The Sustainable University

An exploration of how the sustainable university is conceptualized and takes shape

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Abstract

Universities and other higher education institutions are generally considered to be crucial actors in a societal strive for sustainable development. In light of this, they are called upon to (further) embed sustainability (i.e. attention for socio-ecological issues) so that each of them might become a “sustainable university”. This thesis develops knowledge on two central issues related to this topic: (1) how this notion of “the sustainable university” is conceptualized in research and in higher education practice, and (2) how change processes towards more sustainable higher education systems and practices take shape.

To do so, this thesis empirically analyzes the current higher education system in Flanders (Belgium), studies conceptions of the sustainable university in academic research, and investigates how both play a role within a micro-level practice aimed at embedding sustainability in an engineering bachelor program. This is achieved through the backbone of four empirical papers, by which the thesis builds upon three theoretical and analytical frameworks: the multi-level perspective on sustainability transitions, Laclau and Mouffe’s discourse theory, and pragmatist theory of transaction. In using and building upon these varied frameworks, the thesis also develops and illustrates innovative methodological approaches.

Based on a discourse analysis of 4584 academic publications on sustainability in higher education (paper II), the thesis first of all shows that the notion of the sustainable university is conceptualized in the academic literature in three distinct ways: (1) as a sustainable higher education institution, (2) as an engaged community, and (3) as a green-tech campus. Building further on these results, the thesis provides a detailed account of which “sustainable university” vision is expressed and given shape in a concrete change practice within the engineering bachelor program at a Flemish university (paper IV). Further, in relation to the topic of change, the thesis presents a systems analysis of how the higher education system in Flanders is implementing attention for sustainability (paper I). The main findings include an overview of the characteristics of the Flemish higher education system that can potentially affect the integration of sustainability in that system. Finally, a case study of the same change practice discussed in paper IV shows that the meaning of these characteristics and the effect they can have on a change practice are not set in stone, but are affected by how they are acted upon by those involved in the change practice (paper III).

Keywords: Environmental and sustainability education, higher education, sustainable university, educational change, multi-level perspective, discourse analysis, topic modeling, transactionalism

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List of Papers

This thesis is based on the following four papers, which are referred to in the text by their Roman numerals.


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1 The idea of the paper was developed by the three authors. I did the data collection and initial analysis. Katrien Van Poeck & I discussed the results in a later phase of the analysis after which I wrote the initial draft of the paper. The final stages of writing happened in collaboration with all co-authors.

2 The three authors developed the paper’s approach. The data gathering on the case was done by myself together with Katrien Van Poeck and Ellen Vandenplas. I did the data curation and analysis, and led the development of the typology. I did the main writing on the introduction, description of the case, results and discussion section, Katrien Van Poeck & Leif Östman led the writing of the theoretical section. The final stages of writing happened in collaboration with all co-authors.

3 The three authors developed the paper’s approach. The data gathering on the case was done by myself together with Katrien Van Poeck and Ellen Vandenplas. I did the data curation and analysis, the latter in collaboration with Katrien Van Poeck. The analytical model was based on paper II. I did the main writing on the introduction, description of the sustainable university, description of the case, results and discussion section. The theoretical/methodological section was written and the final stages of writing happened in collaboration with all co-authors.
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### Abbreviations

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<tr>
<td>DT</td>
<td>Discourse theory</td>
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<tr>
<td>ESE</td>
<td>Environmental and sustainability education</td>
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<td>MLP</td>
<td>Multi-level perspective on sustainability transitions</td>
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<tr>
<td>RC</td>
<td>Regime characteristic (plural: RCs)</td>
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<td>RQ</td>
<td>Research question (plural: RQs)</td>
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<td>TM</td>
<td>Topic modeling</td>
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List of concepts

This list offers the reader a quick reference to the central concepts used in the thesis. The list does not intend to offer full definitions and discussions of concepts, but merely aims to provide a starting point for the reader. All concepts will be more elaborately discussed throughout the manuscript.

- **Sustainability.** Refers to the connectedness and attempted reconciliation of socio-economic and ecological concerns.
- **Sustainability issues.** Concrete societal issues that combine an ecological and a social (or socio-economical) aspect.
- **The sustainable university.** An image of a desirable university that engages with sustainability in a particular way and to a certain extent. Different understandings of what such a sustainable university actually should be or could be are possible.
- **The university–sustainability nexus.** Used in this thesis to demarcate the academic literature that deals with the relation between the university / higher education and sustainability (cf. the intersection in a Venn-diagram).
- **The multi-level perspective.** Analytical framework from the field of transition studies used to study sustainability transitions of socio-technical systems. Used in this thesis to study a higher education system.
- **Regime.** Central concept in the multi-level perspective, refers to the dominant rules, technologies, infrastructures, ways of doing etc. of a socio-technical system (here: of a higher education system).
- **Transition.** A deep fundamental change of a societal system. In the case of this thesis: a fundamental change of a higher education system towards a more sustainable configuration (one in which attention for sustainability is to a large extent embedded).
- **Sustainable higher education change practice.** A collective of lecturers and other higher education staff who, over a period of time, attempt to make change in relation to the current dominant higher education system by embedding sustainability in their educational practice.
- **Institutionalized environment.** Used in this thesis to denote the institutional and discursive context within which a change practice navigates while making change. Refers to generalized patterns over time and space.
Now that I am nearing the end of my PhD journey, I am overwhelmed with a sense of gratitude for these past six years. I am so grateful for having been given the opportunity to do my PhD in Uppsala, and to have been able to study, read, write, discuss, explore, experiment, and struggle in an academic environment that was always so good to me. Looking back at the specific trajectory of my PhD, I cannot help but think of the following quote by Tim Ingold:

“All this flies in the face of the real vocation of the scholar, for whom research means what it says: to search and search again. It means a second search. In this, what was an answer in the first search becomes a question in the second. And so it continues: every search both doubles up on what was done before, and is yet an original intervention that invites a double in its turn. There is no end to this, no final breakthrough into the light.” (Ingold, 2020, p. 54)

Throughout these years, I was given the time and space for such re-search and I do not take it for granted. And although there may be no final breakthrough into the light, I experience finalizing this thesis as a temporary resting place, and it was made possible by a lot of amazing people.

First of all, I want to thank my supervisors Leif Östman and Katrien Van Poeck for being my experienced guides along this journey. Thank you for the many thought-provoking discussions, the difficult questions, the constructive feedback, for pushing me when necessary, and for not holding me back when I wanted to do something crazy (like analyzing over 4000 publications). You somehow always found a balance between being present and giving me space, and I do not take it for granted.

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Sweden. I always looked forward to travelling to Uppsala, and it was for a large part because of you.

Furthermore, I cannot thank Petra Hansson & family enough for welcoming me into their home and for making Uppsala my home away from home. These past six years would not have been the same without your kindness. I am uttermost grateful for the hospitality you have given me, ranging from the ease with which you let me into your lives, to the many small gestures along the way. Thank you.

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I will always look back with fondness at my time as a PhD student in Uppsala.

Machelen-aan-de-Leie, 1 April 2024.

Maarten
Chapter 1.
Introduction

1.1 The university and sustainable development

Universities and other higher education institutions are generally considered to be crucial actors in a societal strive for sustainable development. Indeed, the contemporary university\(^4\) is characterized by a plethora of calls, pleas and movements to become more involved with the topic of sustainability, that is: to play a role in addressing socio-ecological challenges such as climate change, energy, mobility, biodiversity etc. Something about universities and their unique combination of education, research and services to society (Biesta et al., 2009), in combination with large campuses, thus seems to be attracting a lot of expectations regarding this topic. While the university may already have negatively contributed to many of the sustainability issues we now struggle with (Howlett et al., 2016; Orr, 1994), the claim has been made that the university would be “morally culpable if it did not do everything in its power to address these [sustainability] challenges” (McCowan, 2018, p. 286).

The movement to embed sustainability in higher education can be traced back to the late 1960s and early 1970s (Corcoran et al., 2004), with the start of the 1990s marking a strong increase in the commitment of universities to various sustainability charters, declarations and networks\(^5\) (Berchin et al., 2021; Lozano et al., 2013; Wright, 2002). At present, international agreements stress the importance of universities in relation to sustainability (e.g. UN, 2015), national policies press universities for more engagement (e.g. UHR, 2015), while faculty and students also push their own universities to have more attention for sustainability (Adomäsent et al., 2019). Wals and Blewitt

\(^4\) In line with McCowan, this manuscript uses the term “university” to refer to “an institution of higher education that engages in teaching, research and public service”, while also acknowledging that both the content of and balance between these activities may vary considerably (McCowan, 2020, p. 4). In following McCowan’s definition, higher education institutions that do not officially carry the name “university” will also be referred to as universities throughout this manuscript.

\(^5\) E.g. the Magna Charta Universitatum ("Magna Charta Universitatum," 1988), the Copernicus Declaration (1994), the Sapporo Sustainability Declaration (2008), the Copernicus Charta 2.0 (CRE-Copernicus, 2011), etc.
(2010) have discerned a shift in focus: from introducing attention for the environment in higher education curricula in the 1970s, to a focus on sustainable campus management in the beginning of the 21st century and finally, towards integrating sustainability in higher education teaching and learning. Nonetheless, a wide variety of expectations are still held towards universities regarding sustainability.

On several policy levels, for example, we see a multitude of arguments for and ambitions related to universities engaging with the topic of sustainability. On the intergovernmental level, for example, in the UN’s Agenda 2030 (UN, 2015), we see that universities should “provide the advanced human resources and knowledge needed to address the complex challenges related to sustainable development” (Martin, 2017). What we can observe here is that what makes a university sustainable, is its output of skilled students and of knowledge, that together might help society tackle complex challenges. On the national level of Sweden, for example, another image emerges of a university that engages with sustainability. Sweden’s Higher Education Act states that “In the course of their operations, higher education institutions shall promote sustainable development to assure for present and future generations a sound and healthy environment, economic and social welfare, and justice.” (UHR, 2015, p. section 5). Here, the focus does not merely lie on the output in terms of skilled students and knowledge, but on what happens “in the course of their operations”. Furthermore, the attention is not placed on the complexity of sustainability challenges, but on “promoting” sustainable development, with specific focus on social aspects of sustainability. While both Sweden’s Higher Education Act and the UN’s Agenda 2030 imply a focus on education, they also bring to mind different images of what makes a university sustainable.

Universities themselves have also come to express a plethora of ambitions and views in numerous (sustainability) declarations throughout the years (Lozano et al., 2015). These declarations show a wide variety of arguments for why universities are being addressed specifically within the sustainability debate: It is the university’s task to spread knowledge among younger generations and to teach future generations “to respect the great harmonies of their natural environment” ("Magna Charta Universitatum," 1988), universities train the coming generations of decision-makers and teachers (CRE-Copernicus, 1994), they can set an example of environmental responsibility (ULSF, 1990), as “neutral and objective” institutions they “are best situated to inform political and social change toward a sustainable society” (G8, 2008, p. 3), they “have the unique combination of teaching, research and service” (CRE-Copernicus, 2011) and so on. Even this short overview shows many different (and often rather vague) understandings of the university in relation to sustainability, each bringing to mind a different image of what makes a university a sustainable university and what sets it apart from a non-sustainable university.
1.2 “The sustainable university” and the change processes towards it

The calls and engagements illustrated above vary widely in ambition and focus, ranging from merely embedding more attention for sustainability in some aspects of higher education, to moving towards the development of holistic sustainable universities. Sterling & Maxey (2013), for example, state that:

“[a] university can only contribute fully to a more sustainable future if it becomes more sustainable itself, if it strives and learns to become a sustainable university. Such a university embodies, critically explores and lives sustainability, rather than seeking to deliver it in various discrete curricula or research programmes without reference to its own ethos, practices and operations.” (p. 7, original emphasis)

The notion of the sustainable university is arguably the central concept of the field of research on sustainability in higher education. It is, however, an ambiguous concept. As has been noted, a university can engage in numerous ways and extents with the topic of sustainability. Consequently, there are also a multitude of ways to understand what a sustainable university is or could be. As will become visible in this thesis, the problem is that the current academic debate seems to insufficiently address this issue, i.e. there is a lack of research focusing on what this concept implies and how stakeholders in universities (lecturers, researchers, leaders, students) understand it. Despite many calls for holistic approaches to sustainability in higher education (Holst, 2023; Maxey, 2009; Sterling, 2004; Sterling & Maxey, 2013), the research field itself is fragmented with an increasing focus on sub-themes (Leal Filho et al., 2021), and with authors bringing to the fore numerous purposes for universities to engage with sustainability: to reduce energy costs (Horhota et al., 2014) and emissions on campus (Rappaport & Creighton, 2007), to enable and accelerate societal sustainability transitions (Stephens & Graham, 2010), to market the institution as sustainable so as to attract better students (Bardaglio & Putman, 2009), to increase the critical thinking skills in students (Howlett et al., 2016), to address students as future societal leaders (Desha & Hargroves, 2013) and so on. The lack of research and explicit debate on what a sustainable university actually is – in other words, lack of research and debate on the central concept of the research field – is only further reinforced by a general lack of conceptual clarity and theoretical thoroughness throughout the field (Corcoran et al., 2004; Figueiro & Raufflet, 2015; Probst, 2022; Shephard et al., 2019; Viegas et al., 2016).6

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6 Shephard et al. (2019), for example, state that misunderstandings and the lending of concepts from other disciplines and languages has led to slow progress in the field.
This shows us that a foundational issue of the research field on sustainability in higher education, *What is a sustainable university?*, is insufficiently explored and discussed. As illustrated in the previous section, many different stakeholders (and researchers in the field) hold different views on the matter, leaving no unequivocal answer. This need not be problematic in and of itself. Both the university and sustainability are highly complex and contested concepts, which leaves the very notion of the sustainable university an ambiguous one. Any fixed definition would ignore the political choices and normative principles that are part of any possible understanding of sustainable development and the university’s role therein. This having been said, while the inherent ambiguity of the concept of the sustainable university is evident and understandable, this very ambiguity is not acknowledged and empirically analyzed enough within the research field.

This brings us to a second insufficiently explored, yet central issue within research on sustainability in higher education: how exactly higher education systems and practices change and how such change relates to the conceptualization of the sustainable university. As will be discussed in chapter 2, a significant amount of studies concerning sustainability in higher education are seen to focus on integration and change processes. A lot of these studies offer dichotomous accounts of aspects or characteristics that either impede or enable such integration and change (Blanco-Portela et al., 2017). Alternatively, others present (often descriptive) case studies of how sustainability was integrated in individual practices (as will be discussed in sections 2.2.2 and 2.2.4). What is lacking, however, is more systemic, theory-driven approaches to understanding the complexity of how higher education systems and practices change. Furthermore, as Köhler et al. (2019) pointed out in relation to the field of transitions research (which this thesis also relates to and draws upon), it is necessary to “combine in-depth attentiveness to particularity [i.e. case studies] with the development of generic insight” (p. 18) on how change takes place. In other words, it is necessary to transcend this dualism between detailed case studies on the one hand, and more generalized accounts of change on the other hand.

### 1.3 Focus of the thesis

Two issues now form the focus point for this thesis. (1) *The very notion of ‘the sustainable university’ is under-researched and undertheorized.* While there are a multitude of actors urging universities to take up their role in relation to sustainability, the actual conceptualization of the sustainable university is not adequately scholarly discussed and empirically analyzed. (2) *Change*

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7 As was, for example, also pointed out by Hallinger and Chatpinyakoop (2019).
processes aimed at integrating sustainability within higher education systems and practices are not adequately empirically analyzed. More research is needed on how change processes towards more sustainable higher education systems and practices take shape.

This thesis is constructed around a core of four papers, each addressing one or both of these issues: Paper I is a systems analysis of the potential for change of a higher education system. Paper II is a discourse analysis of academic literature on the notion of the sustainable university. Paper III is a case study of how a sustainable higher education practice takes shape in relation to the current higher education system. Paper IV is a case study of how, in that same sustainable higher education practice, the sustainable university is conceptualized and given shape.

In addition to focusing on these two issues, this thesis also focuses on different levels of abstraction. The first two papers – the systems analysis (paper I) and the discourse analysis (paper II) – focus on a higher level of abstraction: generalized patterns over time and space. I refer to these institutional and discursive patterns as part of an “institutionalized environment”. Through the two case studies (papers III and IV), the thesis also focuses on what happens in a concrete micro-level practice, but does this in relation to the results of papers I and II respectively. This means that the thesis connects these different levels of abstraction and that papers I and III; and II and IV are consequently interlocked. A brief introduction of the four papers in the remainder of this section will clarify this, after which I can continue to specify the purpose of the thesis in the next section (1.4).

In paper I, an analytical model from the field of transition studies is used in a case study of the Flemish (North-Belgian) higher education system8 to analyze how the current dominant system might affect a transition towards a more sustainable configuration. First of all, paper I maps out the most important characteristics that make up the higher education system in Flanders and explores opportunities and challenges for embedding sustainability in that higher education system. A second function of paper I is that its results are used to enable paper III. It allows to study if and how the (institutional) characteristics of the higher education system come into play in a sustainable

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8 Belgium is a federal state consisting of three communities (the Flemish Community, the French Community and the German-speaking Community) and three regions (the Flemish Region, the Brussels-Capital Region, and the Walloon Region). The capital Brussels partly falls under the Flemish and partly under the Walloon community. The subnational entity Flanders refers to the Flemish Region and the Flemish Community, the latter also partly situated in Brussels. Because educational policy is distributed to the level of the communities, Flanders has its own educational policy, and hence its own higher education system. Flemish higher education thus entails all higher education institutions in Flanders and the Dutch-speaking higher education institutions in Brussels.
higher education change practice and how this affects the kind of educational practice that is developed.

Paper II is a discourse analysis of the literature (i.e. 4584 academic publications) on the university–sustainability nexus. First of all, paper II develops knowledge on how the sustainable university is understood and conceptualized in academic literature. This provides valuable insights into the research field, but also offers an analytical starting point for further empirical research on how the sustainable university is developed in sustainable higher education practices. The latter thus serves a second function in and of itself, making the study in paper IV possible. In paper IV, the results of paper II are used as an analytical model to study how those involved in the change practice relate to different discourses of the sustainable university. Paper IV explores if and how the identified discourses in paper II affect the studied change practice and what kind of sustainable university is conceptualized and given shape in that practice (e.g. what is taken into account, what is foregrounded and how, what is not in the picture, etc.).

