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Assessment of Sustainability Governance in Higher Education Institutions—A Systemic Tool Using a Governance Equalizer

Sebastian Niedlich [1,*], Mara Bauer [2], Margarita Doneliene [1], Larissa Jaeger [2], Marco Rieckmann [2] and Inka Bormann [1]

[1] Department of Education and Psychology, Freie Universität Berlin, Habelschwerdter Allee 45, 14195 Berlin, Germany; margarita.doneliene@fu-berlin.de (M.D.); inka.bormann@fu-berlin.de (I.B.)

[2] Department of Education, Faculty of Education and Social Sciences, University of Vechta, Driverstraße 22, 49377 Vechta, Germany; Mara.Bauer@uni-vechta.de (M.B.); Larissa.Jaeger@uni-vechta.de (L.J.); Marco.Rieckmann@uni-vechta.de (M.R.)

* Correspondence: sebastian.niedlich@fu-berlin.de

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Abstract: The paper aims to add to the discussion on sustainability governance in higher education institutions by examining the role of sustainability assessment and introducing an assessment tool inspired by systemic thinking and centered on a 'governance equalizer'. It discusses recent research and argues that the complexity inherent in sustainability governance remains to be addressed adequately. While a number of models and frameworks have been proposed, most of them remain caught between narrow, management-oriented approaches on the one hand, and rather abstract approaches that provide little guidance for improving the field on the other. Sustainability assessment tools represent a potential way to bridge this gap. While there are existing tools which include issues of sustainability governance, these are often limited to aspects that are easily quantifiable and neglect more complex aspects. Against this background, the article proposes an alternative tool to assess sustainability governance in higher education institutions. The tool is based on a multi-case study in Germany and has been tested in a series of workshops. Drawing on the concept of a 'governance equalizer', it focuses on the functional requirements of sustainability governance in five dimensions—politics, profession, organization, knowledge, and the public—and how they are addressed by the HEI. The tool raises the level of abstraction in order to capture complexity, but at the same time keeps sight of governance structures, processes, instruments, and practices. It combines clearly defined criteria that are assessed using carefully developed maturity scales with a focus on stakeholder participation and knowledge.

Keywords: sustainability assessment tool; sustainability governance; higher education institutions; systems theory; governance equalizer; politics; profession; organization; knowledge; public

1. Introduction

'Sustainable development' (SD) is a widely used term with varying meanings [1]. This paper uses the term to describe efforts to integrate environmental and socio-economic issues in order to meet human needs now and in the future. It involves societal reform and transformation, and a reconceptualization of the relationship of the human race with nature. Higher education institutions (HEIs) are frequently counted among the key players in creating a path for society towards sustainable development. It has been pointed out that this requires a fundamental change in the culture, purpose, policy, and practice of HEIs [2] and a transversal, inter- and transdisciplinary approach, integrating the core HEI domains of teaching, research, campus operations, and outreach [3–5].

A key question which arises is therefore how HEIs can coordinate and steer their actions toward sustainable transformation. This question of sustainability 'governance' has been addressed from different angles by a number of studies. While some try to integrate sustainability governance into existing management approaches, others emphasize its complexity and provide more abstract frameworks. Issues of governance also feature in sustainability assessment tools. Such tools appear promising in that they potentially provide a bridge between abstract models and concrete strategies. However, the existing tools have been criticized for addressing only those aspects of governance that lend themselves to quantitative measurement, while other important aspects have been neglected.

Against this background, the article introduces a sustainability governance assessment tool that combines ideas from systemic thinking with the concept of a 'governance equalizer': It focuses on functional requirements of sustainability governance in five dimensions—politics, profession, organization, knowledge, and the public—and how they are addressed by HEIs. The tool thereby raises the level of abstraction in order to capture the complexity of the subject, but at the same time does not lose sight of governance structures, processes, instruments, and practices.

The article starts with a short overview of recent research on sustainability governance in HEIs, followed by a discussion of sustainability assessment tools for use in HEIs and of the role of governance issues in such tools (Sections 2 and 3). Section 4 explains how our own assessment tool was developed in the 'HOCH^{N}' project based on case studies in eleven German HEIs and validated in a series of workshops. Section 5 presents the tool in detail and provides some remarks on how to apply it in practice. The paper concludes by discussing three perceived merits of the tool.

2. Sustainability Governance in Higher Education Institutions

The issue of sustainable development in HEIs continues to gain attention in both practice and research. Although recent studies show progress towards sustainable transformation of HEIs, including signs of holistic and systemic approaches [3,6], they also report that efforts are often compartmentalized, and practical integration of sustainable development goals remains difficult [7,8].

These findings raise the issue of sustainability governance in HEIs. Governance can be defined as "the process of steering society and the economy through collective action and in accordance with common goals" [9] (p. 4). Drawing on this definition, we use the term 'governance' to denote the process of steering HEIs (and related external actors) through collective action toward the common goal of sustainable development. Questions relating to this process have been investigated in a number of recent studies. Such studies can be categorized into three groups: Case studies, analyses of drivers and barriers, and frameworks and models [3].

