Changing Research Structures and Academic Staff Competence in the Swiss Non-traditional University Sector

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Abstract
Recent reforms in Swiss higher education transformed vocational training institutions with a teaching mission into universities of applied sciences and universities of teacher education that should balance research and teaching activities of individual lecturers following the Humboldtian model. Drawing on the concept of ambidexterity, we aim to examine the current outcome of the reforms in terms of the structural conditions for research and the research competence of lecturers at the two new types of universities. By means of a document analysis, we first assess how the shift manifests itself in institutional mission statements. We then analyze recent survey data (N=2454) regarding the lecturers’ perceptions of the structural conditions for research and their research competence. While our findings suggest that the new higher education sector has formally adopted the Humboldtian model, notable differences between the two types of universities can be observed in the extent to which the new policy imperatives have influenced the mission statements. Furthermore, we find a certain degree of mismatch between the organizational ambidexterity required by the Humboldtian model, the structural conditions for research encountered by lecturers, and the individual research competence. A number of conceptual and policy implications are drawn.

Keywords Non-traditional higher education · Humboldtian model · Research competence · Organizational ambidexterity · Applied research mandate · Research structure

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Introduction

A relatively recent higher education (HE) reform, introduced in the year 1995 (Lepori and Kyvik 2010, 23), brought about the creation of universities of applied sciences (UASs) and universities of teacher education (UTEs) in Switzerland. Together, they form a new non-traditional university sector (Trotter and Mitchell 2019) that has its roots in higher vocational education. As in other countries, where already existing postsecondary institutions were merged into non-traditional universities (Organisation for Economic Co-operation and Development (OECD) 1998), the restructuring of the Swiss HE sector entailed the addition of research to the public mission of the two newly formed types of higher education institutions (HEIs). The new universities, whose institutional predecessors had “very limited research experience” (Lepori 2008, 50), were reorganized according to the Humboldtian model with its unity of research and teaching at the level of the individual lecturer (Schimank and Winnes 2000). While this is somewhat contrary to the observed international trends toward a separation of the two areas in HE (Leisyte 2016), their integration has resulted in the creation of a teaching-research nexus (Neumann 1994) at the Swiss new universities. This change necessitated the development of a research competence at the institutional as well as the individual level in addition to the already existing teaching competence. The Swiss federal government has been actively supporting this development through dedicated funds and supporting measures (Lepori 2008, 46).

We interpret the goal of this developmental process as the attainment of organizational ambidexterity by the new HE sector, i.e., the acquisition of the ability to carry out different tasks simultaneously (Birkinshaw and Gibson 2004) through the functional ambidexterity of the individual lecturers working for these HEIs.

The Swiss non-traditional university sector has grown from 4,900 students in the academic year 1997/98 to 101,400 students in 2019/2020 (Federal Statistical Office 2020). Together with the traditional universities, it fulfills a crucial role in a country with very little natural resources. Given these points, in addition to the importance of research for the innovativeness of new generations of talented professionals working outside of HE (European Commission 2017, 5) as well as for the wider economy and society, we are interested in the results the reform has so far brought about. Roughly 25 years after the reform began, we therefore ask: What is the current outcome of the introduction of a Humboldtian teaching-research nexus in the Swiss non-traditional university sector regarding the structural conditions for research and the research competence of lecturers?

We address this question through three subquestions. First, we establish to what extent the sector has adopted the Humboldtian model in their mission statements, because we view its adoption as a precondition for the analysis of new structures. We then move on to explore the structural conditions for research that lecturers encounter at their HEIs. Thirdly, we assess to what extent lecturers have the self-perceived competence to fulfill the additional research mission successfully thanks to their highest academic degree.
Through this study, we aim to contribute to the application of the concept of organizational ambidexterity in the context of non-traditional universities in binary HE systems. We do this through the specific case of the reformed Swiss HE system by linking ambidexterity to the Humboldtian model. While the nature and profile of research at non-traditional universities as well as the institutional profiles within the sector have been examined (e.g., in de Weert and Soo 2009; Lepori 2008; Kyvik and Lepori 2010), there are very few empirical investigations into the human capital aspects and structural conditions of the research mission of the non-traditional university sector. There is a gap in the knowledge about HEIs’ responses to the change described above and the implications for their staff. The responses from the non-traditional sector are likely to be influenced by the fact that it is not uncommon for it to have a mandate to conduct applied research (De Weert and Soo 2009). In Switzerland, this form of research mandate is especially pronounced and differentiates UASs and UTEs from the traditional universities (Lepori 2008), not least when it comes to recruiting suitable lecturers. One of the possible ways a HEI can react to the changes induced by policy reforms is by adjusting its staff and its staff’s competencies to the prevailing conditions. There is some evidence from German UASs that this mainly happens in the form of an academic drift (e.g., in Ziegele et al. 2017; Hachmeister et al. 2015; Duong et al. 2014).

This paper is divided into seven sections. After the introduction, we present our theoretical framework and review the organizational ambidexterity literature relevant to HE. The next section provides important contextual information on the HE reform in Switzerland. We then describe the methodology of the study. The findings are presented in the fifth section, followed by their discussion. The conclusions and recommendations in the final section complete the paper.

Theoretical Framework

This contribution builds on two main concepts: the Humboldtian model of HE with its unity of research and teaching (Schimank and Winnes 2000), and organizational ambidexterity. We expand the notion of ambidexterity to functional individual ambidexterity in order to account for the fact that HEIs with a strong integration of research and teaching according to the Humboldtian model need lecturers involved in both activities.

