# Using Institutional Rationalities in Sustaining Research Practice in Universities of Applied Sciences

## A (inter)national case study in Higher Professional Education in the Automotive Domain

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**Abstract**

The objective of this paper is to sustain research practice in Higher Professional Education in the Automotive domain, by understanding institutional rationalities of professionals cooperating in the triangle spanned by the communities Education, Research and Industry. Such an understanding is basic for removing any barriers hindering cooperation.

We compare Education, Research and Industry in three (inter)national case studies within HPE Automotive. Our research shows a compelling distinction in perceiving institutional rationalities in e.g. the economic field: cost coverage versus shareholder value. In addition, the three cases show a striking difference in embedding research practice in education.

## Introduction

To acknowledge the international research function of Higher Professional Education institutes, the terminology University of Applied Sciences (UAS) was legally grounded in the Netherlands in 2016 (Bussemaker, 2016) (Overheid.nl, January 1, 2022). Whereas UASs in Europe already existed, e.g., in Germany as of 1968 (Kulicke & Stahlecker, 2010). To support the research functionality, countries like Germany and the Netherlands have implemented specific programs to systematically improve UAS research capacity (de Weert & Leijnse, 2010), (Kulicke & Stahlecker, 2010).

Research groups emerged in 2001 in Dutch UASs1 (van Gageldonk, 2017) prompting the expectation of curriculum innovation and an accepted embedding of research. Research in German UASs has a longer history and has an acknowledged position in the educational system (Kulicke & Stahlecker, 2010).

The steps in the timeline of emerging industrial paradigms show, like envisioned in Figure 1, a tendency to embrace shorter time periods. The Industry 4.0 only just emerged in the early 21st century, and the envisioned perspective of industry 5.0 (Cotta et al., 2021) is likely to emerge within the same century as the previous industrial era. These steps in industrial developments may put pressure on curriculum innovation, and by that affect the compliance

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1    Until 2016, the term HBO (hoger Beroepsoonderwijs is used

of young graduates of the UAS Institute Automotive with state-of-the-art Industry. Striving for sustaining research practice in the Education and Research Communities, may help to close the gap between education themes and state-of-the-art in Industry.
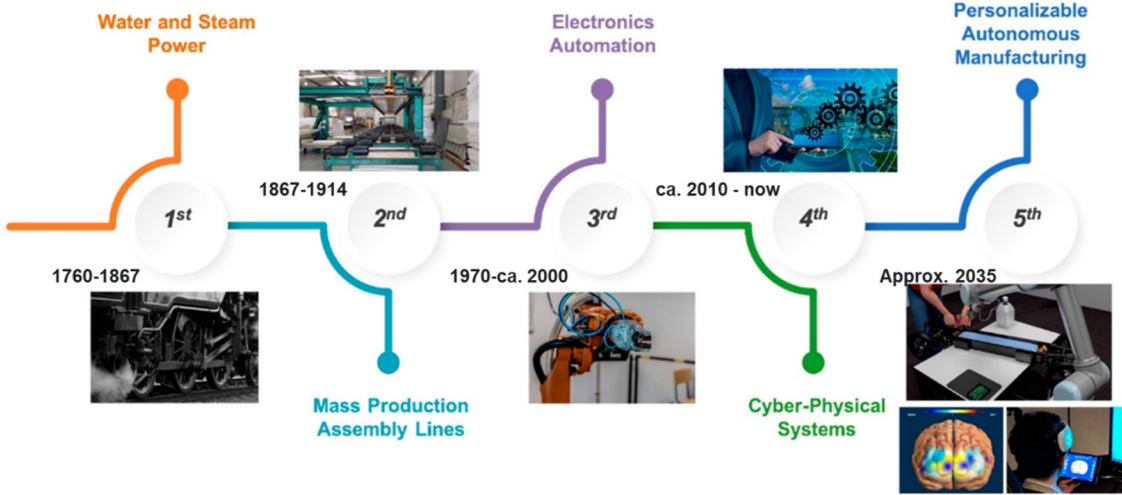


