

Cultures of sustainability governance in higher education institutions: A multi-case study of dimensions and implications

Sebastian Niedlich¹ | Benjamin Kummer¹ | Mara Bauer² |
Marco Rieckmann² | Inka Bormann¹

¹Department of Education and Psychology, Freie Universität Berlin, Berlin, Germany

²Department of Education, University of Vechta, Vechta, Germany

Funding information

Bundesministerium für Bildung und Forschung, Grant/Award Number: 13NKE007A

Abstract

Organisational culture is frequently mentioned in the context of sustainability governance in higher education institutions, but its substance and role for organisational development remain largely unclear. This paper argues that, in fact, sustainability governance in higher education institutions is predicated on cultural orientations. These are explored empirically based on 61 expert interviews with stakeholders (management, sustainability commissioners, academic and technical staff, students) in eleven German higher education institutions. Qualitative (thematic, evaluative) content analysis was used to code and compare data across cases. The study identifies four cultural key dimensions and two overarching orientations: organisational learning orientation and holistic orientation. The analysis suggests that both orientations tend to reinforce each other. They also represent key areas which need to be addressed by higher education institutions seeking change towards sustainable development. The findings demonstrate the need for future research on organisational cultures of sustainability governance and their development over time

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2019 The Authors. Higher Education Quarterly published by John Wiley & Sons Ltd

Zusammenfassung

Im Kontext der Governance von nachhaltiger Entwicklung an Hochschulen werden häufig Fragen organisationaler Kultur aufgeworfen; deren Wesen und Rolle für die Organisationsentwicklung von Hochschulen bleiben indes weitgehend unklar. Der Beitrag argumentiert, dass organisationskulturelle Merkmale eine wesentliche Grundlage für die Nachhaltigkeitsgovernance an Hochschulen darstellen. Dieser Annahme wird auf der Basis von 61 Experteninterviews mit verschiedenen Akteur*innen (Hochschulleitung, Nachhaltigkeitsbeauftragte, akademisches und technisches Personal, Studierende) in elf deutschen Hochschulen nachgegangen. Die Interviewdaten wurden im Rahmen einer strukturierenden und evaluativen qualitativen Inhaltsanalyse kodiert und vergleichend ausgewertet. Die Studie identifiziert vier zentrale Kulturdimensionen und zwei übergeordnete kulturelle Orientierungen: organisationale Lernorientierung sowie holistische Orientierung. Die Analyseergebnisse legen nahe, dass die beiden Orientierungen einander wechselseitig verstärken. Zugleich bilden sie zwei wichtige Gestaltungsbereiche für Hochschulen, die eine Transformation hin zu nachhaltiger Entwicklung anstreben. Insgesamt verdeutlichen die Ergebnisse die Notwendigkeit, hochschulische Organisationskulturen und deren Wandel genauer zu erforschen, um die Nachhaltigkeitsgovernance an Hochschulen besser verstehen und erklären zu können.

1 | INTRODUCTION

A growing number of higher education institutions have been making changes towards sustainability (Leal Filho et al., 2019). Accordingly, the institutionalisation of sustainable development in higher education institutions has gained increasing interest in recent research (Hoover & Harder, 2015; Ramisio, Costa Pinto, Gouveia, Costa, & Arezes, 2019). This includes classifying drivers of and barriers to change (cf. Awuzie & Abuzeinab, 2019; Hoover & Harder, 2015; Verhulst & Lambrechts, 2015) as well as developing wider frameworks of organisational change and identifying phases or steps in the process towards sustainability (Holm, Sammalisto, Grindsted, & Vuorisalo, 2015; Newman, 2007; Rath & Schmitt, 2017). Overall, however, the governance structures as well as processes of sustainable development in higher education institutions are still not well understood (Hoover & Harder, 2015).

Scholars in the field of sustainable development have long emphasised the need for organisational transformation and, consequently, deep and systemic learning on the part of higher education institutions (Adams, Martin, & Boom, 2018; Hoover & Harder, 2015; Sterling, 2004; Sylvestre, Wright, & Sherren, 2013). Drawing on the distinction between first and second order learning (Argyris & Schön, 1974, 1996), they argue that sustainability implies a shift not just in the learning provision and practice of higher education institutions but also in the underlying paradigm—an epistemological change towards, *inter alia*, holism and a change in ethos, purpose and policy (Sterling, 2004). In other words, sustainable development in higher education institutions implies a change in their cultural foundations, and, consequently, research needs to pay more attention to institutional culture (Sterling, 2004; see also Hoover & Harder, 2015; Sylvestre et al., 2013).

This paper aims to address this research gap by drawing on and comparing findings from eleven higher education institutions in Germany. As a first step, the concept of organisational culture and its role in sustainability governance in higher education institutions are discussed and four elements of organisational culture are highlighted. Second, the database and research design of the study are explained. Third, results from the multi-case study relating to the four dimensions of organisational culture are presented and two overarching dimensions—holistic orientation and learning orientation—are derived. In the final discussion, the paper further explores the interrelatedness of these two dimensions and raises questions for future research.

2 | THE ROLE OF ORGANISATIONAL CULTURE IN SUSTAINABILITY GOVERNANCE IN HIGHER EDUCATION INSTITUTIONS

Aspects of organisational culture are frequently counted among barriers to change towards sustainable development (Lozano, Lukman, Lozano, Huisingsh, & Lambrechts, 2013; Sylvestre et al., 2013; Verhulst & Lambrechts, 2015; Zilahy & Huisingsh, 2009) or drawn upon to explain diversity in sustainability implementation (Leal Filho et al., 2019). Conversely, common values, attitudes and behaviours and cultural governance approaches are emphasised as preconditions for deeper change (Sylvestre et al., 2013; Viegas et al., 2016), and, consequently, cultural governance approaches are called for (Adams et al., 2018; Disterheft, Caeiro, Azeiteiro, & Leal Filho, 2015). However, a profound understanding of what organisational culture entails and the role it plays in the context of sustainability governance in higher education is still lacking.

While existing definitions of organisational culture share some similarities, the boundaries of the term remain unclear (Kummerow & Kirby, 2014, p. 47). For the purpose of this study, following Schein's (1985) seminal work, organisational culture can be understood as a pattern of assumptions shared by members of an organisation, developed over time and transmitted through day-to-day interaction with one another. Organisational culture includes both surface-level manifestations—structures, language, practices—and deeper-lying elements such as implicit beliefs, which are less visible and accessible (*cf.* Kummerow & Kirby, 2014).

In the following, it is argued that four dimensions of organisational culture can be identified as key for sustainability governance in higher education institutions: (a) responsibility for sustainable development, (b) purpose of the higher education institution, (c) conception of sustainability, (d) relevance and scope of organisational change. While the discussion draws on extant theoretical and empirical contributions, it must be emphasised that the importance of these four dimensions, in fact, emerged in the course of the empirical analysis, as is typical of the iterative process of qualitative research. In order to provide readers with an 'advance organiser', however, the four dimensions are explained up front. Despite its qualitative grounding, the article's structure thus follows a linear logic.

