# Multi-Dimensional Assessment of a Bavarian and Czech University: A Case Study of Sustainability Implementation

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**Abstract**

Evaluating the effectiveness of sustainability implementation at Higher Education Institutions is still challenging, due to less multi-dimensional approaches. Purpose is to present a new assessment - Sustainable Maturity model (SuMa model) for evaluating the implementation of sustainability at two universities in a border region with different maturity profiles through an internationally designed case study. Therefore, internal documents were analyzed, and interviews were conducted. The pilot implementation of this model showed that it can also be used internationally to evaluate the current state of sustainability implementation. As the assessment results prove, the critical point is effectiveness of strategy implementation and communication. Also, a lack of common understanding of sustainability still exists. The case study shows that the cultural and historical differences that exist in rural areas matters for implementing sustainability. The new SuMa assessment-model is a very suitable tool that delivers relevant indicators for measurable and comparable results over time and, above all, helps and supports the implementation of sustainability across all activities in the higher education landscape. It thus offers the possibility of being a standardized tool used worldwide.

*Keywords: Higher Education Institutions; Sustainability; Strategy Implementation; Assessment*

## 1. Introduction

Higher Education Institutions (HEI) have a special role to play in supporting sustainable development (Leal Filho, 2011; Omrcen et al., 2018), but also in the implementation of sustainable development in their own governance, teaching, research, transfer and campus (Figueiro und Raufflet, 2015). Looking at the communicated engagement, only a few universities around the globe currently publish a sustainability report (Farneti and Guthrie, 2009; Sassen et al., 2014; Sassen und Azizi, 2018b; Sassen und Azizi, 2018a), which suggests that few universities are pursuing a structured implementation of sustainability. Universities as specific organizations (Musselin, 2007) are facing the same challenge as other organizations: Translating sustainability aspects into strategy and measuring the effectiveness. Existing tools for implementing sustainability analyzed already by Shriberg, 2002; Fischer et al., 2015 do not consider both dimensions regarding the requirements of performance measurement (Hudson et al., 2001). Also, for continuous improvement a maturity profile will deliver added value to HEI.

The aim of the paper is firstly to introduce a new holistic model with an assessment approach for sustainability at HEI with focus of demonstrating effectiveness and impact, secondly an international comparison of two universities, a Bavarian university of applied

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sciences and a Czech university within an assessment using the model, and thirdly, to communicate the results of the outcomes.

The first part of this case study is describing a three-dimensional assessment tool (3D-SuMaHEI) as a meta-level-tool, bridging the aspects of a sustainable HEI into a management dimension supporting the HEI in measuring effectiveness and to progress on the basis of a maturity level. For that, existing tools mentioned in Shriberg, 2002 and Fischer et al., 2015 extended by further research were analyzed. Consolidating the findings, the 3D-SuMaHEI model is the tool assessments can be done with. Therefore, this paper also highlights an assessment approach.

The second part of the case study shows the application of the assessment approach at two universities with a different sustainability background. This paper also contains the results of the assessments and conclude with the discussion.

The topic of implementing and assessing universities is still relevant to scientific discussions. Pedro et al. (2021) and Moura et al. (2019) assesses in his study the efficiency of higher education institutions, considering the social, environmental and cultural factors (pro-sustainability), and at the same time examines how this efficiency can influence regional quality of life. Due to those regional influences two universities in a border region were chosen as a case to evaluate their effects to sustainability within these regions.

## 2. Methodology

This paper follows a case study approach to explain and describe the current situation of implementing sustainability at two universities. The case study fits as a research method for single cases within dynamic settings, this allows a study with only two samples (Eisenhardt, 1989; Bryman, 2012; Yin, 2012; Yin, 2014).

Case studies highlight decisions: Why was the decision made, how was it implemented and what are the results (Schramm, 1971). Based on that, case studies fulfill the criterion of a holistic context following investigating phenomena with more depth as empirical practical data explaining real-world context (Yin, 2014). Yin, 2014 recommends a case study research design for understanding a realistic situation within a special context. But case studies are limited in their interpretation, due to the high interaction between the researcher and research question, which develops continuously during the project (Stake, 1995).

The aim of the case study is, following Simon, 1967, to share knowledge and give the possibility of benchmarking management practices (see also Van de Ven, 1989). This research deserves some answers to how mature HEI can implement sustainability and how a model can positively contribute to that development.

First, introducing the theoretical approach of the assessment with the 3D-SuMa model, the assessment results themselves are discussed.

Because of the model 2021 published first, there are difficulties to convince universities management board for participation. First limitation is - as mentioned in literature (Yin 2012) - practical constraints by finding cases, also due to pandemic situation. A study with more samples would be recommended, but this requires a wider range of knowledge of the new model first.

Therefore, internal documents were analyzed, and interviews were conducted at both

universities. At the Czech university interviews were held with 9 faculties (deans) and two research institutes and central administrative departments, while at the Bavarian university 8 interviews with the vice-president, the quality and environment management department, the sustainability coordination department, the research department and administrative staff took place. Also, insights from the students' perspective allowed the internal assessors a scoring for a sustainable maturity profile. The interviews followed a semi-structured form, because this supports the open structure of the interview situation while shedding light on the interviewed person's individual point of view (Bryman, 2012; Flick et al., 2012; Saunders et al., 2009; Veal, 2011). This inductive perspective allows the drafting of building hypotheses while taking into account any generalizations (Bryman, 2012; Flick et al., 2012; Saunders et al., 2009) to allow an assessment score as a maturity level. The 3D-SuMaHEI model and internal documents were used to build hypotheses and questions for the interviews. The questions also referred to aspects that are addressed in the existing instruments or questionnaires for sustainability in higher education.