*Figure 1 Timeline of industrial development (Nahavandi, 2019)*

Figure 2 (Buning et al., 2021b, p. 25) shows the playing field of UASs in the Automotive domain: the Adaptive Learning Triangle. Here the professional has to deal with the communities Education, Industry and Research. Sustaining research practice may be enforced by an enhanced cooperation of the denominated professional in the Adaptive Learning Triangle.
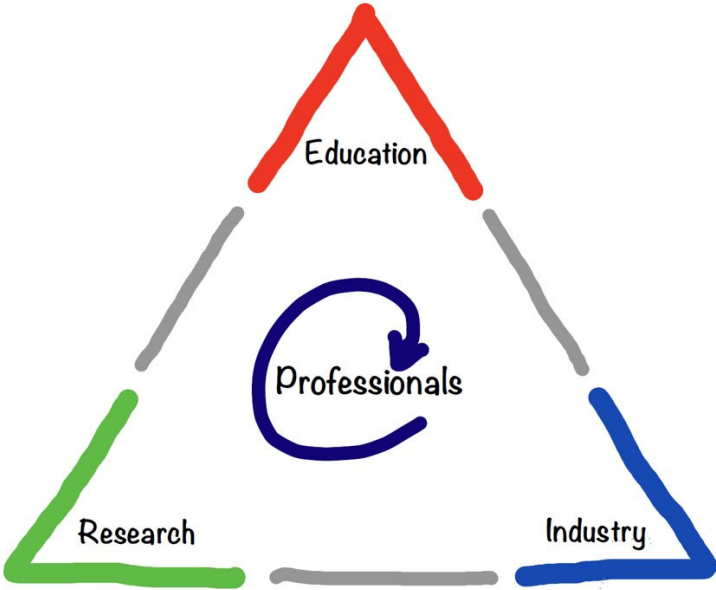


*Figure 2 Adaptive Learning Triangle, consisting of the communities*
*Education, Industry and Research (Buning et al., 2021b, p. 25)*

Our PhD research focuses on understanding institutional rationalities of professionals in the Adaptive Learning Triangle. Here, in the context of the actor, institutional rationalities deals with the coherent combination of one's perception of procedures (prevailing rules) and the acting.

We assessed the professionals' perceived institutional rationales using case studies in two Dutch UASs: 1) the HAN[2] and 2) the HR[3], and an international case study at a German UAS[4], HTWdS. Our analysis showed consistently that communities Education, Industry and Research appear to be different worlds. In line with the forgoing, our research question underlaying this paper is:

*"What institutional rationalities are perceived by professionals cooperating in the Adaptive Learning Triangle of a University of Applied Sciences in the automotive domain?"*

Understanding the institutional rationalities of professionals in the Adaptive Learning Triangle may be a new perspective to shape the cooperation between Education, Research and Industry and initiate an accepted embedding of research in education, and by this sustain reseach practice.

## Background

This section briefly summarizes three aspects within the literature related to our research: (i) research and innovation in UASs, (ii) the different worlds of research and education and, (iii) institutional rationalities of professionals as a new perspective to shape the cooperation.

### Research and Innovation in Universities of Applied Sciences

Innovations (Marx & Ramioul, 2004), sometimes disruptive (Schwab, 2015, 2016), fortified by developments in industry 4.0 (Wilkesmann & Wilkesmann, 2018) and industry 5.0 (Cotta

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2    HAN University of Applied Sciences (Dutch: *Hogeschool van Arnhem en Nijmegen*), Institutes Automotive

3    HR University of Applied Sciences (Dutch: *Hogeschool van Rotterdam*), Institutes Automotive

4    The HTW University of Applied Sciences (in German "*Hochschule für Technik und Wirtschaft des Saarlandes, University of Applied Sciences" (Acronym HTWdS)*), their Institute Automotive

et al., 2021; Nahavandi, 2019) may cause a growing gap[5] between the communities in the Adaptive Learning Triangle: Education, Industry and Research in the automotive domain. This growing gap puts pressure on the compliance of young graduates of the UAS Institute Automotive with state-of-the-art Industry. Striving for sustaining research practice in the Adaptive Learning Triangle may help to affect the growing gap between education themes and state-of-the-art in Industry.