Initially, research frequently took on the form of institutional case studies, often of a descriptive nature and with a focus on storytelling [10]. While some case studies discuss different approaches and give recommendations on supporting sustainable development in HEIs (e.g. [11,12]), theoretical advancements from this line of research are few, and its potential for improving the field remains largely unexploited [4,13] (see also [3]).

Other research focuses on drivers of and barriers to change in HEIs. Based on a literature review, Verhulst and Lambrechts [14] identify three clusters of barriers: (1) A lack of awareness, (2) the structure of higher education institutions, and (3) a lack of resources. They also point out recurring drivers in the literature on organizational change management, such as organizational culture, empowerment and involvement, and internal communication. Other scholars highlight the role of campus SD champions [15] or "a dedicated team of 'sustainability entrepreneurs', continuous interaction among all HEI actors, the creation of a sustainability office of some kind, a predictable budget, alignment with the topics of the imparted careers, formal networks and open and recurrent communication on sustainability on campus and beyond" [5] (p. 4283). Overall, however, drivers and barriers are often described in a "laundry list style", without allowing a profound understanding of how they interact and change over time [14] (p. 191).

Frameworks and models of change, by comparison, tend to provide a more comprehensive perspective, although approaches and perspectives vary. A number of publications attempt to link the issue of sustainable development to management strategies and practices in HEIs [16–19]. Some of these draw on the Plan-Do-Check-Act (PDCA) cycle and define key steps in the sustainability process. For example, Velazquez et al. [16] emphasize the importance of developing a sustainability vision and mission, setting up a sustainability committee in order to create policies, targets, and objectives, and develop sustainability strategies.

Other scholars identify phases or stages of sustainable development in HEIs without reference to management strategies or approaches [2,5,20]. Instead, their focus lies on emergent processes in HEIs. Hugé, MacLean, and Vargas [5] (p. 4279), for instance, conceive sustainability implementation as a process of social issue maturation involving four phases: Emergence, popularization, formalization into a governance framework, and maturity (uptake of sustainability as a norm). Models such as this convey a less rationalistic image of sustainable development in HEIs; they also leave more room for different, diverging approaches of sustainability governance. However, due to the high degree of abstraction involved, it becomes more difficult to derive recommendations for sustainability implementation from them.

A kind of middle ground can be found in a contribution by Ferrer-Balas, Buckland, and de Mingo [21]. Drawing on systems thinking, they distinguish three interacting dimensions—the framework (changes in culture, institutional structure, and technology), the level of system change (system optimization, system improvement, system renewal), and the actors (cooperation between different stakeholders)—which can be used to establish and evaluate strategic and operational objectives. One of the strengths of this framework is that it is utilized in combination with an assessment tool—an approach that can also be found in other frameworks and models [14] (p. 189). This appears interesting, as such tools can provide a bridge between rather abstract models and frameworks, and practical action to promote sustainability in HEIs.

Another approach is the use of a governance equalizer. This idea is not new. It can be traced back to Clark's notion of "pathways of coordination" in higher education [22]. Schimank [23,24] later used the term 'governance equalizer' in an allusion to the equalizer in a mixing console or a stereo system, where different dimensions can be turned up or down. He focused on how the introduction of New Public Management (NPM) gradually shifted dimensions of governance in higher education—such as academic self-organization or top-down management. This research interest led to rather specific governance dimensions. In order to broaden their applicability to other research, Brüsemeister and colleagues put forward an alternative set of governance dimensions that encompasses five dimensions: Politics, profession, organization, knowledge, and the public (for an overview, see Brüsemeister [25]). The five dimensions were initially derived from empirical findings, but are also supported by sociological and organizational theory [26,27].

Recently the governance equalizer has been applied to SD in HEIs with the five dimensions conceived as functional requirements that sustainability governance must address if it is to work effectively [28,29]. This approach used the governance equalizer as a heuristic framework for the analysis of sustainability governance in HEIs. While it thus remained open to different approaches and contexts, it did not provide criteria and procedures to assess sustainability governance in HEIs. This paper aims to close this gap by introducing a (self-) assessment tool based on the governance equalizer. To this end, the following section takes a closer look at sustainability assessment in HEIs before turning to the development and specifics of the tool.

3. Sustainability Assessment in Higher Education Institutions

Sustainability assessment tools (SATs), which are deemed an essential component of sustainability processes in HEIs by some scholars (e.g. [4,28]), have been in use for some time. Several studies provide analyses and comparisons of these tools [29–33]. They show that different purposes and functions are associated with SATs. We summarize these into two key functions: An analytical or cognitive function,

and a communicative or social function. The analytical/cognitive function comprises monitoring of an HEI with the aim of measuring what is being done to move toward sustainability and how it is done, to draw comparisons across campus, to assess progress and identify performance gaps and good practice, and to provide knowledge for creating strategies and planning. The communicative/social function includes building bridges among different stakeholders and encouraging an HEI's move towards sustainability by communicating goals and experiences, stimulating reflection, advocating policy change, triggering and supporting organizational change processes, and lobbying government and media to promote campus sustainability.