However, the qualitative approach is limited by not closing a theoretical gap, due to the fact that there is no theory about sustainability at HEI and also due to common assessment practices the interviews were not recorded with audio equipment (EFQM Assessor Training Course, 2016; Herzner 2021), so only manual recordings to engender more confidentiality and trust were made. The manual notes serve as a basis for the interpretative, qualitative content analysis, which allows scoring for a maturity level. Here, the case studies method does not exactly follow the research literature (Bryman, 2012; Flick et al., 2012; Mayring, 2010; Saunders et al. 2009). All personal data were anonymized for reasons of research ethics. The interviews were conducted on both sides of the border in German and English from August to November 2020.

## 3. The 3D-Model for Sustainable HEIs

Maturity models are widely used and accepted in the field of management science as they provide a method for gathering information for continuous improvement (Lahrmann et al., 2011). A maturity model can identify gaps and advise how to close these gaps by appropriate measures. Therefore, the assessors ask what the organization is doing, why it is doing that and what has to be done to achieve continuous improvement (Drucker et al., 2015). For that, maturity models can be used for external assessment as well as for self-assessment (Hakes, 1997). Critics of maturity models counter that they identify these gaps but do not support the user in closing these gaps (Pfeffer und Sutton, 1999). While this argument fits with general models (e.g. EFQM-Model), the 3D-SuMaHEI model provides clear described maturity levels allowing the user to have a look to the requirements to reach the next level (Herzner 2021).

Furthermore, maturity models should take situational factors into account, which is often missed because of complexity (Mettler et al., 2010). However, a theoretical framework, sufficient documentation and methodological requirements for maturity models are still lacking (Biberoglu und Haddad, 2002).

Also, models are representing their originals as a shorten copy, because the creator of the model only uses the relevant aspects from his or her point of view, which is why models don´t have all attributes of the original and are partly subjective (Stachowiak, 1973). Using

a model with an assessment approach is helpful in finding areas for improvement and identifying a status quo in universities as well (Isaksson and Johnson, 2011).

## 3.1 Theoretical aspects of modeling

Preliminary tools for the evaluation of sustainability at universities are documented by Shriberg, 2002; Jenssen, 2012; Yarime and Tanaka, 2012; Fischer et al., 2015 and Berzosa et al., 2017. Isenmann, 2013 clustered the tools on the one hand into standardized management systems as well as self-assessment systems and questionnaires or benchmarking systems with ratings. Only one tool also offers a certified, integrative system for sustainability assessment (Roorda, 2001). While several tools are focused on specific aspects of HEI, e.g., campus management or curricula assessment, a holistic tool providing all the relevant action fields and a clear description of what has to be done from the management perspective is lacking. Looking at published sustainability reports it is apparent that universities are engaged in single actions, but a holistic management approach is still lacking. While public management addresses higher education institutions as special, hybrid organizations with penetrated hierarchies, universities can draw on and implement management practices (Ferlie et al., 2008; Bleiklie et al., 2011; Bleiklie et al., 2015) themselves. This provides a basis for a model that takes management practices and aspects into consideration as well. On the one hand, relevant management aspects as mentioned in common business management systems (EFQM, 2013a; EFQM, 2019), Balanced Scorecard (Kaplan und Norton, 1992), St. Gallener Management System (Rüegg-Stürm, 2003), Value Management System (Wieland and Fürst, 2003). On the other hand, these management tools deliver a good basis for considering specific aspects in general but not on sustainability in detail. Also, existing maturity tools support identifying the gaps but not closing them. The most lacking aspect is measuring the effectiveness, so the Herzner, 2021 model solves the current weaknesses of tools. That is, why the authors decided to use this model as a basis for an assessment and not for an audit. An audit is just a checklist evaluation of whether people are doing what they were told to do regarding aspects provided by a standard (EFQM, 2013b). Basically, we understand the assessment methodically as a systematic identification and evaluation of the indicators defined in a model (as a set of concepts and principles describing certain desired outcomes).

## 3.2 Multi-dimensional sustainable maturity

The 3D-SuMaHEI model translates all relevant sustainability aspects into the management dimension in three steps. Firstly, the normative development ensures a sound and comprehensive basis; for implementing sustainability into strategies, it requires a definition of sustainability as part of the management strategy. Effectiveness ensures that sustainability is deeply implemented into the university. For assessing the maturity level, clear criteria are defined for all the relevant assessment aspects of sustainability. Clear requirements for the maturity level are defined. The result of a 3D-Assessment is a maturity profile, supported by a feedback report on strengths and improvement opportunities that inspires the organization to improve. Of course, the value is the feedback report and the profile is just an illustration to motivate further improvements. Figure 1 shows the model with all dimensions.
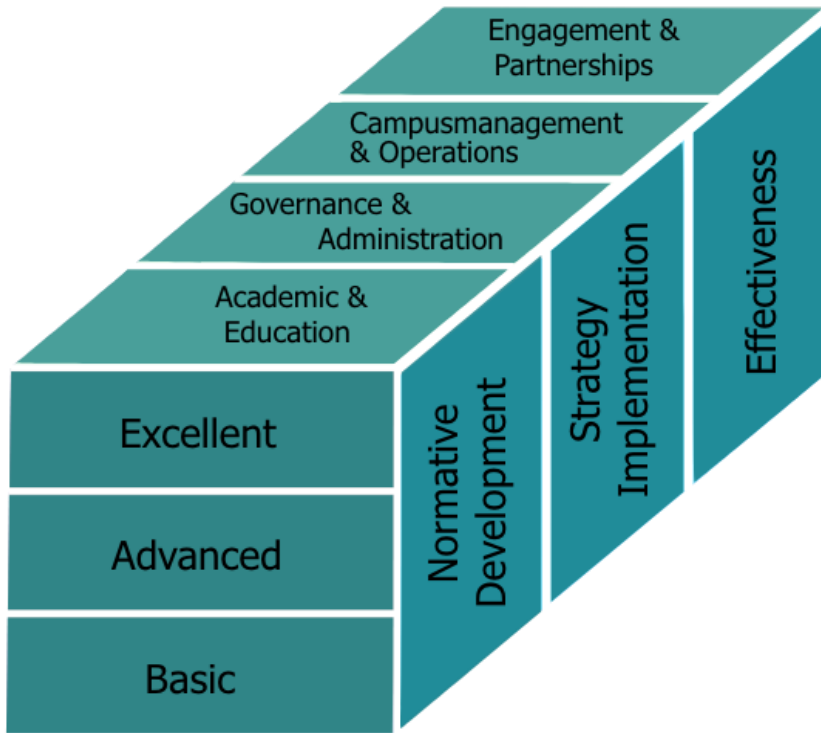
*Figure 1: The 3D-SuMaHEI model in overall perspective (Herzner, 2021)*