## Research and Education – different worlds

The discourse on 'research' invokes many perspectives, for brevity we refer to Gibbons et al. (1994), and Mode I (fundamental) and Mode II (applied). For research in UASs, we adopt (Christis, 2020), using practice-oriented research. Equally diverse is the perception on research excellence:

1. "… research excellence is a multidimensional, complex, and value-laden concept whose quantification is likely to end in controversy…"(Ferretti et al., 2018)" to
2. "… research excellence is defined as the top-end quality outcome of systematically performed creative work undertaken to increase the stock of knowledge…" (Hardeman et al., 2013, p. i)

However, one may well argue that cooperation between the Education and Research Community is important for both to sustain research practice. In line with earlier research (Camilleri et al., 2014), researchers of the Automotive Research Community find it hard to mobilize their direct educational colleagues to participate in applied research on state-of-the-art themes. This disturbs enhancing research practice in Automotive Education within UASs.

## Institutional Rationalities as a new perspective to shape the cooperation

Conducted research environments (Bouw et al., 2019; Cremers, 2016; van der Stappen & Zitter, 2016) emphasizes the importance of enabling educational staff to participate in applied research in UASs. However, research conducted on the design strategy of learning environments (Bouw et al., 2019; Cremers, 2016; van der Stappen & Zitter, 2016) currently

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5   The gap growth may be considered to be exponential. A parallel with the exponential change over time in computer technology can be seen (Moore, 1998)

focuses on the educational perspective. Whereas, central in the Adaptive Learning Triangle are the interacting professionals, including those from industry.

Weber elaborated in "*Wirtschaft und Gesellschaft* "(Weber, (Originally 1921) 1976) on what he called: "types of social action". In a rationalization process Weber defined four types of rationalities:

1. Substantive - reflects on whether the action corresponds to a certain value system (political or aesthetic view of life);
2. Formal - acting according general rules, i.e./e.g. laws, regulations;
3. Practical - accepts reality and works on the realization of everyday self-interest;
4. Theoretical - grip on daily activities through increasing precision in theoretical frameworks

The understanding of institutional rationalities perceived by professionals cooperating in the Adaptive Learning Triangle may be seen as a new perspective to shape the cooperation between Education, Research and Industry.

To study the perception of the professional in the prevailing rationalities in the Adaptive Learning Triangle, we interviewed professionals acting in this triangle.

## Methodology

This research aims to identify prevailing institutional rationalities in UASs in the Automotive domain, using case studies. Let us briefly introduce it. In each UAS we interviewed the professionals acting in the Adaptive Learning Triangle (see Figure 2) using semi-structured interviews (Keeney, 2009). Leading in the interviews are six dimensions of institutional rationality (Buning et al., 2021b): 1) Economy, 2) Education, 3) Organization, 4) Policy & Law and 5) Project management, 6) Research.

The data emerged from the interviews by qualitative analysis using holistic coding (Bryman, 2012; Saldaña, 2016). By using triangulation in the data collection and analysis (Maso, 1984, pp. 77,78), validity and reliability of the emerged results are guaranteed.

## Provisional Results

The research in the three participating UASs and the interviews with the professionals in the

Adaptive Learning Triangle yielded a wide variety of data. In this section, we provide an initial and preliminary overview of the results.

In the following we present an overview of preliminary results emerging from the interviews for the subsequent dimensions of the three institutional rationalities. The presented statements are literal quotations. They represent the perspective of the interviewee towards each of the six dimensions of institutional rationality.

## Economy

When it comes to the *economic dimension* of institutional rationalities, the following observations emerged from the interviews.

*The education community*

[**HAN,HR]** When the issue of a budget is raised in the interview, the lecturer reflects on this with, saying: 'my concern is spending hours, not the financial aspects involved'.

[**HTWdS**] Administration on hours for teaching nor for research are registered; only check in and check out time is registered.

*The industry community*

[**HAN,HR]** A prompt response from the professional in the industrial community when it comes to Economy can be considered 'return on investment'. This is seen as essential; a literally translated response is 'in the end money is required to survive'.

[**HTWdS**] For innovation, out of the box thinking, or when it is expected to open new pathways, the UAS connection is considered and money is not the leading thought to connect.

*The research community*

[**HAN,HR]** The researcher in the Adaptive Learning Triangle is confronted with the requirements of education: developing the students' competences is the main goal. This is perceived as in conflict with their clients' company goals.

[**HTWdS**] Acquiring more projects, or big projects with the industry opens the option to reduce education obligation.

## Education

The following observations on *educational dimension* of institutional rationality emerged

from the interviews.

*The education community*

[**HAN,HR**] A lecturer made the profound observation that taught topics do not comply with the state-of-the-art at small and medium-sized enterprises (SMEs).