The origins of the Humboldtian model go back to early nineteenth-century Germany, where Wilhelm von Humboldt initiated the founding of the University of Berlin with the unity of research and teaching as one of the cornerstones of the Humboldtian university concept (Nybom 2003, 144). The model has since influenced the university sectors on a worldwide scale (Fuller 2005, 29; Höhle and Teichler 2013a, 79; Nybom 2003, 145). While the unity of research and teaching originally meant that there is no differentiation between the two tasks (Schimank and Winnes 2000) and von Humboldt even viewed professors and students as being united in “the common pursuit of knowledge” (Hattie and Marsh 1996, 507), its meaning has altered over time. Today, it describes the integration or blending of teaching and research in the professorial role (Clark 1983, 98). Additionally, there is a situational
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Differentiation between the two activities, i.e., “There are different situations in university life, with some being devoted to teaching and others to research.” (Schimank and Winnes 2000, 398). The linking of the two activities is often seen as positive and synergetic in the literature (Elken and Wollscheid 2016) as research activities can improve the quality of teaching activities, which in turn can result in positive feedback for research (Höhle and Teichler 2013b). However, the reliance on the unity of research and teaching is also viewed critically as the empirical evidence for a clearly positive relationship between the two areas is weak (Verburgh et al. 2007; Elken and Wollscheid 2016).

We do not further examine the reasons for the choice of the Humboldtian model for the new types of HEIs in Switzerland here. However, for the analysis of the work of academics, their competences and the structures at Swiss HEIs, it is important to note that there are incentives and legal requirements for Swiss HEIs, briefly described in the next section, to adhere to this model. Coping with the resulting work situation requires individual lecturers to be competent in research and in teaching. In terms of organizational theory, the two tasks can be seen as ambidextrous activities. Their successful integration at the individual level and the ability of the new HEIs to fulfill the decreed mission in a Humboldtian way require individual functional ambidexterity that relies on underlying competences. The notion that individual functional ambidexterity is key to organizational ambidexterity (Schnellbächer et al. 2019, 3) therefore applies to Humboldtian HEIs.

Traditionally, in the organizational literature ambidexterity broadly refers to an organization’s ability to pursue two disparate things at the same time (Bledow et al. 2009; Birkinshaw and Gibson 2004). As a concept, it “provides some theoretical guidance on how organizations create structures and systems for managing conflicting demands in their task environments” (Ambos et al. 2008, 1428). As a business management concept (Tahar et al. 2011), it has gained acceptance by describing the ability to engage in exploration, i.e., the search and creation of new knowledge (Popadiuk 2015, 28) and exploitation, i.e., refinement and implementation (da Silva Souza and Wünsch Takahashi 2019, 400). In a HE context and in terms of the Humboldtian model, we interpret exploration as research-related activities, while exploitation relates to teaching-related activities.

Studies on ambidexterity are not of a uniform stream (da Silva Souza and Wünsch Takahashi 2019), but tend to have corporate settings (Kobarg et al. 2017). Relatively few studies apply the concept to HE. Those that do so can be loosely grouped into studies concerned with HEIs that need to commercialize their research in addition to fulfilling their traditional mission, and other studies that do not share a common conceptual base, linking the pursuit of various other tasks to the need for ambidexterity. Examples for the first group include Ambos et al. (2008), who show how commercialization in research-intensive universities is often facilitated by creating organizational ambidexterity through dual structures. On the individual level, however, they find ambidexterity is rather rare and determined by personal characteristics. Chang et al. (2009) conceptualize organizational ambidexterity as a combination of structural and contextual ambidexterity, i.e., specialized organizational units and individual researchers that are able to do research as well as commercialize research results. Still in that first group, Leisyte (2015) adopts the concept in

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her study of Dutch entrepreneurial universities. These HEIs balance research and technology transfer in organizationally ambidextrous research units, consisting of individual researchers that exhibit contextual ambidexterity (5), i.e., the capacity to cope successfully with their institutional environment where more than one mission has to be pursued. Chang et al. (2016) link the commercial performance of entrepreneurial universities to “research ambidexterity” (8), a concept they develop emphasizing the necessity to jointly develop research publication and research commercialization. As the last example of studies from the first group, Sengupta and Ray (2017) empirically examine the drivers of the successful linkages between research and commercially oriented knowledge transfer and find that the two areas are connected in a bi-directional “virtuous cycle” (895).

Within the second group of research papers, the understanding of ambidexterity differs considerably. Markides (2007) develops ideas in management education regarding the improvement of the combination of rigorous academic research with managerially relevant research in one person, which would result in ambidextrous professors. Tahar et al. (2011) see universities as ambidextrous organizations balancing efficiency-driven units (back-offices) that support the faculty in their creativity driven research and teaching tasks (303). Soares et al. (2018) directly transfer the concept from business administration to HE. They examine how the ability of Brazilian universities to explore and exploit, as perceived by their managers, explains the variance in student numbers. Another study set in Brazilian HE by da Silva Souza and Wünsch Takahashi (2019) explores how dynamic capabilities, organizational learning and organizational ambidexterity are connected. Their case study operationalizes organizational ambidexterity as the balance between discovery and implementation that results from a given set of systems and processes guiding the behavior of an organization’s members.