The first dimension addresses the action fields, since the relevance of sustainability at HEI is higher (Figueiro and Raufflet, 2015). Following Figueiro and Raufflet, 2015, Shrivastava, 2010 and Mauser et al., 2013, teaching and research are the first fields of action fostering sustainability in the core activities of HEI: academic work but also the transfer to society. Of course, sustainable practices are not limited to teaching and research (Alshuwaikhat and Abubakar; Young et al., 2016). Looking at sustainability guidance, e.g. the modular system sustainable campus (Brauweiler and Baukastensystem, 2017), KriNaHoBay (Nachhaltige Hochschule, 2017) and HS-DNK (Hochschulspezifischer Nachhaltigkeitskodex, 2018), the fields of actions can be defined as follows: *academic and transfer, governance and administration, campus and operation, engagement and partnerships*.

These areas and the aspects are not only found there, but also in the questionnaires and self-assessment tools mentioned in earlier research (Shriberg, 2002). Figure 2 shows all areas and aspects being assessed with the management´s indicators.

| | Academic & Transfer | Governance & Administration | Campus & Operation | Engagement & Partnerships |
|---|---|---|---|---|
| **specific aspects** | | | **Mobility:** Excellent universities offer a socially and environmentally compatible mobility programme. | |
| | | | **Operational processes:** Excellent universities demonstrate in their management systems that the operational processes (e.g. procurement) are designed with a view to the careful use of natural resources, respect human rights and comply with applicable law. | |
| | | | **Energy efficiency:** Excellent universities demonstrate in their management systems that all processes are energy efficient. | |
| | | **Human resources management:** Excellent universities offer an environment that enables all stakeholders to further develop the university as a sustainable university. | **Water:** Exzellente Hochschulen weisen in ihren Managementsystemen nach, dass alle Prozesse und Aktivitäten unter Berücksichtigung der Aspekte Wasserherkunft, -verwendung inkl. Rückfluss ablaufen. | **Extern partnerships:** Excellent universities actively design external partnerships with key partners that enable a sustainable university. |
| | **Further Education:** Excellent universities address diverse target groups with their continuing education programmes and transfer events. | **Governancestructures:** Excellent HEIs have governance structures that enable them to develop further as sustainable HEIs (QM, appointment procedures, promotions, etc.). | **Campusgestaltung:** When designing their properties, excellent universities demonstrate that they take the best possible biodiversity and other relevant aspects of sustainability into account for all sites and buildings. | **Intern partnerships:** Excellent universities actively shape internal partnerships with key partners that enable a sustainable university. |
| | **Teaching:** Excellent universities address diverse target groups with their continuing education programmes and transfer events. | **Health and safety procedures:** In their management systems, excellent HEIs demonstrate an appropriate health and safety procedure that covers university-specific and relevant aspects and goes beyond the required level. | **Waste and waste water:** Excellent universities demonstrate in their management systems that all processes are carried out under consideration of environmentally friendly disposal. | **Student initiatives:** Excellent universities actively support student involvement that goes beyond mere participation, thus enabling a sustainable environment. |
| | **Research:** Excellent universities demonstrate in their management systems that their research is geared towards promoting sustainable development. | **Organisational culture:** Excellent universities demonstrate a sustainable, diverse culture that promotes all dimensions of sustainable development. (Diversity (international, gender, age etc.), internationality). | **Emissions:** Excellent universities demonstrate in their management systems that all processes are designed with emissions in mind. | **Society:** Excellent universities demonstrate in their management systems that they bring benefits to society through their activities and do not cause harm or violate applicable human rights or be complicit in any violations. |
| **general aspects** | **Qualification:** Excellent universities offer appropriate further training for all employees in all fields of action and aspects so that everyone can support sustainable development. | | | |
| | **Incentive systems & performance evaluation:** Excellent universities have developed incentive systems that support rather than counteract the goals and strategies of the fields of action. | | | |
| | **Compliance & Integrity:** Excellent universities demonstrate standards and processes of integrity in the areas of human rights, labour standards and anti-corruption (especially in sensitive areas such as research, third-party funding and contract research) and ensure that these are observed. | | | |
| | **Transparency:** Excellent universities ensure the necessary transparency in all relevant areas with suitable instruments & measures. | | | |
| | **Reporting system (whistle-blowing, central office):** Excellent universities have processes in place to ensure that violations of aspects can be reported and dealt with. | | | |
| | **Academic & Transfer** | **Governance & Administration** | **Campus & Operation** | **Engagement & Partnerships** |
| | | **Dimension Sustainable University** | | |

*Figure 2 The fields of action of a sustainable university (Herzner, 2021)*

The Sustainable Maturity Model for Higher Education Institutions (3D-SuMaHEI) consists of three organizational maturity levels, i. e. the respective developmental stage of the organization at which it is currently located is displayed (Herzner, 2021).
At the same time, it motivates continuous improvement, so that the aim is to reach the highest level. 3D-SuMaHEI distinguishes between Basic, Advanced and Excellent.
In the horizontal axis SuMaHEI is structured along the normative, strategic and operative management levels. These levels are characterized as *Normative Development*, *Strategy*

*Implementation* and *Effectiveness*.