[**HTWdS**] The use of students in project work, may be an option as of from the 6th semester (but this is limited in time and budget/earnings). Students can learn, but the time with a project is not a part of education.

*The industry community*

[**HAN,HR**]The practitioner cannot always understand the world of education; don't they understand that theory is at odds with practicality.

[**HTWdS**] professors predominantly spend their time in the academic arena, and not calibrated to industry style; how can they educate and train young people to be problem orientated ready to participate in the industry?

*The research community*

[**HAN,HR**] Researchers were surprised by the lack of curiosity amongst lecturers in their field.

[**HTWdS**] Research projects lead in principle to the involvement of students. However, though not the majority, research projects may disregard students' involvement.

## Organization

The following observations on *the organizational dimension* of institutional rationality emerged from the interviews.

*The education community*

[**HAN,HR**] Interviewees called the organizational connection with the research community weak.

[**HTWdS**] Contact to the industry may be characterized as limited; mainly the professors are connected

*The industry community*

[**HAN,HR**] From the perspective of the interviewees, the education and research communities are considered as one.

[**HTWdS**] the process in the industry is budget and time calibrated; e.g. deliver results in a given time frame and budget. The professionals in UASs are more knowledge calibrated; focused on what could be done and not so much on what should be done

*The research community*

[**HAN,HR**] Researchers recognize the 'separate worlds' issue with regard to the education community.

[**HTWdS**] Research and Education are separated world; both have their individual financial budgets: Research – private based and Education – tax-based

## Policy and law

The following observations on the *dimension policy and law* of institutional rationalities emerged from the interviews.

*The education community*

[**HAN,HR**] In general, the lecturers seek out the boundaries of procedures, although they do admit to staying within the ethical boundaries of the law.

[**HTWdS**] Teaching innovations are a) bound to accreditation, and b) can be dictated by external governmental bodies (**example** - in 2018 it was decided that larger courses, of 5-6ects are more efficient and 2021 this is reversed again)

*The industry community*

[**HAN,HR**] The professional practitioner is aware of regulations and acts accordingly and consider compliance with regulations as providing added value.

[**HTWdS**] Keeping all policies and laws gives us a clear understanding of boundary conditions for our daily work, especially if that work is related to topics out of the fields of Safety, Compliance or Emissions

*The research community*

[**HAN,HR**] Researchers experience only minor restrictions with regard to intellectual property issues. However, when it comes to publications, companies do not share much.

[**HTWdS**] Pursuing teaching innovation is difficult, because there should be a written exam and discussions on this innovation with colleagues emerged criticism to the approach

## Project management

The following observations on the *dimension of project management* of institutional rationality emerged from the interviews.

*The education community*

[**HAN,HR]** Due to strong theoretical awareness, lecturers exhibit remarkable inflexibility regarding project management.

[**HTWdS**] Basically one is responsible for organizing their own job, whereas education maintains a strict schedule

*The industry community*

[**HAN,HR]** Professional practitioners exhibit high compliance with project management, and uses project management for result assessment.

[**HTWdS**] Project management is a base for usable results, keeping time, quality and costs within agreed boundaries, gaining importance with increasing complexity of projects.

*The research community*

[**HAN,HR]** The research community maintains a pragmatic attitude towards project management.

[**HTWdS**] PM, e.g. communication, with companies is important to acquire projects. A company decides on involvements of students: a) a lower price, but longer period to delivery, or b) a higher budget and short delivery time

## Research

The following observations on *research dimension* of institutional rationality emerged from the interviews.

*The education community*

[**HAN,HR]** The lecturer is positive towards research and experiences the added value for students' competence development.

[**HTWdS**] In developing the research skills of students, research papers are used, emerging from a diversity of research projects..

*The industry community*

[**HAN,HR]** The professional practitioner shows a pragmatic attitude towards research; t's a business model.

[**HTWdS**] outsourcing research to UAS professionals requires careful consideration and don't (quote) "*get frustrated with the level of design*". The requirements in the automotive industry are pragmatism and speed, is completely different world from UAS

*The research community*

[**HAN,HR**] The research community shows a tendency to keep its distance from education, though it is open to knowledge sharing. Students are encouraged to publish in a professional journal.