1. Responsibility for sustainable development. As Sterling notes, a 'key issue is one of "response-ability": how far institutions and higher education as a whole are able to respond sufficiently to the wider context of the crisis of unsustainability and the opportunities of sustainability' (Sterling, 2004, p. 50). Sustainability governance is therefore linked closely with issues of authority, resources and specialisation,

and self-determination (Verhulst & Lamrechts, 2015, p. 194). In response, many scholars stress the importance of participation and dialogue, framing sustainable development as a co-creative process that requires the involvement of diverse stakeholders and non-vertical decision-making (Disterheft et al., 2015; Holm et al., 2015; Hoover & Harder, 2015; Leal Filho et al., 2019; Sylvestre et al., 2013). On the other hand, a recurrent argument in the literature emphasizes the role of committed individuals or 'champions' and higher education institutions' leadership (Leal Filho et al., 2019; Lozano et al., 2015; Sterling, 2004; Zilahy & Huisingsh, 2009). While reliance on experts and 'champions' is also criticised as potentially 'leading to a substantially unsustainable model for change' (Hoover & Harder, 2015, p. 186), this does not rule out that stakeholders in higher education see institutional transformation as the task of a selected elite (Rath & Schmitt, 2017, p. 467). It is therefore crucial to analyse how responsibility for sustainable development is perceived and attributed.

2. Purpose of the higher education institution. It has been argued that sustainable development requires an intimate link between higher education institutions and society (Hoover & Harder, 2015). Indeed, since the 1980s, making a societal contribution has emerged as higher education institutions' 'third mission' (cf. Trencher, Yarime, McCormick, Doll, & Kraines, 2014). While several studies have attempted to determine how higher education institutions can make such a contribution (cf. Zilahy & Huisingsh, 2009, p. 1059f.), it appears that the potentials of the 'third mission' remain yet to be realized (Leal Filho et al., 2019; Zilahy & Huisingsh, 2009). In part, this finding can be attributed to institutional cultures and to how higher education institutions' role in relation to society is perceived (Sylvestre et al., 2013; Zilahy & Huisingsh, 2009). Notably, the idea of a 'third mission' today is strongly associated with economic contributions, especially the transfer of technology from higher education institutions to enterprises (Trencher et al., 2014). However, sustainable development calls for 'a co-evolutionary rather than linear view of the relationship between education and society' (Sterling, 2004, p. 67f.). Therefore, the pursuit of sustainable development can be interpreted as an alternative, 'fourth' mission involving the co-creation of societal transformations by large-scale coalitions involving academia, industry, government and civil society (Trencher et al., 2014). Consequently, there is a need for 'a shift in organizational culture toward a more open and holistic engagement in seeking to prevent and/or solve real world problems' (Zilahy & Huisingsh, 2009, p. 1065). Another element of organisational culture to be investigated is thus how higher education institutions define their vision and mission in relation to the broader social context.
3. Conception of sustainability. It has often been pointed out that sustainable development is a rhetorically malleable and fluid term (Weisser, 2017). While the three-pillar conception of social, economic and ecological sustainability is ubiquitous, no theoretically rigorous description of the three pillars can be found (Purvis, Mao, & Robinson, 2019), integration of sustainable development is shaped by faculty-specific perspectives (Sammalisto, Sundström, & Holm, 2015) and a comprehensive understanding is lacking (Wu & Shen, 2016). In response, it has been suggested that instead of creating a single vision of sustainability higher education institutions should envision a plurality of 'sustainabilities' in order to avoid narrow thinking (Sylvestre et al., 2013, p. 238). Other authors argue for a refinement of the concept's cores, focusing on the preservation of critical natural capital (Ott, Muraca, & Baatz, 2011; see also Liu, 2009; Steffen et al., 2015). In a similar vein, Elkington, who devised the Triple Bottom Line in order to measure an organisation's success along economic, social and ecological lines, 'recalled' the concept, claiming 'hard-wired cultural problems', including a tendency to adopt a trade-off mentality between the three pillars and failure to bury the single bottom line paradigm (Elkington, 2019). Hence, the question of how higher education institutions conceive sustainable development must be considered as an important aspect of organisational culture with direct bearing on sustainability governance.
4. Relevance and scope of organisational change. Finally, another aspect that has been highlighted as crucial is the need to achieve holistic governance covering all core areas of higher education institutions—teaching, research, operations and outreach (Hoover & Harder, 2015; Singer-Brodowski, Etzkorn, & von Seggern, 2019). Sustainable development, in this view, must be more than an 'add-on' to existing structures and curricula (Sterling, 2004) and become 'the "Golden Thread" throughout the entire university system' (Lozano et al., 2013, p. 10). However,

whereas the 'greening' of higher education institutions' physical operations has met with certain success, incorporating sustainability principles into management, research and teaching has proven difficult (Hoover & Harder, 2015; Leal Filho et al., 2019). Sylvestre et al. suggest that such difficulties arise because changes in these areas 'involve negotiating the sorts of cultural or ideological differences inherent in socially constructed notions of: how we educate and why' (cf. Sylvestre et al., 2013, p. 224). The question if organisational change is perceived as an immanent part of sustainable development and what scope of change is envisioned are therefore further aspects to be investigated more closely from an organisational culture perspective.

3 | RESEARCH DESIGN

Research on sustainability in higher education institutions tends to lack quality and methodological rigour, with a predominance of descriptive studies and storytelling (Barth & Rieckmann, 2016). With that in mind, this paper aims at contributing to more rigorous research on sustainability governance in higher education institutions. To this end, a multi-case study approach was chosen, using data from eleven different higher education institutions in Germany. The data was collected in the research and development project 'Sustainability at Higher Education Institutions: develop - network - report' (HOCH-N; <https://hoch-n.org/en>), focusing on the implementation of sustainability initiatives and the role of so-called 'governance equalizers' (for more details see Bauer, Bormann, Kummer, Niedlich, & Rieckmann, 2018). The extensive data set allowed for cross-case analysis and conclusions (cf. Corcoran, Walker, & Wals, 2004; Kyburz-Graber, 2016). As the importance of institutional culture emerged, a secondary analysis was conducted (for an overview of both steps see Figure 1). Based on the preliminary findings and a literature review, the analysis shifted to the four dimensions of institutional culture associated with sustainability governance in higher education institutions discussed in the previous section, which served as sensitising concepts (Strauss & Corbin, 1996).

3.1 | Data collection

The study covers eleven German higher education institutions, which are all members of the joint project HOCH-N. However, they differ from each other in terms of location, size, disciplinary scope and the start of their respective sustainability process (Table 1).