1.4 Purpose of the thesis

The primary purpose of this thesis is to explore and develop knowledge on the two central issues I introduced in the previous sections, which are: (1) how the notion of the sustainable university is conceptualized in research and practice and (2) how change processes towards more sustainable higher education systems and practices take shape. Building on the distinction between different levels of abstraction and on the subsequent brief descriptions of the papers, we are able to phrase the first purpose as follows:

To develop knowledge on the institutionalized environment in which sustainable higher education practices navigate, and on how this environment comes into play in, is affected by, and has an effect on a sustainable higher education change practice.

A few concepts in this rephrased purpose warrant some further elaboration. I use the notion sustainable higher education practice to refer to a practice within higher education in which sustainability has been integrated, for example a single course that is redesigned to also address sustainability. A sustainable higher education change practice is a collective or working group that works to integrate sustainability in a higher education practice. Such a change practice is situated on the micro-level and is the empirical object in the case studies in papers III and IV. The thesis aims to develop knowledge on how such a change practice relates to an institutionalized environment. This refers to the wider context of more generalized patterns the change practice interacts with. In this thesis, papers I and II can be understood as analyzing aspects of
this institutionalized environment by respectively studying institutional and discursive generalized patterns.  

This implies that the main purpose of this thesis is not to merely look at singular sustainable higher education practices or singular writings about this topic. Instead, I look explicitly at more generalized patterns (characteristics of the dominant higher education system and discourses in international peer-reviewed literature) and how these can come into play in, are affected by, and have an effect on how educational change is made in sustainable higher education change practices.

The second purpose of the thesis is methodological and can be described as an exploration of different ways in which the two central issues can be studied and understood. Throughout the four papers, different methodological approaches are introduced from other fields or are developed to explore what they (not) make possible to reveal and understand. Offering a methodological contribution is an important aim of this thesis which is for example also reflected in the expansive methodology chapter in this manuscript. This means that the thesis aims at knowledge and methodology development to advance the research field on the university–sustainability nexus.

Thirdly, with the thesis I also hope to inspire a well-informed, in-depth and more precise debate (scholarly and in practice) on what a sustainable university might entail. Based on my personal experiences with sustainability practices in the university (based on being involved in sustainability initiatives at Ghent University and on many conversations and interviews with lecturers and other higher education staff with a passion for embedding sustainability in their university) I observed that offering additional tools (vocabulary, typologies…) could be useful for discussing these matters more accurately.

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9 The institutionalized environment studied in this thesis thus refers to the combined object of knowledge of papers I and II. The characteristics of the dominant higher education system that are identified in paper I transcend the level of the idiosyncratic university in which the case of papers III and IV is situated. The discourse analysis in paper II identifies discourses across 4584 academic publications. “Discourses” are here understood in line with the discourse-theoretical background of paper II in which a broader definition of text as materializations of meaning and a broader definition of context as the social is used. This is elaborated in paper II, and in sections 3.2.2 and 4.2. of this kappa.

10 An interesting aspect of studying higher education is that the researcher often is a part of the very thing she is studying. This overlap will reappear a few times throughout this thesis, but, in reference to myself, here it means that I have first-hand experience in sustainability practices, projects, and movements in higher education. When I was a researcher at Ghent University, I worked on an internal research and innovation project on sustainability and on a Government-funded project on sustainability in the Flemish higher education system. The latter formed the impetus for the presented PhD project. These conversations revealed a variety of manifestations, perspectives, approaches and conceptualizations regarding the relation between the university and sustainability. While often very skilful and knowledgeable about embedding sustainability in their university, probing questions about the intended outcome and reasons for doing it all too often led to responses such as “because it is important”, “because we have to” or “because it is our responsibility”.

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Besides enabling the debate, this thesis also wants to instigate the debate on what a sustainable university could be or should be. The central argument here is that what the sustainable university is, has been taken for granted for too long. The aim here is thus to question what might have been taken for granted and in doing so to make new things possible. Simons et al. (2005) describe such a goal fittingly: “To let appear the present as a question […] exposes the present and brings it out of position” (829). By reformulating and representing an ongoing situation, in this case how the sustainable university is commonly conceptualized, it becomes exposed and alternative conceptions become possible. In this sense, I follow Allen (2018, p. xiii) in seeing science (and this thesis) not as a guide, but as a support. Instead of leading the way towards the ultimate sustainable university, I wish to support others by opening up and enabling a debate on what the most desirable sustainable university might be. The envisioned outcome of this thesis is thus to instigate and enable questioning, discussing and building (c.f. Latour, 2004) understandings of what a sustainable university is, could be or should be. Through the knowledge development described above, this is something this thesis also wishes to contribute to.

1.5 Research questions

This thesis can be understood as essentially addressing 8 research questions. Research questions 1 - 4 are the primary research questions of the thesis which are in line with the first purpose as described in the previous section. Research questions 5 - 8 are methodological research questions and are thus related to the second purpose of the thesis. The four primary research questions are:

RQ1. What institutionalized characteristics of a higher education system can potentially play a role in the process and outcome of the integration of sustainability in higher education?

RQ2. What dominant discourses on the sustainable university can be identified in the academic literature on the university–sustainability nexus?

RQ3. How are institutionalized characteristics of the current higher education system acted upon in a sustainable higher education change practice and how does this affect (a) the meaning of these characteristics and (b) how sustainability is embedded in the curriculum?

RQ4. How is the sustainable university conceptualized and how does it take shape in a concrete higher education change practice aimed at embedding sustainability in the curriculum?

Finally, the thesis also has four methodological research question.
RQ5. How can the way the current higher education system plays a role in the integration of sustainability be analyzed in a systemic and theory-driven way?

RQ6. How can discourses on the sustainable university be empirically and systematically analyzed in a large corpus of academic publications?

RQ7. How can we analyze how characteristics of the higher education system are acted upon in a sustainable higher education change practice aimed at embedding sustainability in the curriculum?

RQ8. How can we analyze how the sustainable university is conceptualized and takes shape in a sustainable higher education change practice aimed at embedding sustainability in the curriculum?

While these research questions are also addressed throughout this manuscript, the four papers that form the core of this thesis each mainly address a specific research question. Figure 1.1. shows the four papers of this thesis and which research questions are primarily addressed by which paper.

![Figure 1.1. Representation of how the eight research questions relate to the four papers.](image-url)
Chapter 2.
Prior research on the university–sustainability nexus

2.1 Introduction

Research dealing with the relation between the university (or higher education) and sustainability – or in other words: the university–sustainability nexus – has known a remarkable growth in the past decade (Alejandro-Cruz et al., 2019) and has grown into “a substantial research field” (Probst, 2022, p. 1). This second chapter provides a discussion of this prior research on the university–sustainability nexus. It provides a structured and focused overview of the knowledge base this thesis intends to add to.

This thesis has a double relationship with the literature presented in this chapter. First of all, the thesis connects to and builds upon the prior research on this topic. It addresses and intends to offer a contribution towards a number of gaps, tensions, and limitations which I bring to the fore and discuss in this chapter. Secondly, this literature is also in itself the object of study of one of the studies of this thesis: a discourse analysis of how the sustainable university is conceptualized in the academic literature (paper II). This means that throughout the chapter, I also signpost a number of points that specifically relate to this discourse analysis.

There are different ways to find one’s way through the literature on the university–sustainability nexus. One very popular way is to look at domains or areas in which the university can be engaged with sustainability. A rather thorough example is offered in the encyclopedia on sustainability in higher education (Filho, 2018) in which a number of categories are presented:

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11 Research on the university–sustainability nexus is approached from within different wider academic fields (environmental & sustainability education [ESE], educational theory, higher education studies, but also more non-educational fields as I will discuss in section 2.3 in this chapter). The main focus of this chapter lies on ESE research that is dedicated to higher education. However, I also use a wider lens where relevant (e.g. in section 2.5). In the literature, this ESE research on higher education is sometimes referred to as research on sustainability in higher education or higher education for sustainability.

12 Similar examples are discussed in paper II.
campus greening, design, operations, and carbon impacts; policy-making, visioning, structures, management, and strategies; research and transformation; students and stakeholders’ initiatives and involvement; and teaching, learning, and competences. Such a topical division can be useful and says something about the themes addressed by scholars in the field. This chapter is constructed in a particular way to complement this approach. I use four specific angles to approach the literature. Each in its own way allows me to highlight a number of trends, tensions, limitations, and positions in the field which this thesis addresses or relates to. In section 2.2, I present a review of reviews with which I highlight four trends in the literature which are relevant for this thesis. In section 2.3, I introduce two fault lines which help to grasp the diversity of the literature. This thesis addresses this by connecting it to the concept of the sustainable university. Section 2.4 zooms in on the specificity of sustainability and its didactical implications for teaching and learning practices. Section 2.5 connects the thesis to the wider academic literature on higher education. The chapter ends with a conclusion in section 2.6.

2.2 A review of reviews

Research on environmental and sustainability education in higher education is a rather novel field of study (Alejandro-Cruz et al., 2019), but there are already a lot of literature reviews on the topic. In the present section, I use these reviews as a point of entry into the field: I conduct a review of reviews (or meta-review) in which I identify four larger patterns or trends that connect to the purposes of this thesis as presented in section 1.4.

The approach of a meta-review is chosen because it allows to identify and critically discuss large patterns of similarity in the field regarding what kind of research has been done and what is deemed important and problematic. The focus of this review of reviews is on the topics and the findings of the reviews. This makes it possible to point out and relate this thesis to two recurring theoretical-methodological points of critique (discussed in sections 2.2.1 and 2.2.2) and two trends regarding the topic and focus of studies in the field (discussed in sections 2.2.3 and 2.2.4).

2.2.1 A lack of conceptual clarity and theoretical thoroughness

A first often-recurring point of critique that comes to the fore in many reviews is a lack of conceptual clarity and theoretical thoroughness: Important concepts are not sufficiently defined and there is a lack of (educational) theoretical foundations in many papers. Figueiro and Raufflet (2015) for example state in their systematic review on sustainability in management education that most
studied articles lack consistency in the conceptual framework and lack reference to educational theory. In an extensive and thorough systematic analysis using the Proknow-C method, Viegas et al. (2016) find an “existing lack of depth and comprehensiveness” in literature on the university–sustainability nexus. Shephard et al. (2019) make a similar analysis of substantial internal contradictions and inconsistencies throughout the literature, claiming that miscommunications and misunderstandings regarding basic concepts such as democracy, pedagogy, learning outcome, competence, ability, and Bildung leads to slow progress of the field. They state that concepts “need to be defined clearly with respect to their educational context” (p.544) and that it is necessary to reflect on whether or not there is some sort of consensus in the field on what the central concepts are and what they mean. Based on a review of the empirical evidence in 357 studies, Probst (2022) also states that more attention should go to conceptual clarity, “rather than further conflating different learning gains in seemingly holistic concepts that mainly serve to stifle the meaningful debate” (p. 16). Probst notably also found that most reviewed studies were undertheorized regarding the relationship between specific teaching practices and learning outcomes.

An important attempt to substantiate the theoretical underpinnings of the field by clarifying a central concept, can be seen in a number of reviews that (partially or completely) focus on competences. A review by Wiek et al. (2011) forms an important milestone in this process. Wiek et al. present a reference framework for academic program development and identify five key competencies for sustainability: systems thinking, anticipatory thinking, normative thinking, strategic thinking and interpersonal competencies. As Google Scholar tells us it is cited 2947 times13, it is safe to say that Wiek et al. (2011) put competences on the map. Lozano et al.’s (2017) review analyzes competences and pedagogical approaches in the literature and contributes to the body of work by connecting them in a framework of twelve sustainability competences and twelve pedagogical approaches. They underline the importance of providing students (as future leaders, decision makers, educators, and change agents) with a complete set of sustainability competences. Lozano et al. (2017) plead that the field should have more attention for curricular work related to integrating sustainability in higher education. Linking competences with the what and how of teaching (or in other words: ends and means) is crucial for this to succeed. Shephard et al. (2019) share a similar interest in sustainability competences, but instead of identifying different competences, they study how the terms “competence” and “capability” are used in papers on (higher) education for sustainable development and identify a number of contradictions and inconsistencies in how these concepts are used. Competences indeed take up a prominent position in the literature on the university–

13 On March 25th 2024.
sustainability nexus. Even to such an extent, that the topic of competences emerges as separate from education in itself. For example, Caniglia et al. (2017) discuss goals related to competencies as separate to those related to educational programs.

The discussion in this subsection shows that the lack of conceptual clarity and theoretical thoroughness is an often-recurring concern and point of critique in reviews of the field. This thesis shares this concern and intends to contribute to addressing the issue by exploring how arguably the pivotal concept of the field – the sustainable university – is dominantly conceptualized in the literature. This relates to the first central issue in this thesis as introduced in sections 1.3 and 1.4 of the introduction chapter.

2.2.2 Methodological rigor and the researcher-practitioner overlap

This thesis also addresses a second object of concern that recurs in a number of reviews on the field: a lack of methodological rigor. Figueiro and Raufflet (2015), for example, state in their systematic review on sustainability in management education that most studied articles are descriptive in nature. Barth and Rieckmann (2016) criticize the state of the art of research on sustainability in higher education because they observe a strong predominance of descriptive research that does not meet the necessary quality standards. They hence also call for more methodological rigor and more comparative research. Barth and Rieckmann (2016) emphasize the severity of their call, noting that about one third of the articles in their review did not give details on the data collection and analysis process. In her review, Probst refers to Barth & Rieckmann’s 2016 paper, stating that “there has been little methodological progress” made ever since (Probst, 2022).

This general lack of methodological rigor can be related to two additional observations. Barth and Rieckmann (2016) problematized the predominance of descriptive research in the field in relation to the large amount of case studies, as 51.3% (n=265) of the articles they reviewed were case studies. Probably the most striking critical assessment of the amount and quality of case studies in the field was by Corcoran, Walker, and Wals (2004). In “Case studies, make-your-case studies, and case stories: a critique of case-study methodology in sustainability in higher education”, they underline the potential of thorough case studies if the research methodology is properly theorised and understood, something they argue is all too often not the case in this field of study. Probst (2022) problematizes that of the 357 publications she reviewed, most studies were case-driven and aimed to confirm the effect of a specific teaching practice. Whereas Findler et al. (2019) find that this high prevalence of case studies (see also reviews by Hoover & Harder, 2015; Lozano et al., 2015; Menon & Suresh, 2020) somewhat impedes academic advancement of
the field, Corcoran et al. (2004) underline the importance of improving their methodological rigor and understanding and communicating their purpose and potential.

A second observation related to methodological rigor is what I describe as the researcher-practitioner overlap. This refers to the observation that many researchers in the field are actually also practitioners (i.e. lecturers) in the cases they study. As Probst (2022) points out: “For the most part, the studies were reflections on specific courses conducted by the implementing lecturers themselves rather than deliberately designed comparative studies” (p. 17). Seven years earlier, Figueiro and Raufflet (2015) already pointed out that research on sustainability in management education often contains the author’s own experiences in practices: it is “an area whose authors, as professors and lecturers, are both practitioners in the field and authors of the articles simultaneously” (p.30). A lot of the literature in the field is thus written by practitioners (i.e. lecturers) themselves. In these publications they then reflect on or evaluate their own practices. This also implies that many authors in the field do not have an educational background while writing about educational practices.

In relation to the second purpose of this thesis, I intend to contribute to addressing the methodological concerns I brought together in this section in three ways: by actively exploring alternative ways of empirically analyzing sustainability in higher education, by giving detailed accounts of the methodological approaches used in this thesis, and by connecting the empirical analysis of cases with more overarching concepts and theories of change. However, the descriptive nature, the many case studies, and what I labeled the researcher-practitioner overlap also offer methodological opportunities. It implies a close connection between the academic literature and what happens in practice, which means that it can be argued that analyzing this literature also says something about practice. This connection is argued for in section 4.2.3 (in terms of a double object of knowledge) and is empirically investigated in paper IV in which I connect the results of a discourse analysis of the literature (paper II) to what happens in a sustainable higher education change practice.

2.2.3 Focus on sub-themes

A third point I wish to highlight here is the large degree of fragmentation in the field. In a review article focusing on trends in scientific publishing about the university and sustainability, Leal Filho et al. (2021) identify a “trend towards a fragmented discourse” (p. 7), referring to an increasing focus on sub-themes in the field. Leal Filho et al. see this reflected in the topics researchers

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14 This is a concept that I loosely based on the “victim-offender overlap” which refers to the relation between victimization and offending in criminological and victimological research (see e.g. Averdijk et al., 2016)
write about, but also in the amount of special issues in the field. Even within one specific sub-theme – sustainability in management education – Figueiro and Raufflet (2015) find fragmentation in terms of issues, methodologies, theoretical frameworks, research issues etc. Findler et al. (2019) come to a similar conclusion as Leal Filho et al., and relate a general lack of a more holistic perspective on the impact of higher education institutions on sustainability with the strong focus on case studies dealing with specific projects. Fragmentation and a focus on case studies seems to impede more holistic approaches to and understandings of the university’s relationship with sustainability. Rieg et al. (2021) do observe an increasing amount of high-quality studies that approach the integration of sustainability more holistically. They did, however, only find 33 studies to include in the study.

The very idea of a literature review relates to overcoming this fragmentation and offering a more overarching understanding of the field. This aim is for example explicitly mentioned in the reviews by Findler et al. (2019) and Menon and Suresh (2020). However, the focus on sub-themes as described by Leal Filho et al. (2021) is also mirrored in how a large amount of reviews on the topic specifically seem to focus on sub-themes. Reviews on specific educational programs such as engineering education (e.g. Thürer et al., 2018), methods for assessing higher education institutions (Gutiérrez-Mijares et al., 2023), on specific ways to move universities to take up the glove such as student-led action (Murray, 2018), on specific topics such as sustainability leadership (Aung & Hallinger, 2023) and disciplinary priorities in engineering and management education (Barth & Rieckmann, 2016), and so on. Publications in the field being published in a wide spread of journals further adds to this general fragmentation (Findler et al., 2019).