In addition to functions associated with them, extant SATs also differ in the domains they cover as well as in the underlying methodology. Yarime and Tanaka [30] show that education, research, and outreach are not well addressed by most tools, as their focus frequently lies on operational eco-efficiency and governance issues. This focus has been explained by the fact that aspects of governance and operations "are easily observable and manageable, often with quantitative goals and objectives" [30] (p. 74). However, this does not apply equally to all aspects of governance. Governance indicators in SATs frequently refer to visions, strategies, policies, planning, and initiatives. By contrast, informal and more complex issues—such as faculty development in sustainability areas, implementation of policies, multi-stakeholder involvement in decision-making, and inter- and transdisciplinary approaches—have not been addressed adequately [30] (p. 73 f.).

The choice of methodology is thus crucial for SATs. Quantitative approaches alone have been judged insufficient for sustainability assessment purposes because they are unable to capture the interactions within complex systems [34] (p. 2). It has also been criticized that SATs in HEIs predominantly follow a managerialist approach, which aims to incorporate sustainability issues into existing management accounting practices and, in doing so, fails to question underlying unsustainable patterns [4] (p. 1764). SATs, it has been concluded, should not focus on accountability and control, but on stimulating reflection and change, and the use of qualitative indicators is called for to support this aim [28] (p. 818). At the same time, the issue of subjective bias in qualitative assessment needs to be addressed by engaging all stakeholders, defining clear criteria, and insisting on dialogue and consensus among all involved in the assessment [28](p. 819).

4. Tool Development—Background and Project Design

In the following, we introduce a tool for assessing sustainability governance in HEIs. On the one hand the tool builds on the insights obtained from the literature. On the other hand it draws on empirical data from case studies in eleven German HEIs, which were carried out in the project 'Sustainability at Higher Education Institutions: Develop—network—report' [35]. The case studies consisted of 61 face-to-face interviews with different stakeholders (management, sustainability coordinators, student initiatives, technical administration, and academic staff). Inclusion of interview partners followed a selective sampling process. 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 [36] to ensure that substantial expert knowledge of the sustainability processes of the higher education institutions could be collected. The interviewees were identified and recruited in collaboration with partners within the HOCH-N project and through desktop research. The case studies drew on the concept of a governance equalizer to investigate, inter alia, how the HEIs addressed the functional requirements of sustainability governance (see next section for details).

The interviews were analysed using qualitative content analysis [37]. This included examination of the measures the HEIs took to improve the five dimensions of the governance equalizer, of how progression in each dimension was manifested in institutional arrangements and practices, and of how stakeholders judged the performance of the HEIs in each dimension. By comparing the eleven cases, five levels of progression were defined for each dimension. The findings fed into a preliminary version of the assessment tool, containing a key question and a five-point scale of progression for each governance dimension, along with practical examples for each point on the scales.

The preliminary version of the assessment tool was published as part of a (beta version of a) guide on sustainability governance in HEIs [38]. In a subsequent project phase, the assessment tool was put to the test. To this end, stakeholder workshops were held in several German HEIs which were neither included in the case studies nor in the HOCH-N project. We attempted to include representatives from all stakeholder groups in the HEI, but actual participation from these groups varied. Overall, however, the workshops included feedback from all relevant stakeholder groups. The workshops started out by explaining the five governance dimensions and the assessment scales. Participants were then asked to assess their HEI's performance on each scale and to provide arguments and concrete examples to substantiate their assessment. Furthermore, following the assessment, participants were asked to comment on the comprehensibility and applicability of the tool. The feedback gathered in the validation workshops led to a number of revisions: Comprehensive explanations of the five dimensions were added, definitions of the levels of progression were improved, and additional examples for each point of the scales were included. The description of the tool in the following section reflects these revisions.

5. A Systemic Tool for Assessing Sustainability Governance in HEIs

The design of the assessment tool picks up on some key points discussed above. The tool's main purpose is to support HEIs in their transformation toward sustainability. It aims at providing analytical insight and practical guidance for HEIs while acknowledging the complexity of sustainability governance. In particular, we see the need to ensure an integrated, transversal perspective, to account for the entangled relationships among actors in HEIs, and to recognize the importance of context for sustainability processes and their outcomes. Our approach thus bears a certain proximity to systems thinking (cf. [39] p. 18 ff.). Systems thinking deals with complexity by "increasing the level of abstraction or overview, rather than the conventional reductionist route of examining detail and dividing the issues into smaller parts" [2] (p. 49 f.). The tool follows this prescription to some extent, but attempts to uphold a link with concrete governance structures, processes and instruments.