The study consists of face-to-face interviews with different actors at the eleven higher education institutions. In order to gain an in-depth understanding and to incorporate different views and perspectives on sustainability governance, 61 stakeholders from the following groups were interviewed:

- Management (11 interviews)
- Sustainability coordinators/commissioners/managers (10 interviews)
- Student initiatives (14 interviews)
- Technical administration (14 interviews)
- Academic staff (professors or researchers) (12 interviews)

Inclusion of interview partners followed a selective sampling. In addition to their time and willingness to participate, criteria for selection included knowledge of and first-hand experience with their institution's sustainability process (cf. Morse, 1994) to ensure that substantial expert knowledge on the higher education institutions' sustainability processes could be collected. The interviewees were identified and recruited in collaboration with partners within the HOCH-N network and through desktop research. Thirty interviewees were female and 31 male. As the study followed a cross-sectional design, all persons were interviewed only once. The average

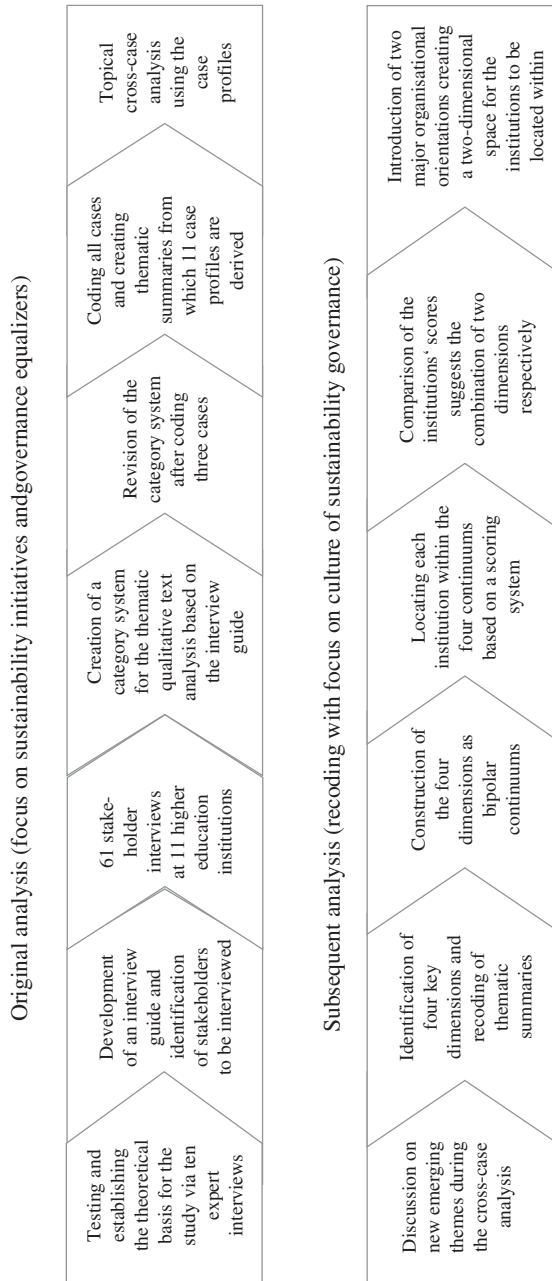


FIGURE 1 Steps in the data collection and analysis of the eleven cases

TABLE 1 Overview of the eleven higher education institutions in the sample^a

HEI	Location	Type	Size (number of students)	Disciplinary scope	Sustainability process traced back to ...
I	Urban	University	Above 50,000	Broad	2003
II	Urban	University	25,000 to 50,000	Broad	Mid-1990s
III	Urban	University	25,000 to 50,000	Broad	2013
IV	Urban	University	25,000 to 50,000	Broad	1990s
V	Rural	University	25,000 to 50,000	Broad	2007
VI	Urban	University	25,000 to 50,000	Broad	Mid-1990s
VII	Rural	University of Applied Sciences	Below 10,000	Broad	1995
VIII	Urban	University	25,000 to 50,000	Broad	1996
IX	Rural	University	Below 10,000	Narrow	2015
X	Rural	University	Below 10,000	Narrow	1990s
XI	Rural	University of Applied Sciences	Below 10,000	Narrow	1992

^aFor a better overview, the higher education institutions are listed in the order used in the empirical analysis, which is based on their scores on the four cultural dimensions of sustainability governance.

duration of an interview was 47 min. All interviews were recorded and transcribed, using a simplified approach (Dresing & Pehl, 2015).

The interviews were conducted using an interview guide including questions on the following topics, each containing one key question and supplementary questions (for more detail see Supplement 1):

1. Development of the sustainability process
2. Importance of specific actors, structures and processes
3. Sustainability as a guiding principle for the institutions
4. Evaluation of the sustainability process
5. Assessment of the stakeholder network (*visual query*)

The interview guide was designed to gather solid information on and appraisals of facts and processes of the sustainability governance at the higher education institutions. The interviews can therefore be characterized as expert interviews. Based on the idea that experts possess valuable insider knowledge this type of interview offers an efficient way of data collection (Bogner, Littig, & Menz, 2009). An important limitation, in the context of organisational culture, could be seen in the fact that expert interviews primarily focus on the explicit knowledge of the interviewees. This might be problematic as organisational culture also includes unconsciously held ways of perceiving and thinking that are not as easily accessible. Nonetheless, at a minimum, expert interviews can provide insight into both overt behaviour as well as into values that inform actions. In fact, it is the 'normative function of values that makes it possible to ask about them; that is, if prompted to think about the values that underpin their behaviour, organisation members can reasonably be expected to identify at least some of these values' (Kummerow & Kirby, 2014, p. 58). While inferences about deeper levels of an organisation's culture require further analysis, the investigation of overt behaviour and underlying values can certainly provide interesting clues.

3.2 | Data analysis

Data from the eleven case studies were analysed using qualitative content analysis, a systematic, rule-governed process built around analytical categories which are used to compress and summarise data (Kuckartz, 2014). To

ensure high quality, in all phases of the analysis at least two researchers were involved and the data analysis and interpretation were validated among researchers in a communicative process (cf. Kyburz-Graber, 2016).

First, a thematic qualitative content analysis (Kuckartz, 2014) was conducted. Major categories for the analysis were taken from the interview guide. After coding data from three cases, additional categories and subcategories were created. The final category system (see Supplement 2) thus contains both categories derived from theory as well as categories grounded in the data. Subsequently, data from all eleven cases were coded using the final category system and thematic summaries for all coded text segments were generated.

On this basis, case profiles were produced which, in addition to a timeline of sustainability processes, comprised findings on the state of sustainability activities, initiatives and actors, motives and objectives, views on the societal role of higher education institutions, influencing factors (structural/institutional, processual, personal, size, external), and case specifics of particular interest. Case profiles were used to carry out a cross-case topical analysis with the aim of identifying differences and similarities.

In a subsequent step, the analysis shifted to aspects of organisational culture. First, the summaries from the thematic analysis were recoded with the four dimensions used as the main analytical categories. On this basis, differences and similarities among institutions as well as 'opposing' traits of sustainability governance were identified and interrelations between the four dimensions analysed. To refine the prior results, each of the aforementioned four analytical categories was conceptualised as a bipolar continuum comprising five points (from 1 = clearly end point A to 5 = clearly end point B), and ideal type definitions of the end points of each continuum were constructed.

The next step included an evaluative qualitative content analysis. This method of content analysis involves building categories whose characteristics are usually noted as ordinal numbers or levels (Kuckartz, 2014). Aiming to ensure the quality of the ratings, scores were first assigned independently by five researchers. Divergent ratings were then discussed in the group until a consensus on all ratings was reached.