This thesis relates to this fragmentation in a number of ways. First of all, it addresses the more overarching question of what the university in relation to sustainability is, could be, or should be. This can be understood as an attempt to supersede this fragmentation. Secondly, to make this more specific, in a discourse analysis of academic literature (paper II), the thesis identifies dominant conceptions of the sustainable university, which is a way to transcend the abovementioned fragmentation by referring to what arguably is the central concept of the field. Finally, this thesis connects what happens in micro-level practices to aspects of a larger more institutionalized environment.

2.2.4 Integration and change processes

Another trend becomes visible by further zooming in on the focus of many reviews on the university–sustainability nexus. There seems to be a dominant focus in the literature on the act of integrating sustainability in universities. With this I refer to the focus on the process of integrating and implementing sustainability in all aspects of the university. In other words: the process of
integration becomes central, not the desired educational configuration nor the reasons for doing this. The examples are paramount. A number of reviews explicitly focus on factors that affect the implementation of sustainability. Velázquez et al. (2005) identify factors that could obstruct the implementation of sustainability in universities. This study thus focuses on obstacles for the success of sustainability initiatives in universities, although it is stated that much can be resolved with clear enforceable sustainability policy. Also the earlier mentioned review by Thürer et al. (2018) has a related focus, looking at 247 studies on the implementation of sustainability in the engineering curriculum.

Another review, by Blanco-Portela et al. (2017, p. 576), found a “high number of publications on the drivers and barriers to change in Higher Education Institutions”. These drivers and barriers are structured according to the level (individual, groups, and organization) and the “attitude” (informational, emotional, behavioral, and systemic) and are compared to those found in companies. The article focuses on the “way towards sustainability” (p. 567), but fails to specify what the final destination of this way is. The question remains unanswered if these drivers and barriers are affected by the end goal of this integration process. Hoover and Harder (2015) also contribute to developing this research agenda on organizational change by presenting a meta-ethnography of 13 qualitative studies. They identify hidden complexities (i.e. contradictions and tensions) in the implementation of sustainability in the university that lead to barriers to change, for example a tension between discourses of collaboration and competition. Caniglia et al. (2017) present a review of 46 articles on transnational collaboration between universities to advance sustainability research and teaching. Whereas these kinds of collaborations are said to advance the integration of sustainability, the main goal of this paper is to help advance transnational collaboration. This is done by providing information and inspiration and by reporting challenges and strategies.

The high prevalence of publications on integrating sustainability was also reported in reviews with a different focus. Cheeseman et al. (2019) present a review of policy literature (91 articles) with a focus on the uptake of sustainability policies in universities but they too find that the “vast majority” of papers reviewed discuss drivers and barriers. Other reviews refer to this topic in their conclusions and recommendations. A review discussed above in relation to the lack of conceptual clarity which focuses on depth and comprehensiveness of our understanding of sustainability in the university ends with a very specific vocabulary: “benchmarking [...] mitigate barriers [...] the best means [...] incentivate communities [...] build strategies for leverage [...] best practices to achieve [...] most effective means” (Viegas et al., 2016, p. 270) in

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15 Similar tensions can be found in the results of paper I, especially in the opportunities for further integration of sustainability. An all too pragmatic approach to this can lead to conceptual tensions, Hoover and Harder show in their paper.
such a way that the paper inscribes itself into this thread of contributing to the integration of sustainability as the highest purpose. The literature on sustainability funding in universities, as reviewed by Montenegro de Lima et al. (2020) can as well be interpreted as focusing on the role funding plays in the integration of sustainability. Also the systematic review of 63 articles on sustainability in management education by Figueiro and Raufflet (2015) identified that the literature often holds a strong focus “on the range of challenges in promoting sustainability in management education” (p. 30). Finally, reviews of methods for assessing higher education institutions (Gutiérrez-Mijares et al., 2023) can also be seen as part of a focus on the integration of sustainability in higher education institutions.

Integration and change processes appear to be a dominant trend in the literature. This thesis builds upon this prior research and offers a contribution by introducing an analytical framework from the field of transition studies (the multi-level perspective, see section 3.2.1) and by attempting to supersede the above-mentioned dichotomy between drivers and barriers or enabling and impeding factors (see paper III and see section 4.3 for the methodological approach).

2.3 Fault lines in literature on the university–sustainability nexus

In the previous section, reviews on ESE in higher education were used as a lens to make four points that connect closely to the purposes of this thesis. Because reviews by definition transcend the level of individual papers, this led to observations on what many papers in the field have in common. The present section complements this by using a different approach. I zoom in on the different ways within which the literature on the university-sustainability nexus presents how universities can address sustainability. I use this to construct two fault lines: (1) between educational and non-educational approaches to sustainability in higher education, and – within the former – (2) between instrumental and open-ended approaches to education.

A few things need to be said about this approach. First of all, these fault lines should be understood as focal points for discussion or points of contention in relation to which a spectrum of approaches arises. Fault lines as a concept is thus not used in this section in a dichotomizing way. Secondly, the focus of this section is not on specific contextual differences and historical trajectories in the field. Instead, the aim is to use the concept of a fault line

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16 The same applies to the discourse analysis of academic literature in paper II, as argued for in section 4.2.3 in relation to “the corpus in time and space” (the concept “corpus” refers to a collection of texts subject to data mining).
to get a grasp of the diversity of the research field on the university–sustainability nexus.

2.3.1 Educational vs. non-educational approaches

This first fault line I wish to introduce here is related to how sustainability is addressed by universities. A good way to explore this topic is by looking at a recurring theme in research on the university-sustainability nexus: the categorizing of ways in which the university can engage with sustainability. The university is commonly understood in relation to three main “tasks” (or pillars, roles, functions, dimensions, constitutive elements etc.): teaching, research, and public service (see e.g. Biesta et al., 2009; McCowan, 2020). A number of sustainable university scholars have developed their own interpretation of these three tasks in order to grasp the multitude of ways attention for sustainability can find its way into the university (see e.g. Filho, 2011, 2018; Findler et al., 2019; Henderson et al., 2017; Leal Filho et al., 2021; Lozano et al., 2015; McCowan, 2020; Sedlacek, 2013). Henderson et al. (2017), for example, discern five domains: governance, education, campus operations, research and community outreach. Findler et al. (2019) focus on education, research, outreach, campus operations and campus experiences. McCowan (2020) discusses five modalities of action: education, knowledge production, service delivery, public debate and campus operations. Whether they have 3, 5, 7 or even more categories, these kinds of distinctions mainly serve the analytical purpose of complexity reduction: They allow to categorize different ways in which the university can engage with sustainability. Furthermore, they basically all follow a rather similar pattern, referring to education and research, complemented with some combination of outreach, campus, internationalization, collaboration, community work, campus operations, HR, campus experience, competences etc.\textsuperscript{17}

The literature on the university–sustainability nexus primarily seems to focus on two of these approaches: education (incl. competences) and campus operations (Lambrechts et al., 2018; Vaughter et al., 2013; Wals & Blewitt, 2010; Wals, 2014) which reveals a first fault line in the field: Between approaches that focus on the educational aspects of the university and non-educational approaches. Educational approaches relate closely to the wider ESE research and focus on topics such as sustainability knowledge (as educational purpose), sustainability skills and abilities, sustainability attitudes and values, sustainability behavior, and sustainability competences (Probst, 2022). The latter, of which Wiek et al. (2011) can be seen as a seminal paper, is an important topic in the field (as already touched upon in the review of reviews in

\textsuperscript{17} These categorizations are also used in the analytical approach of the discourse analysis of academic literature (see paper II and the description of the methodology in section 4.2).
section 2.2.1). Within these educational approaches, we can find another fault line: between instrumental and open-ended approaches (Lambrechts et al., 2018). This will be addressed in the next section (2.3.2).

Non-educational foci in research on the university–sustainability nexus primarily relate to so-called greening the campus programs (Lambrechts et al., 2018). Some, for example, focus on creating plastic-free campuses (Nguyen et al., 2022), reducing carbon emissions of university campuses (Aghamolaei & Fallahpour, 2023), environmental assessment of university campuses (Leon et al., 2018), sustainable campus initiatives in general (Amaral et al., 2020), or resource and material flows on campus (Kumdokrub et al., 2023). These non-educational approaches are an important phenomenon in the field. In the first decade of this century, studies on reducing the ecological footprint of higher education institutions were even dominating the International Journal of Sustainability in higher education (Wals & Blewitt, 2010). While these examples are clearly non-educational, others that for example aim at behavior change in a non-educational way could also be placed at this end of the spectrum. Nudging approaches, for example, are commonly discussed in the field (Franchini et al., 2023; Wongprawmas et al., 2023) but could arguably be seen as non-educational.

This subsection started off within the field of ESE in higher education, but made clear that the university is also called upon to address sustainability in non-educational ways. This is first of all acknowledged in this thesis by also incorporating non-educational characteristics in the systems analysis in paper I. Secondly, because non-educational aspects in which the university can address sustainability come to the fore in and beyond literature on ESE in higher education, it is necessary to also investigate how exactly the sustainable university is approached and framed across these different approaches. This makes it clear that, in order to understand how the university is approached in academic literature (which is the aim behind research question 2, see section 1.5), it is necessary to not only look at the specific literature that focuses on ESE in higher education but to use a wider lens. This is done in this thesis in a discourse analysis of academic literature in paper II.

2.3.2 Instrumental vs. open-ended education

A second fault line I wish to bring to the fore here zooms in on the educational of the previous section. For this, I build on one of the central debates in the wider field of ESE research: between instrumental/normative approaches on the one hand, and more open-ended, emancipatory, and transformative forms of education on the other (Garrison et al., 2015; Lambrechts et al., 2018; Van Poeck & Vandenabeele, 2012; Wals, 2010).

On the one end of this continuum, scholars argue that instrumental approaches to ESE are necessary because of the urgency and severity of
environmental problems: Without an instrumental approach, ESE might not achieve its purpose (Kopnina, 2012). Referring to Wildemeersch’s (1998) description of instrumental environmental education, it is possible to describe instrumental ESE as education that aims at making people behave more sustainable (or environmentally friendly, ecological…) in which the meaning of behaving more sustainable is predefined and undisputable. Consequently, it can be described as education that has a clear and pre-defined goal in terms of changing the student’s behavior or in terms of installing a certain set of knowledge, skills and attitudes in the student. The aim is to “integrate competences in order to ‘solve’ sustainability issues” (Lambrechts et al., 2018, p. 2), understood as a set of knowledge, skills, attitudes and values that allow the student to cope with sustainability issues (Lambrechts & Van Petegem, 2016).

Instrumental approaches to ESE have been criticized as undemocratic (Van Poeck et al., 2014) and incompatible with educational goals as emancipation and critical thinking (Gough & Scott, 2003). This critique can also be related to a broader philosophical concern about the instrumentalization of education for tackling societal and political problems (Säfström & Östman, 2020; Van Poeck & Östman, 2020). Besides undesirable, instrumental and normative approaches to ESE can also be seen as impossible. Biesta (2007) for example problematizes understandings of education as a linear process of which you can clearly pre-define the outcome.

A number of authors thus plead for other understandings of what education should do in relation to sustainability issues. This brings us to the other end of this spectrum where we find more emancipatory and open-ended approaches to ESE (Gough & Scott, 2003; Ideland & Malmberg, 2015; Jickling & Wals, 2008; Singer-Brodowski et al., 2022). In such approaches, the focus is on the critical and transformative capabilities of the learner (Jickling & Wals, 2008). Lotz-Sisitka et al. (2016) further differentiate between transformative learning and transgressive learning. Transformative learning is a broader category related to cognitive, emotional and potential social change while transgressive learning has been described as a form of transformative learning that is aimed at challenging specific normalized aspects of society (Lotz-Sisitka et al., 2016). Pluralistic ESE can also be discussed in relation to this end of the spectrum. This is a conflict-based approach in which students are brought into contact with different perspectives, views and values regarding sustainability.

18 The concept of ESE (i.e. environmental and sustainability education) is a combination of the environmental education of which Wildemeersch spoke in 1998 and the more recent concept of education for sustainable development. The latter’s introduction was subject to an entire debate of itself, which is not relevant for this thesis.
issues (Öhman & Östman, 2019a). Discussions are a central part of such pluralistic ESE.

Pluralistic ESE has been the focus of a large amount of research (Tryggvason et al., 2023), not in the least in the context of a wider discussion of so the so-called teaching (or selective) traditions of ESE\(^{19}\) (Öhman, 2009; Öhman & Östman, 2019a; Sund & Wickman, 2011): the fact-based tradition, the normative tradition, and the pluralistic tradition. These three traditions differ regarding the why, what and how of ESE; the aim and purpose of ESE, the nature of the content, and the teaching method (Öhman & Östman, 2019a). The fact-based tradition focuses on teaching facts and information to students, trusting that students who have enough information will be able “to judge between different political alternatives in sustainability issues” (Öhman & Östman, 2019a, p. 80). In this first tradition, the democratic process takes place after education. In the normative tradition: students are to adopt the desired sustainable behavior and attitudes which were selected by the teachers in advance. In the third tradition, sustainability issues are seen as political, so students should learn to take a stance and have critical discussions as part of the democratic debate.

These three traditions link back to the fault line between instrumental and open-ended ESE in a number of ways. First of all, there is an overlap between the normative tradition and instrumental approaches to ESE. In this sense, the normative tradition helps us to better understand the nuances and implications of instrumental ESE. Secondly, the traditions present a vocabulary that enables to talk about the different possible purposes of ESE, or at least the different types of purposes.

This discussion on instrumental and open-ended approaches to ESE is rather important in the field. However, as has become clear in the preceding paragraphs, this should not be understood in a dichotomic way. The instrumentality vs. open-endedness dichotomy might be a false dichotomy and obfuscate what is really at stake. Despite the many pleas for open-ended education, it can be asked if education can be anything else but purposeful. Biesta, for example, claims that education is teleological by definition (Biesta, 2015). Ferreira (2009) discusses this issue specifically in relation to the instrumental vs. open-ended education divide in ESE, stating that all education has a purpose, even this so-called open-ended education, but that what counts is what this purpose is, that is: what kind of person is shaped (e.g. docile eco-friendly citizens vs. critical thinkers). Consequently, she claims that the debate should focus on what this purpose is, instead of whether or not there is a purpose.

\(^{19}\) The concept of the three selective traditions was developed in relation to environmental education, but since it can be stated that the discussion between environmental education and education for sustainable development in the research field has come to an end, I relate it to the notion of ESE (environmental and sustainability education).
This fault line between instrumental and open-ended education presents a glimpse of the diversity of approaches to education in the academic literature on ESE in higher education. This is further empirically investigated in this thesis in relation to the concept of the sustainable university (see paper II).

2.4 The (assumed) specificity of sustainability as educational content

A recurring topic in the literature on sustainability and on ESE is what makes sustainability special or unique. This of course has its effect on teaching and learning practices. In this third approach to understanding research on the university–sustainability nexus, I will zoom in on how the specificity of sustainability, as central educational content, is framed and understood. In a first subsection, I will zoom in on the specificity of sustainability and sustainability issues in general. Here, the focus is on the wider sustainability, policy, and transition literature to explore how sustainability issues are said to differ from other scientific and societal problems. This is used to get a first glimpse of how sustainability’s specificity might affect what happens in teaching and learning practices. In the second subsection (2.4.2), the focus shifts to which specific challenges for teachers are discussed and empirically investigated in the wider ESE literature. These challenges are a popular theme in the literature and discussing them here gives a valuable insight into how the research field approaches the specificity of what happens (or might happen) when students and teacher meet sustainability as content. The second subsection thus has a more clear didactical perspective and relates to the case studies of a sustainable higher education change practice in which sustainability is embedded in an educational practice (see papers III and IV).

While the discussion in this section is not always specific to higher education, it does point to important and relevant elements for sustainable higher education research. In doing so, it also paves the way for the final section of this chapter in which sustainability is situated within the wider higher education literature.

2.4.1 Sustainability and its (assumed) specificity

There are a number of concepts and categorizations in the wider literature on policy, transitions, and sustainability that are used to grasp the specificity and complexity of sustainability and sustainability issues. In this section I will introduce three such accounts: unstructured problems (Hisschemöller & Hoppe, 1995), post-normal science (Funtowicz & Ravetz, 1993), and wicked issues (Rittel & Webber, 1973). Before venturing into this literature, I will first
briefly elaborate on the definition of sustainability and sustainability issues in the next paragraph.

Besides referring to a complex phenomenon (as described below), sustainability as a concept is in itself ambiguous, evading any fixed and set definition. There are many accounts of sustainability’s ambiguity and conceptual fluidity but in essence, sustainability always has to do with the intersection of socio-economic and ecological concerns (e.g. Block & Paredis, 2019; Hopwood et al., 2005). Sustainability thus refers to the connectedness and attempted reconciliation of socio-economic and ecological concerns (Viegas et al., 2016). Sustainability issues, then, are concrete societal issues that combine an ecological and a social (or socio-economical) aspect (Block & Paredis, 2019). They can be understood as the societal issues we encounter in a strive for sustainable development. Because the concept relates to specific socio-ecological issues (such as mobility, biodiversity, climate change), it more clearly refers to potential educational content.

One way to grasp the specificity of sustainability issues is to understand them as so-called “unstructured problems” (Hisschemöller & Hoppe, 1995). This term stems from an analysis of four types of policy problems based on whether or not (1) there is certainty about relevant knowledge to solve the problem, and (2) if there is consensus on relevant norms and values related to the problem. Unstructured problems have neither, which can also be argued for a lot of sustainability issues (Block et al., 2018). This means that dealing with sustainability issues often means dealing with a lack of certainty on relevant knowledge, and with disputed norms and values. Given that sustainability issues are issues where ecological, economic and social concerns are intertwined (Block & Paredis, 2019), this means that a lot of different knowledge and value frameworks come into play, adding to this complexity.