Our use of the concept of organizational ambidexterity is motivated by the interest in how public non-traditional universities balance their dual mission of research and teaching and harmonize it with their resources and capabilities. Since research and teaching functions cannot be structurally separated into subsystems (e.g., as suggested by Gupta et al. 2006) because they rest on the shoulders of the same individual in a Humboldtian system, HEIs need human resources that enable them to fulfill both functions. This is reflected in the functional definition of ambidexterity as suggested by Bledow et al. (2009) that is more generalized and extendable to individuals (320). According to them, any system or individual that meets conflicting demands by engaging in different activities by displaying the ability to “switch between different mindsets and action sets” (322) is functionally ambidextrous. However, little research has been devoted to examine the ability of individuals to manage and fulfill different functions (Bonesso et al. 2014, 1).

Since the predecessors of the Swiss non-traditional universities were teaching institutions and lecturers are still primarily hired to fulfil teaching obligations (Baumberger 2017; Fumasoli and Goastellec 2015), it can be assumed that UASs and UTEs have always been able to fulfill their teaching mission or function. However, their research capacity has been developing since their transformation into HEIs and the adaption of the Humboldtian model. In this article, we therefore focus on the research aspect of their functional ambidexterity and assess it by examining...
the perceived organizational structures for research and the self-reported individual competence in doing research independently.

**Background Information and Context**

In its HE reform, Switzerland lagged behind other European countries that had already incorporated advanced vocational education and training (VET) into the HE sector. For example, several German federal states began to set up UASs (*Fachhochschulen*) in the 1970s (Lehmann 2016, 251), Austria’s UASs were established by 1995 (Beerkens 2001, 35) and in Belgium, non-traditional universities had been part of HE even before the establishment of the *hogescholen* in the early 1990s (Verhoeven 2008). The central reason for the Swiss introduction of UASs and UTEs, which belong in the same category of HEIs regarding their mandate (Graf 2016, 9; Organisation for Economic Co-operation and Development (OECD) 2003, 64), was the promotion of economic competitiveness (von Matt 2010).

In the Swiss reform, already existing postsecondary level institutions of vocational training without a research mission were upgraded to HE level and charged with a public mission that includes both research and teaching. Using the analytical distinction regarding the relationship between research and teaching in HE by Schimank and Winnes (2000), it can be argued that the policy makers thereby chose the Humboldtian model for the new non-traditional university sector or enlarged the already existing Humboldtian HE system by adding new institutions to it.

Swiss HEIs have some leeway in managing their mission, and there is no direct legal requirement to adhere to the principle of the unity of research and teaching at the individual level. However, the federal financing mechanism contains the incentive for HEIs to commit lecturers in both areas and distributes 7.5 percent of the federal funds for UASs according to the number of employees engaged in both activities (State Secretariat for Education, Research and Innovation 2020). In addition, the higher education act (HEdA 2015) which took effect in 2015 and also regulates traditional universities requires from all types of HEIs that they accomplish their public mission of teaching and research to a high standard of quality and with qualified staff (HEdA 2015, Art. 30, Par. A).

There is a general understanding or consensus that lecturers are responsible for teaching and research in the non-traditional university sector in Switzerland (Martin 2017, 7). UASs and UTEs therefore need a high percentage of academic staff with mixed profiles in order to pursue the two activities in a Humboldtian system (Böckelmann and Nagel 2018, 38; Chamber of Universities of Applied Sciences and Arts 2013, 15; Graf 2018, 20–26). Such profiles lead to individual functional ambidexterity underpinning the new HEIs’ organizational ambidexterity. The consequences of the new Humboldtian mission for the non-traditional universities have prompted the Rectors’ Conference of Swiss Higher Education Institutions, swissuniversities, to support them financially in improving the profiles of dual competence of their teaching staffs since the beginning stages of the reform (Swissuniversities, online; see also Lepori 2008, 50). Previous research by Hazelkorn (2005) has shown that non-traditional HEIs often suffer from a lack of qualified faculty with the research experience and skills a
doctorate typically promises. Since in Switzerland, this degree is not a legal requirement for academic staff at non-traditional universities (European Commission/EACEA/Eurydice 2017, 33), this measure seems suitable in supporting the formally already completed reform.

**Methods and Data**

**Introduction**

Our study is based on a triangulation of different methods as described by Flick (2011). More specifically, qualitative and quantitative approaches are used to complement each other by providing stimuli for further analysis with the other approach (76). In our case, a qualitative document analysis of mission statements from all Swiss UASs and UTEs active in the year 2019 is complemented by a two-part quantitative analysis of recent nationwide survey data.

**Qualitative Data**

HEIs have adopted mission statements from the corporate sector (Kosmützky 2016), where they are used to define organizational purpose (Campbell and Yeung 1991). Since the mission decreed by the federal authorities obligates Swiss HEIs to conduct both research and teaching and the incentives for a Humboldtian model are in place, this should be expressed in their mission statements. Internationally, a reference to the beneficial effect between research and teaching is often made in mission statements (Jenkins et al. 2003). In order to find documentary evidence for the adoption and interpretation of the Humboldtian model by the Swiss non-traditional university sector, the contents of the individual institutions’ mission statements were analyzed by skimming, reading and interpreting them (Bowen 2009). In order “to create metrics and other analytics” (Dooley 2016, 244), the document analysis combined manifest content analysis with a subsequent simple thematic analysis. In February 2020, we examined the internet sites of all public UASs and UTEs existing in the year 2019 in Switzerland to find their mission statements. In order to identify the right institutions, we used the information provided the federal State Secretariat for Education, Research and Innovation (State Secretariat for Education, Research and Innovation 2019). It classified 23 institutions as public UASs or UTEs along with a single private UAS that we exclude from our analysis because of its specialized nature. If the public entities provided neither a mission statement on a webpage nor as a downloadable document, we looked for other statements that referred to the mission of the institution. In this manner, we identified 23 documents for the qualitative analysis.