To this end we approach sustainability governance from a functionalist perspective, as represented by the governance equalizer. As mentioned, the five dimensions represent requirements that sustainability governance must address if it is to work effectively (see also [27,40]). The tool provides a scale for each governance dimension. Some of the criteria and examples in the scales lend themselves to quantification. However, such quantitative indicators alone do not provide sufficient information to assess the state of sustainability governance. Qualitative information—for example, on the quality of multi-stakeholder interaction, the creation of a common understanding of sustainability, or the transfer and use of knowledge—is also required. To allow a comprehensive assessment, the tool uses clearly defined criteria that are assessed using carefully developed maturity scales (cf. [41,42]). It thus provides a means to analyze the existing status of sustainability governance, to identify areas for improvement and, by being applied repeatedly, to assess progress in governance.

This section provides an overview of the five dimensions and how they are accounted for in the assessment tool. Each subsection begins with a definition of the respective governance dimension. This is followed by the five-point scale used to assess progress in the dimension, including definitions, key aspects, and practical examples for each point on the scale. Finally, points of particular interest are discussed, including issues raised in the validation workshops.

5.1. Politics—How is Sustainability Entrenched and Legitimized in the HEI?

This dimension deals with the question of how sustainability can move beyond individual support points and be embedded long-term on the HEI's agenda. The term 'politics' in this context does not (primarily) refer to political institutions outside the HEI, but to actors within the HEI who need to take formal and informal decisions regarding internal goals, structures, procedures, and measures, as well as membership of external networks in the context of sustainability. Collectively binding decisions

lend justification to and offer guidance for actions toward sustainability, and provide criteria to judge their success.

On the lowest level of progression in this dimension, support from decision-makers for SD-related activities is merely granted unofficially (see Table 1). The next level includes public, official commitment to the goal of sustainability. On the following levels, sustainability is subsequently codified as an institutional goal (becoming more and more independent from the support of key individuals), broken down to different HEI domains, linked to responsibilities and resources and, finally, operational measures are defined and their implementation and effects assessed.

Table 1. Assessment scale: 'Politics'.

Level	Definition	Examples
5	The objectives of the sustainability process are translated into binding, operational measures and their implementation and effects are evaluated.	- Agreements on sustainability-related targets have been set and implemented. - Procurement agreements include concrete sustainability-related provisions and criteria. - Binding decisions to include sustainability in research have been taken. - Administrative sustainability units and steering bodies are mandated to approach and involve other HEI staff to pursue sustainability-related goals - Sustainability-related evaluation, accountability, reporting, and control instruments and practices are established - Sustainability-related auditing/certification takes place. - Binding operational measures in different domains have been introduced.
4	The goal of sustainability is broken down to and embedded in different domains.	- Issues of sustainability are included in procurement directives. - (Domain-specific) strategies are available and include sustainability-related objectives. - Sustainability is included in the HEI's charter. - Responsibilities for sustainability issues and tasks have been assigned. - Concepts and/or guidelines on sustainability have been developed.
3	Sustainability is codified—in a non-binding form—as a general goal of the HEI.	- Sustainability has been included in the HEI's mission statement and has thus been established as a task independent from individual agents in the HEI. - Sustainability features in the HEI's name or in the name of one or more of its organizational units. - Agreements about participation/membership in inter-organizational networks among HEIs have been signed by the HEI.
2	Decision-makers in the HEI publicly voice their commitment to the goal of sustainability.	- Public declarations stating the commitment of decision-makers in the HEI to sustainability exist. - Decision-makers in the HEI openly support existing initiatives towards sustainability.
1	Individual decision-makers in the HEI recognize and support sustainability-related activities in informal and non-public ways.	- There are informal, non-public declarations of intent and commitment to sustainability.

On the lower levels, the scale emphasizes the role of decision-makers. It is important to clarify that this term does not exclusively refer to top-level management in the HEI, but encompasses all members of the HEI that take part in decisions on goals, priorities, resource allocation, etc. The emphasis on decision-makers echoes the important role that is attributed in parts of the literature

to decision-makers in general and of top management in particular. In our view, this role should not be overestimated, however. Managers of course have an important role to play, but while their leadership can be a necessary condition of success, it is hardly sufficient. Instead, successful transformation requires that the goal of sustainability should spread throughout the entire organization and must be translated into concrete decisions and actions. The upper levels of the scale reflect this imperative. Furthermore, it is important that binding decisions should not be confused with centralized, top-down decision-making. Decisions can be arrived at via both hierarchical as well as participative decision-making processes, and, in many instances, broad stakeholder participation may well be more conducive to the sustainability process.

5.2. Profession—How are Different Professional Perspectives and Competencies being Connected?

The dimension 'profession' focuses on the development of an interdisciplinary and transversal understanding of sustainable development in the HEI. The different domains—education, research, campus, and outreach—are marked by different demands, processes, and framework conditions. As a result, they require specific competencies and knowledge, and exhibit specific standards and cultures. Similarly, differences among academic disciplines as well as among external actors related to the HEI can be observed. Moving towards sustainability necessitates a cross-cutting dialogue about what SD should encompass, what principles and standards should apply, and how SD can be integrated in everyday practices in the different domains and disciplines.