Another description of a category of problems that is used to understand sustainability issues is offered by Funtowicz and Ravetz (1993) in their account of post-normal science. They describe a type of issues related to risk and the environment where the facts are uncertain, the values are in dispute, the stakes are high, and the decisions are urgent. This adds two extra challenging layers to our understanding of sustainability issues of unstructured problems: as important and urgent issues. Funtowicz and Ravetz’ argument is that such problems require and are bringing into life a different type of scientific activity: post-normal science which is “based on the assumptions of unpredictability, incomplete control, and a plurality of legitimate perspectives.” (p. 739).

A third description of sustainability issues that is often used in sustainability research and other disciplines (Lönngren & Van Poeck, 2020) is “wicked

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20 While I use “Sustainability” and “sustainable development” interchangeably, my preference goes out to the former because it has less of a sustained growth connotation (Viegas et al., 2016).
issues” (Rittel & Webber, 1973). In the original paper, Rittel and Webber use the term *wicked issues* to describe social science problems as utterly different from the problems natural scientists and engineers usually deal with (i.e. “tame or benign problems”). Wicked issues are characterized by a lack of a definitive problem definition and a stopping rule. Solutions to wicked problems are good or bad, not true or false. This means that values, personal interests and ideological predilections come into play here (Rittel & Webber, 1973). Furthermore, every wicked problem is essentially unique: some may be similar but “one can never be certain that the particulars of a problem do not override its commonalities with other problems already dealt with” (Rittel & Webber, 1973, p. 165). Although it originated in social policy studies, the concept has found its way into sustainability literature (Lönngren & Van Poeck, 2020), for example by analyzing climate change as a wicked issue (Incropera, 2016), and has also found its way into ESE research (e.g. Block et al., 2019; Lehtonen et al., 2018; Lönngren, 2019; Lönngren et al., 2017). Wicked problems as a concept is not undisputed. It has been criticized for presenting a false dichotomy between wicked and non-wicked issues, being analytically imprecise, being used as a rhetorical device, and leading to paralysis and discouragement (Lönngren & Van Poeck, 2020).

To sum up, I highlighted three concepts that are repeatedly used in the wider sustainability, policy, and transition studies literature to grasp the specificity of sustainability issues: non-structured issues (Hisschemöller & Hoppe, 1995), Funtowicz and Ravetz’ depiction of issues in relation to post-normal science; and wicked problems (Rittel & Webber, 1973). While post-normal science has also been discussed in relation to education (see e.g. Block et al., 2018), mainly the concept of wicked issues has found its way into educational literature, and – even more relevant for this thesis given the case in papers III and IV – into literature on sustainability in engineering education (see e.g. Lönngren, 2019; Lönngren et al., 2017).

Overall, these three accounts of (sustainability) issues share two common characteristics: They emphasize the complexity and the normative character of these issues. This has didactical implications when these issues are brought into teaching and learning practices. In the next subsection, I discuss a number of didactical challenges that are related to sustainability’s specificity as educational content. These challenges are relevant for the two case studies of a higher education change practice in this thesis (papers III and IV).

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21 In line with the overarching theoretical framework of this dissertation, I do not use the term wickedness as an ontological quality of sustainability issues. Issues are not wicked in themselves or by nature, they are wicked because we experience or approach them as such. This also relates to sustainability issues’ wickedness as educational content in teaching and learning practices.
2.4.2 Specific challenges for teaching and learning practices

A recurring topic in ESE literature relates to how the specificity of sustainability issues is said to offer specific challenges for teaching and learning practices (see e.g. Östman et al., 2019a). The lack of unambiguous and uncontested expert knowledge and the social and political controversy surrounding sustainability issues is said to make them to be at odds with common, traditional conceptions of teaching and learning in terms of knowledge transfers and the acquiring of competences, skills, values, attitudes etc. (Van Poeck, Östman, & Ohman, 2019). This has resulted in a wide literature on ESE that elaborates specific challenges sustainability poses to teachers and investigates the ways teachers can address these. In this section I briefly explore this literature. The guiding questions are what types of specific challenges for teaching and learning practices are explored and what these challenges imply for teaching and learning practices? I zoom in on two types of challenges: knowledge-related challenges and political and ethical challenges as these are relevant for the case studies of a sustainable higher education change practice in this thesis.22

Knowledge-related challenges

A first cluster of challenges for teaching and learning practices is knowledge related, that is: related to factual knowledge about sustainability issues and sustainable development in general. In this cluster, we see two types of arguments about the specificity of sustainability appear in the literature on ESE.

A first recurring argument in research on ESE is that sustainability issues lack a stable and uncontested knowledge base (Öhman & Östman, 2019a). This makes that, although consensus on for example climate change grows (Lynas et al., 2021), an important challenge of sustainability that teachers have to deal with is factual uncertainty (Block et al., 2019; Östman et al., 2019a). Sometimes sustainability issues are so complex and interwoven and rely on science-in-the-making that clear-cut answers are not (yet) available. Expert knowledge then sometimes fails to offer unambiguous and uncontested foundations for decision-making (Ashley, 2000). Scientific advice can also be incommensurable and irreconcilable: Different disciplines might suggest different roads of action. Sustainability issues’ threefold character (ecological, social & economic) does not help in this regard. This is an important challenge that teachers have to deal with in addressing sustainability issues in the classroom: How to teach about something of which the knowledge base can be so uncertain?

22 Other types of challenges that have received more and more attention in ESE research are those related to emotional aspects of sustainability issues (Finnegan; Grund et al., 2024; Hickman et al., 2021; Ojala, 2012) and the existential dimension (Bergdahl & Langmann, 2022; Van Poeck et al., 2023; Vandenplas et al., 2023). These are of less relevance for this thesis as they do not come to the fore in the case studies in papers III and IV.
Although this is considered to be a “knowledge problem” for teaching and learning practices, it does not necessarily require a “knowledge solution” in the sense of waiting for more knowledge to be created. Several pathways for dealing with this multi-faceted uncertainty are discussed in the literature. Tauritz (2019) distinguishes between specific teaching strategies to deal with knowledge uncertainty in the classroom, for example by employing a language of conditionality and using appropriate educational goals in relation to the knowledge uncertainty inherent to sustainability issues. As educational goals, Tauritz for example discusses so-called uncertainty competences, which consist of knowledge, skills, strategies, dispositions, values and the ability to mobilize these to deal with knowledge uncertainty. In response to these challenges, others plead for the pluralistic perspective on education in which students can critically assess and discuss a number of different ways of handling sustainability issues (Öhman, 2008; Öhman & Östman, 2019a; see also Tryggvason et al., 2023 for a scholarly review on this topic).

A second knowledge-related challenge that comes to the fore in the literature on ESE is that there seem to be gaps in teachers’ subject knowledge on sustainability issues. This has been highlighted in several empirical studies. Majid et al. (2023) for example find that pre-service teachers lack sufficient knowledge on climate change and sustainability to teach it in a good way in school. Foss and Ko (2019) found that even science teachers were not always more informed about the technicalities surrounding climate change than the general public. Indeed, misconceptions surrounding climate change are present in in-service teachers (Liu et al., 2015). A related issue is that of selecting teaching content and finding ways to teach often complex issues in a good way. Kriewaldt and Lee (2023), for example, find that the challenge for teacher education is to enable teachers to bridge disciplinary knowledge with everyday forms of knowledge by finding the right concepts and ways of explaining. Besides a knowledge issue, it thus also becomes a didactical issue about selecting what to teach and how to teach.

**Political and ethical challenges**

Although some sustainability issues are more controversial than others (see e.g. Alkaher and Carmi (2024) on the topic of population growth), controversy is an inevitable ingredient of ESE (Van Poeck et al., 2014). This makes it challenging and daunting for teachers. The controversy of sustainability issues does not only involve questions of knowledge (Block et al., 2019) but also political and ethical questions: There is controversy surrounding sustainability issues due to a lack of agreement on the norms and values at stake (Öhman & Östman, 2019a). Indeed, sustainability issues are stacked with “value-based dilemmas” (Shephard, 2015). This implies that when you teach about them,

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23 As already introduced in the discussion of two central fault lines in the field in section 2.3.
you introduce value issues into the classroom (Öhman, 2008; Öhman & Östman, 2019c). Here we find a second source of specific challenges: the political and ethical dimensions of sustainability issues.

The political dimension, understood as the engagement with questions (and conflicting views) on how to organize society, receives a lot of attention in didactical ESE research. Some, for instance, have classified a diversity of situations in which the political dimension of sustainability issues appears in ESE practices (Håkansson et al., 2018; Håkansson et al., 2019). Others explored teacher’s different moves in relation to how the political appears in the classroom (Van Poeck & Östman, 2018), the political dimension of discussing the consumption of animal product in upper secondary schools (Lindgren, 2020), or discern between two different approaches to the political dimension of ESE within a pluralistic and conflict-acknowledging framework (Tryggvason & Öhman, 2019).

Closely related to this, Östman et al. (2019a) stress the importance of acknowledging and dealing with pluralism in sustainability teaching. Pluralism can be described as the existence or the acknowledgment of “different visions and opinions on how society should take form” (Tryggvason & Öhman, 2019, p. 116) which has a knowledge aspect (as touched upon above), but also a clear political aspect. Acknowledging this in teaching practices can be done by bringing in different perspectives and types of values (Östman et al., 2019a) and letting students encounter different expressions of the right and the good (Öhman & Östman, 2019b). This pluralistic approach is often discussed in relation to the danger of sliding into a “relativistic tolerance that grants every opinion equal value” (Van Poeck et al., 2014, p. 807). However, a recent scholarly review on the topic noted that empirical research does not seem to point this out as a practical didactical problem, making this risk of relativism mainly a philosophical problem (Tryggvason et al., 2023).

While the political relates to “the best and correct way of organizing society”, the ethical refers to “the best and correct way of acting towards humans and nature” (Östman et al., 2019a, p. 49). It is about the good values that people find desirable and how this translates into actions, for example in who we take into account when imagining a sustainable future (other parts of the world, future generations…) (Öhman & Östman, 2019b). Scholarly attention for the ethical dimension has for example led to research on the moves teachers make to open the space for ethical deliberations (Van Poeck, Östman, & Öhman, 2019), or on didactical tools to support teachers to address global ethical issues (Sund & Pashby, 2019).

The ethical and political dimensions of ESE are often entangled (Östman et al., 2019a). In combination with the factual controversy of these issues discussed above, this brings to mind the concept of wicked issues as discussed in

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24 A similar argument was made by Clifford Geertz (1984).
Indeed, there is a significant body of work on ESE in which sustainability issues are approached or understood as wicked issues (see e.g. Block et al., 2018; Block et al., 2019; Lehtonen et al., 2018; Löngren, 2017; Löngren & Van Poeck, 2020; Singer-Brodowski et al., 2018).

2.5 Sustainability within the wider higher education literature

In this final section of the chapter on prior research, I relate this thesis to the wider academic literature on higher education and the university. The purpose is not to summarize the entire literature on and philosophy of higher education in this section. However, a selection of concepts, frameworks, and understandings are highly relevant for the topic and purpose of this thesis.

Concretely, this section starts with an introduction of an understanding of “the university” as a contested notion (section 2.5.1). This supports the framing of the sustainable university as a contested notion which forms one of the starting points of this thesis (see section 1.2). In the following section (2.5.2), I zoom in on the university’s relationship to the world by constructing a continuum between two images of the university: the activist university and the university as ivory tower. This allows to get a general grasp of the variety of ways in which this relationship can be conceptualized, which is made more specific in this thesis (1) by focusing on the university’s relationship to sustainability and (2) by empirically analyzing this in the scholarly literature on the university–sustainability nexus (paper II). The third section (2.5.3) focuses on the relationship between neoliberalism in higher education and ESE. There is a substantial strand of academic literature on a number of trends and evolutions in higher education that can be related to neoliberalism. This topic also seeps into ESE research on higher education in which primarily the detrimental effect of neoliberalism on sustainability efforts is emphasized. I discuss a number of researchers that nuance such deterministic approaches, for which this thesis offers further empirical evidence in paper III.

2.5.1 The university as a contested notion

The rather recent debate about the university and sustainability (which has emerged in the late 1960’s and early 1970’s (Corcoran et al., 2004)) actually fits within a larger, historical, and ongoing debate about what a university is for and what its relation to society actually is or should be. The university as idea already sparked a dedicated literature over 200 years ago (Peters &
Barnett, 2018)\textsuperscript{25} with the likes of Kant (1789) and Newman (1873). This debate has since the 90’s gradually found a home in the nascent field of the philosophy of higher education (Barnett, 2022).

In order to make this notion of “the idea of the university” clearer and more useful for this thesis, an important distinction has to be introduced: that between the university as idea and the university as institution (Barnett, 2022). The latter refers to the university as a real institution in time and space, a material and institutional entity, an institution with its own particularities, such as Uppsala University, for example. The former, however, refers to the idea of what a university is or could be. This literature on the idea of the university is not a univocal literature. On the contrary, Peters and Barnett write that “the contemporary landscape of the idea of the university is not just awash with ideas but is a site of conflicting ideas.” (2018, pXXIX). This makes the idea of the university, or the idea of what a university actually is or should be, a contested notion (cf. Gallie, 1956). There is not one definition of what the university is or should be, nor should there be one. This is not only a philosophical debate. Krejsler (2006), for example, gives an account of how the changing meaning of the university is subject to “discursive battles” in Denmark with very real implications on university policy and practice. When applied to sustainability, this brings us to the starting point of this thesis as introduced in the previous chapter: There is not one way to be (cf. Barnett, 2011a) a sustainable university. If the university has a role to play in relation to sustainability, there is not one way to do this. The question then becomes a normative one: What should this role be, and what kind of university does it imply. An understanding of the (sustainable) university as a contested concept lies at the heart of this thesis and becomes most clear in paper II, which can be understood as an attempt to address this rather philosophical question in an empirical way, by studying how the sustainable university is conceptualized in academic literature.

2.5.2 The university’s relationship to the world

The notion of the sustainable university implies a relation between the university and sustainability, and as a consequence between the university and society / the world. This is a recurring topic in the wider literature on higher education and the university. Briefly highlighting some aspects of that literature will also be valuable here.

There are a number of tensions or distinctions that can help to shine a light on the issue of the university’s relationship to the world. Perhaps the most relevant one here is that between two images of the university: that of an

\textsuperscript{25} A rich literature which is seldom a point of reference in contemporary debate on higher education (Peters & Barnett, 2018).
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activist university which is actively engaged in the world vs. the image of a university as ivory tower. When applied to the relationship between the university and sustainability, it shows us two completely different expectations of how the university should relate to sustainability issues: a shift to more active engagement in addressing and solving (local) sustainability issues vs. a more distanced approach of knowledge creation and dissemination. I will briefly delve into this distinction in an attempt to clarify how it sheds light on the university’s relationship to sustainability.

On the one end of this continuum, we find the activist university, referring to an understanding of the university and its inhabitants as being truly engaged towards understanding, addressing, and solving real-life problems such as sustainability issues. The activism end of this continuum can thus be defined rather broadly as an expectation of the university to be actively engaged in society and to have a practical approach in general. To, for example, have more attention for the local community and serve and change society. There are many different conceptions of the university related to this general depiction of the university. To give just two examples: Barnett (2011b, 2013) presents his “feasible utopia” of the ecological university as an idea of the university as responsible, engaged, interconnected and contributing to bringing about a better world. Watson et al. (2011) describe a different image of the university, as an engaged university. In such a university, civic engagement and the direct tackling of community problems is in the forefront. When zooming in on the university and sustainability, there is a large body of work on topics such as fostering sustainable development at the regional level (Sedlacek, 2013), engagement in regional initiatives (Lehman et al., 2009), universities as local change agents (Peer & Stoeglehner, 2013), collaboration with the local community (Mbah, 2019) and so on. All of these imply a more engaged and activist attitude of the university. However, at the same time some scholars nuance activism and (local) engagement as the sole purpose of a university. They underline that universities do not exist exclusively to satisfy local concerns (Barnett, 2011b; Mbah, 2019; Nixon, 2011), referring to other tasks such as education in general, research on broader topics and so on. Furthermore, Barnett (2011, p449) and Mbah (2019, p16) also mention the importance of respectively “the public interest” and “the common good” when discussing the goals of the university, which goes beyond the local and regional context.

On the other end of the continuum we find the image of the university as ivory tower, detached from these so-called real-life problems and favoring general non-practical, non-applied knowledge as the highest good. The image of the ivory tower university calls to mind what Barnett describes as “the research university”: A university in which “knowledge is everything”, priding itself on its separation from society (Barnett, 2011b, p. 433). Such a university does not actively engage with actual societal challenges (such as sustainability) and is not activist in the sense that it does not act: The university here does not have the intention to solve societal problems. It seeks knowledge for the

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sake of knowledge. This is thus an intellectualist university. In the more popular understanding of intellectualism, it has a rather negative connotation, referring to the idea of the detached intellectual (cf. the university as ivory tower) whom should be distrusted. This movement of thinking is labelled as anti-intellectualism (Peters, 2019). However, intellectualism also has a distinct meaning in relation to epistemology: Intellectualism can be defined by the statement “whether a true belief amounts to knowledge depends exclusively on truth-related factors” (Grimm, 2011, p. 706). Both understandings are related. Intellectualism for example has received much criticism from pragmatism (Roeber, 2017) underlining the importance of practical interests when it comes to knowledge, consequently challenging the separation from society and real-life problems. This has epistemological implications, but also implies a different image of what a university should be and do. It brings to mind a university that is actively involved in and with society.

The distinction between these two images of the university is closely related to a distinction between so-called externalist vs. internalist conceptions of the university (Barnett & Peters, 2018). On the one hand, externalist conceptions focus on the university’s role in society and the world. These conceptions look for the university’s raison d’être beyond the university walls. Internalist conceptions, on the other hand, focus on the internal goods and virtues of the university (e.g. reason, inquiry, truthfulness…). The activist university, as described above, can be seen as an example (or cluster of examples) of the former, whereas the ivory tower can be regarded as an example of the latter.