**Quantitative Data**

The quantitative data used in this study were collected through an online survey in an extensive effort in the autumn of 2018 to gain empirical information on the
profiles, qualifications, attitudes, and perceptions of lecturers with permanent and fixed-term contracts at Swiss non-traditional universities. As hitherto almost no empirical data on this group of professionals existed (Böckelmann et al. 2019), the survey was quite extensive and required about 30 to 45 minutes to complete. Among the more than 90 questions, the respondents answered several attitudinal questions about their perceptions of their employer’s institutional structure regarding teaching and research, and about their own competence to conduct research projects. The answers to these questions represent the quantitative data used for the purpose of this article.

The link to the survey instrument was e-mailed to 10,025 lecturers by the human resources departments of their respective employers. By the deadline of October 22, 2018, there were 2,454 usable responses received from 16 UTEs and seven UASs. The response rate on the individual level is therefore 25 percent. On the institutional level, it reached a much higher response rate of 96.3 percent, as only from one of the targeted institutions (a UTE) there were no responses. Due to the pairwise deletion of missing data, the actual sample size in the different analyses of the survey data deviates slightly from this number. Regarding the institutional affiliation of the respondents, 32.4 percent work for UTEs and 67.6 percent for UASs. Due to the slightly higher response rate of UTEs, their lecturers are overrepresented in the total sample, possibly rendering results per HEI type more conclusive than for the total sample. Regarding gender, the samples for UTEs and UASs are representative when compared to official statistics reported by the Federal Statistical Office (2018) on the staff of educational institutions.

As described above, the dual organizational functions of research and teaching rest on individual functional ambidexterity. This requires the embodiment of the corresponding competences in each lecturer and the presence of favorable structural conditions on the institutional level. The quantitative analysis of the survey data will first demonstrate how the individual lecturer perceives the organizational structure regarding research and teaching and whether it underpins individual ambidexterity. We use this perception measured through three survey items in order to reach a judgment to what extent the preconditions for the successful realization of the remit are present in the non-traditional universities. On a Likert-type scale from “1 fully agree” to “7 fully disagree,” the respondents were asked to rate their agreement with the following statements:

1. At my HEI, lecturers are expected to be active in teaching as well as in research.
2. At my HEI, simultaneous activities in research and teaching are facilitated.
3. At my HEI, it is easiest for lecturers to work predominantly in teaching with regard to the way work is organized.

The first two items measure the structural conditions for functionally ambidextrous individual work. While the first one does so through the institutional expectation that lecturers are active in teaching as well as research, the second one measures it through the perceived facilitation of the two activities by the respondents’ employers. The third item serves to assess the influence of the institutions’
organizational structures on the lecturers’ choice to engage in research. Possible obstacles to this choice may be found in the competitive procedures for the allocation of internal research funds and the need for lecturers interested in research to find research funding through external contracts as described in Lepori (2008). The uncertain outcomes of such endeavors and the ensuing risk of unfulfilled work time agreements can to a large degree be blamed for the decision by lecturers to abstain from research activities and a focus on more stable teaching activities (Böckelmann et al. 2019).

The items represent the subjective dimension of how the organizational structure impedes or supports individuals in their pursuit of ambidexterity. As perceptions play an important role in how people construct their own social realities (Jusims 1991), the results may also be a suitable indicator of the true participation in research. Individual lecturers who perceive their employers’ expectation to do research, feel that they receive support in that activity, and are not primarily led to teach by the structures of their employers will be more likely to be active researchers than they would be otherwise, regardless of how objective they are. Given the remit of the non-traditional university sector, the hypothesis, that overall, the structure is perceived to be supportive of research (H1), suggests itself and is tested.

We then proceed to analyze data on the self-perceived research competence thanks to the highest degree obtained by the lecturers surveyed. In a first step, this will allow us to describe the outcome of the diversification of the HE sector regarding the presence of research competence in the population of non-traditional university lecturers. Through a one-way ANOVA, we then statistically assess the influence of the highest academic degree on the self-perceived ability to conduct research (as measured on a scale from 1 to 4). This provides an insight into what qualifications are the most likely to allow lecturers to successfully complement teaching with research, i.e., bring about a functional ambidexterity. Here, the hypothesis that the higher the degree, the higher the research competence is tested (H2). The academic degree was surveyed in six categories ranging from a bachelor’s degree from a UAS or UTE to a habilitation. These categories, along with their distribution in the total sample as well as the sub-samples are shown in Table 1. As no research competence is expected from lecturers with vocational degrees, this group, including the

| Type of HEI (Employer) | Highest degree | BA/BSc | BA/BSc | MA/MSc | MA/MSc | Doctorate | Habilitation | Vocational or unknown |
|------------------------|----------------|--------|--------|--------|--------|-----------|-------------|----------------------|
|                        |                | UAS/UTE | UNI    | UAS/UTE| UNI    | UNI       | UNI         | UNI                  |
|                        | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| UTE                    | 11 | 1.4 | 8 | 1.0 | 69 | 8.7 | 336 | 42.3 | 258 | 32.5 | 24 | 3.0 | 88 | 11.1 |
| UAS                    | 86 | 5.2 | 17 | 1.0 | 195 | 11.7 | 531 | 32.0 | 666 | 40.1 | 70 | 4.2 | 95 | 5.7 |
| Total                  | 97 | 4.0 | 25 | 1.0 | 264 | 10.8 | 867 | 35.3 | 924 | 37.7 | 94 | 3.8 | 183 | 7.5 |