[**HTWdS**] Economic strength evolves out of sciences (Academic and Applied). Research projects leads in principle to the involvement of students. However, though not the majority, research projects may disregard students' involvement.

As addressed in the introduction, the results in this research embrace three Universities of Applied Sciences: 1) HAN, 2) HR, and 3) HTWdS. Data collected from the annual management reports over 2020 (published in 2021) is used to visualize a first quantitative comparison, see Table 1, and in Table 2, some interesting qualitative differences may be observed.

*Table 1 Typical differences within the involved UASs on quantitative organizational data*

| # | UAS Subject | HAN | HR | HTWdS |
|---|---|---|---|---|
| A | Overall Budget | 354M€ | 353M€ | 54M€ |
| B | #Students (**teacher : student**) | 37408 (**1:19,1**) | 39381 (**1:19,9**) | 6018 (**1:27,3**) |
| C | Research revenue in % of overall budget | 9% | 3% | 21% |
| D | #Professors6 | 46 | 39 | 129 |
| E | Number of Semesters | 8 semesters, including a minor | 8 semesters, including a minor | 7 semesters, no minor |

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6  A professor in this paper: 1) carries a doctorate, 2) has proven experience in the automotive domain and is connected to a University of Applied Sciences)

*Table 2 Typical differences within the involved UASs on on qualitative organizational data*

| # Aspect | UAS HAN | HR | HTWdS |
|---|---|---|---|
| 1 Teaching staff (employed) | Master level (by HAN) | Master level (by HR) | Doctorate level (by local government[7]) |
| 3 Research | Research Groups | Research Groups | Professor |
| 4 Participation of lecturers in research | Passive, Low | Active - HRM[8] | None, only project staff |
| 5 Quality assessment | Research and Teaching | Research and Teaching | Only in teaching |

## Summarizing the provisional results

The HTWdS is a relatively small University of Applied Sciences; the number of students in 2020 was 6018, the HAN had 37408 students and HR 39381 students (see Table 3). However the ratio budget per student was rather comparable: 1) HAN €9463, 2) HR €8964, and 3) HTWdS: €8973. The number of professors to the number of students, is 17 times higher than at HAN and 22 times higher than at HR.

The case studies offered a unique opportunity to observe rationalities as they emerged. Table 3 shows the preliminary results emerging from the three case studies.

While it is not common to posit something as a fait accompli, it can be argued that the changes resulting from industrial paradigm shifts (industry 4.0 emerged in 2011, and industry 5.0 expected in or after 2035), will have an impact on education, as Marx and Ramioul (2004) articulated "just" before the emergence of Industry 4.0. With the expectation that industry 5.0 (Cotta et al., 2021; Nahavandi, 2019) is foreseen to emerge in the same era as industry 4.0, an impact may be expected which may perhaps to end up in a non-linear growing gap between education en research in UASs. These industrial paradigm shifts, emphasize the importance of sustaining research practice.

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7   Local government, or 'Bundesland' (German)

8   HRM – Human Resource Management

*Table 3 Summary of preliminary results for the different perspectives on the dimensions of institutional rationales*

| Dimension | Case | Education | Industry | Research |
|---|---|---|---|---|
| Economy | HAN&HR | Spending hours is the adage | 'Return on investment', is seen as very essential | Education requirements ~~is~~ are in conflict with clients' goals |
| | HTWdS | Check in/out is obligatory, but no administration | Innovation is important, money is not the leading thought | Acquiring projects leads to less education obligation |
| Education | HAN&HR | Taught topics do not comply with the state-of-the-art at Industry | Don't teachers understand that theory is at odds with practicality | Lecturers surprise researchers by their lack of curiosity in their field |
| | HTWdS | Students educational projects are not connected to research projects | Academic professors can't train problem orientation to students | Research projects may disregard students' involvement |
| Organization | HAN&HR | Interviewees emphasized on weak connection to research | Education and research are considered as one | Researchers recognize the 'separate worlds' with education |
| | HTWdS | Mainly professors are connected to the industry | The industry is budget and time calibrated, the UASs are knowledge calibrated | Research and Education are separate worlds |
| Policy & Law | HAN&HR | Lecturers explore within ethics, the boundaries of procedures | Industry considers compliance with regulations as added value | Researchers experience minor restrictions on intellectual property |
| | HTWdS | Teaching innovations are bound to accreditation | policies and laws are boundary conditions for our daily work | Teaching innovation is difficult due to rules and opposing colleagues |
| Project management | HAN&HR | Due to their focus on theory lecturers persist in inflexibility | Uses project management for result assessment | Maintains a pragmatic attitude towards project management |
| | HTWdS | One has job responsibility; education keeps a strict schedule | Driven by time frame, quality and costs within agreed boundaries | Communication is mandatory to acquire projects |
| Research | HAN&HR | Lecturer experiences the added value of research for students | Has a pragmatic attitude towards research; t's a business model | Research shows a tendency to keep its distance from education |
| | HTWdS | Research papers in developing the research skills of students | UAS research requires attention and (quote) "*don't get frustrated with the level of design*" | Research projects should involve students, but in reality students are disregarded |