While this discussion seems to lean more towards a focus on the research function of the university, it is important to also have some attention for what this implies for education. Sustainability activists tend to see sustainability educators as direct allies with a similar purpose, urging them to “inform and even convince the public through educational actions in formal, non-formal and informal ways, of the urgency of disaster mitigation” (Wildemeersch et al., 2023). This somewhat brings us back to the aforementioned discussion of instrumentality in ESE. Both activism and instrumental ESE seem to have a common root: the urgency of sustainability issues (see discussion on the specificity of sustainability issues in section 2.4). Wildemeersch et al. (2023), however, argue that ESE in response to this urgency and these expectations of activists, should not result to informing and convincing the public. Education has a different role to play. This different role, they say, should precisely be to counter the pressure of quick solutions to take the time to explore these issues in-depth and in such a way potentially open up for new pathways to solutions. This does not mean that that educators and activists cannot be allies, but it means that they might have different roles to play.

To sum up, in line with the argument in the previous section that the university is a contested notion, there are many different conceptions of how a university could and should relate to the wider society and world. A
continuum between an activist conception on the one hand, and an ivory tower conception on the other hand was suggested. This continuum also sheds light on what the role of the university in relation to sustainability issues can be, and will be valuable to put the results of paper II in perspective (see section 5.2).

2.5.3 Neoliberalism & Co. vs. sustainability?

There is a substantial strand of academic literature on a number of trends and evolutions in higher education that can be related to neoliberalism. Concepts such as “new public management” or “new managerialism” (state steering of the public sector within the neoliberal climate (Bessant et al., 2015; Deem & Brehony, 2005; Deem et al., 2007; Jarvis, 2014)); “governmentality” (building on Foucault’s work to, for example, study how the academic subject is governed (Morrisey, 2013)), “marketization” (the deliberate exposure of higher education institutions to competitive market mechanisms (Ek et al., 2013; Williams, 2016)); “corporatization” (a shift towards a university model that is based on neoliberal values and practices (Bessant, 2017; Jarvis, 2001)), and “bureaucratization” (the enlargement of bureaucratic processes in higher education (Barnett, 2011a)) are used to identify and criticize evolutions in contemporary higher education. This cluster of connected topics has generated a vast amount of literature which is too wide and large to cover in the context of this thesis. However, there is a body of work that relates this topic with ESE. This literature tends to paint a picture of a stark and insurmountable ideological contrast between neoliberalism and (what ought to be the goals of) ESE. As Kopnina (2016, p. 140) for example wrote: “Various critical environmental educators and more radical proponents of ESD identify the “enemy” as a capitalist neoliberalism”.26 Others claim that neoliberal ideals “constrain how we conceptualize and implement environmental education” (Hush et al., 2015, p. 299), or describe how education for sustainability “is impregnated by a neoliberal rationality” (Ideland & Malmberg, 2015, p. 181). Some, however, aim to nuance such accounts of the impact of (acting upon) a neoliberal discourse. In an empirical study, Bengtsson (2016) for example confirms the validity of warnings that are uttered about the potential reproduction of certain (neoliberal) discourses but at the same time questions deterministic approaches to the issue. In a case study of Vietnamese policy making, he finds that the predominant economist/globalist discourse does not determine the meaning of sustainable development and education for sustainable

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26 A lot of this literature is also closely related to the discussion about “environmental education” being replaced by the concept of “education for sustainable development”, in which the latter was, for example, said to help to entrench the invisible hand of the market into environmental concerns. (Irwin, 2007, pg. 12).
development. Bengtsson emphasizes the importance of focusing on particular cases in their particular contexts and “create shared knowledge about the general principles and means by which particular actors are capable of influencing the politics of education” (p. 87).

Besides in the wider ESE literature, neoliberalism and related concepts also found a way into literature on sustainability in higher education. In this literature, neoliberalism & Co. are often situated within the current dominant higher education education system, which makes the discussion focus on a “perceived clash of interest between the corporate university model underpinned by neoliberal values and practices and the perceived social and environmental responsibilities of higher education” (Bessant, 2017, p. 10). Indeed, central in this specific literature is an (assumed) incomparability between the current dominant (neoliberal, marketized, corporate…) higher education system and attempts to integrate and upscale ESE practices. Jucker (2014) poses the question as follows: “[…] how do you want to mainstream something [ESE] into a system whose ideology, construction principles, guiding values and understanding of education are diametrically opposed to sustainability?” (Jucker, 2014, p. 39). In line with this, Blewitt (2013) calls believing in the meaningful reform of higher education from within “self-deception” (2013, p. 53). He strongly argues against collaborating with “the myth of efficiency, quantification, targets, performance indicators, attributes, strategies, action plans, work plans, outputs, outcomes, specifications, institutionalised visions, missions and so on” (p. 52). He argues against “compromise, accommodation and incorporation” when embedding sustainability within higher education, and states that practitioners should be more “political in their contestations of institutional practices” (Blewitt, 2013, p. 61). The overarching rationale in these arguments is that operating within or in close proximity to neoliberal frameworks implies helping to sustain them while, in the meantime, compromising the radical potential of the desired change (Bessant, 2017).

Not all, however, make such stark distinctions between sustainability and contemporary higher education. Maxey (2009), discussing contemporary higher education primarily in terms of the corporate university, acknowledges that sustainability can be used to serve neo-liberal interests and that there is a danger that initiatives in higher education merely “tinker with the fringes” (p. 444). However, he also states that this does not need to be the case. We should move “beyond a binary framing of sustainability vs. corporatisation” (p.440). He sees the relationship between sustainability and corporatisation as still taking shape: It is an ongoing process and thus not yet fixed. Bessant (2017) seconds this, emphasizing that practice (i.e. actual people integrating sustainability in actual higher education institutions and practices) is much more complex than any possible ideological contradictions between sustainability and the way contemporary higher education is structured might make appear.

This thesis relates to this prior research on neoliberalism and (sustainability) in higher education in a number of ways. First of all, the thesis entails a
systems analysis of the Flemish higher education system (paper I). A number of the findings of this systems analysis link back to this literature on neoliberalism.27 Secondly, the discussion in this subsection showed that some scholars nuance deterministic understandings of the effect of neoliberalism on attempts to embed sustainability in (higher) education (Bengtsson, 2016; Bessant, 2017; Maxey, 2009). This thesis builds further on this work. This is done by empirically analyzing if and how (neoliberal) characteristics come into play in a working group dedicated to embed sustainability in higher education.

2.6 Conclusion

This chapter offered an account of the prior research on the university–sustainability nexus in connection to the purposes and approach of this thesis. This was done from four different angles: a meta-review, the introduction of two fault lines, a discussion of the specificity of sustainability, and a connection to the wider higher education literature. The next chapter introduces the theoretical framework with which this thesis intends to contribute to the research described here.

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27 The paper identifies 21 characteristics of the current Flemish higher education system of which some are clearly related to this topic. For example, the “expansion of the Flemish higher education system” regime characteristic in combination with the “market logic and competition between institution” regime characteristic can be closely related to the marketization of higher education. To give a second example, the “competition between researchers” regime characteristic brings to mind Donzelot’s observation that neoliberalism always demands “intervention at the service of competition” (2009, p. 9)
Chapter 3.
Theoretical framework

“It is not that there is more than one truth. It is simply that truth is so large that no one telling can encompass it.” (Special Agent Fox Mulder)

This thesis is rooted in a strong sense of theoretical and methodological pluralism and purposefully incorporates different perspectives and approaches. In this way, the thesis can be understood as functionally and purposefully non-dogmatic: It actively builds upon theories and methodologies which are selected in function of the research purposes. Or to put it in relation to the above-mentioned quote: theories and methodologies are selected in function of what part of that large “truth” I am interested in.

As described in section 1.4, this thesis explores and develops knowledge on two issues: (1) how the notion of the sustainable university is conceptualized in research and practice and (2) how change processes towards a more sustainable configuration of higher education systems and practices take shape. In function of this, three theoretical and analytical frameworks are brought in: First, the multi-level perspective on sustainability transitions (Geels, 2002) allows to study (potential) change of a higher education system (see section 3.2.1). Secondly, discourse theory (Laclau & Mouffe, 1985) allows to analyze different discourses on how the sustainable university is conceptualized in academic literature (see section 3.2.2). Thirdly, pragmatist theory of transaction (Dewey & Bentley, 1949) allows to study what happens in a working group dedicated to embedding sustainability in higher education by focusing on the interplay with aspects on a larger institutionalized environment (see section 3.2.3).

Taken together, this brings us to the main purpose of the thesis as presented in the introduction chapter:

The study of the institutionalized environment in which sustainable higher education practices navigate, and how this environment comes into play in, is affected by, and has an effect on a sustainable higher education change practice.

Based on its discussion in section 1.4, we can understand this institutionalized environment as the wider context of more generalized patterns with which the
change practice interacts. This implies that the multi-level perspective and discourse theory are used to analyze different aspects of this institutionalized environment (respectively institutional and discursive patterns) and that transactionalism is brought in to analyze the interaction with the change practice.

The present chapter continues with a chronological account of the thesis (section 3.1), highlighting the theoretical and methodological choices made throughout the four papers. This is followed by a separate discussion of the three central theoretical and analytical frameworks upon which this thesis builds (section 3.2) and a section dedicated to the issue of educational change (3.3). The chapter ends with a conclusion (section 3.4), which opens the path to the presentation and discussion of the methodology in the next chapter (chapter 4).

### 3.1 A chronological account

The consecutive starting points throughout the PhD are formed and informed by a sequence of interlocking research aims and questions, not by a predefined theoretical position. The thesis is thus also a theoretical and methodological exploration, not for the best way to study the sustainable university and how such practices come into being in general, but to find out what approach allows to study what aspect of this central object of knowledge. In this sense, one of the ways in which the thesis can be understood is as a theoretical dialogue, reflecting an evolution throughout the different papers which finds a – temporary – endpoint in the closing chapters of the kappa. In this sense, this thesis comprises four papers with a very particular chronology. The format, a compilation thesis with a “kappa” in which I summarize, expand on, and discuss the papers in relation to each other allows such an approach.

This chronology can be understood in a number of ways. First of all, it is the result of the writing of a PhD as learning process: I have been experimenting with a number of theoretical and methodological approaches around a central object of knowledge. Besides this admittedly rather cliché reference to a learning process, something else is going on as well. To refer to Tim Ingold, it is a reflection of what research actually is about: to search and then to search again: to re-search (2020). Every question answered opens up a new question. This approach is reflected in the succession of papers. Both the results and the gaps of the previous paper inform the next one. This succession, and the

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28 I use the term “object of knowledge” in this manuscript to denote what I want to create knowledge on. The term “object of study”, then, is used to denote what is studied. The actual empirical material offers an entry point into this object of study. For example: analyzing relevant higher education policy documents allows to study the Flemish higher education system, allowing to create knowledge on which characteristics of a higher education regime might enable or impede change.
theoretical dialogue it implies, is made explicit in the remainder of the present subsection.

With paper I, the thesis starts off close to a dominant theme in the current sustainable higher education literature (see section 2.2.4 and 2.2.5) with a focus on integration & change processes of sustainability in higher education institutions. In an attempt to shed a new light on this theme, I use a systemic change lens and introduce the multi-level perspective (see section 3.2.1), native to the field of transition studies, in the study of sustainability in higher education. Doing this implies understanding the embedding of sustainability in the university as a (potential) transition, that is: as a deep and fundamental change of a societal system (Grin et al., 2010). In this case, the societal system is the higher education system and the transition is towards a more sustainable configuration of this higher education system. I thus use concepts and insights of the transition studies field to approach higher education as a system in potential transition, and to bring in an understanding of how systems change, and which factors might facilitate and impede such a change.

By using the MLP, a novel theoretical and analytical framework is brought into research on the university–sustainability nexus but it is used in alignment with a dominant theme and research approach: To contribute knowledge on how sustainability is embedded in higher education institutions. However, the use of the MLP in paper I revealed the necessity – and the lack – of knowledge on possible and desirable end-points of a sustainability transition of the university. Identifying what might enable or impede a change towards a more sustainable configuration of the system is challenging without a clear definition of what this more sustainable configuration actually entails. This gap became clear while using the MLP in this study, but is not something that in itself can be studied through the MLP. This means that another analysis and thereby another theoretical perspective is needed to take the research a step further.

Paper II addresses this issue by operationalizing a post-structural understanding of discourse to study how the sustainable university is conceptualized in academic literature. This theoretical approach (see section 3.2.2) allows to understand the sustainable university – which emerged in paper I as the ambiguous and implicit endpoint of a potentially ongoing transition of the university – as a conflictual, contingent, and discursively constructed notion (see also section 2.5.1). On the methodological level, such an approach enables the analysis of conflicting discourses within the object of study (i.e. academic literature on the university–sustainability nexus), offering a conceptual toolbox to understand what these discourses consist of and how they relate (as will be discussed in section 4.2). Such a conflictual and contingent understanding of discourses also opens up for an understanding of the sustainable university as a concept that is (or should be) subject to debate beyond academia, on a wider societal level.
While both papers share the same general object of knowledge: the sustainable university and more specifically: a general movement towards a more prominent place for sustainability in the university, the use of the multi-level perspective in paper I and post-structural discourse theory in paper II allowed to look at different aspects in a different way: The MLP enabled to zoom in on the change process in a very systematic way. Discourse theory (Laclau & Mouffe, 1985) made it possible to get a grasp of dominant and institutionalized discourses within academic debate on what the end-point of such a change process might entail. However, the change process and the (envisioned) end-point are closely related. Discussions on the integration of sustainability in higher education are meaningless without at least some notion of the end point of such a transition, that is: What is the desirable sustainable university at the end of the road? Discussing and studying change processes in themselves only makes sense if connected to what the change can or should lead to. In this sense, the results of paper II complement those of paper I.

Paper III addresses a limitation of the results of paper I while also applying them to a different setting. In paper I, a very systemic account of the impact of characteristics of the dominant higher education system (i.e. “regime characteristics” in the MLP jargon) on a sustainability transition is given in terms of potentially enabling and impeding such a transition. Due to its focus on the systemic level, paper I’s findings are not specified on the level of actual change practices. It is thus not clear how these different characteristics of the dominant system affect what happens when people come together to “make change”. A number of questions thus remain unanswered after paper I: Is the effect of characteristics of the dominant system predetermined (as often implied in the literature, see sections 2.2.4 and 2.5.3)? Are there other options beyond the dichotomy between enabling and impeding characteristics? Do all characteristics of the dominant system always play a role? These questions are combined in the main research question of paper III: How are characteristics of the current higher education system acted upon in a sustainable higher education change practice? Answering this research question requires a different theoretical framework than the one used in paper I (the MLP).

Paper III studies the relationship between a specific change practice and the dominant higher education system. While the latter is operationalized by using the findings of the MLP study as an analytical model (as will be discussed in section 4.3), a theoretical framework is needed to understand how precisely characteristics of that dominant higher education system come to the fore. Building on pragmatist theory of transaction (Dewey & Bentley, 1949; Garrison et al., 2022), I understand the interplay between the educators developing education and their (institutional) environment as a continuous, simultaneous and reciprocal transformation of transactants (Hofverberg, 2022) (see section 3.2.3). Such an approach holds a ground between actor voluntarism and structure determinism and thus provides a suited
theoretical lens to tackle this research question. This approach allows to apply the results of paper I to the level of concrete practices.

Paper IV studies how the sustainable university is conceptualized and how it takes shape in a concrete higher education change practice. In doing so, paper IV builds on the results of paper II. The results of the discourse analysis in paper II also say something about how the sustainable university is conceptualized in practice (as I will discuss in section 4.2.3). Since it is not yet clear nor verified how and to what extent this is the case, further work is needed to test if, how, and to what extent the results of paper II can be used to study practices. This question is addressed in paper IV, which implies creating knowledge on how the three discourses help to understand what happens when educators together develop a new educational practice.

In order to operationalize the three discourses for a study of a concrete change practice, paper IV builds on pragmatist theory of transaction (Dewey & Bentley, 1949) similarly as in paper III. Central here is the interplay between the educators developing education on the one hand, and the three discourses on the sustainable university on the other hand. The latter are understood as specific constellations of nodal points and elements. Building on the notions of environing (Östman et al., 2019b) and privileging (Wertsch, 1998) allows to understand if and how elements and nodal points of these three discourses are taken into account and given importance in how the sustainable university is conceptualized and how it takes shape in the change practice (see section 3.2.3). It is also in the embedding of sustainability in an educational practice that the specific didactical challenges for teaching and learning more explicitly come to the fore (as discussed in section 2.4.2).

3.2 Theoretical and analytical frameworks

As shown in the previous section, this thesis combines a number of theoretical and analytical frameworks. Together, they allow to empirically analyze the sustainable university and how it is conceptualized and takes shape from different angles. These frameworks are compatible in some ways and cause friction in others, but are bound within the context of this thesis primarily in two ways: a pragmatic use in function of the interlocking aims of the four papers and a shared overarching (although differently understood and approached) object of knowledge: the sustainable university and how sustainable higher education practices come into being. This means that the major (and arguably most important) fit is not theoretical but functional. In this sense, this thesis in its entirety builds on a theoretical and methodological pragmatic approach.

I am aware that methodological and theoretical blurring in research has been subject to critique for a long time (see e.g. Burrell & Morgan, 1979), and that this critique has been echoed within the field of sustainable higher
education research (Dillon & Wals, 2006). Furthermore, the attentive reader will remember that I myself also echoed this critique earlier in this manuscript (section 2.2.1). However, the four papers in this thesis consist of a deliberate and thought-through combination of different theoretical and analytical frameworks and methods, which are elaborated and discussed in the papers and are further addressed in this kappa.

In the following three subsections, I will introduce the multi-level perspective (3.2.1), discourse theory (3.2.2), and pragmatist theory of transactionalism (3.2.3) and discuss their fit, strengths, and limitations in relation to the purpose of this thesis. For a more detailed introduction to and account of how they were applied in the respective papers, I refer to the papers in attachment and the methodology chapter of this manuscript (chapter 4).