BA/BSc = Bachelor’s degree; MA/MSc = Master’s degree; UNI = degree from traditional university.
respondents whose highest degree is unknown, is excluded from the subsequent analyses.

**Findings**

**Document Analysis**

The analysis of the 23 mission statements has revealed that 18 can be classified as self-defined mission statements. The rest of the documents, all from UTEs, are partially rephrased or reproduced legal texts and requirements serving as mission statements (see Table 2). Of the 23 institutions, 22 referred directly to research and teaching as their main activities, while one mission statement of a UTE only indirectly refers to research and teaching by stating its mission is to “create knowledge” and “build competencies.”

Almost 80 percent of the institutions, including all UASs, have mission statements that are specific to the institutions. The following two quotes exemplify this:

Graduates of the [HEI No. 7] possess reflective, professional, research and practice-based competences which can be applied in demanding professional fields in our knowledge-based society. The dual emphasis of higher education is guaranteed by the programmatic coupling of studying with research and development, as well as with practical application. … (UAS)

We are a competence and innovation center for lifelong learning in the educational area of [HEI No. 20]. We meet high demands made on teaching, continued education, service provision and research by basing our activities in practice and science and aligning them with the needs of our stakeholders and target audience. … (UTE)

**Table 2** Mission statements summary

| Type of HEI | Number of public HEIs | HEIs with an institution specific mission statement | HEIs referring to public remit instead of mission | HEIs referring to research and teaching as missions / public remit | HEIs referring to Humboldtian teaching-research nexus |
|-------------|-----------------------|---------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------|--------------------------------------------------|
| UTE         | 16                    | 11 68.75                                          | 5 31.25                                       | 15 93.75                                                       | 1 0.06                                           |
| UAS         | 7                     | 7 100.00                                          | 0 0                                           | 7 100.00                                                       | 0 0                                               |
| Total       | 23                    | 18 78.26                                          | 5 21.74                                       | 22 95.65                                                       | 1 0.04                                           |
Instead of providing a specific mission statement online or as a downloadable document, slightly more than 30 percent of all UTEs or just under 22 percent of all non-traditional HEIs state what their public remit is, often by referring to the articles of the respective legal basis. The quote below illustrates this practice:

The [HEI No. 14] facilitates the continuing education of the teaching staff on all levels of basic education and the training of the mentors of teaching internships, conducts applied research and development in the area of basic education and offers services to third parties (cf. Higher Education and Research Act, Art. 9). (UTE)

No UASs were found that exclusively refer to the public remit, which points to differences in the profiles between the two subcategories of non-traditional universities that require further research. One of the UTEs is the only institution formulating in its mission statement that individual lecturers are responsible for both research and teaching. As the statement of an organizational purpose does not necessarily have to include how that purpose is served, this result is not surprising.

In summary, the document analysis shows that the non-traditional HE sector appears to have adapted to the role it is supposed to play after the reform in Switzerland by focusing on teaching and research. Although UTEs lag behind UASs in terms of formulating a distinctly own mission as evidenced by the relatively high percentage that only refer to their public mission and/or legal basis for their existence, the shift from teaching institutions to Humboldtian research and teaching institutions has formally occurred. Therefore, the precondition for the further analysis of the functional ambidexterity in the non-traditional university sector is satisfied.

Survey Data Analysis

Institutional Structures for the New Remit

The survey results show that slightly more than two-thirds of all lecturers agree that their employers expect them to be functionally ambidextrous, i.e., active in both research and teaching (see Table 3). About 55 percent agree that their employer facilitates simultaneous activities in research and teaching. However, almost two-thirds of the lecturers in the non-traditional university sector agree that it is easiest to just concentrate on teaching, given the way work is organized. UASs exhibit larger shares of agreement to the first and third statements than UTEs. In line with this, Chi-square tests of independence show that there are significant associations between the type of HEI the respondents work for and the proportions of the answers to the first and third statements \(X^2 (6, N = 2327) = 82.051, p < .001\) and \(X^2 (6, N = 2303) = 35.038, p < .001\). However, in both cases the association is not very strong \([CC = .122, p < .000; \text{Cramer’s } V = .123, p < .000 \text{ and } CC = .185, p < .000; \text{Cramer’s } V = .188, p < .000]\). For the second statement in Table 3, no statistically significant association could be found and the facilitation of simultaneous research and teaching activities does not seem to depend on the type of HEI.
### Table 3  Distribution of lecturers’ perception of structural conditions for research and teaching