On the lowest level of progression, this involves reflections on issues of sustainability by individuals in specific domains or faculties (see Table 2). A next level is reached when groups of individuals in a domain or in a faculty jointly reflect on sustainability. Higher levels include an exchange of ideas and perspectives across domains and/or disciplines, eventually resulting in a common position on sustainability which, ultimately, is reflected in everyday professional actions and joint (interdisciplinary and transversal) activities.

Table 2. Assessment scale: 'Profession'.

Level	Definition	Examples
5	A common understanding of sustainability is reflected in inter-/transdisciplinary and transversal practices within the HEI and beyond, and such practices are a defining trait of the HEI.	- Inter- and transdisciplinary courses and research projects are continuously developed and refined. - Sustainability is a mandatory course content for all students at the HEI. - Transdisciplinary activities (such as project workshops, Real-World Laboratories) within the HEI and together with external actors are realized on a continuous basis. - Sustainability serves as a criterion in appointment procedures. - There is a range of trainings on sustainability-related issues that are mandatory for HEI staff. - Permanent and temporary academic positions in transdisciplinary research on sustainability have been created.
4	Actors across disciplines and domains have developed a common understanding of sustainability, which they continuously review and revise.	- A common understanding of sustainability for the whole HEI (e.g., in the form of a mission statement) has been developed. - A joint transversal position on sustainability has been established. - A sustainability strategy exists.
3	A dialogue on sustainability across different domains and across disciplines takes place.	- Different formats of interdisciplinary exchange (such as a research platform) have been established. - Conferences and symposia on sustainability-related issues are held. - Interdisciplinary lecture series, colloquia, degree courses, and research projects addressing issues of sustainability are carried out.
2	Sustainability issues are addressed collectively within individual faculties or domains.	- Sustainability issues are addressed by environmental management. - Teachers at a faculty collaborate to strengthen/include sustainability in the faculty's courses.
1	Individual actors within separate faculties or domains address issues of sustainability.	- Individual researchers or research projects focus their work on sustainability issues. - Individual teachers address sustainability in their courses. - Individuals from other stakeholder groups work on sustainability-related issues.

Examples in the 'profession' scale frequently refer to professional practices such as academic courses or environmental action. This is particularly pertinent for Levels 1, 2, and 5. Finding a few of these or similar examples in an HEI, however, can hardly be seen as progression of the HEI as a whole. The assessment must therefore also include the institutional spread of such practices.

In this context, it also needs to be stressed that some of the examples, such as courses focusing on sustainability, are important steps toward an education for sustainable development. In the context of the assessment tool, however, this aspect is not of particular interest. By contrast, changed practices are important because they indicate a transformed professional understanding, which can form the basis for joint action and institutional transformation.

Part of this is the process of aligning different ways of understanding of sustainability. Importantly, this does not mean that a single, unified understanding should be achieved. Both case studies and validation workshops repeatedly showed the need to leave room for diverging professional perspectives. Nonetheless, it is important for HEI stakeholders to come to an agreement that allows joint action. To this end, it might be helpful to settle on a set of normative boundaries within which all stakeholders can pursue their different professional rationales.

5.3. Organization—How are Cooperative Work and Task Performance Made Possible?

Moving HEIs towards sustainability requires breaking down sustainability-related goals so that concrete actions can be taken. This includes the provision of adequate resources and creating structures and procedures that ensure continuous and reliable work. What is more, actions must extend beyond existing organizational boundaries, and interdisciplinary and transversal networks and coordination of activities play an important role. Networking involves actors exchanging views and knowledge and cooperating, whereas coordination aims to ensure coherence and synergies between sustainability-related activities. Overarching coordination does not necessarily mean centralized control, however. Rather, it can also aim to support decentralized initiatives in order to maximize their effectiveness.

At the lowest level of this dimension, individual actors in an HEI take actions towards sustainability (see Table 3). On the subsequent levels, such actions are channeled through projects or other initiatives, structures, and procedures are created to facilitate networking, and resources are provided to coordinate sustainability-related activities. While such provisions are often temporary and rely on specific (competent, motivated, well-connected) persons, at the highest level of this dimension, networking and coordination are established as a permanent function in the HEI and backed by regulations and long-term allocation of resources.

Table 3. Assessment scale: 'Organization'.