The *Normative Development* dimension focuses on the normative development of the university from the actual state to a requested future with a focus on the university´s own values as part of the discourse with stakeholders (Freeman und Auster, 2011). The criterion *designed* examines the development of the basic attitudes, beliefs and values that influence the thinking and actions of the university's members (Bleicher, 2011). Regarding sustainable development, the university must develop itself and create internal organizational conditions for sustainability before it is able to create new forms of exchange between science and society (Pellert, 1999). Discussions on goals and mission statements for sustainable development are indispensable for the next communication processes. 3D-SuMaHEI assesses if the university is committed to sustainability within its normative statements.

Further, it will be assessed how the university is *communicating* their mission to sustainable development. The participation of stakeholders and dialogue-oriented communication is also addressed in several instruments of higher education institutions. At the same time, external communication is becoming increasingly relevant for universities. One aspect is creating a unique profile within the increasing competition between institutions, which offers universities the potential to create and sharpen a positive profile with the sustainable university and to establish sustainable development as part of the university's brand (Boos et al., 2013).

The increasing competition between universities also requires the development of strategies (Krücken, 2017). The management processes of strategy development and implementation can therefore also be set on the university's agenda.

Herzner (2021) called the criterion "*aligned*" as a respond to this and questions whether the normative contents are also adopted in the strategies of the university (Sussland, 2003; Kaplan and Norton, 2006; Schiemann, 2009).

*Strategy Implementation* addresses a balanced and controlled set of goals as a result of the alignment process also in operative processes. An effective strategy must build on the university culture and have an impact on the process landscape (Yaprak et al., 2011). Due to the lack of literature on HEI strategy management (Shah and Sid Nair, 2014), there is a lack of strategy. That is why general management tools have to be applied in addition to content orientation, and a structured and a planning approach is required. Since public higher education institutions show a lack of effective strategy implementation within the faculties and departments, a clear allocation of responsibilities, a monitoring system with performance measurement, quality measurement and a complete consideration of all fields of action are needed. The strategy implementation of the higher education institution is therefore assessed on sustainability aspects with the criteria *balanced*, *implemented* and *controlled* (Herzner, 2021).

The higher education strategy should contain *balanced* objectives with appropriate measurements and target values, which take all fields of action equally into account and are geared to the needs of the stakeholders (Tarlatt, 2001; Kaplan and Norton, 2001). Due to Herzner 2021, this criterion relates to the sustainable development fields of action of the first dimension.

When *implementing* the strategy, it is particularly important for universities to pay attention to the direction of the implementation. Although, a higher education institution is

considered a hierarchically structured organization, several actors penetrate this structure (Bleiklie et al., 2015). These circumstances challenge the integration of the aspects of sustainability into the operational processes (Bassen et al., 2018). This leads to a review of existing processes which have to be changed, or new processes have to be set up. Process management will therefore become more important for universities in the future (Becker, 2011; Groening and Schade, 2011).

The criterion *controlled* assesses whether and how the university systematically implements, evaluates and manages the strategy (Herzner, 2021). This controlling process ensures the achievement of the goals anchored in the strategy and the target values of the measurement parameters. HEIs with a controlling system are therefore more effective than HEIs without controlling (Whitley, 2008). Performance indicators, benchmarks and measures can be drawn out of existing instruments.

Measuring the *effectiveness* of the outcomes also plays a more important role for universities. It is even indispensable to present the achievement of objectives to external stakeholders such as ministries, foundations or society. The model assesses sustainability's effectiveness with the criterions *relevant*, *benefit* and *sustained*.

The criterion *relevant* asks whether the higher education institution has a coherent set of perception and performance indicators that adequately reflect performance in the fields of sustainability. The key figures or indicators aligned with the strategy should show the performance of the strategic engagement (Behlau, 2001).

If the measures are having a positive impact in the field of sustainability, the university is creating *benefit* for the stakeholders. Recording to Herzner (2021), this criterion shows evidence that the strategy was implemented successfully based on stakeholders' feedback. The EFQM, 2019 RADAR-based criterion *sustained* in the sense of the sustainable maintenance of strategies, implemented processes and achieved results also focuses on the credibility of universities. The university has to clearly show that it will dedicate itself to the topic in the coming years. The positive results achieved in the fields of action can be maintained in the long term. This means that the higher education institution will probably be able to maintain the efforts and results achieved to date in the future and will continue to expand them.

### 3.3 Procedure of the assessment

Following Herzner (2021) the assessment is divided into four phases:

The preparatory phase begins with the university's willingness to carry out this evaluation. 3D-SuMaHEI is suitable for an internal self-evaluation as well as for an external evaluation. Ideally, an internal team from various departments is commissioned to collect the relevant data and prepare it for the assessors.

In addition to the mission statement and the higher education strategy, the basic documents for conducting the assessment are primarily the basic documents of an environmental management system, quality management system, process manuals and the results of other evaluations, module manuals of the study programs, other reports to the higher education management or ministries and if available, a sustainability report. While for an internal self-evaluation the team gets an overview of the documents among themselves, for an external assessment it is also necessary to provide the documents to the peer members for preparation.