3.2.1 The multi-level perspective

The multi-level perspective is a theoretical/analytical framework for the analysis of transitions of complex socio-technical systems (Geels, 2002, 2005; Geels & Schot, 2007; Smith et al., 2010). A socio-technical system is to be understood here as a cluster of connected elements (technology, science, regulation, user practices, markets, cultural meanings, infrastructures, production and provision networks) that fulfil a specific societal function (e.g. housing, food provision, transport) (Paredis, 2013). Within this thesis, the Flemish higher education system (i.e. the collection of all higher education institutions together with dominant regulations, rules, norms and values, technologies, infrastructures, ways of doing and acting etc.) is approached as a socio-technical system. The MLP views transitions of such systems, to be understood as deep and fundamental change of societal systems (Grin et al., 2010), as non-linear processes which are the result of an interplay between three analytical levels: landscape (macro), regime (meso) and niches (micro) (Geels, 2005, 2011). The systemic change this thesis focuses on is the integration of sustainability within a higher education system.

The central (meso) level of the MLP is the socio-technical regime (see figure 3.1). This regime has a particular configuration and should be understood as an interwoven whole of dominant regulations, rules, actor networks, artefacts, institutions, norms and values, technologies, infrastructures, ways of doing and acting etc. (Paredis, 2013). Within the MLP, the regime is considered to be rather stable and its actors and logics are closely intertwined. It structures

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29 While the MLP can be seen as a theory on the continuity and change of socio-technical systems (some say it is more the former than the latter), in this thesis it is primarily used as an analytical framework, i.e. a framework that guides and structures the empirical analysis.

30 Using the MLP for the study of an education system does not imply a straightforward copy of its application in other, more obvious, socio-technical systems such as energy or agro-food systems. How precisely it is operationalized is discussed in section 3.1 and in paper I.
the activities of actors (Paredis, 2013) and is “dynamically stable” (Geels, 2005): Despite the stability there is some room for newness and creativity. This means that such regime change is always incremental. A transition according to the MLP, however, is a major shift from one regime configuration to another. This implies that, during a transition, some of the dominant regime characteristics radically change while others might remain constant.

Secondly, on the micro-level of the MLP we find the niches. Niches are small-scale experiments that form a potential alternative to the current regime configuration. They can be understood as incubation rooms (Geels & Schot, 2007), somewhat delineated and relatively safe environments within which it is possible to experiment and innovate. This is seen as being more difficult within the regime itself because it is dynamically stable, hence the importance the MLP attaches to niches in understanding transitions. Radical innovations consequently often emerge in the margins or outside of existing regimes. Niches implicitly or explicitly are reactions on problems within the regime and can be developed by citizens, societal groups, companies, policy makers
etc. These problems can be related to sustainability, but this is not per se the case. This means that niches, as practices that divert from the regime, are not necessarily potential contributions to creating a more sustainable alternative to this regime. What it exactly means to be more sustainable, that is: at which point an alternative practice qualifies as a sustainability niche in the analysis, is a methodological challenge in using the MLP. This is first and foremost a matter of inclusion and exclusion: Which niches (as alternative practices) are relevant for the analysis? It is however also related to the question what sustainable development actually means. These issues are discussed more thoroughly in the next chapter.

Thirdly, the socio-technical landscape is situated on the macro level, as can be seen in Figure 3.1. The landscape refers to a rather stable exogenous environment that encompasses deep cultural patterns, macro-political developments and macro-economics which influence the other two levels but can also influence other regimes.

The MLP helps us to understand that transitions of socio-technical systems are often the consequence of an interaction of events on all three levels. The MLP assumes that niches put pressure on the regime and can develop to mature alternatives to the regime. Internal contradictions in the regime can make it more prone to change. Changes in the landscape can facilitate niches, can question the taken-for-grantedness of certain regime characteristics, and can invoke and lay bare problems in the configuration of the regime. When trends and events on the three levels can reinforce each other, the opportunities for transitions, that is for radical change of the regime, will increase. Things happening simultaneously on the three levels become connected and opportunities for change grow. This can lead to so-called windows of opportunity (Geels & Schot, 2007). Regimes, however, are dynamically stable and regime actors will defend their position (Grin et al., 2010). Lock-ins within the regime impede change, novel practices have a hard time to survive, and certain landscape trends also play stabilizing roles.

The MLP brings a number of things to the table in this thesis. First of all, it allows to study the (potential) change of a higher education system as a whole. It is a framework that offers a way to understand how systemic change takes place and which aspects of a system play a role in either enabling or impeding such change. The MLP thus offers an interesting way to widen the empirical lens to study how sustainability is and can be integrated in a higher education system. This is brought to the foreground in paper I. However, through its focus on the interplay between different levels, the MLP also provides a framework to study which aspects of the wider system can have an impact on individual sustainable higher education practices. This is a second function of the MLP within the thesis: It allows to connect the larger systemic context (in this case the overarching higher education system) to what happens in individual practices in which change is made. This connection between
individual practices and their larger context lies precisely at the heart of the primary purpose of this thesis and is specifically addressed in paper III.

In addition to this, using the MLP allows to introduce a transition studies perspective into research on sustainability in higher education. Transition studies can best be described as a scholarly field and not as a uniform theoretical approach. While the field shares a joint object of study (i.e. transitions), it does not have a shared object of knowledge, theoretical approach or discipline. However, it still warrants a place in this overview because precisely this framing of the integration of sustainability in the university as a transition was important for the overall theoretical focus of this thesis. It formed the starting point of the thesis, as already discussed in the chronological account in section 3.1.

The link between transition studies and (higher) education is not new. In research on sustainability transitions, universities have been identified as important change agents (Brown et al., 2003; Larsson & Holmberg, 2018; Schiller & Radinger-Peer, 2021). There is also a recent trend in literature in which research on ESE (and educational theory in general) is brought together with research on sustainability transitions. This growing body of literature introduces ESE perspectives (and educational theory in general) into studies of sustainability transitions. This is for example done by studying the role and meaning of learning in transition movements (see e.g. Van Poeck & Östman, 2021, 2022; Van Poeck et al., 2020). In this thesis, the opposite movement is made by introducing sustainability transition perspectives in ESE literature, with a more specific focus on higher education. At the moment of publication of paper I, this was to my knowledge a novel approach. Since the publication of paper I, applying insights from transition studies in (higher) education research has gained a bit more traction in the field (see e.g. Radinger-Peer et al., 2021).

Despite its merits, the MLP also has its limitations, and has been criticised in the transition studies literature. The MLP’s limits tend to become visible when you wish to give an account of exactly how change happens (Pesch, 2015), in what ways and under which circumstances transitions are made (Farla et al., 2012; Pesch, 2015), and what happens in concrete, observable practices (De Roeck & Van Poeck, 2023). Overall, it has been criticised for being too structuralist (Fuenfschilling & Truffer, 2014; Smith et al., 2005; Upham et al., 2018) and how the possibility of change through niche practices is more assumed than analyzed (Fuenfschilling & Truffer, 2014). In addition to this, a recurring criticism on the MLP is a lack of attention for agency in the model (Geels, 2011), reducing transitions to processes in networks, institutions and related to technology, and in doing so removing the individual out of the picture. Since this thesis precisely aims to explore what happens in concrete, observable practices, these limitations need to be addressed, which is done by introducing pragmatist transactionalism (Dewey & Bentley, 1949) (see section 3.2.3). A final limitation relevant to mention here, is that the MLP offers a mechanism to understand systemic continuity and change, but does
not offer a lens to find what kind of change (in terms of potential end-points of a transition) is possible or deemed desirable. Precisely because this thesis intends to connect change processes and their substantive potential outcome (i.e. the sustainable university, as discussed in section 1.4), this gap needs to be addressed which is why discourse theory (Laclau & Mouffe, 1985) is brought in (see the next section).

3.2.2 Discourse theory
The MLP offers a framework to understand and study the potential change of a higher education system, but leaves us blindsided regarding what might be the potential outcome of such change processes. This requires a different theoretical lens for which this thesis builds upon a purpose-oriented use of Laclau & Mouffe’s (1985) post-structural discourse theory.

According to discourse theory, a discourse “is a social and political construction that establishes a system of relations between different objects and practices” (Howarth & Stavrakakis, 2000, p. 3). This implies that discourse theory builds upon a broader definition of text, as “materializations of meaning and/or ideology”, and a broader definition of context, understood as the social, than many other approaches to discourse analysis (Carpentier & Cleen, 2007, p. 277). This implies that the interests of a discourse-theoretical analyst do not lie in the specific words used by the speaker/writer within a specific setting, but in understanding them as part of a larger whole: The text is a materialization of larger discourses and discursive struggles on a larger scale and should hence be situated in a context on the latter level. Discourses, as systems of relations (Howarth & Stavrakakis, 2000), can be understood as constellations of connected elements, that is: words or phrases that receive their meaning through their connectedness. 31 Central elements in these constellations are called nodal points. They play an important role in providing structure and overall meaning to the discourse. Elements are connected through the practice of articulation, which is any practice in which connections between elements are established through which their meaning changes.

Within this thesis, I use discourse theory in combination with the data mining approach topic modeling (see section 4.2) to construct a methodological approach for a discourse analysis of how the sustainable university is dominantly conceptualized in a large corpus of academic publications on the university–sustainability nexus. This is done in paper II. Using discourse theory in such a way implies that the question of how the sustainable university is

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31 In line with Carpentier & De Cleen (2007) I do not follow the original distinction Laclau and Mouffe (1985) make between signs that are part of the discourse (i.e. “moments”) and signs that are not part of the discourse but could be (i.e. “elements”). To improve the readability of the text, I use the latter term to refer to both.
conceptualized in the academic literature can be rephrased to the question which (dominant) discourses on the sustainable university can be identified. Discourse theory makes it possible to see the research field as a specific social system (cf. Howarth & Stavrakakis, 2000), understood as consisting of different discourses that are continually reproduced and/or challenged through articulations: academic publications. In combination with the data mining approach topic modeling, discourse theory makes it possible to trace large overarching patterns of similarity and difference throughout this field. At the same time, the specific structure of the discourses as constellations of elements allows to be concrete as to what these discourses actually entail.

This approach builds further on Laclau & Mouffe’s social ontology, using the vocabulary and mechanics of discourse theory as were briefly introduced in the previous paragraphs. This means that discourse theory is pragmatically used in this thesis and focuses on what can be described as the first level of Laclau & Mouffe’s Hegemony and Socialist Strategy: discourse theory in the strict sense (Carpentier, 2017; Carpentier & Cammaerts, 2006). This means that the way it is used in this thesis does not include Laclau & Mouffe’s identity theory (Smith, 1999) (i.e. level 2) nor their plea for a radical and democratic politics (i.e. level 3). In the second level, Laclau & Mouffe describe how identities lack any essence (i.e. are non-essentialist) and are formed through political struggles which generate processes of othering (Carpentier & Cammaerts, 2006). The third layer is positioned within the field of democratic theory, arguing for an extension of democracy into other areas of the social (Carpentier & Cammaerts, 2006). Both are not relevant for the purpose of this thesis. It could thus be said that discourse theory was applied as an analytical framework.

3.2.3 Pragmatist theory of transaction

Both the MLP and discourse theory primarily allow to trace more generalized patterns: respectively (characteristics of) the higher education system and large discursive patterns. However, the purpose of this thesis is to connect such more generalized patterns (i.e. the institutionalized environment) with what happens in concrete practices in which sustainability is embedded within higher education. This means that a theoretical framework is needed that allows to bring aspects of this institutionalized environment into the empirical analysis of a concrete practice in which change is made. For this, I build on pragmatist theory of transaction (Dewey & Bentley, 1949) which helps to understand the interplay between the work done in the change practice and its environment as a simultaneous, continuous and reciprocal transformation of what is done and the environment (Garrison et al., 2022). Transactionalism thus allows me to understand and empirically analyze how what happens in a
sustainable higher education change practice is related to this wider institutionalized environment. Transactionalism is used in two ways in this thesis.

In paper III, the aim is to make sense of if and how educators within a sustainable higher education change practice act upon characteristics of the dominant higher education system which I identified using the MLP in paper I. This is analyzed in relation to how those characteristics affect what happens in the change practice but also to how the meaning of the characteristics themselves is changed. The specific intention is to do this in a way that allows to escape the dichotomy between actor voluntarism (that actors can do what they want with these characteristics of the system) and structure determinism (that the characteristics of the system fully determine what happens within the change practice). Such an approach is found by building upon the notion of transaction from pragmatist theory of transaction (Dewey & Bentley, 1949). The institutional environment is operationalized for the study through the regime characteristics that formed the core of the results of paper I.

A transactional approach implies that the meaning of the characteristics of the dominant higher education system is affected by how these educators act upon them. This leads to an understanding of the change practice that allows for more complexity and nuance than if one would just look at how the regime affects the change in the making. This general approach is further specified in the thesis through the use of the notion of transactants (Hofverberg, 2022). Hofverberg introduced the notion of transactants to further theorize this interplay, described as "what makes a difference and has a force in the transactional activity […] – the activity in which humans and their environments affect each other". This allows to see the regime characteristics as potential transactants within an activity in which they affect and are affected by those involved in the change practice. Turning to pragmatist theory of transaction (Dewey & Bentley, 1949) and the notion of transactants in paper III is thus a suited way to (1) pull the results of the MLP study in paper I from the systemic level to the level of a concrete change practice, and (2) bringing the situated actions of those involved in such a change practice into the analytical lens by looking at if and how they act upon characteristics of this system, the conditions under which this occurs, and the consequences it brings about.

Paper IV also builds on transactionalism in a similar way, but uses a different conceptual lens: the concepts of environing (Östman et al., 2019b) and privileging (Wertsch, 1998). In line with the primary purpose of the thesis, the aim of paper IV is to empirically analyze if and how those involved in a sustainable higher education change practice conceptualize the sustainable university and give shape to a sustainable higher education practice. This means that a different conceptual lens is needed. Transactionalism helps to understand the interplay between what happens in the change practice and its environment as a simultaneous, continuous and reciprocal transformation of what happens in the change practice and the environment. However, not everything that might be taken into account (i.e. the surroundings of the practice) is also
taken into account (into the environment of the practice). Some things are selected while others are neglected. To approach this, the paper builds on the concept of environing (Östman et al., 2019b) which makes it possible to analyze what becomes part of the environment and what not. Secondly, not everything that becomes part of the environment also plays an active role in the change process. Some things are merely brought up and then neglected while others have an impact on the outcome of the change practice. To approach this, the paper builds on the notion of privileging (Wertsch, 1998) which refers to the dynamic process of inclusion and exclusion in which some things are taken into account and become part of the meaning-making process while others are not. In order to be able to analyze what is environed and privileged, an external point of reference is needed, which is brought to the table by the findings of the discourse analysis of the academic literature.

3.3 A note on educational change

The primary way in which the theoretical and analytical frameworks of this thesis tie together, is through their function as part of this thesis. They are bound together by the different purposes of the thesis and the papers, every one focusing from a different angle on a different aspect of the overarching object of knowledge: the sustainable university and how sustainable higher education systems and practices come into being. This has become clear in the chronological account of this thesis in section 3.1, in which every paper required a specific theoretical framework to address the new questions that arise from the previous paper. This means that the research questions (and previous results on which they build) guided the study, not the theoretical stance. On the meta-level, all different approaches are tied together by a pragmatic approach to composing the theoretical framework of the thesis.

However, while the major fit of the different theoretical frameworks is functional, their function can be traced back to the ultimate convergence point of this thesis: Understanding what happens in a change practice where teachers embed sustainability in their educational practice. Or more precisely: Understanding how those involved in a change practice embed sustainability in the curriculum of the bachelor electromechanical engineering—how they change the content, purpose and methods of their teaching practices—and what the role of the institutionalized environment in this process is.

This requires some further explanation of how educational change is approached in this thesis. In the introduction chapter, I described how universities are addressed by governments and intergovernmental organizations to become more sustainable, to become sustainable universities. While this concept of the sustainable university lies at the heart of the thesis, the focus is not on top-down coordinated, system-wide attempts for reform, as is often dominant
in educational reformers’ thinking (Hargreaves et al., 2010). First of all, this becomes clear in paper I where the MLP is used as analytical framework. The MLP is precisely a theoretical framework that understands change of socio-technical systems as taking place through the dynamics between landscape, regime and niches. The MLP does not hold a linear understanding of how systemic change takes place, and the role of niche practices is often pushed to the foreground, implying the importance for change of bottom-up movements (or in MLP jargon: the upscaling of niche innovations). While the first half of this thesis does have a rather “macro” focus, with papers I and II addressing the Flemish higher education system and the concept of the sustainable university, the micro-level focus on educational change becomes clear in papers III and IV.\(^{32}\) They contain an analysis of how educational change takes place on the level of actual lecturers making change. Overall, this means that educational change in this thesis is approached as something that takes shape in the actions of what people (i.e. lecturers) do within an (institutional) environment. This means that this thesis does not explore how higher education institutions can be made more sustainable by policy change\(^{33}\), but that the focus lies on how change (and thus the sustainable university) is made in practice.

Such an understanding of change is enabled by the transactionalist theoretical framework used in papers III and IV. More specifically, educational change is studied in papers III and IV in relation to respectively two things: the dominant higher education system and the idea of what a sustainable university could be. In the former, the focus lies on how change is made by acting upon characteristics of the dominant higher education system. The notion of embedded agency plays an important role here as well, in which social structures are perceived as “both the medium and the outcome” of social interactions (Shilling, 1992, p. 78). In the latter, change in the making is approached through looking at how the sustainable university is conceptualized and takes shape in action by those involved in the change practice. This means that, while educational change on the micro-level is the clear focus of the third and fourth paper of this thesis, this focus is enabled by the first and second paper.

3.4 Conclusion

This chapter introduces the three theoretical and analytical frameworks this thesis builds upon: the multi-level perspective, discourse theory, and pragmatist theory of transaction. Together, they allow me to study the sustainable university and how it is conceptualized and takes shape from different angles in order to fulfil the purpose of this thesis. In doing so, this highlights the

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\(^{32}\) I will get back to this in the discussion chapter (chapter 6).

\(^{33}\) With which I do not question its possibility.
purposeful and functional non-dogmatism that guides the doctoral research. To refer back to the quote that opened this chapter: The central object of knowledge of this thesis – what the sustainable university is and how it comes into being – is too large to be encompassed by any one telling. This is fully embraced in this thesis, leading to a careful selection of theoretical and analytical frameworks that throughout the thesis allow to offer a telling of the part of the object of knowledge I am interested in.