Level	Definition	Examples
5	Firmly established (yet flexible) institutions and processes for the coordination of sustainability-related activities exist on a permanent basis.	- Permanent functions/staff positions to ensure coordination and networking independent of specific individuals have been created. - Other sustainability-related tasks and objectives have been codified and permanent staff positions have been created to ensure implementation. - Management functions have been expanded to all domains (from environmental to sustainability management). - Procurement throughout the institution is based on binding sustainability-related directives.
4	Resources for coordination of sustainability-related activities are provided on a temporary basis.	- A central coordination unit for sustainability-related issues has been established on a temporary basis. - Institutions such as green offices or similar contact points have been set up. - Temporary posts are in place in the administration for the performance of sustainability-relevant tasks.
3	Structures and procedures exist to facilitate networks among sustainability initiatives in the HEI.	- Networking and dialogue across faculties and domains (possibly including external stakeholders) have been institutionalized, e.g., in the form of round tables, working groups, commissions, or other authorized bodies. - Networks and communication platforms to ensure dialogue and cooperation with external actors exist.
2	Sustainability-related actions are taken collectively within separate faculties or domains.	- Decentralized procedures to align sustainability-related actions in the HEI exist (no overarching coordination). - Projects and initiatives are carried out independently, without coordination across faculties or domains.
1	Actions towards sustainability are taken by individual actors in the HEI.	- Individual students or academic or administrative staff members carry out sustainability-related activities.

In total, the examples provided in the scale deal with collective capacity for action and how action can be directed towards sustainability through rules, incentives, etc. Many of the examples refer to

structures that need to be in place for this purpose, such as committees, coordination units, or staff positions. The formal existence of such structures by itself, however, does not guarantee effective action. When assessing the 'organization' dimension, it is therefore necessary to reflect how these structures work in practice and to judge if they actually serve their purpose. This would include, for example, analysing the quality of interaction in a committee or the actual mandate of a coordinating unit and the barriers that it might encounter in its work.

5.4. Knowledge—How is the Necessary Knowledge Generated and used Competently?

Sustainable development calls for complex knowledge management. For joint action, actors in HEIs must develop a common understanding of the problems to be addressed and their causes (systems knowledge), they must agree on a judgment of the current situation and set goals for the future (target knowledge), and they must identify ways to solve the problems at hand (transformation knowledge). In addition to technical expertise, this requires knowledge about actors, structures, and processes in the HEI in order to determine the preconditions for successful implementation. Furthermore, it is insufficient for effective sustainability processes to draw upon knowledge in the HEI on an ad hoc basis. Instead, the HEI needs to create ways to continuously identify, generate, disseminate, and utilize knowledge in order to react adequately to emerging problems and facilitate longer-term learning processes. In addition to technical solutions, this calls for participation and networking to support knowledge transfer.

On the first level of progression in this dimension, the relevant knowledge is held by a limited number of individuals (see Table 4). On the next level, the existing knowledge is documented and made available to other actors. While in this case knowledge only flows in one direction, the subsequent levels increasingly include the mutual exchange and joint creation of knowledge. This involves creating opportunities for knowledge transfer, joint problem-solving activities and, ultimately, building the capacity to continuously process and use knowledge to support the sustainability process in the HEI in a longer-term perspective.

It was mentioned before that in assessing structures, the actual working processes associated with them need to be taken into account. This is especially relevant for the 'knowledge' dimension. The structures and procedures listed above are merely the 'containers' that serve to facilitate knowledge work in the HEI. Consequently, the existence of such informal and formal structures, while an important prerequisite, is merely the starting point, and the contents and processes of this knowledge work and their quality should be at the centre of the assessment in this dimension.

Table 4. Assessment scale: 'Knowledge'.

Level	Definition	Examples
5	Structures and procedures for continuous joint knowledge work are used to support the sustainability process in the long term.	- Dialogic forms of cooperation (e.g., committees) exist that provide room to work on sustainability-related issues in a long-term perspective (independent of present problems that require short-term solutions). - Comprehensive knowledge (inventory, analysis of problems and causes, analysis of actions and their effects) is generated and used to support the management and coordination of the sustainability process. - Sustainability reporting is linked to concrete sustainability-related measures and goals.
4	Structures and procedures for joint knowledge work aiming at (short-term) solutions to present problems are in place.	- Dialogic forms of cooperation (e.g., committees) exist that provide room to work on concrete actions toward sustainability (e.g., events, guidelines, courses, or projects). - Evaluations of specific activities/measures are carried out. - Sustainability reporting provides an analysis of sustainability-related issues and challenges.
3	Opportunities for knowledge exchange are in place.	- Research platforms that enable the sharing of individual knowledge have been created. - Conferences and colloquia on sustainability-related issues take place. - Transformative, participative, interactive courses focusing on sustainability issues are carried out.
2	Knowledge is documented and made available (unidirectional, without dialogue/exchange).	- A sustainability report is published. - Libraries and databases provide sustainability-related literature and information. - Sustainability-related training for employees and researchers is available. - Individual lectures and seminars on sustainability-related topics are held. - Handouts and guidelines on sustainability are provided, e.g., by the administration. - Formats such as newsletters or websites on sustainability exist.
1	Relevant knowledge is limited to individuals and/or projects and is not taken up by the HEI.	- Knowledge on sustainability issues is generated individually, e.g., thesis papers or research projects.

5.5. The Public—How is Awareness of the Need for Sustainable Development Achieved in HEI?

Making sustainability initiatives visible in public is an important part of sustainability governance in HEIs, because doing so creates the opportunity for stakeholders to observe issues, positions, activities, and their results, and to react to them. For instance, actors in HEIs can contribute to increased awareness and participation by demonstrating the need for action, communicating goals and measures, and reporting on progress made. Public attention also helps to reinforce the importance of sustainable development both within and outside the HEI, and to communicate sustainability as part of the HEI's profile in relation to (potential) students and external partners.