The university also defines target groups for the assessment interviews. These target groups should reflect the stakeholder diversity. Questions are prepared for each stakeholder group based on the model that allows an assessment later. The questions should focus on the fields of action (1st dimension) and the assessment criteria (2nd dimension). Existing questionnaires, catalogues of criteria (e. g. Nachhaltige Hochschule, 2017 or HOCH-N handouts) provide a wide range of questions and topics which can be asked. It is important to highlight that the interviews should provide an overall impression. The conduct of the actual assessment through interviews is the second phase. For this purpose, the target groups are interviewed by two assessors each. For reasons of simplification and data protection, only written records are made without the use of computers and no transcripts are produced. Thus, this approach is in line with EFQM Assessment procedures (EFQM, 2013). The answers are treated anonymously, ensuring their individuality and authenticity. In order to validate the answers, especially on critical aspects, critical questions are always asked of at least two different people in different interviews. The answers can be compared retrospectively to find out different process variants or if similar issues are perceived differently.

The third phase is about scoring the maturity level. For that, the answers of the interviews are discussed by the assessor team and thus the individual impressions are consolidated into an overall impression. It is critical to state at this point that this assessment approach follows a subjective impression of the assessors and the result lacks in objectivity. Nevertheless, based on the overall impression from the fields of action, the criteria for Normative Development, Strategy Implementation and Effectiveness are evaluated and maturity is determined for each criterion (see Figure 3). For that, the scoring follows simple principles that the lowest level of maturity of an aspect is decisive for determining the level of maturity, and secondly, that the process sequence is taken into account, so the scoring subject is limited to the preceding aspect.
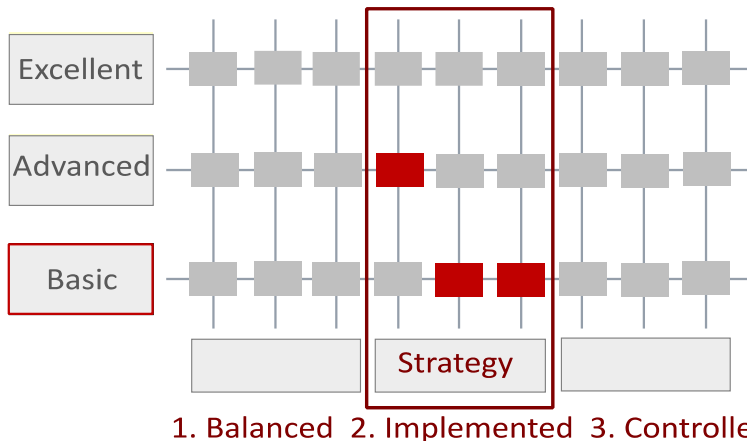


*Figure 3 Scoring methodology (Herzner, 2021)*

Following the assessment process, the team summarizes the results of the assessment in a feedback report (phase four), which includes the respective potential in the fields of action

which the university can use in future to improve its normative, strategic and effective position. The feedback can also be used for other management systems (quality, process, environmental management) for continuous improvement.

## 4. Case Study: Assessing the Sustainability of Two Cross-Border Universities

### 4.1 Introducing the case universities
Evaluating the maturity status of implementing sustainability in the university, the 3D-SuMaHEI model was used. The model contains all the relevant aspects a sustainable university has to consider. Further, the model is management oriented and provides a description of a necessary management process considering the aspects.

This discussion is based on a case study of two universities. This case study describes two universities in similar areas but with differing cultural background. Both universities are located in rural areas with a similar population and economic structure. Both universities are in the border region between Germany and the Czech Republic with basically the same attitudes of each population.

The case study objects are a university of applied science in Bavaria and a university in Bohemia. The case study follows the assessment approach as Herzner 2020 recommends based on the 3D-SuMaHEI model. Therefore, employees of both universities - academic as well as administrative staff, were interviewed based on the observations by the assessors of studying internal documents (strategy and quality documents, sustainability report, homepage, etc.). Based on the desk research of internal documents, in total, 16 interviews of 1 up to 1.5 hours were conducted, 12 at the Czech and 7 at the Bavarian HEI on relevant management levels – vice-president, deans, staff and students. The interviewee were selected considering the universities sustainability background and structure following EFQMs Assessment recommendations.

The University of Applied Sciences (Case 1) is a 25-year-old public higher education institution in north-eastern Bavaria, which is a rural area as well. However, the university is an innovation and economic enabler in that region for local small and medium-sized companies. The university counts a body of 3,500 students and 399 staff members in administration and in four faculties (3 technical and 1 business school). The university has two equivalent campi in with 40 km distance.

The University in Bohemia (Case 2) is a public higher education institution of the university type established in 1991. The university draws on its tradition of technical specializations, which are complemented and enriched by disciplines from the humanities, economics, arts and health care. The University is divided into 9 faculties and 2 university institutes.

In 2018, the University had a total of 133 accredited study programs. The university counts a body of over 11,000 students and over 2,200 staff members.

During the interviews the topics of governance, teaching, research, transfer and campus were mentioned. Questions concerned an understanding of sustainability, knowing a strategy, motivation to contribute to sustainability, about explicit or implicit research and teaching of sustainability, as well as future plans. In terms of management, the questions focused on what responsibilities or governance structures would be necessary, but also about communication, measuring benefits and effectiveness. Also, more general questions

based on the model were asked (training, labor condition, health management, leadership).

## 4.2 Results and a cross-border comparison

After the interviews, conducted by two persons, the given answers were discussed and compared. Coming to a consensus, the assessors can score and give feedback.

The applied science university (case 1) reached an advance maturity level in the normative development dimension. As proof, the university does explicitly address sustainability in their mission statement. Further, the university is an advanced member of UN PRME and committed to Fairtrade as a Fairtrade University. It was the first university in Bavaria joining UN PRME as a whole institution not just a single faculty. Also, the university was the first applied sciences university in Bavaria to be certified a Fairtrade University. A commitment by the board of directors was only the starting point in 2012. In 2020, the university started to implement an environmental management system (EMS), as the university board has committed to it. This leads to an excellent score for all action fields regarding to designed.