All these *tellings* are closely connected and interwoven in this thesis: through the specific chronology of the papers, through the fact that papers address aspects of the others and contribute to their understanding, and finally through the shared object of knowledge: the sustainable university and how it is conceptualized and takes shape. However, despite the pluralism and non-dogmatism, in the end this thesis pivots around a specific approach to educational change: how lecturers develop a new curriculum and a new teaching practices and how this relates to more generalized institutional and discursive patterns.

The next chapter elaborates on how the theoretical and analytical frameworks introduced in this chapter are built upon and *used* in the methodologies of the four papers.
Chapter 4. Methodology

The second purpose of this thesis is to explore new ways to study how the sustainable university is conceptualized and takes shape (as described in section 1.4). This means that an important aspect of the thesis is methodological: The development of novel analytical approaches and the introduction of approaches from different fields that are novel to research on (sustainability in higher) education. In function of this purpose, this chapter does more than merely presenting and summarizing the methodologies developed and used in this thesis. The chapter also engages in critical discussions of said methodologies, highlights methodological connections throughout the thesis, and contains a number of specific detailed accounts in function of reproduction.

The incorporation of a more thorough methodological discussion in this chapter together with the fact that a number of findings also serve methodological purposes within this thesis implies that it is necessary to already here refer to some findings of the four papers. Full summaries of the findings of the papers are introduced in the next chapter (chapter 5).

This chapter contains four subsections, respectively discussing the multi-level analysis of the Flemish higher education system (section 4.1), the discourse analysis of academic literature (section 4.2), and the case studies of a sustainable higher education change practice (section 4.3), followed by an elaboration of the ethical considerations on the empirical research (section 4.4).

4.1 Multi-level perspective analysis of a higher education system

4.1.1 Introduction

In an empirical analysis of the Flemish (North-Belgian) higher education system using the multi-level perspective on sustainability transitions (MLP) (Geels, 2002), this thesis creates knowledge on a (potential) sustainability transition of that higher education system. In addition to this, the analysis explores opportunities and challenges for embedding sustainability within that
This analysis (which is presented in paper I and summarized in section 5.1) shows how some characteristics of the higher education system impede the further integration of sustainability while other characteristics offer a number of opportunities to foster this.

Paper I builds on the multi-level perspective on sustainability transitions (see below), which functions as the analytical model in the study. It is mainly in the use of this systems approach to study educational change that the methodological novelty of the study lies. The empirical data consist of policy documents, university websites, an exploratory survey, interviews, and a focus group interview.

After this short introduction, this section on the MLP analysis (4.1) continues by justifying the choice for the MLP for this study, emphasizing what the MLP brings to the table (4.1.2). Subsequently, a number of issues related to how the MLP was employed in this specific study are discussed (4.1.3). This is followed by an elaboration of the data collection (4.1.4) and the data analysis (4.1.5). In the conclusion (4.1.6), the MLP’s potential for research on sustainable higher education and its potential in relation to curriculum studies and educational change research are explored.

4.1.2 Rationale behind using the multi-level perspective

The multi-level perspective is a well-established theoretical/analytical framework for the analysis of transitions of complex socio-technical systems (Geels, 2002, 2005; Geels & Schot, 2007; Smith et al., 2010). The major methodological novelty of paper I is the use of the MLP for a systems approach to the integration of sustainability in a higher education system. This means that the higher education system is approached as a socio-technical system. While there is a growing body of literature on the implementation of sustainability in the university and on what facilitates and impedes this implementation, only some of these explicitly refer to systems theory or change theory to theoretically ground their study and this has been done mainly with a focus on the institutional level (see e.g. Rieg et al., 2021 for a review of this literature). Faham et al. (2017), for example, used system dynamics to study how education for sustainable development can be integrated in the university. Lidgren et al. (2006) use a systemic approach to analyze barriers to incorporating sustainability in courses and curricula at Lund University, based on Meadows’ places to intervene in a system. Verhulst and Lambrechts (2015) use a change management perspective to present a conceptual model on the integration of

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34 This makes the Flemish higher education system the object of study and the potential sustainability transition of that higher education system and opportunities and challenges for embedding sustainability within that system the object of knowledge of this study.

35 As discussed in sections 2.2.4 and 2.2.5 of the prior research chapter.
sustainability in higher education institutions. They try to combine the more commonly discussed drivers and barriers (as often discussed elsewhere, see section 2.2.4) with human factors affecting the process. In a comparative multi-case study of different universities, Barth (2013) draws on organizational change scholarship to look at dynamics of and between drivers and barriers for change from a process-oriented perspective. Using this approach, Barth identifies a number of main patterns of implementation processes. Littleeleyke et al. (2013) plead for the importance of a systems approach to foster the integration of sustainability education in higher education. To inform such an approach, they seek to identify factors that foster sustainability, factors that act as a barrier, and desirable models for a system approach. They propose an inductively designed systemic model that presents how these elements of their study interact.

Systems approaches are thus not entirely new in the field and are a promising thread of research (Rieg et al., 2021). Paper I connects to this earlier work, while also offering something new: With the MLP, paper I introduces a well-established analytical framework for studying change of socio-technical systems. This means that the MLP allows to study the system as a whole instead of staying on the institutional level. Introducing the MLP into educational research and research on sustainability in higher education also offers a connection to the wider literature on sustainability transitions, which is for example built upon in paper III.

At the time of publication of paper I, the MLP had (to my knowledge) not yet been used to study an education system. Paper I is thus also a way to experiment with a new perspective for the wider curriculum studies literature dealing with educational change. By building on the transition literature, educational change research might draw on a larger set of perspectives and frameworks to understand and study how educational systems change and which factors affect this change. The MLP offers a framework to approach transitions with a broad problem framing and analytical perspective (Smith et al., 2010) by including many elements such as technology, dominant regulations, rules, actor networks, artefacts and infrastructures (which are related to technology), institutions, norms and values, and ways of doing and acting (Paredis, 2013). Grin et al. (2010) refer this to the concept of co-evolution: simultaneous change on different levels and in different elements. It is precisely because the MLP brings the whole system in an intricate way under the analytical lens that it can be valuable as an analytical framework and, I argue, to study educational change.

4.1.3 Applying the multi-level perspective

Three issues regarding how the MLP was used in the analysis of the Flemish higher education system in paper I require some further attention. This section
subsequently addresses the case itself, the choice for doing a so-called static analysis of the case, and a discussion on some delineation and selection issues.

**Case study research: Flemish higher education system**

Paper I builds in-depth insights into how sustainability is finding a place in one higher education system, i.e. that in Flanders. In this sense, paper I is a case study, with an aim to “reveal the multiplicity of factors [which] have interacted to produce the unique character of the entity that is the subject of study” (Yin, 1989, p. 82). The focus is thus on the case’s specificity, its context, and the many factors that make the case what it is. As discussed in the state-of-the-art chapter, there are already a lot of case studies on sustainability in higher education, and their prevalence and quality has been criticised in the past (Corcoran et al., 2004). The novelty and primary contribution of the study in paper I in relation to that body of literature is that the paper does not focus on a specific practice but transcends this level by looking at an entire system. Whereas many case studies in the field focus on specific practices, universities, etc., paper I looks at how the higher education system as a whole deals with sustainability. Furthermore, by using the MLP, paper I does more than just describing one idiosyncratic case: It tests out the use of the MLP for an analysis of change of an educational system.

The choice for the Flemish higher education system was made for a number of reasons. While there had been done some scientific work about sustainability in higher education in Flanders (e.g. Lambrechts et al., 2018) it was still a rather unexplored case. At the same time, many things were also happening regarding the integration of sustainability in higher education in Flanders. A lot of institutions were mentioning sustainability on their websites, sustainability policy documents on the institutional level were being developed, and sustainability was being integrated in courses and programs in a number of institutions. Furthermore, a number of initiatives on the policy level were specifically oriented at the integration of sustainability in the higher education system. Besides a Flemish Government-level sustainability commission on higher education, there was a Flemish Government project specifically aimed at integrating sustainability in higher education institutions: Ecocampus. It is the latter that wanted a study on how sustainability was integrated in the Flemish higher education system, which led to the starting point of the study in paper I. The Ecocampus project offered access to a wide network of higher education practitioners that were involved with sustainability in higher education and had a lot of in-house knowledge on sustainability related projects and initiatives that were already going on in higher education in Flanders.

Besides this specific context that led to paper I, the Flemish higher education system was also a good fit for an analysis of the higher education system, because on the one hand, it is not too large so it is feasible in a single study of a PhD while on the other hand it still offers quite some variation within the system. Furthermore, prior to the study, I was already familiar with the case,
both with how the system is structured in itself, as to how sustainability was finding a way in the higher education system. This familiarity made it easier to situate and have access to a number of key respondents for the interviews. Familiarity with the language was an additional strong argument, as this allowed to interview people in their own language, and be able to understand all local documents and university websites.

A static analysis of the higher education system

The MLP was used in paper I in a specific way: to perform a so-called static analysis of the Flemish higher education system. This means that the study focuses on the current regime configuration, in relation to the landscape, and the niches that can be identified. There was thus no focus on how change was happening, but on how the three levels and their interplay could impede or facilitate a potential transition. Or in other words the focus was on how sustainability was finding a place in the current system. The choice for a static analysis was because the primary focus was on characteristics of the higher education system that enable or impede the further integration of sustainability.

The MLP was originally developed for analyzing (sustainability) transitions of socio-technical systems. Transition theory is a process theory (Paredis, 2013), which implies that also the MLP is generally used to analyze and understand transition processes. The focus of the first paper was somewhat different because it entailed a static analysis of the Flemish higher education system. However, a hypothetical higher education system at the end of a sustainability transition could have many shapes and sizes. There are numerous scenarios for such a new, more sustainable, regime configuration. Which one will be the end result of a potential transition depends on many things. Or to refer to the title of this manuscript: there are many different sustainable universities possible. This links clearly to the aim and focus of paper II.

The choice for a static analysis of the Flemish higher education system has closely intertwined analytical and conceptual consequences. First, the analytical implications. Doing a so-called static MLP analysis means that there is no study of change over time. The focus is on a conditional ongoing transition, which implies that there might as well not be a transition taking place. A static analysis offers a way to grasp if and how sustainability already has found its way into the higher education system and offers insights in how things can evolve from that point onwards. A static MLP analysis thus entails an analysis of the three levels of the current Flemish higher education system and how they interact at one specific point in time but without identifying how this transition might move forward in the (near) future.

Using the MLP for a static analysis of sustainability in a higher education system also has conceptual implications. First of all because it is easily influenced by, and tends to contribute to, a general blurring of the term transition. The multi-level perspective is a framework from transition theory, so its goal is to shed a light on transitions. The possibility that there is no transition taking
place is no problem in itself: The MLP equally well sheds a light on what impedes transitions, for example by giving a framework to study and understand lock-in mechanisms in the regime. But because of the static nature of an analysis like in paper I, it becomes tempting to see transitions everywhere. Then the threshold to speak of a transition gets lower and lower and the term ultimately loses its meaning. If an education system merely embeds attention for sustainability in the current regime, a transition has not taken place and it has to be analyzed as such: A transition that did not happen. Concretely, in a static analysis any hint of potential for change (e.g. when mentioned by an interviewee) becomes tempting to see as the first step of a transition, which is not the point of such an analysis. If the potentiality and conditionality of a transition are not on the forefront, the central concepts of the analysis begin to blur or start to show their limitations.

This brings us to the second conceptual implication of doing a static MLP analysis: The direction of the potential ongoing sustainability transition. Having a clear transition as central focus of a study helps to specify what is meant with “more sustainable”. In a static analysis with an open scope, sustainability is understood in the broadest sense possible: towards more attention for socio-ecological concerns. In the case of paper I this led to refrain from defining a general direction of a sustainability transition, entailing a very open scope and declaring everything that only hints at sustainability as relevant. Defining possible directions of such a transition can be a next valuable research step, which is exactly the contribution of the second paper of this thesis. Paper III, then, addresses some of the limitations and weaknesses of the MLP already pointed at here.

**Delineation and selection**

Several important decisions in the analysis in paper I are related to delineation and selection. In a first step the system itself has to be delineated. The socio-technical system under analysis in paper I is the higher education system in Flanders. In paper I, the choice was made to limit the system to all universities and university colleges that are acknowledged by the Flemish Government and the niches that take place within these institutions. This can be related to Barnett’s claim that “unlike ‘education’, ‘higher education’ is more or less entirely coincident with institutions of higher education” (Barnett, 2004, p. 61). This means that a higher education system is more easily understood as a delineated system than education in general. An MLP analysis of “education” in general would be more difficult to delineate (with for example the question to include non-formal education). The fact that the Flemish higher education institutions are acknowledged by (and are accountable to) the Flemish Government also facilitated this delineation as it offered clear inclusion criteria. In other countries (for example the United States) the label “university” is not protected which would complicate a similar process.
Secondly, the three levels – landscape, regime, and niches – that constitute the higher education system also have to be delineated. Mainly distinguishing between regime and niche practices warrants some further explanation. Notions of sustainability for example can be found on all three levels which means that it is not a discriminatory factor in identifying niches. This is not an analytical problem in the case of the landscape (e.g. climate change as landscape trend). It does make the distinction between regime and niches more complicated. Since regimes are dynamically stable, they are continually (but incrementally) changing. This implies that attention for sustainable development has also entered the dominant regime configuration in some way or another. Not all attention for or mentioning of sustainability can thus be regarded as a sign of a niche practice. For example: Adding a slide about sustainable development to the slideshow of a lecture does not turn a course into a niche experiment. While this is a rather easy example, not all cases are so straightforward. It can be a fine line between attention for sustainability within the dominant regime and system-challenging sustainable niche experiments. The degree of innovation, the radical character, and the extent to which a practice challenges the current configuration of the regime functioned as guidelines on which to decide if a practice functions as a niche within the system or if it is merely a way of the regime to incorporate sustainability in a regime-friendly way (c.f. the dynamic-stable character of the regime). This were not one-off decisions, but were part of an ongoing analytical process in which the co-authors discussed the confines of the regime and its relations to niches. The people from Ecocampus acted as critical friends in this process. In paper I this delineation was embedded in the analytical steps from the onset but continued to return as an empirical question throughout the analysis. The complex relation between regime and niches is something that is also addressed in paper III.

While the radicality or innovative character of a practice is the main criterion to decide whether or not a practice counts as niche, it says nothing about the relevance of the niche for the ongoing study. Non-sustainable niches could, for example, also play a role in a transition. An example might help to clarify this. In his study of the historical transition from horse-drawn carriages to automobiles in the United States in between 1860 and 1930 (Geels, 2005). Frank Geels also discusses seemingly non-relevant niches such as the upcoming safety bicycle, arguing that many niches that did not grow into a mature alternative for the regime, still played a role, for example in contributing to the fluidity in the urban transportation domain. This shows that not only niches that become mature and highly influence the regime are relevant in an MLP analysis. It is more complex than that. Niches, that is: small-scale innovative practices, take place all the time and most of them do not lead to a transition. They die a silent death, continue to live in the margins, or are incorporated in the regime in a regime-friendly way. The example also shows that determining which niches are relevant to include in the analysis is first and foremost an empirical and methodological question. Where this is difficult in the analysis
of a historic transition as in the example of the automobile, this is even more complex in analyses of ongoing transitions that are open-ended, which was the case in the first paper.

A final important issue in the delineation of regime and niches was the overlap between regime actors and niche actors. In the data collection for paper I, regime and niche actors were interviewed in two consecutive phases of the study. However, this proved to be more challenging than expected. Regime actors turned out to also be involved in relevant niches while interviewed niche actors were also involved in regime-confirming practices. Because most niches within a higher education system are per definition part of a higher education institution (as discussed above), niche actors were also part of the dominant regime in one way or another (as lecturer, researcher…). Looking at actions instead of actors formed a way out of this problem. This will be further elaborated upon in the discussion of the methodology of paper III.

4.1.4 Data collection

Studying something that is as large and multi-faceted as a higher education system requires more than one source of data. The dataset in paper I consisted of a number of types of data:

- Relevant policy documents related to higher education, research and innovation, sustainability. These documents were from the sub-national, national and international level.
- Texts on the websites of all Flemish higher education institutions: general presentation, mission and vision, educational vision and mission, research vision and mission, vision on sustainability, and the most recent year report that was available.
- Interviews with 21 higher education actors. 9 of them were a priori identified as closely related to dominant regime practices. 12 were a priori identified as closely related to niche innovations. The sample was made out of the larger pool of respondents on the survey and aimed at maximal variation (Patton, 2002) based on these criteria:
  - As many different institutions as possible are represented
  - An equal spread between universities and college universities. The latter provide more profession oriented higher education and are less involved in research.
  - Geographical spread of the respondents’ institutions
  - Variation in discipline of the respondents
  - Variation of position in the organizational chart of their institution (e.g. lecturers, researchers, supporting staff, managers….)
• An explorative survey that supported the preparations of the interviews.
• A focus group interview with a selection of the respondents of the individual interviews.

Combining these different types of data was a way to achieve data triangulation, approaching the same object of study through different data sources to allow to answer the research question (Patton, 2002). The different data sources were complementary and allowed to get a wider overview of the object of study. Because of the systems approach and the multi-faceted nature of the object of study, this was necessary. On top of this, the triangulation of qualitative data was a way to overcome the vulnerabilities of any single method, while also allowing for so-called cross-data validity checks (Patton, 2002). This allowed to see inconsistencies between different data sources. For example, the websites of one particular higher education institution described high sustainability ambitions while an interviewed lecturer said this came down to one-off events such as a warm sweater day in which the institution forgets to turn the heat down.

4.1.5 Data analysis

The quantitative survey was limited in scope, descriptive in nature and supported the preparations of the interviews in terms of questions and selection of the respondents.

All qualitative data was analyzed through thematic analysis, a method for identifying, analyzing and reporting patterns or themes across an entire dataset (Braun & Clarke, 2006, 2012, 2021). A theme, here, refers to a recurring element in the data set that is important and meaningful in relation to the research question. In this specific study, this comes down to recurring elements in the data that are related to how sustainability is integrated or can be integrated in the higher education system.