On the lowest level, the public dimension involves active communication about sustainability by a small circle of individuals, mostly in their immediate professional surroundings (see Table 5). The second level is reached when individual faculties or other organizational units pursue a targeted communication approach. On the third level, such an approach addresses the whole institution as well as the external public. Ideally, this leads to sustainability becoming a characteristic part of the HEI's identity and, ultimately, the HEI's profile.

Table 5. Assessment scale: 'The public'.

Level	Definition	Examples
5	Sustainability is a central distinguishing feature of the HEI, both internally and externally.	- Specific faculties, departments, or the HEI as a whole carry the term sustainability in their names. - When new professorships are advertised, they are specified with sustainability in mind. - Local sustainability-related debates are taken up and shaped by members of the HEI. - Sustainability research and teaching are attractive for students and teachers.
4	Sustainability is a visible part of the HEI's conception.	- Sustainability is included in the HEI's mission statement. - The HEI awards sustainability prizes. - Sustainability-related courses, lectures, and other events are open to external interested parties (pupils, senior citizens, etc.). - A sustainability report is published.
3	A coordinated approach exists to communicate sustainability issues within the whole institution and to the general public.	- Research platforms that enable the sharing of information on sustainability-specific issues have been created. - Conferences and colloquia on sustainability-related issues take place. - Transformative, participative, interactive courses focusing on sustainability issues are carried out. - The HEI's website provides information on its sustainability-related goals and activities.
2	Targeted measures are carried out by organizational units to communicate sustainability issues.	- Sustainability-related issues are addressed in newsletters by faculties, while administrative departments or projects address sustainability issues in newsletters or at specific events, press conferences, etc.
1	A small circle of individuals actively engages in (informal) communication about sustainability issues.	- Sustainability-related information is passed on to those directly affected (e.g., energy-saving in the administration). - Committed stakeholders share sustainability-related information with their colleagues.

Making sustainability part of the HEI's public image was a particular point of discussion in the validation workshops. While the case studies included HEIs that built their entire identity around the issue of sustainability, some workshop participants argued that this was impossible for larger HEIs, which can't focus solely on a single issue and for which it is more difficult to raise awareness of sustainability issues throughout the institution. The revised scale reflects these concerns, but also maintains that incorporating sustainability in an HEI's identity, both internally as well as in its public image, is an important functional requirement for the transformation toward sustainability.

5.6. Working with the Assessment Tool

The main function of the tool does not lie in objective measurement and assessment of sustainability governance, much less in providing the basis for benchmarking among HEIs. Its primary purpose is to enable stakeholders in an HEI to attain a comprehensive picture of sustainability governance that is grounded in systematic analysis, includes different perspectives, and draws on different types of knowledge. In this way, it facilitates dialogue among stakeholders and promotes agreement on both the existing status and the way forward. Furthermore, while some of the information required for the assessment can be obtained from official documents such as strategy papers, sustainability reports, or procurement directives, the knowledge of different stakeholders in the HEI is the key source for a comprehensive assessment.

Against this background, a participatory approach that involves all stakeholder groups in the HEI is recommended. This can take the form of stakeholder workshops (as used in testing the assessment tool) or similar formats. In addition, the test phase showed that it can be helpful to take stock of sustainability governance before carrying out a stakeholder workshop and to present an overview (possibly coupled with a preliminary assessment) to the workshop participants. By doing so, participants are provided with a shared knowledge base and a more structured discussion is facilitated.

The analysis should cover all domains in the HEI (education, research, campus, and outreach). It is not to be expected that sustainability governance will be equally developed in all domains. For example, there might be far-reaching governance structures in place in campus management, but not in education or research. It is therefore important to look at each domain specifically. Some participants in the validation workshops even suggested conducting a separate analysis for each domain. However, we believe that the concept of sustainable development requires a whole-institution approach and that all domains should therefore be included in an integrated analysis.

The assessment process starts out by identifying elements of sustainability governance in the HEI that are relevant for one or several of the five dimensions, and assessing their contribution to those dimensions. This includes the following steps:

1. Creating an overview of existing governance elements (gathering information on all elements of sustainability governance).
2. For each governance dimension: Checking which elements are relevant (assigning all relevant elements to the respective dimension(s)).
3. For all elements assigned to the respective dimension: Evaluating the contribution of each element (assigning a score on the assessment scale).

The examples listed in the assessment scales provide some orientation for identifying and assessing governance elements. It is important to be aware, however, that in the end they are just that—examples. This means that effective sustainability governance does not require that all examples from the scales are in place or that forms of sustainability governance should be limited to these examples. On the contrary, the analysis needs to be open to specific approaches in the HEI that may differ from the examples.