## Discussion

To sustain research practice, a good cooperation between research and education is a key issue (Ferretti et al., 2018; Hardeman et al., 2013). At HTWdS the teaching professional - called professor9 - carries by definition a doctorate in the field taught, has several years of relevant practical work experience outside the university, and has a teaching obligation of 18hrs10 (GermanGovernment, 2021). This in principle ensures the connection to the industry. However, research is expected, not mandatory (quote: "*To be up to date to meet the requirements of industry, they have to be connected to the industry, to find out what is state-of-the-art*").

The rationality as perceived on the dimensions 'Education', and 'Research' at HTWdS, sprouts from the same human entity, the professor, and therefore may enhance sustaining research practice. An additional benefit may be considered to be the compliance of the curriculum at HTWdS with the state-of-the-art in industry.

The teaching professionals at HAN and HR are educated on (professional) master level, the relevant working experience is preferred, not mandatory, and the teaching load is 100%. On the dimensions of institutional rationalities, a tendency to diverge may be observed, fortifying a two-world paradigm. This confirms the finding of Camilleri et al. (2014), where the researchers experience difficulties to connect the teachers to research. One may argue that the two-world paradigm complicates the state-of-the-art compliancy of the curriculum used in education.

Though our research is not focused on type casting research in communities of the Adaptive Learning Triangle, some distinctive features may be observed:

o The industry is more focused on the business case arising from research;
o Research maintains an applied approach (Mode II, (Gibbons, 2001; Gibbons et al., 1994);
o Education embraces a practice focused approach (Christis, 2020).

A consequence of this distinction may be that the research communities of the involved UASs, maintain a certain distance; see Table 3 - **'Research**': "… *tendency to keep its distance from*

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9  The professor is employed by the local state (German: 'Bundesland').

10  18hrs teaching – this is equal to 36hrs educational commitment. Next to 18hrs teachting, in terms of physical knowledge transfer, there are additional tasks: exams, curriculum development, staff meetinges, etc.

*education*", and "*… in reality students are disregarded*". An interesting observation that may be mentioned here emerged from the Education community on the dimension **'Research'** (see Table 3): "*…experiences the added value for students*". In line with (Ferretti et al., 2018; Hardeman et al., 2013) the cooperation between the communities in the Adaptive Learning Triangle is important to sustain research practice. It could be argued that a divergence can be observed in the dimensions of subsequent rationalties. Whereas, methodological similarity can be found in the research approach of applied research (Gibbons, 2001; Gibbons et al., 1994) and practice-based research (Christis, 2020), enforcing sustainability of research practice.

Table 3 shows on multiple occasions that the worlds of education, industry and research perceive the same dimension of institutional rationality in a different way. In a first step towards understanding these differences we, for the sake of brevity, bulletize the rationalities defined by Weber ((Originally 1921) 1976) and mirror some of the results presented in Table 3:

o The practical rationality is defined as accepting reality and working on the realization of everyday self-interest:

*Some connections found*

➢ "*Research projects should involve students, but in reality students are disregarded*"

➢ "*The industry is budget and time calibrated, the UASs are knowledge calibrated*"

➢ "*Spending hours is the adage*"

The formal rationality is defined as acting according general rules, i.e./e.g. laws, regulations

*Some connections found*

➢ "Due to their focus on theory lecturers persist in inflexibility"

➢ "Industry considers compliance with regulations as added value"

➢ "Teaching innovation is difficult due to rules and opposing colleagues"

The theoretical rationality is defined as getting grip on daily activity through increasing precision in theoretical frameworks

*Limited connection found*

➢ "Research papers in developing the research skills of students"

The substantive rationality reflects on whether the action corresponds to a certain value system

*No connection found*

In our view, these provisional findings on the perceived institutional rationalities, combined with

the approach by Weber, may serve as a basis for a better cooperation of the professionals within the Adaptive Learning Triangle of Figure 2.