Assessing communication and alignment, the university does not fulfill all aspects mentioned in the maturity dimension, so it receives only an advanced maturity level. Not all employees know about UN PRME, Fairtrade University or the EMS. The communication is often face to face with the relevant stakeholders and also, the university reports (one-way) its activities.

Looking to the Strategy Implementation, it is obvious that the goals of normative development are not translated into all the field's strategies. With a vice-president for sustainability, a sustainability office and a multi-stakeholder committee, the university shows a balanced set of representatives within their governance structure. New approaches are in planning, so theoretically a higher score would be easy to achieve in *governance and administration*.

Also, *Engagement and Partnerships* mature at an advanced level due to active engagement in all the relevant sustainability networks, e.g., Fairtrade town initiatives – which enables multi-stakeholder involvement and makes the university a role model in the region. The projects and activities are awarded from different institutions, the re-certification was also successful, and benefits can be shown with contributions and awards. Theoretically, the HEI would achieve a higher score here, but due to the scoring methodology, the lowest score of strategy implementation sets the limit.

Looking at *Campus and Operation*, a clear strategy is not obvious, but that will change in future with the EMS. Right now, there is no balanced, controlled strategy at an advanced level, but a few aspects and plans will change that.

Assessing *Academic and Transfer*, individual lectures and modules can be seen. Even some special study programs are provided in environmental sectors. However, during the assessment, no targets or metrics that allow the assessors to score higher could be provided. In that point the HEI has a great potential to achieve a higher score in future. This is also the result for research. Of course, there are projects but sometimes the researchers are not aware of doing sustainability research. This loops back to communication and awareness in normative development.

Having a closer look at effectiveness, it can clearly be seen that it is quite difficult to measure benefits in the fields with relevant indicators. In student evaluations, sustainability

topics are not mentioned. As recommended in Herzner et al., 2020, a sentiment barometer survey can be a first option to pick up the voices of students, but it is not representative due to methodology limitations. While the HEI publishes information about its activities, even in a structured sustainability report on the GRI basis, the interviewee could not confirm a strategic setting behind it. This leads the assessors to score a basic maturity in all action fields. But it should be stated that in some fields just a little engagement is missing to increase the maturity.
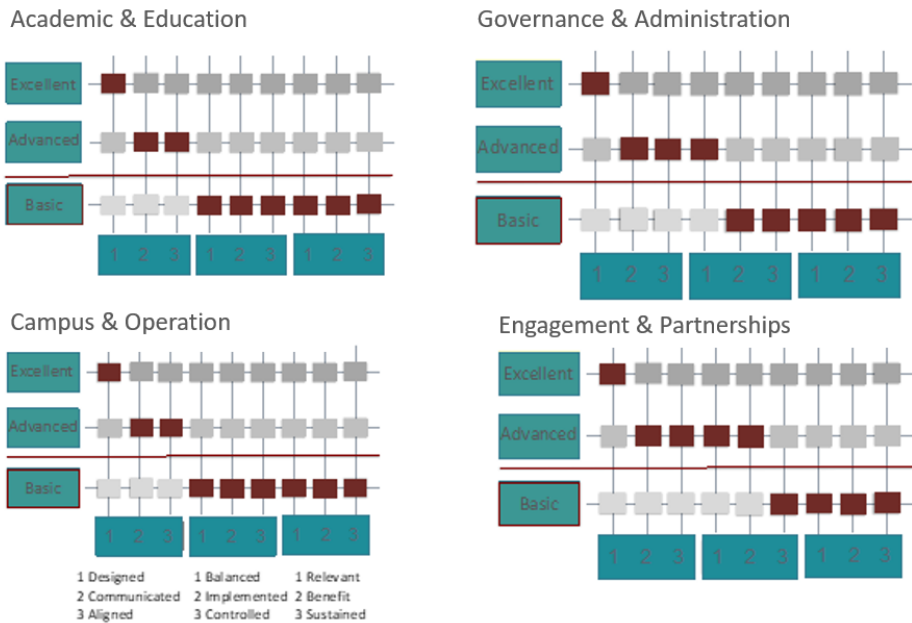


*Figure 4 Overall Assessment result of Bavarian HEI (own figures, 2021)*

The Czech university (Case 2) reached a basic maturity in all aspects. This result is due to the fact that the university is not aware of a common understanding of sustainability as several UN conferences / researcher discussed the last decades started with the World Commission on Environment and Development, 1987 understanding. We see this phenomenon in another case too, Bukhari et al., 2020 discussed this issue in Pakistani universities. While the mission of the university is well-known, sustainability is not mentioned at all. Without a clear mission statement on sustainability, no alignment in strategy procedures is possible. Of course, without a sound strategy, effectiveness is not possible either. Figure 5 shows the maturity profile of the Czech case.