The results of the analysis can be documented by creating a table for each governance dimension that lists all elements of sustainability governance assigned to each point on the scale (using the assessment scales as templates). As above, this can lead to a number of examples at each level of a scale. The analysis then moves on to the next steps:

4. Conducting an overall assessment in each dimension (determining a score).
5. Identifying the strengths and weaknesses of sustainability governance in the HEI and the requirements for action.

Determining a score for each dimension requires weighing the relative importance of different governance elements, and should be based on discussion among stakeholders. While the assessment scores are thus not objective, they are grounded in the stakeholders' expertise and undergo intersubjective validation. Together, the scores from the five governance dimensions provide a comprehensive assessment of sustainability governance in the HEI. Forms of visualization such as a spider diagram can be used to illuminate the relative strength of the five governance dimensions. It is then up to the stakeholders in the HEI to discuss how the situation should be judged, if one or more governance dimensions needs to be intensified, and how this could be achieved.

6. Discussion

The governance equalizer focuses on the functional requirements that sustainability governance needs to address if it is to work effectively. Framing these requirements in the form of the governance equalizer suggests that HEIs can influence—'turn up' or 'turn down'—the level of each dimension

in their institution—and that turning up one or more dimensions will increase the chances of successful sustainability processes. Elements of governance—structures, processes, instruments, and practices—can thus be analyzed by asking if and how they contribute to these functional requirements. This approach, in our view, has several advantages.

Firstly, by considering different functions, the analysis facilitates a multi-dimensional understanding of governance elements, instead of limiting them to a single purpose. For instance, sustainability reporting can provide an information base ('knowledge') for decisions about a sustainability strategy and to judge its success ('politics'). At the same time, the process of gathering data, assessing progress, and writing the sustainability report could change stakeholder understanding of sustainability and their own role in moving toward it ('profession'). Furthermore, publication of the report could raise overall awareness of sustainability issues ('the public'). Sustainability reporting could thus affect several governance dimensions to different degrees—and its main impact might differ from what would be expected at first glance.

Secondly, by focusing on functions we avoid any overemphasis on individual elements and ask instead if and how the mix of different elements provides a basis for effective governance. For example, parts of the literature highlight the role of sustainability 'champions'. This is also reflected in the assessment tool, as several of the definitions and examples make reference to dedicated and influential individuals. However, the assessment scales also illuminate the complexity of the task of moving HEIs toward sustainability, and demonstrate the multitude of other pieces that also need to be put into place. In the process, rather than depending on individual actors, sustainability has to become institutionally embedded through a number of complementary elements.

Thirdly, the functional perspective offers a way to analyze the divergent governance structures and processes that the HEI creates on the basis of specific institutional cultures (cf. [43]) under a common framework. Instead of looking for 'the best way', the assessment tool leaves room for different approaches to sustainability governance that might be effective (in specific contexts), and thus creates the possibility of identifying 'functional equivalents'. While this can also be done for individual elements of sustainability governance, it applies in particular to the combination of several elements, i.e., the governance mix that underlies an HEI's sustainability process.

The assessment tool aims to create some middle ground between quantitative, objective measurement and the need to capture the more complex aspects of governance. To this end, on the one hand, the analysis is based on clearly defined criteria that are assessed using carefully developed maturity scales (cf. [41]). On the other hand, the tool puts a strong emphasis on the participation of stakeholders in HEIs. These are not just important sources of information—assessing the five governance dimensions ultimately relies on their judgment. We concur with some of the literature that the inclusion of different perspectives in this process represents a way of ensuring its quality, as the chances of avoiding one-sided judgments improve. However, this does not mean that stakeholders need to agree on all issues. In fact, as systems thinking teaches us, it can be useful to deliberately seek out differences in order to achieve a better understanding of the situation [39] (p. 12). In this sense, identifying areas of disagreement can be an important part of the assessment and provide clues for improvements.

Of course, governance in HEIs is only one element of their transformation to sustainability, but one that should support fundamental changes in an HEI's core domains. Sustainable development in these domains can also be supported by sustainability assessment tools. It is the aim of this article to provide the means for a more refined analysis of sustainability governance. This does not mean that other domains should be neglected, however. In fact, it could be both useful and feasible to use more than one assessment tool to support sustainability processes in HEIs [28] (p. 819).

7. Conclusions

This article introduced a sustainability assessment tool centered on five governance dimensions. While these dimensions have been drawn on for analytical purposes, they do, of course, also include

a normative component. They are based on the premise that attaining sustainable development is desirable and that, in order to do so, organizational boundaries need to be bridged, perspectives aligned, overarching coordination ensured, and so on. These assumptions are in line with much of the literature on sustainable development as well as with governance literature in general. Nonetheless, they, too, should be subject to further empirical research. Future insights might therefore require a revision of the functional norms represented by the five dimensions. Moreover, the dimensions and examples were derived exclusively from empirical cases and workshops in German HEIs. The applicability of the assessment tool for HEIs in other countries, especially in the Global South, remains to be empirically investigated.

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