| Survey statement                                                                 | Fully/mostly/somewhat agree (%) | Indifferent (%) | Somewhat/mostly/fully disagree (%) |
|----------------------------------------------------------------------------------|----------------------------------|-----------------|-------------------------------------|
|                                                                                  | UTEs | UASs | Whole sector | UTEs | UASs | Whole sector | UTEs | UASs | Whole sector |
| At my HEI, lecturers are expected to be active in teaching as well as in research | 58.3* | 71.4* | 67.1         | 15.3* | 11.8* | 13.0         | 26.3* | 16.8* | 19.9       |
| (N)                                                                              | (441) | (1121) | (1562)       | (116) | (186) | (302)        | (199) | (264) | (463)       |
| At my HEI, simultaneous activities in research and teaching are facilitated       | 52.9  | 55.5  | 54.6         | 17.7  | 18.0  | 17.9         | 29.5  | 26.5  | 27.5        |
| (N)                                                                              | (398) | (870)  | (1268)       | (133) | (282) | (415)        | (222) | (416) | (638)       |
| At my HEI, it is easiest for lecturers to work predominantly in teaching with regard to the way work is organized | 57.4** | 67.4** | 64.2         | 26.8** | 19.1** | 21.6         | 15.7** | 13.5** | 14.2      |
| (N)                                                                              | (428) | (1050) | (1478)       | (200) | (298) | (498)        | (117) | (210) | (327)       |

*/** Significant (p < .001)
Along with the differences between the proportions of agreement with the survey statements, we also tested the differences in the mean scores of the lecturers’ assessments of these statements for statistical significance (see Table 4). While t-tests were used in the cases of the second and third statements, a nonparametric Mann–Whitney $U$ Test had to be used for the first one because a Levene’s test showed that equal variances could not be assumed ($p = .004$). At UTEs ($median = 5$), lecturers agree significantly less on average that there is an expectation to do both research and teaching than their counterparts at UASs ($median = 5$) ($U = 465014.500, p < .001$). However, the effect size $r = .186$ is small. The result of the t-test for the mean scores of the second statement shows that UTEs ($M = 4.37, SD = 1.674, n = 753$) also seem to facilitate the simultaneous activities in research and teaching slightly less well $[t(2319) = −2.064, p = .039]$ than UASs ($M = 4.53, SD = 1.660, n = 1568$). However, UASs ($M = 5.08, SD = 1.5, n = 1558$) have the statistically significant larger issues than UTEs ($M = 4.76, SD = 1.5, n = 745$) when it comes to the preference for teaching $[t(2301) = 4.876, p < .001]$. The effect sizes according to Cohen (1992) for the second and third statements are negligible with $r = .203$ and $r = .101$, i.e., the type of HEI plays only a small or very small role in creating the differences in the mean scores of the lecturers’ answers. The structural conditions for ambidextrous work of lecturers therefore closely resemble each other at UASs and UTEs.

In summary, the results presented in Tables 3 and 4 lead to the rejection of H1 for both of the two types of HEIs or the non-traditional university sector as a whole. The majority of lecturers at UASs and UTEs perceive that their institutional structures guide them toward integration of research and teaching, although sizable shares that are indifferent or do not feel the same way remain. However, this overall perception is moderated by the fact that almost two-thirds of all the lecturers feel that it is easiest to just teach, given the structures for the organization of their work. The gap between the picture emerging through the items regarding the institutional expectation and facilitation of individual ambidextrous activities and the picture emerging through the third item measuring the organizational preference for teaching is more pronounced in UASs than in UTEs. However, the effect sizes suggest that the differences between the new HEIs play a rather small role in our results.

When the statistical analysis of the three variables is contrasted with the results of the preceding document analysis, it becomes evident that the perception the institutions create through their mission statements is just partly matched by the perception of the individuals on which the institutional mission relies on for its fulfillment. In other words, the individual ambidexterity required by the Humboldtian model is just partly supported by institutional structures. This suggests that a certain degree of mismatch between the sector’s communicated mission and its actual structures has accrued or was acquiesced in the transition from pure teaching institutions to Humboldtian institutions.

Self-Perceived Research Competence

The frequencies of the self-perceived research competence shown in Table 5 show that a clear majority of lecturers (70.9 %) rate their research competence as at least good, while 29.1 percent rate it low or non-existing. When the two different
Table 4 Comparison of mean scores of lecturers’ perception of structural conditions for research and teaching

| Survey statement                                                                 | UTEs          |               | UASs          |               | Whole sector  |               |
|----------------------------------------------------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
|                                                                                  | N  | Mean | SD  | N  | Mean | SD  | N  | Mean | SD  |               |               |               |
| At my HEI, lecturers are expected to be active in teaching as well as in research | 756 | 4.5** | 1.7 | 1571 | 5.2** | 1.6 | 2327 | 5.0  | 1.6 |               |               |               |
| At my HEI, simultaneous activities in research and teaching are facilitated      | 753 | 4.4*  | 1.7 | 1568 | 4.5*  | 1.6 | 2321 | 4.5  | 1.7 |               |               |               |
| At my HEI, it is easiest for lecturers to work predominantly in teaching with regard to the way work is organized | 745 | 4.8** | 1.5 | 1558 | 5.1** | 1.5 | 2303 | 5.0  | 1.5 |               |               |               |

*aSignificant (*p* = .05); **significant (*p* < .001)
types of HEIs are considered, the UTEs have a lower proportion of lecturers with good to very good research competence (67.4%) than UASs (74.4%). A Chi-square test of independence shows that there is a significant association between the type of HEI and research competence \(X^2(3, N = 2163) = 10.217, p = .017\). However, the association is very weak, as attested by the contingency coefficient and Cramer’s V \((CC = .069, p = .017; Cramer’s V = .069, p = .017)\). For the purpose of our further analysis of the lecturers’ research competence and its connection with the highest academic degree obtained, we therefore only consider the total sample. In addition, the degree categories of doctorate and habilitation were combined because the latter does not necessarily attest improved research competence in comparison with a doctorate.