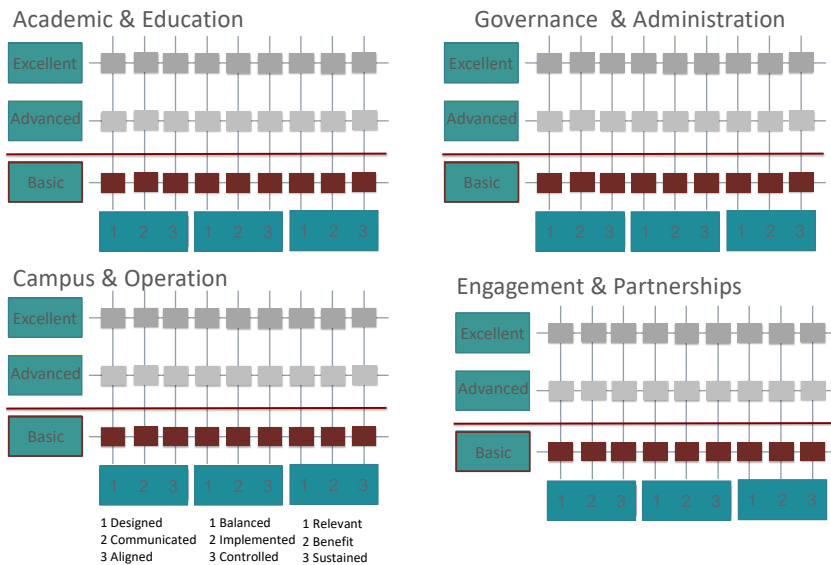## Overall Assessment Result Case 2



*Figure 5 Assessment results of the Czech university (own figures, 2021)*

But the assessment delivers a lot of insights that make it possible to improve and develop a strategy based on the model. The interviewees mentioned their great willingness to support a future sustainability strategy. Due to less knowledge about sustainability, they would like strong support from the president's board with guidelines and best practices. So, concrete steps need to be implemented, but these aspects are provided within the model. Also, the interviewees recommend responsibilities for persons in charge to coordinate sustainability engagement (e.g., a sustainability office).

### 4.3 Research limitations

There are several limitations that must be underlined. The qualitative approach is limited by not closing a theoretical gap, due to the fact that there is no theory about sustainability at HEI.

Due to common assessment practices the interviews were not recorded, and only handwritten notes were the basis for assessment maturity. Using a model is still subjective in parts, but the assessment procedures ensures as much objectivity as possible.

### 5. Discussion and Implications

The following chapter discusses the results in detail and compares the situation on both sides of the border.

First, it is interesting that the term sustainability is still defined differently. While in Germany sustainable development is linked to common definitions, some interviewees already mentioned SDGs. In the Czech Republic sustainability is more a positive long-

term achievement of different goals (often the goals of the faculty or study programs but also projects) and follow just the *sustained* aspect of the 3D-SuMaHEI model. After decades of discussions, it is surprising that it is still such a challenge to communicate the aspects of sustainable development. Looking at the literature, we find no explicit research about understanding sustainability due to cultural or historical backgrounds, but a difference in university stakeholder groups e.g., students (Tuncer and Sahin, 2016) or teachers (Reid und Petocz, 2006).

Further, while Lozano et al., 2015 highlight commitment by signing a declaration, our results show that commitment alone is not enough, but an essential starting point. We agree that commitment has to be translated into policies and strategies, both cases are only basic or half-advance concerning their maturity level, because due to less effectiveness and measurement.

A high priority can be seen in the normative development as the universities mention sustainability in their mission statements, and they also achieve better outcomes (Lopez and Martin, 2018). The case study confirms this also.

The mission statements of both universities are known, and in some cases interpreted with sustainable values as a family-oriented culture, but only the Bavarian university mentions sustainability. So, a commitment from the top management level is nevertheless one of the most important points (McCaffery, 2010), but top-management has also to acts as a role model for sustainability, not only for special issues (Macarie and Moldovan, 2012). The next important aspect is an integrative communication and training format for the workforce, enabling them to be more greatly committed (Kolb et al., 2017). Compared to Isaksson and Johnson, 2011 the Bavarian university does explicitly address sustainability in its vision statement. But coming to goalsetting and measurable outcomes, we come to the same conclusion as international comparisons showed (Isaksson and Johnson, 2011).

Further, networks of sustainable education such as UN PRME / UNESCO ESD are unknown in both countries. In Germany UN PRME was mentioned by interviewees who have direct contact with the sustainability department or who are involved in sustainability issues. However, the relevant faculty staff was also not aware of PRME for developing new programs. The Bavarian university is committed to UN PRME as a whole institution – that is still quite unique. On the Czech side only one of the nine faculties is a member of SDG Accord, but the interviewees highlighted the exchange and benchmarking as most important advantage. Commitment to a network is a good starting point, but nevertheless communication is the main sore point.

In both countries, interviewees complained about the lack of communication on sustainability and strategies in general. Sometimes people receive the information rather by chance than in a structured way.

Connected to communication, in both countries it is obvious that change management still does not receive the relevant priority. Universities as complex organizations with penetrated hierarchies have to improve their communication and change management. In terms of sustainability, communication must be very selective and appropriate to the target group (Franz-Balsen and Heinrichs, 2007). For example, some faculties in the Czech university would like concrete plans and policies, targets and measures communicated top-down. This is in line with a Spanish benchmark as well (Larrán et al., 2016). The Bavarian university still communicates and campaigns its mission and strategy and follows a top-

down and bottom-up approach.

Third, the governance structure is also different. However, this aspect is due to the level of development. The Czech university is starting with sustainability as a strategic aspect and asked the faculties/departments about their favorite structure. The heterogeneity of faculties and research centers can also be seen in the heterogeneity of sustainability centers, as Soini et al., 2018 mentioned. Neither of the cases are an exception.

The Bavarian university started its journey with its own department, which has led in the meanwhile to a vice-president for sustainability and is also starting an environment management system. The sustainability center is still responsible for interdisciplinary teaching and research, but also for improving the campus management.

The short distances and flat hierarchies offer optimal conditions for a permeable flow of information, which should also be used consistently. The central motive should be seen through all communication and the external appearance of the university. Some interviewees mentioned that often information is available that is not known to the majority. This information should be communicated in a channeled and structured way.

Also, external pressure from accreditations or EU research aspects on sustainability increase the awareness and motivate the people to move forward (Larrán et al., 2016). For example, in one study program the external evaluator mentioned that a higher engagement in sustainability topics would be good and the faculty is now more aware and after intensive communication also intrinsically motivated.