## Conclusions

This paper elaborates on sustaining research practice in Universities of Applied Sciences by understanding the perceived perception of professionals in the Adaptive Learning Triangle (see Figure 2). The question underlaying this paper is:

*"What institutional rationalities are perceived by professionals cooperating in the Adaptive Learning Triangle of a University of Applied Sciences in the automotive domain?"*

The provisional results emerging from the interviews at HAN, HR and HTW University of Applied Sciences in Table 3, show differences in perceptions on institutional rationalities. Further exploring of the rationalities defined by Weber ((Originally 1921) 1976) in relation to the differences in perceptions of institutional rationalities, may lead to a better mutual understanding of professionals cooperating in the Adaptive Learning Triangle, presented in Figure 2.

Understanding the perceived rationalities of the professionals in the Adaptive Learning Triangle, may prevent a growing gap between topics taught in education at HAN and HR Universities of Applied Science, and the state-of-the-art in industry and research in the automotive domain. This growing gap may put pressure on the compliance of young graduates of the UAS Institute Automotive with state-of-the-art industry.

Understanding the perceptions of the interacting professionals in the communities spanning the Adaptive Learning Triangle (see Figure 2), may stimulate the participation of educational staff in research in UASs. Conducted research emphasizes the importance of enabling educational staff to participate in applied research in UASs (Bouw et al., 2019; Cremers, 2016; van der Stappen & Zitter, 2016). Eventually, this understanding will lead to intertwining education and research and thus sustain research practice.

## Forthcoming Research

In our perception, the most profound difference between the Universities of Applied Sciences of HAN, HR and HTW, is the teacher. In the HTWdS the teacher carries a doctorate in the area taught, expected to do research with the industry. Whereas in HAN and HR, the teacher has a master level, not necessarily in the field taught. In the perspective of sustaining research practice, it may be interesting to assess the impact of teachers with a doctorate in the field taught and well connected to industry on the students' level on research skills. For this we are initiating two master thesis projects: one pedagogic and one on education science, assessing the competence of research skills of (i) students in their final semester11 and (ii) graduates during the first-year experience in their professional domain.

One of the dimensions of institutional rationality is explicitly focused on organizations, and as the Adaptive Learning Triangle shows, the cooperating professionals originate from different organizations. From that perspective, exploring the phenomena of boundary organizations introduced by Guston (1999), may have added value. According to (Guston, 2001), boundary organizations use co-creation in two ways: they facilitate collaboration between professionals of two organizations, and they bring stability through the use of boundary objects, e.g. patents (IP), model contracts. Gustafsson and Lidskog (2018) broaden the perceptive of boundary organizations to other counterparts, such as industry. Like Guston (Guston, 1999, 2001), Gustafsson emphasizes both governing and facilitating collaborations.

In Buning et al. (2021a), we elaborated on the dimensions of institutional rationalities, using data emerging from interviews with managerial and operational professionals, of both HAN and HR University of Applied Sciences. For this we used the definitions of institutional rationalities by Mannheim (1935), as they may emerge in a worldly perspective:

1. substantial: consciously acting from a holistic insight into the coherence of the events;
2. functional: every action has a functional role in the realization of a given goal, with the help of consistent and objectively reducible means.

We found that the difference in perceived institutional rotationality between operational and

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11  The curriculum of HTWdS consists of seven semesters and the curriculum of HAN and HR, consist of eight semesters, one of which is a minor carrying an extra-curricular theme.

managerial professionals may hinder the resilience to meet environmental 'shocks' like Industry 4.0 or Industry 5.0. In this paper we found that our provisional findings on the perceived institutional rationalities, combined with the approach by Weber, may serve as a basis for a better cooperation of the professionals within the Adaptive Learning Triangle of Figure 2.

Using both Weber ((Originally 1921) 1976) and Mannheim (1935, 1940), we intend to design a framework for exploiting our knowledge of the perceived institutional rationalities of professionals in order to enhance the cooperation in the Adaptive Learning Triangle to fortify research practice in universities of applied sciences.

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