Subsequently, the ratings from the analysis were used to identify different groups of higher education institutions. While three distinct groups emerged from this step, questions regarding the interrelations between the four dimensions of organisational culture remained. As a consequence, it was decided to introduce two overarching analytical categories which were formed by combining respectively two of the four dimensions. For each higher education institution, the average scores were calculated for both categories and used to map the eleven higher education institutions in a two-dimensional space.

4 | RESULTS

4.1 | Four dimensions of sustainability governance in higher education institutions

As a first step, this section provides an overview of findings regarding the four cultural dimensions of sustainability governance.

4.2 | Attribution of responsibility for sustainable development

In the sample, different responsibility structures in relation to sustainable development were identified. At some institutions, management showed a strong commitment to sustainable development and became a driving force, in other cases centralised management was accompanied by a lack of commitment, and the sustainability process, as a consequence, made only little progress. Other institutions showed a different structure of responsibility, emphasising the development of sustainability as a joint development process encompassing all of its stakeholders. Institutions with such an approach stressed the importance of the different stakeholders and favoured

communication, participation and networking. Responsibility for the sustainability process was shared between the various disciplines and institutional areas.

Although in both groups of cases, specific persons or units were installed to coordinate the sustainability process, their roles varied significantly between top-down and bottom-up versions of sustainability governance. In the first case, coordinating entities were meant to act as extensions of the institutions' management with the purpose of ensuring a smooth implementation of predefined goals. In the second case, the role of the coordinating entities lay in facilitating joint formulation and realisation of goals.

4.3 | Purpose of the higher education institution

Research and teaching were considered core missions in all eleven institutions. In some institutions, especially the large ones with a broad range of disciplines, this was coupled with a strong research tradition, an emphasis on academic competition and output, and predominant disciplinary orientations, research agendas and methodologies. Ties to external actors played a minor role in these institutions and mostly occurred in the context of knowledge and technology transfer from the higher education institution to the private or public sector.

In other cases, inter- and transdisciplinary approaches and a transformative understanding of science could be observed. Higher education institutions tended to be viewed as change agents, promoting sustainable development in science and society by following and leading sustainability debates, by supporting the diffusion of knowledge and by raising awareness. Institutions that followed this view also showed stronger links with external actors, especially on the regional level, for instance with municipalities, schools, nongovernmental organisations and other institutions. Such collaborations as well as inter- and transdisciplinary platforms and projects were meant to serve not only to transform society, but also the higher education institution from within.

4.4 | Conception of sustainable development

Significant differences between the higher education institutions were found with regard to how sustainable development is conceived. Some institutions had not even made attempts at a common definition. At other institutions, discussions were confined to small circles of sustainability advocates, single faculties or administrative units. Sometimes this inspired the process, but often it complicated the communication. Yet again other institutions had developed comprehensive conceptualisations of sustainable development in the form of mission statements, strategic concepts or monitoring approaches.

In some instances, the higher education institutions approached sustainable development mainly as a subject related to environmental issues. Discussion of such issues often formed the starting point of sustainability initiatives at the institution and resulted in energy-saving programmes or environmental management. Other institutions simultaneously targeted the environmental, economic and social dimension of sustainable development, with initiatives ranging from local projects to an institution's own carbon compensation scheme that entails financial and organisational support of initiatives in developing countries.

4.5 | Relevance and scope of organisational change

A minority of the higher education institutions in this study aimed at an overarching coordination of the sustainability process—by individuals such as sustainability commissioners or larger entities such as administrative departments or centres of excellence. Such coordinating structures also served to promote the issue of sustainable

development as an institutional cross-cutting task. Where this has been achieved, networks and processes of tight communication and exchange between all institutional stakeholder groups could be observed.

However, establishing a whole-institution approach to sustainability governance proved to be a major challenge for most institutions. In some cases, sustainability-related activities took place independently and without linkages between organisational areas. Where sustainable development was closely associated with environmental issues, activities were frequently limited to matters of campus management, for example energy-saving or reducing plastic waste.

4.6 | The four dimensions as a continuum

In a second step, based on the empirical findings, each of the four dimensions was conceptualised as a continuum, and ideal type descriptions of both ends of the continuum were made (Table 2). To this end, findings from the eleven cases were drawn upon to create opposing traits for each dimension. These traits, therefore, do not represent individual cases. Rather, they can be understood as hybrids of characteristics found in several different cases, which, taken together, result in a stylised (albeit empirically grounded) definition—an ideal type.

Together, the four cultural dimensions thus form two distinct patterns. On the one side, responsibility for sustainable development is strongly centralised with the higher education institution's management setting the goals and acting as gatekeeper. This is accompanied by a traditional understanding of the higher education institution's purpose, which includes strong disciplinary boundaries and a focus on knowledge creation and transfer to external actors. The conception of sustainable development is fragmented and subdimensions are perceived as competing issues. Sustainability initiatives focus on single institutional areas, while cooperation and coordination remain limited. On the other side, sustainable development is seen as an open and co-creative process, with management as part of the community and provider of support. The higher education institution's purpose goes beyond the 'third mission', as it is conceived as an agent of societal change, engaging in inter- and transdisciplinary settings. Organisational culture is marked by an integrated view of both the different dimensions of sustainable development as well as institutional areas, requiring far-reaching mechanisms for exchange and coordination.

4.7 | Assessment of cases on the four dimensions

As explained in the section on data analysis, following the thematic analysis, the four dimensions of sustainability governance were analysed further, in the form of an evaluative content analysis. To this end, for each case, values for each dimension were assigned on a 5-point-scale (Table 3).

The cases in the table are arranged by their average scores on all four dimensions, from lowest to highest (left to right). As can be seen, the full scale from 1 to 5 was applied in all dimensions, with the exception of the relevance and scope of organisational change, where scores range from 1.5 to 5. Moreover, a comparison of the eleven institutions reveals three distinct groups: (1) cases 1 and 2, with scores of 2 or less in all dimensions, (2) a large group composed of seven cases (III to IX), with scores ranging from 2 to 4, and (3) cases X and XI, with scores of 4.5 or 5 in all dimensions. Groups (1) and (3) can be interpreted (within the institutions analysed) as extreme cases that show only rudimentary forms of sustainability governance on the one hand, and very sophisticated levels on the other.