For that, both universities have to activate their student bodies to bring in ideas and engagement. Also, students can be seen as one major change driver for sustainability in teaching (Beyer and Weber, 2018; Daubner et al., 2018).

One positive that can be seen is that there is a broad commitment to a sustainability strategy at the Czech university, but the motivation depends on workload as well as an incentive system for professors, researchers and students. In Germany the situation is similar. Intrinsically motivated or convinced staff supports single campaigns (e.g. switching to Fairtrade chocolate at fairs). At the same time, the people see a gap between normative commitment and strategic goals and actions/effectiveness. One interviewee mentioned the lack of separation of waste, and the consideration of Fairtrade and ecological aspects in procurement processes.

Correa et al. (2020) presents an interesting case study from Portugal, that provides a picture of two HEIs' sustainability behavior from the students' standpoint, which can be important for decision-makers in HEIs, in as much that students are one of the HEIs' major stakeholder groups; furthermore, it enables them to better guide their efforts towards sustainability.

The Bavarian university staff is also aware of the legal aspects of sustainability e.g. corruption, due to mandatory seminars, while at the Czech university none of the interviewee mentioned trainings in sustainability topics. This highlights the importance of training the workforce in sustainability issues as well.

Looking at the labor conditions at the HEI, it can be seen that the intense and ever-increasing workload was mentioned several times in the interviews. This bears the risk of highly motivated people able to support sustainability in future being lost. More important should be a way to motivate more people to engage, due to the intense working environment for university staff (Navarro et al., 2010; Rojas-Martini et al., 2002). For that,

we could find less empirical evidence in research on labor conditions at HEI, but it would be relevant for future research due to increasing pressure, higher productivity and new public management methods / economization of universities.

Despite the similarities of culture and the regional structures, the historical background of both countries is still visible. While in the Czech Republic a top-down approach is mentioned in 8 of the 9 interviews, in Germany it is quite a bit more heterogenous.

For both universities, effectiveness is essential for reaching sustainable outcomes (Mohrmann and Lawler III, 2014). While one university has already developed a sustainability strategy, it has to link it to other strategies and improve their effectiveness. The assessment shows that their campaigns and projects are often not perceived as part of a strategy by other university members.

Developing a strategy based on 3D-SuMaHEI from zero is the future plan for the Czech university. Starting with ad-hoc activities and campaigns may be a good strategy, as empirical data shows that other universities do so (Vargas et al., 2019).

This case study confirms that external pressure will lead to strategic activities in sustainability (Larrán et al., 2016). Especially the university with a strong focus on research mentioned EU projects as one major goal dealing with sustainability in research.

## 6. Conclusion

While sustainability is becoming more important to society and business, universities have to deliver skilled people, able to act and change development in a sustainable and positive way (World Environment Center and Net Impact, 2011). Universities have a major role and a great responsibility in fostering sustainability (Leal Filho, 2011; Paletta et al., 2019). Universities have to be the incubator on the regional level (Sedlacek, 2013). Therefore, universities should implement sustainability in their own fields of action. Existing tools do not consider both dimensions regarding the requirements of sustainability and the performance measurement criterion (Hudson et al., 2001).

Also, for continuous improvement a maturity profile will deliver added value to HEI. This paper discussed two international case studies in a direct comparison using a multi-dimensional model and assessment procedure. Still, following Jorge et al., 2016, there is a need for a common tool due to the weakness of the existing ones. Our experience with the 3D-SuMaHEI Model and the assessment procedure confirms, as Sturlaugson et al., 2019 stated, that assessment is crucial for improvements, creates more awareness and trust than audits, and a model gives a good structure for developing strategies. The interviews and analysis of internal documents come in useful here. Still, it should be mentioned that an external side-visit would increase the importance of such an assessment due to the conflict of interest of internal assessors.

Judging from the results of both assessments, the weak point of both universities' strategies appears to be their effectiveness.This fact leads to a basic maturity. Even advanced engagement in mission and strategy does not deliver benefits if the HEI does not manage to implement and maintain this commitment effectively.

Using a standardized model and assessment procedure, the approach delivers added value to the university compared to existing approaches yet. The advantage of the maturity model is to deliver an explicit description of what has to be improved. It also motivates by

showing how far the HEI is - and sometimes only little aspects have to be improved to mature to the next level. The approach also allows a benchmark and giving best practices in a nutshell.

Effectiveness can be significantly increased if the measures are controlled and stabilized (Herzner, 2018), so a structured strategy, effective communication and controllable measures will be more important for future sustainable HEIs.

But there is also one factor missing: Sustainability needs time to create awareness, set a strategy and fill the engagement with content. The long way to the top can be seen at the Bavarian university, which after more than eight years is still achieving only basic mature in some areas. Of course, small universities can make decisions faster, but the governance structure has to be more comfortable for sustainable development.

The Czech university uses the model starting development of a strategy by using the basic description and aspects recommended in the model. At the same time, the Bavarian university (Case 1) communicates environmental guidelines to inform the university members about implementing an environmental management system and to encourage them to support the strategy. This is a result of the assessment feedback, that further, major focus should be on communication and empowerment. All the university's actors (professors, students, staff) have to be informed about the sustainability definition and the university strategies and goals for sustainable development. In both cases, communication and change management are the key aspects to motivate for engagement (Ferrer-Balas et al., 2008), combined with measurement in general and with relevant performance indicators in particular. Without their support, effectiveness will not be possible. If the support is not there yet, universities have to find ways to engage the students and staff.

Concluding the case study, the following future research aspects can be highlighted. One of the possible aspects to be covered may be the cultural and historical backgrounds of different geographical areas of the world and their influence on implementing sustainability as well as the way sustainability is understood. Further, as the interviews showed, research about sustainability aspects are still not finished and social aspects as intense working conditions, (gender) equality or ethical behavior by the university itself could be expanded or updated.

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