Overall, the mean score of the research competence of the total sample of lecturers reaches the threshold of three \((M = 3.01, SD = .92, n = 2163)\), attesting that on average lecturers feel able to conduct research independently. As shown in Table 6 however, the mean ratings in all categories except in the one for a doctorate or habilitation are below this level. This suggests that on average, lecturers holding Bachelor’s and Master’s degrees are not sufficiently prepared for research work and therefore lack an important prerequisite for functional ambidexterity in a Humboldtian system.

A Shapiro–Wilk test \((p < .05)\) showed that the dependent variable research competence is not distributed normally in any of the groups formed by the different academic degrees. As normalcy is a condition for a conventional one-way ANOVA, this prompted us to conduct a nonparametric Kruskal–Wallis test in order to determine whether the score of the research competence is the same across the different categories of the highest degree. Its result suggests that the

| Table 5 | Self-perceived research competence due to highest degree obtained |
|---------|---------------------------------------------------------------|
| Research competence rating | Total sector | UTEs | UASs |
| | N | % | N | % | N | % |
| 1 None at all | 142 | 6.6 | 43 | 6.3 | 99 | 6.7 |
| 2 Low | 488 | 22.5 | 180 | 26.3 | 308 | 20.8 |
| 3 Good | 744 | 34.4 | 238 | 34.7 | 506 | 34.2 |
| 4 Very good | 789 | 36.5 | 224 | 32.7 | 565 | 38.2 |
| Total | 2163 | 100.0 | 685 | 100.0 | 1478 | 100.0 |

| Table 6 | Self-perceived research competence of highest degree categories |
|---------|---------------------------------------------------------------|
| Highest degree | Mean | SD | N |
| BA/BSc UAS/UTE | 2.35 | .92 | 96 |
| BA/BSc University | 2.29 | .81 | 24 |
| MA/MSc UAS/UTE | 2.45 | .87 | 212 |
| MA/MSc University | 2.74 | .87 | 826 |
| Doctorate or Habilitation | 3.43 | .78 | 1015 |
| Total | 3.01 | .92 | 2163 |
highest degree has a statistically significant effect on the self-perceived competence to conduct research \( [H(4) = 445.634, p < .001] \). The effect size is calculated as \( \eta^2 \) based on the H-Statistic (Tomczak and Tomczak 2014). With \( \eta^2 = .21 \), it reaches the threshold for a large effect according to Cohen (1988).

Subsequent post hoc tests (Dunn–Bonferroni tests) in the form of stepwise step-down multiple comparisons reveal that there are three homogeneous subgroups of degrees differing significantly in their research competence \((\alpha = .05)\). As shown in Table 7, Bachelors \((M \text{ Rank} = 616.33)\) and Masters \((M \text{ Rank} = 722.88)\) from the non-traditional university sector as well as Bachelors from traditional universities \((M \text{ Rank} = 678.35)\) do not differ significantly in their research competence and form subset 1. Masters from traditional universities \((M \text{ Rank} = 893.84)\) report a significantly better research competence than subset 1 and form subset 2. Subset 3 consists of lecturers with a doctorate or a habilitation \((M \text{ Rank} = 1362.08)\). They in turn have the statistically significantly better research competence than the degrees in subsets 1 and 2.

These results prompt us to reject H2 partially because they show that for the lowest three categories of degrees there is no statistically significant difference in the self-perceived research competence. Consequently, lecturers of the non-traditional sectors can be grouped into three groups according to their ability to meet expectations regarding their functional ambidexterity. While Bachelors along with Masters from UASs and UTEs exhibit the least and PhDs the most promising potential in this regard, Masters from traditional universities form the middle ground, albeit with an average research competence that is closer to subset 1 than subset 3 and insufficient for independent research.

Table 7 Homogeneous subsets based on highest degree and research competence

| Subset (\( \alpha = .05 \)) | 1          | 2          | 3          |
|-----------------------------|------------|------------|------------|
| Sample\(^a\)               | BA/BSc UAS/UTE | 616.333    |            |            |
|                             | BA/BSc Univ.  | 678.349    |            |            |
|                             | MA/MSc UAS/UTE | 722.880   |            |            |
|                             | MA/MSc Univ.  | 893.839    |            |            |
|                             | Doctorate or Habilitation | 1362.081 |            |            |
| Test Statistic              | 1.649 \(^b\) | . \(\ldots\) | . \(\ldots\) |
| Sig. (two-sided test)       | .438 \(\ldots\) | . \(\ldots\) | . \(\ldots\) |
| Adjusted Sig. (two-sided test) | .618 \(\ldots\) | . \(\ldots\) | . \(\ldots\) |

Homogeneous subsets are based on asymptotic significances

\(^a\)Each cell shows the sample average rank of the category of highest degrees

\(^b\)Unable to compute because the subset contains only one sample
Discussion and Limitations

From the document analysis, it can be concluded that UASs and UTEs have formally adopted the new Humboldtian mission. In only one exception, research and teaching are not directly mentioned as purposes of the non-traditional universities. The high shares of lecturers that perceive the institutional expectation to be active in research and teaching found in the quantitative analysis validate the finding from the document analysis. However, there are differences between the two types of HEIs in that UTEs refer more often to the legal basis of their mission than formulating an own mission. This indicates that there is more reactive than active adjustment to the reform at these institutions than at UASs, which all formulate their own missions. This finding is substantiated by the result from the survey analysis that UASs are perceived to be more facilitating of research than UTEs and that lecturers in teacher education feel less expected to be active in both research and teaching. However, UTEs seem to provide better structures for functionally ambidextrous lecturers because in the perception of lecturers, UTEs favor teaching less than UASs through the way work is organized.