In the case of group (1), both institutions are marked by a high degree of centralised control. However, the institution's management appears reluctant to provide the necessary support and resources for the sustainability process. This reluctance is paired with a traditional understanding of the institution's mission. At the same time, and partly due to low leadership support and a traditional conception of higher education institutions, there has been little debate about sustainable development, which is frequently reduced to its ecological dimension. In line with this, sustainability actions are focused on aspects of campus operations and mainly aim at reducing

TABLE 2 Ideal type ends of the continuum for the four dimensions of sustainability governance

	Ideal type A	Ideal type B
Attribution of responsibility for sustainable development	<p>Sustainable development as a management task</p> <ul style="list-style-type: none"> • Centralised decision-making, goal formulation • Centralised controlling and enforcement of implementation • Contact to stakeholder groups (within & outside of university) via central actors • Legitimacy by authority 	<p>Sustainable development as a community task</p> <ul style="list-style-type: none"> • Inclusion of a wide range of actors in goal formulation and realisation • Management as part of the community • Focus on communicative and social processes • Legitimacy by participation
Purpose of the higher education institution	<p>Higher education institution as knowledge producer</p> <ul style="list-style-type: none"> • Traditional 'missions': teaching; basic research; technology transfer • University as a value-neutral authority, positivist notion of science • Focus on established criteria of academic excellence • Issues of sustainability 'monopolised' by individual academic disciplines • Transfer of knowledge from university to society/economy (unidirectional) 	<p>Higher education institution as change agent</p> <ul style="list-style-type: none"> • Additional 'fourth mission': co-creation for sustainability • University as an agent of change • Transdisciplinary view on sustainability • Knowledge creation and transfer as complex, multi-directional process • Close ties to broad range of external actors, including civil society
Conception of sustainability	<p>One-dimensional/fragmented</p> <ul style="list-style-type: none"> • Focus on a single dimension of sustainability OR different dimensions of sustainability addressed independently • Sustainability 'competing' with other cross-cutting issues in university (such as gender, diversity, academic excellence) 	<p>Multi-dimensional/integrated</p> <ul style="list-style-type: none"> • Focus on several (environmental, economic, social) dimensions of sustainability simultaneously and in an integrated manner • Sustainability as a comprehensive concept integrating cross-cutting issues
Relevance and scope of organisational change	<p>Single-area focus</p> <ul style="list-style-type: none"> • Initiatives focused on single area of activity (such as teaching, research, campus management) OR different areas addressed independently • Limited exchange and networks across different areas 	<p>Whole-institution approach</p> <ul style="list-style-type: none"> • Sustainability as reform perspective for the whole institution • Creation of bodies for cross-sectional decision-making and realisation • Overarching coordination of the sustainability process

TABLE 3 Scores on the four dimensions of sustainability governance

Dimension of organisational culture in HEI sustainability governance	Higher education institution (case no.)										
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
Attribution of responsibility for sustainable development	1.5	1	3	3.5	2.5	2	4	4	4	5	5
Purpose of higher education institution	1	2	2	2	3	3	2	3	3.5	4.5	5
Conception of sustainability	1	1	2.5	2	3	3	3.5	2	4	5	5
Relevance and scope of organisational change	1.5	2	2.5	3.5	3	3.5	3.5	4	4	4.5	5

costs through energy savings. Both institutions also lack a structured approach to coordinating the sustainability process.

The two institutions in group (3) represent the opposite of group (1), with almost ideal type traits (of type B) in all four dimensions. In both cases, the sustainability process involves the participation of a wide range of stakeholders with horizontal forms of coordination. Both institutions strongly emphasise the 'third mission' and their role in societal transformation, evidenced by a high degree of inter- and transdisciplinarity in research and teaching, and by strong ties to and mutual interaction with external actors, including civil society. Finally, the two institutions clearly demonstrate a multi-dimensional understanding of sustainability, expressed both in mission statements and concepts, as well as in practice, for example in teaching and initiatives. They follow a whole-institution approach in putting sustainable development into practice, with initiatives taken in all areas and overarching coordination structures and processes in place. It should be noted that both cases are small higher education institutions, located in rural areas. What is more, in both cases a time of crisis and transition allowed stakeholders to redefine the institution's identity (vision, profile) around the issue of sustainability.

In comparison to groups (1) and (3), the picture in group (2) is less clear, as the analysis revealed no clear patterns among higher education institutions in this group. Further type-building analysis, as had originally been intended, thus proved difficult. Instead, in order to better understand the interrelations between different elements of sustainability governance, in the course of the analysis the idea emerged of using the four dimensions to define two overarching categories:

1. **Holistic orientation:** This category combines *conception of sustainability* and *relevance and scope of organisational change*. Both dimensions emphasise the need to consider different elements (dimensions of sustainability, institutional areas) simultaneously, and to link these elements in an integrated approach. Taken together, the two dimensions therefore represent the holistic ideal inherent in the concept of sustainable development.
2. **Organisational learning orientation:** This category combines *attribution of responsibility* and *purpose of the higher education institution*. The focus lies on the degree to which sustainable development is seen as an issue of organisational development and learning. In this view promoting sustainable development as a community task and moving beyond the traditional view of the institution's mission involves the creation of structures and processes that allow second order learning which challenges existing frameworks, norms and routines. By contrast, centralised decision-making and enforcement coupled with a traditional conception of higher education institutions remain locked within such frameworks and allow only action-oriented, incremental (first order) learning.

By taking the average scores of the two dimensions underlying each orientation, the eleven higher education institutions can be placed in a two-dimensional space (Figure 2).

The three higher education institutions with the highest scores on both analytical categories have some features in common: they are all located in rural areas and they are relatively small higher education

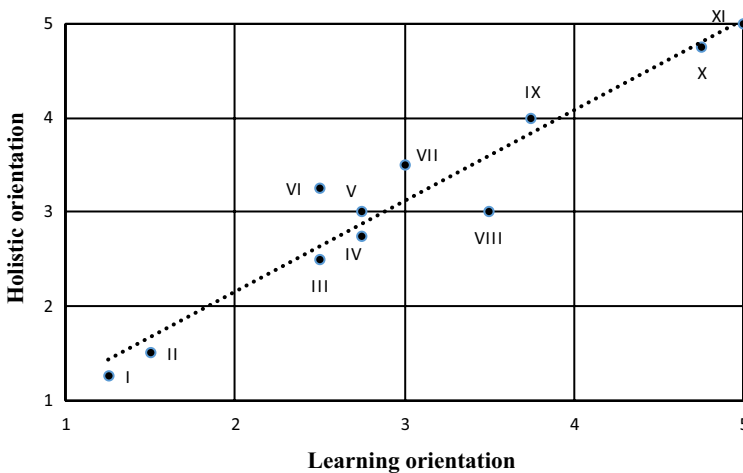


FIGURE 2 Location of the higher education institutions in a two-dimensional space [Colour figure can be viewed at wileyonlinelibrary.com]

institutions with less than 10,000 students. Furthermore, the range of academic disciplines represented at these higher education institutions is comparatively small. These findings suggest that a relatively high importance as a regional actor (in rural areas) and lower institutional complexity facilitate the emergence of high learning and holistic orientations. By contrast, the duration of the sustainability process—measured from the point of the first sustainability initiative reported in the interviews—does not appear to be a relevant factor. This might change, however, if the quality (depth, spread) of the sustainability process were also taken into account.

One interesting point raised by Figure 2 is a possible linear relationship between the holistic orientation and the orientation towards organisational learning. In other words, both aspects of sustainability governance seem to be linked closely—they mutually reinforce each other. This relationship is illustrated by the trend line. While the institutions in the middle group (III–IX) show some deviations from the trend line, all remain within the four inner sections. There are, however, some notable differences among the institutions in the middle group. These ‘outlying’ cases (III, VI, VIII and IX) are investigated more closely in the following paragraphs.

