paper, we primarily use six institutional rationalities from table 3.1 to assess organizational learning. In Section 2 Background, four models are brought forward that support the ability to step into the other world. These models may facilitate the understanding of the other professionals’ perception of institutional rationalities. In Table 5-2 an overview is given, using a bi-level indicator (+ indicates a positive interaction).

Table 5-2 Supporting models to observe institutional rationality

#	Supporting Model	Description	Operational professional	Managerial professional
i	Boundary crossing (Bakker & Akkerman, 2014)	Individual and groups processes that occur at boundaries to ensure or restore continuity in interaction or action	+	-
ii	Flexible expertise (Birney et al., 2012)	Individual expertise beyond routine type of expertise, crosses domains, and mechanisms are more domain-general.	+	-
iii	Cross functional integration (Baunsgaard & Clegg, 2013)	Cross-functional integration is the interaction and collaboration defined as a process where two or more departments work together.	-	+

iv	Absorptive capacity (Lane & Lubatkin, 1998)	A firm's ability to value, assimilate, and utilize new external knowledge, and builds on its <u>members' individual</u> absorptive capacity.	+	-
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Table 5-2 may be seen as a guideline use scientifically grounded models in assessing institutional rationalities in enhancing organizational learning.

6 Conclusion

This paper addresses the differences in the perceived institutional rationalities within the group of operational professionals in the adaptive learning triangle, comprising the communities of education, industry and research. Moreover, we identify differences on group level with the group of managerial professionals in academic and industry. The education- and research community are part of the HAN University of Applied Sciences, in the domain of Automotive Engineering and the industry community is the related domain of the automotive industry. Summarizing, the paper elaborated on the research question *'What differences in perceived institutional rationalities can be observed: (i) between the operational professionals, (ii) between the group of operational and the group of managerial professionals?'*

We found that the operational professional in the adaptive learning triangle may show an interesting similarity to Mannheim's functional institutional rationalities; acting according to daily events. Whilst the managerial professional's perceptions of institutional rationales seem to be more similar to substantial institutional rationales; a more worldly view of events in society. Next to this, we found challenging differences in perception on the six institutional rationalities amongst the operational professional in the adaptive learning triangle, i.e., the communities of education, industry and research. These differences, between operational professionals and managerial professionals may hinder the enhancement of organizational learning climate, challenging the resilience to meet environmental 'shocks'.

The process of dealing with the differences found in perceiving institutional rationalities, among operational professionals and between the group of operational and the group of managerial professionals, may be supported by using one or more of the four models mentioned in Section 2 Background: i) boundary crossing, ii) flexible expertise, iii) cross functional integration, and iv) absorptive capacity. The supportive ability of these models to step into the other world may facilitate the understanding of the other professionals' perception of institutional rationalities. Understanding the prevailing institutional rationalities amongst the professionals acting in the environment visualized in Figure 1 2, may fortify organizational learning, which in turn may enhance resilience towards future environmental 'shocks'.

7 Next research

The analysis set out in this paper indicates an opportunity to study the perhaps rather well aligned with institutional rationalities between operational professionals in the industry community and their managerial professional. This may raise the opportunity to create a better organizational learning in industry.

In the presented paper, we observed similar, but opposite affects between the academic managerial professional and the operational professional in the education and research community. Refining these differences and understanding the differences in wordings using Mannheim, may lead to enhancing the

organizational learning climate. On this, we refer in Section 2 Background, to the study of Daniëls et al. (2021). We have to point out that this study is carried out amongst primary school leaders in Flanders, Belgium, therefore representativeness with respect to our study must be evaluated.

The interesting study of Manheim on substantial and functional institutional rationalities brought us also on the track of Max Weber's descriptions of rationalities. Weber described four types of rationalities from different perspectives, within organisations, and groups (Kalberg, 1980, p. 1148): (i) **practical rationality** realization of everyday self-interest, (ii) **formal rationality, acting** according e.g. laws, regulations, (iii) **theoretical rationality**, working in increasing precision within theoretical frameworks, and iv) **material rationality** reflects on whether the action corresponds to a certain value system. These philosophical perspectives on institutional rationalities may fortify our research on colliding rationalities in the adaptive learning triangle.

Although we are aware that our research may be characterized as qualitative, a valuable next step in achieving validity and reliability of the acquired data would be using triangulation in the research method (Bryman, 2004, 2012; Hussein, 2009). Subsequently we are developing a questionnaire to enhance the qualitative data with quantitative data. Questions addressing compliance with organizational learning are explicitly incorporated. We are also considering researcher triangulation (Bryman, 2004; Lewis-Beck et al., 2004; Miles & Huberman, 1994) in data analysis.

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