In terms of the survey results in general, it can be established that the institutional structures in the new HE sector do not fully support the lecturers in being functionally ambidextrous, i.e., in integrating teaching and research. While lecturers generally feel expected to do research and perceive that there is some form of facilitation of it, the majority of all lecturers perceive the structure of their employers to favor teaching. Also relatively large portions of the lecturers at both types of HEIs do not agree that research is facilitated or expected of them. These findings lead us to reject H1, and we conclude that while the institutions of the non-traditional university sector try to structurally absorb their newer research mission according to the Humboldtian model, the older purpose of teaching is still dominant, which is perceivable by the way work is organized. This finding can be corroborated by older research on Swiss HEIs illustrating that the all-round demands placed on faculty lead to structural frictions (Böckelmann 2009, 20). The transformation from vocationally oriented teaching institutions to HEIs is therefore not yet entirely completed.

The structural inequalities between research and teaching might be partially responsible for the fact that staffing practices of the new HEIs have not been completely adjusted to accommodate the need for more research competent staff. As almost 30 percent of the total sample does not have more than a low research competence, only 70 percent of the lecturers can be expected to be functionally ambidextrous. Even though the average lecturer feels well prepared to conduct research independently thanks to her or his highest academic qualification, this result is driven by PhDs, the most numerous highest degree in the sample. When it comes to lower degrees that make up 55.2 percent of the academics in the total sample (UTEs 60.1 percent, UASs 53 percent), Masters from traditional universities feel better prepared than masters from UASs and UTEs, and bachelors in general. While this finding does not lead to an outright rejection of H2, none of these degrees prompt their holders to feel well prepared for independent research.
on average. This observation is matched by Clark’s (1997) statement that “the doctoral level is where the commandment to do research most fully takes over.” (251). Given the relatively high number of PhDs in the ranks of its faculty, the non-traditional university sector seems to take this partially into account when hiring lecturers. This has, for instance, also been observed in Germany, where a growing percentage of the teaching staff of UASs possess PhDs or habilitations due to the altered requirement for a greater affinity toward research and scientific qualifications (Hachmeister et al. 2015, 20). However, large proportions of the Swiss lecturers do not feel well prepared for independent research, which may have a detrimental effect on the research efforts of non-traditional universities unless the average competence can be increased. In combination with the structural problems, the deficit in research competence leads to an only partial organizational ambidexterity of the sector.

This study has some potential limitations worth noting when interpreting the results. The first one arises from the nature of the survey data that might contain biases due to the respondents’ lack of objectivity. In particular, results of the self-perceived research competence might be subject to self-enhancement tendencies present in individuals (John and Robins 1994). The fact that the participation in the survey was voluntary and not supported by any incentives might also lead to a selection bias in the sample. In addition, the samples for the documentary and survey analyses are country-specific which might lead to results that are not generalizable to other contexts.

Conclusion

The triangulation of documentary evidence and survey results leads us to conclude that so far the outcome of the reform in Swiss HE is a new sector that can only partially attain the Humboldtian ideal of a unity of research and teaching. Even though we demonstrate that there is a formal institutional emphasis of research as a complement to teaching in mission statements as well as in structural terms, the recent reform left structures at the new HEIs that favor teaching. The misalignment of structure and mission is further exacerbated by the fact that almost 30 percent of lecturers do not feel well prepared to do research. Thus, the organizational ambidexterity of non-traditional universities has to rely on an incomplete individual functional ambidexterity, which in turn is not wholly supported by suitable organizational structures. The conclusion of the triangulation is therefore that the new HEIs in Switzerland are not yet at the point where the reform process is concluded. The governance bodies of the new HEIs have to pay attention to the competences of the faculty as well as to the organizational structures that still favor teaching.

With the mentioned limitations in mind, we are of the opinion that our findings can be helpful in informing members of the management and administration of Humboldtian non-traditional universities in their quest to improve the organizational ambidexterity through the individual ambidexterity of lecturers. The findings of this study may also justify additional work uncovering underlying reasons for the perceived structural frictions and lack of research competence to develop strategies that
positively impact the two areas of the non-traditional university sector. Aside from the continuation of public financial support for competence development programs, we recommend that non-traditional universities review their structures systematically in order to improve their alignment with the research mission. Furthermore, given the relatively low research competence of UAS and UTE graduates, Master’s degree programs of the non-traditional university sector should focus more on research skills in order to bring its graduates to the same level of competence as their equivalents at traditional universities. This would enable UAS and UTE graduates to continue an academic career, i.e., a doctorate without significant disadvantages in this respect. Such careers are currently quite rocky (FH Schweiz, n.d.), necessitating a change to the traditional university sector and the compliance with requirements that do not exist for graduates of traditional universities.

Declaration

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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