Cases III and IX are both close to the trend line. However, whereas case III is located at the lower left end, case IX sits at the upper right end of the middle group. In other words, the two cases show comparatively large differences both in their degree of holistic orientation as well as in their learning orientation. Case IX shows higher levels in both orientations. Achieving sustainability is viewed as a long-term process of cultural change, which includes all dimensions of sustainable development and all institutional areas. This process is based on the notion that coordination is more important than control, focusing on facilitating participation and networking. By comparison, case III is marked by stronger centralisation and a lesser degree of integration. However, efforts towards broader participation and coordination can be observed. Both institutions thus appear to be moving on a similar development path. Differences between the two cases can be linked to their size and locations: case IX is a relatively small higher education institution in a rural area, while case III is larger and located in a major city.

A different picture emerges by comparing cases VI and VIII. Both higher education institutions initially focused on the ecological dimension of sustainability, but have since moved toward a multi-dimensional approach, which includes elements of an overarching coordination. The two cases diverge, however, in their learning orientations. While both emphasise the societal embeddedness of their institutions and the need to engage with external actors (albeit with a unidirectional conception of knowledge transfer), case VI follows a rather centralised approach

of centralised goal-setting and controlling, whereas case VIII relies on broad participation, which includes a view of students as a 'big think tank'.

Initially, in the analysis, it was hypothesised that institutions in the middle group would diverge more strongly with regard to their learning orientations than in their holistic orientations. Institutions VI and VIII are cases supporting this idea. Overall, however, the holistic orientation and learning orientation seem to go hand in hand.

5 | DISCUSSION

In this paper, organisational culture is viewed as more than another factor or 'barrier' influencing sustainability governance, as the treatment of cultural aspects in some studies seems to imply. Rather, organisational culture is perceived as a fundamental part of sustainability governance in higher education institutions. This relationship of organisational culture and sustainability governance requires some clarification. On the one hand, organisational culture can be understood as preceding action, as all reasoned action is based on a 'logic of appropriateness'—an understanding of what is true, reasonable, natural, right, and good (March & Olsen, 2011). In this view, organisational culture becomes the framework inside of which sustainability can take place. On the other hand, a case can be made for a more dynamic understanding of organisational culture. In this view, organisational culture is not predetermined and static. Rather, following structuration theory (Giddens, 1984), it can be argued that organisational culture must continuously be reconstituted through action and interaction and, in this process, can also be changed. In other words, cultural orientations shape the way sustainable development is perceived and governed in higher education institutions, but the practice of sustainability governance, in turn, also shapes the way stakeholders think about sustainability governance.

This latter conception of organisational culture also allows for a dynamic relationship between different elements of organisational culture. In line with this, the findings suggest a linear relationship between the holistic orientation and the learning orientation. Thus, a broad understanding of both the higher education institution's purpose and of sustainable development—the two components of the holistic orientation—might foster an organisational learning orientation. Recognising the need for a closer examination of the organisation's contribution to sustainable development can lead to ongoing reflexive learning, and, eventually, the goals and objectives of an organisation might become subject to change. Once such second-order learning processes call existing premises into question, it can become difficult to maintain one-dimensional approaches. In such cases, the holistic orientation and the organisational learning orientation mutually influence each other positively.

It remains unclear, however, if this means that progress in one orientation cannot be achieved without simultaneously raising the other, although such a view is reinforced by the absence of cases in the upper left and lower right areas of the two-dimensional space of cultural orientations. Still, holistic approaches implemented top-down or learning-oriented approaches which are limited to one dimension of sustainable development or a single organisational area remain hypothetically possible. In fact, whereas some institutions in the study lean on open-ended experiential learning environments in which ideational aspects of the innovation 'sustainable development' are jointly developed, others stick to a managerial habitus involving predominantly traditional governance processes and structures for sustainable development. These higher education institutions seem to assume that a strong learning orientation can be stimulated by top-down approaches. In this view, an increasing interest and willingness of the higher education institution's management to contribute to holistic change might raise awareness for sustainable development, lead to the coordination of isolated sustainability initiatives and facilitate the involvement of a wide range of stakeholders. However, the findings also illustrate the risk that top-down-led management of sustainability processes may come to an impasse, as it lacks support from 'disenfranchised' stakeholders.

Overall, the study's findings suggest that an organisation's learning orientation and its holistic orientation should be understood as concurrent challenges. Higher education institutions thus need to be 'ambidextrous', learning to recognise sustainable development as a multi-dimensional issue affecting the whole institution while simultaneously

changing their conception of how organisational learning can be accomplished. Doing so is an important step towards sustainable development in higher education institutions, as ongoing organisational learning and innovation, over time, might lead from a predominantly rationalistic self-conception of the institution towards a cultural governance approach.

Having said that, an organisation's culture is obviously not the only factor influencing the dynamics of sustainable development, and organisational culture is itself influenced by other factors as mentioned above. The study's findings suggest that exogenous factors such as size, location or disciplinary scope as well as overall political regulatory measures affect both how cultural orientations develop and how their orientations are put into action. As the multi-case study analysis confirms, institutional transformation takes time, but the duration of the sustainability process as such is a poor indicator of cultural change. Rather, the quality and trajectory of the sustainability process need to be taken into account—including the range of barriers affecting sustainability governance discussed in prior studies. Future research should use longitudinal research based on extensive cross-case analysis in order to shed light on these complex relationships and on how organisational culture changes over time.

5.1 | Merits of the study

This study aimed at expanding the existing frameworks and categorisation schemes of sustainability governance in higher education institutions. With the two major scales of holistic orientation and organisational learning orientation and their respective merged characteristics, it offers an original and empirically-founded categorisation for higher education institutions. This new scheme can be applied by practitioners, researchers and higher education policy-makers alike.

By putting the categorisation into practice, sustainability coordinators at higher education institutions, for instance, can assess their institution according to the characteristics given in Table 2 and identify obstacles and leverage points on their path to sustainable development. Becoming aware of an institution's cultural predispositions might open up new discussions, arguments and formats for practitioners at higher education institutions.

Researchers might find the results a useful contribution to the current scientific debate on the whole-institution approach within sustainability governance in higher education institutions. Its advocates will appreciate the importance that is once again attributed to the holistic view on the institutions, but also on the sustainability concept itself. The study, furthermore, proposes a new methodological approach to the field—still dominated by (descriptive) single-case analyses—by breaking down the data from stakeholder interviews from multiple cases into a system of coordinates that enables plausible visualisation of complex systems in the context of sustainable development in organisations. However, it goes without saying, that this categorisation comprises many different factors and can only be one of many steps along the road.

5.2 | Limitations and prospects

Apart from its strengths and merits, this study has some limitations worthy of mention.

First, the sample includes eleven higher education institutions that are part of the HOCH-N project in Germany. It could be criticised that the eleven higher education institutions are all relatively advanced, and thus atypical, and that the cases are restricted to Germany. However, it can be argued that the dimensions identified represent fundamental facets of governance which should be relevant for studies of other cases in Germany or elsewhere. Such studies can also contribute to a more precise understanding of the two cultural orientations.

A second limitation refers to a potential bias, as the interviews included a purposefully selected but limited number of stakeholders already involved and committed to sustainable development. By contrast, less affirmative voices were not captured. In addition, the limited number of interviewees cannot appropriately represent a complex constellation of actors, nor can a single interviewee be considered as an adequate representative of a

specific status group. However, because the sample involves perspectives across different stakeholder groups, it does provide a multi-faceted picture of sustainability governance in higher education institutions. Furthermore, through the triangulation of perspectives, information provided by the interviewees could be validated.

A third limitation concerns the fact that interviews were conducted only once at a given moment in the sustainability process. Thus, the conclusions need further investigation in longitudinal research which might also analyse how learning orientation and holistic orientation evolve over time. Particularly, it remains open whether the trend line displayed in Figure 2 represents a necessary path for all higher education institutions addressing the issue of sustainable development.

Finally, another limitation relates to the type of interviews underlying the analysis. Using expert interviews, the study focused on rather 'objective' milestones of sustainable development in higher education institutions, governance structures and processes, and explicit values associated with these. However, as discussed, organisational culture includes tacit basic assumptions that are not reflexively available to members of the organisation. Further studies need to draw on methods that capture pre-reflexive elements of organisational culture. While qualitative methods, such as qualitative reconstructive research (cf. Scheunflug, Krogull, & Meyer, 2016), seem particularly promising for this purpose, standardized instruments such as surveys could be useful in generating a more representative picture. However, such instruments would have to be constructed with great care to ensure that they capture more than surface aspects of an organisation's culture (Kummerow & Kirby, 2014, p. 71).

6 | CONCLUSION

Organisational culture, it was initially argued, plays an important role for sustainability governance in higher education institutions. The findings presented in this paper reinforce this view and provide empirical evidence of four key dimensions of organisational culture. These four dimensions were condensed further into two cultural orientations: an organisational learning orientation and a holistic orientation. It has been shown that higher education institutions differ significantly in these orientations. The analysis was based on information, provided in qualitative interviews, about concepts, structures and practices as well as underlying values in the governance of sustainability processes in higher education institutions. The higher education institutions' approaches to sustainability governance are thus interpreted as expressions of their organisational culture.

Overall, the multi-case research design resulted in an original, empirically-founded categorisation of characteristics of sustainability governance. Notwithstanding the highly context-dependent conditions under which higher education institutions act, the insights into their sustainability-related governance gained thus allow a certain degree of generalisation. For future research, it will be of interest to relate this evidence-based categorisation of institutional orientations of sustainability governance to 'governance equalizers', which describe functional requirements of sustainability governance in higher education institutions (Bauer et al., 2018). This might provide new insights into how cultural orientations relate to the measures and instruments of higher education institutions' sustainability governance.

ORCID

Sebastian Niedlich  <https://orcid.org/0000-0002-8547-7400>

Benjamin Kummer  <https://orcid.org/0000-0002-1413-8014>

Marco Rieckmann  <https://orcid.org/0000-0002-1212-7346>

Inka Bormann  <https://orcid.org/0000-0002-9372-7334>

REFERENCES

- Adams, R., Martin, S., & Boom, K. (2018). University culture and sustainability: Designing and implementing an enabling framework. *Journal of Cleaner Production*, 171(2018), 434–445. <https://doi.org/10.1016/j.jclepro.2017.10.032>
- Argyris, C., & Schön, D. (1974). *Theory in practice: Increasing professional effectiveness*. San Francisco, CA: Jossey-Bass.

- Argyris, C., & Schön, D. A. (1996). *Organizational learning II: Theory, method and practice*. Reading, MA: Addison-Wesley.
- Awuzie, B. O., & Abuzeinab, A. (2019). Modelling organisational factors influencing sustainable development implementation performance in higher education institutions: An interpretative structural modelling (ISM) approach. *Sustainability*, 11(16), 4312. <https://doi.org/10.3390/su11164312>
- Barth, M., & Rieckmann, M. (2016). State of the art in research on higher education for sustainable development. In M. Barth, G. Michelsen, M. Rieckmann, & I. Thomas (Eds.), *Routledge handbook of higher education for sustainable development* (pp. 100–113). London, UK: Routledge. <https://doi.org/10.4324/9781315852249>
- Bauer, M., Bormann, I., Kummer, B., Niedlich, S., & Rieckmann, M. (2018). Sustainability governance at universities: Using a governance equalizer as a research heuristic. *Higher Education Policy*, 31, 491–511. <https://doi.org/10.1057/s41307-018-0104-x>
- Bogner, A., Littig, B., & Menz, W. (Eds.) (2009). *Interviewing Experts*. Basingstoke, UK: Palgrave Macmillan.
- Corcoran, P. B., Walker, K. E., & Wals, A. E. J. (2004). Case studies, make-your-case studies, and case stories: A critique of case-study methodology in sustainability in higher education. *Environmental Education Research*, 10(1), 7–21. <https://doi.org/10.1080/1350462032000173670>
- Disterheft, A., Caeiro, S., Azeiteiro, U. M., & Leal Filho, W. (2015). Sustainable universities – A study of critical success factors for participatory approaches. *Journal of Cleaner Production*, 106, 11–21. <https://doi.org/10.1016/j.jclepro.2014.01.030>
- Dresing, T., & Pehl, T. (2015). *Manual (on) transcription. Transcription conventions, software guides and practical hints for qualitative researchers* (3rd English ed.). Marburg, Germany. Retrieved from <http://www.audiotranskription.de/english/transcription-practicalguide.htm>
- Elkington, J. (2019). 25 years ago I coined the phrase “triple bottom line.” Here's why it's time to rethink it. *Harvard Business Review*. Retrieved from <https://hbr.org/2018/06/25-years-ago-i-coined-the-phrase-triple-bottom-line-heres-why-im-giving-up-on-it>
- Giddens, A. (1984). *The constitution of society. Outline of the theory of structuration*. Berkeley, CA: University of California Press.
- Holm, T., Sammalisto, K., Grindsted, T. S., & Vuorisalo, T. (2015). Process framework for identifying sustainability aspects in university curricula and integrating education for sustainable development. *Journal of Cleaner Production*, 106, 164–174. <https://doi.org/10.1016/j.jclepro.2015.04.059>
- Hoover, E., & Harder, M. K. (2015). What lies beneath the surface? The hidden complexities of organizational change for sustainability in higher education. *Journal of Cleaner Production*, 106, 175–188. <https://doi.org/10.1016/j.jclepro.2014.01.081>
- Kuckartz, U. (2014). *Qualitative text analysis: A guide to methods, practice & using software*. London, UK: Sage.
- Kummerow, E., & Kirby, N. (2014). *Organisational culture. Concept, context, and measurement*. Singapore, Singapore: World Scientific Publishing. <https://doi.org/10.1142/7146>
- Kyburz-Graber, R. (2016). Case study research on higher education for sustainable development. Epistemological foundation and quality challenges. In M. Barth, G. Michelsen, M. Rieckmann, & I. Thomas (Eds.), *Routledge handbook of higher education for sustainable development* (pp. 126–141). London, UK: Routledge. <https://doi.org/10.4324/9781315852249>
- Leal Filho, W., Shiel, C., Paço, A., Mifsud, M., Veiga Ávila, L., Londero Brandli, L., ... Caeiro, S. (2019). Sustainable development goals and sustainability teaching at universities: Falling behind or getting ahead of the pack? *Journal of Cleaner Production*, 232, 285–294. <https://doi.org/10.1016/j.jclepro.2019.05.309>
- Liu, L. (2009). Sustainability: Living within One's Own Ecological Means. *Sustainability*, 1(4), 1412–1430. <https://doi.org/10.3390/su1041412>
- Lozano, R., Ceulemans, K., Alonso-Almeida, M., Huisingh, D., Lozano, F. J., Waas, T., ... Hugé, J. (2015). A review of commitment and implementation of sustainable development in higher education. Results from a worldwide survey. *Journal of Cleaner Production*, 108, 1–18. <https://doi.org/10.1016/j.jclepro.2014.09.048>
- Lozano, R., Lukman, R., Lozano, F. J., Huisingh, D., & Lambrechts, W. (2013). Declarations for sustainability in higher education: Becoming better leaders, through addressing the university system. *Journal of Cleaner Production*, 48, 10–19. <https://doi.org/10.1016/j.jclepro.2011.10.00>
- March, J. G., & Olsen, J. P. (2011). The logic of appropriateness. In R. R. Goodin (Ed.), *The oxford handbook of political science* (pp. 478–497). Oxford, UK: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199604456.013.0024>
- Morse, J. M. (1994). Designing funded qualitative research. In N. K. Denzin, & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 220–235). Thousand Oaks, CA: Sage Publications.
- Newman, J. (2007). An organisational change management framework for sustainability. *Greener Management International*, 57, 65–75. Retrieved from <https://www.jstor.org/stable/greemanaint.57.65>
- Ott, K., Muraca, B., & Baatz, C. (2011). Strong sustainability as a frame for sustainability communication. In J. Godemann & G. Michelsen (Eds.), *Sustainability communication. Interdisciplinary perspectives and theoretical foundation* (pp. 13–25). Dordrecht: Springer. https://doi.org/10.1007/978-94-007-1697-1_2

- Purvis, B., Mao, Y., & Robinson, D. (2019). Three pillars of sustainability: In search of conceptual origins. *Sustainability Science*, 14, 681–695. <https://doi.org/10.1007/s11625-018-0627-5>
- Ramiso, P. J., Costa Pinto, L. M., Gouveia, N., Costa, H., & Arezes, D. (2019). Sustainability strategy in higher education institutions: Lessons learned from a nine-year case study. *Journal of Cleaner Production*, 222, 300–309. <https://doi.org/10.1016/j.jclepro.2019.02.257>
- Rath, K., & Schmitt, C. T. (2017). Sustainability at universities: Degrees of institutionalization for sustainability at German higher education institutions – A categorization pattern. In W. Leal Filho, L. L. Brandli, P. Castro, & J. Newman (Eds.), *Handbook of theory and practice of sustainable development in higher education* (pp. 451–470). Cham, Switzerland: Springer International Publishing. https://doi.org/10.1007/978-3-319-47868-5_28
- Sammalisto, K., Sundström, A., & Holm, T. (2015). Implementation of sustainability in universities as perceived by faculty and staff – A model from a Swedish university. *Journal of Cleaner Production*, 106, 45–54. <https://doi.org/10.1016/j.jclepro.2014.10.015>
- Schein, E. H. (1985). *Organizational Culture and Leadership*. San Francisco, CA: Jossey-Bass.
- Scheunpflug, A., Krogull, S., & Meyer, A. (2016). Understanding learning in world society: Qualitative reconstructive research in global learning and learning for sustainability. *International Journal of Development Education and Global Learning*, 7(3), 6–23. <https://doi.org/10.18546/IJDEGL.07.3.02>
- Singer-Brodowski, M., Etzkorn, N., & von Seggern, J. (2019). One transformation path does not fit all – Insights into the diffusion processes of education for sustainable development in different educational areas in Germany. *Sustainability*, 11(1), 269. Retrieved from <https://www.mdpi.com/2071-1050/11/1/269>
- Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., ... Sörlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223), 1259855. <https://doi.org/10.1126/science.1259855>
- Sterling, S. (2004). Higher education, sustainability, and the role of systemic learning. In P. B. Corcoran & A. E. J. Wals (Eds.), *Higher education and the challenge of sustainability: Problematics, promise and practice* (pp. 49–70). Dordrecht, the Netherlands: Kluwer.
- Strauss, A. L., & Corbin, J. A. (1996). *Grounded theory. Grundlagen qualitativer Sozialforschung*. Weinheim, Germany: Beltz.
- Sylvestre, P., Wright, T., & Sherren, K. (2013). Exploring faculty conceptualizations of sustainability in higher education: Cultural barriers to organizational change and potential resolutions. *Journal of Education for Sustainable Development*, 7(2), 223–244. <https://doi.org/10.1177/0973408214526491>
- Trencher, G., Yarime, M., McCormick, K. B., Doll, C. N. H., & Kraines, S. B. (2014). Beyond the third mission: Exploring the emerging university function of co-creation for sustainability. *Science and Public Policy*, 41, 151–179. <https://doi.org/10.1093/scipol/sct044>
- Verhulst, E., & Lambrechts, W. (2015). Fostering the incorporation of sustainable development in higher education. Lessons learned from a change management perspective. *Journal of Cleaner Production*, 106, 189–204. <https://doi.org/10.1016/j.jclepro.2014.09.049>
- Viegas, C. V., Bond, A. J., Vaz, C. R., Borchardt, M., Medeiros Pererira, G., Selig, P. M., & Varvakis, G. (2016). Critical attributes of sustainability in higher education: A categorisation from literature review. *Journal of Cleaner Production*, 126, 260–276. <https://doi.org/10.1016/j.jclepro.2016.02.106>
- Weisser, C. R. (2017). Defining sustainability in higher education: A rhetorical analysis. *International Journal of Sustainability in Higher Education*, 18(7), 1076–1089. <https://doi.org/10.1108/IJSHE-12-2015-0215>
- Wu, Y.-C., & Shen, J.-P. (2016). Higher education for sustainable development: A systematic review. *International Journal of Sustainability in Higher Education*, 17(5), 633–651. <https://doi.org/10.1108/IJSHE-01-2015-0004>
- Zilahi, G., & Huisingh, D. (2009). The roles of academia in Regional Sustainability Initiatives. *Journal of Cleaner Production*, 17, 1057–1066. <https://doi.org/10.1016/j.jclepro.2009.03.018>

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

How to cite this article: Niedlich S, Kummer B, Bauer M, Rieckmann M, Bormann I. Cultures of sustainability governance in higher education institutions: A multi-case study of dimensions and implications. *Higher Educ Q*. 2020;74:373–390. <https://doi.org/10.1111/hequ.12237>