The MLP as analytical framework in paper I functioned in two ways during the data analysis. First of all, the MLP introduces concepts that offered guidance for the data analysis in a way that can be best described as sensitizing concepts (Blumer, 1954). In other words, it shows where to look, but does not define what you should see. It sensitizes you to have attention for more subtle aspects of the data (Tuckett, 2005). Secondly, the MLP also provides a framework (e.g. the landscape-regime-niche distinction) and a way of thinking to make sense of the case and to structure the data into a meaningful whole. In this sense, the analysis in paper I relates closely to what Braun and Clarke (2006) describe as theoretical thematic analysis, which is more driven by the specific theoretical interest in the area, in this case based on earlier work on
the MLP, allowing for a more detailed analysis of specific relevant aspects of
the data. This led to the following analysis procedure.

Before the analysis could start, all interview data was transcribed ad verba-
tim. The transcripts were added to the other data and uploaded into an NVivo
project. After familiarizing myself with the data (of which the transcription
already was a part), the data was coded, in this way creating an initial coding
scheme. The initial codes were as specific and narrow in scope as possible and
they stayed close to the data. This initial coding was guided by the research
question but the aim was to code for as many potentially relevant themes and
patterns as possible. After this initial coding, themes on a broader level were
sought by connecting codes throughout the data. These themes were dis-
cussed, reviewed and refined with the three authors of the paper in a next phase
during which they were explicitly positioned within the MLP framework. The
following analytical questions, for examples, were asked: Which themes are
(related to) regime characteristics, what are niche practices, which themes im-
pede or enable a potential transition, what might function as a lock-in, etc.
Here, the analytical framework explicitly entered the analysis. This was an
iterative process between the developed themes, the data and the theory to
arrive at a functioning analysis

4.1.6 Conclusion
The methodological approach described in this section led to the findings that
are presented in paper I and summarized in section 5.1 of this manuscript. A
part of these findings are also used in this thesis as analytical model in a case
study of a sustainable higher education change practice which is presented in
paper III (see section 4.3.3 in this manuscript for a discussion of the analytical
model).

4.2 Discourse analysis of academic literature
4.2.1 Introduction
In a discourse analysis of 4584 academic publications (which is presented in
paper II and summarized in section 5.2), this thesis develops knowledge on
how the sustainable university is conceptualized in the academic literature on
the university–sustainability nexus.\textsuperscript{36} The methodology pivots around
the combination of the data mining technique topic modeling and post-structural

\textsuperscript{36} This makes the academic literature on the university–sustainability nexus the object of study
and the way the sustainable university is conceptualized in this literature the main object of
knowledge
discourse theory (Laclau & Mouffe, 1985). This combination makes it possible to do a discourse analysis of a very large body of literature while still staying close to the data and rigorously avoiding to see what one expects to see. On the one hand, topic modeling reduces the complexity of the data in a way that prepares it for a discourse analysis. On the other hand, discourse theory is purposefully operationalized in a way that allows to analyze the data in a coherent, consistent, meaningful, and theoretically sound way.

After this introduction, the section continues with a brief justification of my decision to combine discourse theory with topic modeling (section 4.2.2). After this, I address some issues related to how I employed the discourse theory – topic modeling combination (section 4.2.3). This is followed by a rather technical presentation of the data collection and analysis (section 4.2.4), which is primarily intended for readers who want to do a similar study. The section ends with a short conclusion (4.2.5).

4.2.2 Rationale behind combining discourse theory and topic modeling

Topic modeling (TM) is a powerful text mining method that allows to do an automated content analysis of large bodies of text (Arora et al., 2018; Jaworska & Nanda, 2018). It derives latent meaning from documents by investigating large patterns over multiple documents. TM is thus able to reduce the complexity of a collection of texts (i.e. a corpus) by identifying topics: “collections of words that have a high probability of co-occurrence” (Jaworska & Nanda, 2018, p. 11). These identified topics, collected in a ”topic model”, offer a representation of the content of the corpus. The combination of discourse theory (as introduced in section 3.2.3) with topic modeling needs some further elaboration and deserves a discussion in relation to its theoretical context. Topic modeling and discourse theory could be seen as something of a symbiotic relationship (Jacobs & Tschotschel, 2019). Both seem to profit from teaming up and this can be brought back to two main points. Firstly, topic modeling’s topics are not really “topics” in the commonsensical meaning of the word; or do not necessarily have to be interpreted as such (Jacobs & Tschotschel, 2019). In other words, the method is not able to deliver clear-cut answers to research questions by itself. When using topic modeling in research, a conceptual framework is necessary to analyze and interpret these topics in relation to the research question, to give meaning to what they say us about the world. Discourse theory provides such a framework.

Secondly, an important challenge of interpreting qualitative data is getting away from pre-established interpretations (Feldman, 1995). Using topic modeling in a discourse analysis helps to deal with this challenge thanks to its highly inductive nature. Topic modeling provides a methodological toolbox to make the jump from empirical material (texts, micro-level) to discourses
In this way, topic modeling provides a way to postpone judgment and can be used as an analytical method between data and theoretical framework. Such an analytical method is intended to “discipline and systematize the researcher’s work, to maintain openness for empirical surprises and to disrupt potential Hineininterpretierung” (Van Poeck & Östman, 2021). Rheinberger (2007) discusses this issue from a different angle:

One can characterize research as a search moving on the borderline of knowing and not-knowing. The basic problem is that one does not really know what one does not know. This is, briefly and concise, the essence of research. In the end it is about gaining new insights; and what is really new, is by definition not to foresee, and it can also only be produced in a limited way. What is really new, has to arrive, and one has to create conditions in order to make its arrival possible. (Rheinberger, 2007, p. 3)

Doing research, and consequently also selecting a methodological approach, thus entails the creation of such conditions in which one can find those new things, of which you even did not know that you did not know them. Using topic modeling as method in a discourse analysis was a way to create such conditions. However, using topic modeling is not a way to cut the researcher out of the equation. The approach used in paper II is an example of a so-called corpus-based discourse analysis. This is a type discourse analysis that analyzes large bodies of text (i.e. corpora) by also using automated computational processes (Baker, 2006). Baker (2006) lists a number of advantages of corpus-based approaches to discourse analysis: It helps to reduce researcher bias, allows to study the subtler aspects of language use, enables to identify resistant and changing discourses, and allows for triangulation. However, “corpus data does not interpret itself, it is up to the researcher to make sense of the patterns of language which are found within a corpus” (Baker, 2006, p. 18). And this sense-making has to happen while taking heed of the social conditions of production and interpretation of the texts (Fairclough, 1989). When analyzing a corpus, or text in general, these contextual aspects need to be considered which is not done by the computer, but by the researcher.

37 I will come back to this “jump” in section 4.2.3.
38 To read something into it that is not there.
39 Original quote in German: “Man kann das Forschen also als eine Suchbewegung charakterisieren, die sich auf der Grenze zwischen dem Wissen und dem Nichtwissen bewegt. Das Grundproblem besteht darin, dass man nicht genau weiß, was man nicht weiß. Damit ist das Wesen der Forschung kurz, aber bündig ausgesprochen. Es geht letztlich um das Gewinnen von neuen Erkenntnissen; und was wirklich neu ist, ist definitionsgemäß nicht vorhersehbar, es kann also auch nur begrenzt herbeigeführt werden. Was wirklich neu ist, muss sich einstellen, und man muss Bedingungen dafür schaffen, dass es sich einstellen kann.”
4.2.3 Applying the discourse theory – topic modeling combination

Academic literature as object of study
The choice for academic literature as object of study for a discourse analysis requires some further argumentation. While academic literature is not the usual suspect when it comes to a discourse analysis, a number of arguments back this choice.

First of all, approaching academic literature as empirical material is theoretically sound within the paper’s discourse theoretical background. Understanding the studied research field as a so-called “social system” (Howarth & Stavrakakis, 2000) means that the research field is understood as consisting of different discourses that are continually reproduced and/or challenged through articulations. The articulations that continually reproduce and/or challenge these different discourses are the academic publications that make up the field and form the dataset for the paper. This implies two things. (1) On the one hand, it shows that it theoretically makes sense to approach academic literature as empirical material, like any other object of study would be. It is a social system in its own right, just like any other social system. (2) On the other hand, if academic research is just a social system, albeit with its own specific rules and customs, there is no reason that it should by default be treated any differently in research. My first argument is thus that nothing is stopping us from having scientific literature as the object of study in an empirical study instead of merely as the focus of literature review research.

Having argued that academic literature is a valid object of study and theoretically makes sense for a discourse analysis, some additional points have to be made that further justify this choice. What follows will also lay the groundwork for the next section in which I will zoom in on the complexity of the object of knowledge of the study.

A second point relates to what was described in chapter 2 as the researcher-practitioner overlap. Figueiro and Raufflet (2015) describe literature on sustainability in management education as “an area whose authors, as professors and lecturers, are both practitioners in the field and authors of the articles simultaneously” (p.30). This means that the backgrounds of the researchers who publish in the field do not necessarily lie within the field in which they publish. In addition, Figueiro and Raufflet (2015) claim that publications on sustainability in management education are generally very descriptive and often contain the author’s own experiences in practices.

In chapter 2, I have argued that the researcher-practitioner overlap is present in many publications in the entire field. While Figueiro and Raufflet (2015) frame this overlap as a point of critique, or at least as a potential
weakness, it also offers possibilities for interesting research. This researcher-practitioner overlap, together with the often-descriptive nature of publications, makes that studying this literature says more about practice than appears on first sight: It implies you are also studying what professors and lecturers who are involved in sustainability practices in universities write about these same practices, often in very descriptive and personal accounts. This means that studying academic publications on the topic entails two things: On top of doing a scientific review, you also get an indirect entrance into what these very practitioners find worthwhile writing about. This sheds a new light on the title of paper II. The “we” in “Which sustainable university are we actually talking about?” does not only refer to authors/researchers publishing in the field, but because of this overlap also to actual practitioners that are involved in sustainable higher education practices.

A third point that supports the choice for academic literature as object of study is that the field contains both empirical work and more theoretical reflections. This means that empirical studies on existing sustainable higher education practices, practitioners, systems etc. are complemented in the corpus by theoretical reflections on what a sustainable university should be or could be. This combination of what is and what should be holds a number of advantages for the study. Publications with empirical work reflect what currently happens in practice (for example through the many case studies): studies of niches (to use the MLP jargon), change processes, states of affairs of sustainability in higher education… In this way, they bring what happens in practice into the corpus of paper II. In addition, empirical studies also reflect what authors in the field find important enough to study and to write about: what they find valuable: both in the positive (what should be valued) as the negative sense (what should be problematized).

A double object of knowledge
The previous section argues for the use of academic literature as object of study, but an important, and related, point should be made about the object of knowledge as well. While the object of knowledge is presented in the research design in brief section as “how the sustainable university is conceptualized in the academic literature”, it actually exceeds this and encompasses “how the sustainable university is conceptualized by those involved in sustainable higher education practices” as well. In other words, paper II does not only say something about how the sustainable university is conceptualized in literature, but also says something about how it is conceptualized in practices.

41 An important point to add here is that the specific approach of paper II, as made clear in the paper, does not allow to differentiate between both.
There are a number of arguments for this claim. First of all, the previous section made clear that there is a strong connection between the content of the corpus and practices. Be it through authors also being practitioners in their cases, through the highly descriptive character of many entries, or by the large portion of empirical work in the corpus, practice is very much represented in the data, and hence also in the results. Secondly, the identified discourses in paper II describe such general discursive patterns that a link with practice is unavoidable. The highly abstracted nature of the results, together with the size of the corpus, make this clear.

An important point to make here, though, is that the relation between the object of study and higher education practices as object of knowledge should be approached with some caution. There are plenty grounds to argue that the results of paper II do give a hint of how the sustainable university is conceptualized in higher education practices that deal with sustainability, but the approach used in paper II does not allow to verify to what extent and whether or not this goes for all topics in the topic model / all discourses or not. Precisely this point led to the research question of paper IV: to test (albeit in one case) in what way the results of paper II say something about what happens in a higher education change practice.

**From object of study to object of knowledge**

Based on the idea that discourse studies always focus on text in context, Carpentier and Cleen (2007) structure the field of discourse studies according to macro-textual / micro-textual and macro-contextual / micro-contextual axes, positioning discourse-theoretical analysis on the macro ends of both axes (as also discussed in section 3.2.2). However, while being interested in text and context on the macro level, empirical work starts on the micro-level: by studying the language used in specific texts in specific conversational contexts. In other words, while the object of knowledge in discourse-theoretical analysis lies on the macro level of text in context, the object of study inevitably always lies on the micro-level, that is: one or many very specific and very micro texts. Paper II offers an example of this. The object of study consists of concrete academic writings. That is: a large corpus of academic texts on the university–sustainability nexus, made up of specific words in specific wordy contexts as part of a specific academic conversation. The object of knowledge, however, relates to discourses on the sustainable university. By looking at specific texts, the intention is to know something about discursive patterns beyond the texts. The texts are thus articulations of these discourses, and by looking for patterns of similarities and differences in a larger corpus, these can be studied.

This means we need to make the jump from the micro empirical material to discursive patterns on the macro level (which is where our discourse theoretical focus leads us). Discourse theory itself offers little to no guidance to do this. Consequently, one of the major challenges in such a discourse analysis lies specifically in bridging that gap between the object of study and the object
of knowledge. In paper II topic modeling serves this purpose: It helps to make the jump from the micro-level object of study to the object of knowledge. Figure 4.1, based on the earlier discussed figure of Carpentier and De Cleen (2007), illustrates this function.

Topic modeling serves the purpose of facilitating the jump from the object of study to the object of knowledge. It makes an abstraction of concrete text in concrete context on the micro-level to a more abstract collection of topics on the macro level by inferring topics from a large corpus of texts. This implies that the focus shifts to the whole corpus away from individual texts. This does not mean that the topic model (i.e. the collection of topics that makes out the output of the topic modeling) forms the object of knowledge. Topic modeling helps us to abstract the object of study in such a way that we become able to say something about the object of knowledge. The model still needs to be analyzed in order to be able to say something about the object of knowledge, as is shown in paper II.

![Discourse analysis + topic modelling](image)

Figure 4.1. Representation of the function of topic modeling within paper II (based on Carpentier & Cleen, 2007, p. 277)

**Full publications instead of abstracts**

Using TM for analyzing scientific literature has been done before, but primarily with another unit of analysis: abstracts (e.g. Daenekindt & Huisman, 2020; Vander Beken et al., 2021) and only to a lesser extent the main text of publications (e.g. Asmussen & Møller, 2019). While I acknowledge the advantages of working with abstracts (i.e. access, easier and faster data collection, cleaner data, and a lower workload in general), using the main text of publications
was desirable due to the depth and specificity of the research question. Abstracts work well if one interprets topics as representations of content (cf. the “aboutness” of a text) but in a study with a high number of topics (i.e. 200 topics) and a specific fine-grained focus (i.e. the sustainable university) this would arguably not work sufficiently. To cope with the length requirements of optimal topic modeling, the publications were cut in pieces (see section 4.2.4 for details).

The corpus in time and space

Paper II approaches the corpus without taking temporal and contextual differences between academic publications within the corpus into account. This was done for a number of reasons. First, regarding the temporal aspect. While trends obviously play a role in academic debate, the impact of “older” publications lingers on, way beyond that of for example a newspaper article. While there is a tendency to prefer more recent references in an article (e.g. from the past 5 to 10 years), the APA style for example includes no timeliness guidelines for references. This means that publications can have a continuing impact in the field, by being referred to directly, or by influencing more recent works that are then referred to in their turn. This led me to approach the entire corpus at one point in time as one single entity. Dominant ideas will be repeated (and vice versa) and thus picked up in the topic model, marginal ideas will be invisible in the topic model. It was not my intention to study where the field has come from and where it is heading\textsuperscript{42}, but to show how differently the sustainable university is and can be presented within the field: to simply lay bare the differences and similarities, and in doing so opening up pathways to advance the field.

Regarding the context and country of publication. The only contextual delineation in the study was the language: English. Only publications in English were included in the corpus. I did not take national or regional origin of publications/authors into account in the analysis because that was not the purpose of the study. All English publications that fitted the brief and were present in the chosen database were included. This means the study does not include publications in other languages (e.g. Portuguese, Spanish, French, German… to name a few).

\textsuperscript{42} Such a thing could for example be done in a follow-up study.
4.2.4 Data collection and analysis

The final subsection of this section on the discourse analysis of academic literature presents the rather technical process of the data collection and analysis in great detail. This part will be mostly relevant for those who intend to do a similar study.

Greckhamer and Cilesiz (2014) posit that one of the key challenges of performing an empirical discourse analysis is to do the analysis transparently and to represent the analysis process in a way that is comprehensible for readers. In response to this, the present section gives an overview of the different methodological steps taken in the study in order to provide such transparency. The section provides a clear overview of the subsequent different steps and decisions I took throughout the data collection and analysis. Such an overview is in line with Constas’ (1992) call that researchers should provide a chain of evidence to explicate how they move from data to results (in Greckhamer & Cilesiz, 2014).

While the main aim is methodological clarity, which is a valuable goal in itself, my explicit intention with this section is also in line with the methodological purpose of this thesis: To allow colleagues to build further on my work, critically as well as constructively. I wish to provide colleagues who intend to do a similar study with some guidance and inspiration. Paper II is the result of a high cost, high gain study, and hopefully this will help people who want to conduct similar research to somewhat lower that cost.

Although the overview below is sequential, it is important to note the highly iterative nature of the process: a constant back-and-forth movement between different steps. This circular movement is mentioned throughout the overview where applicable.

**Database selection**

Before the data collection could commence, one database has to be chosen. The citation and abstract database SCOPUS was selected because it offers the largest amount of hits on the search query (see next step, cf. the iterative process of the research steps). Web of Science was not selected because it offers less coverage of educational work (Hallinger & Chatpinckyakooop, 2019)) and ERIC’s focus on educational research would put an undesirable limit on the study, as this would mean that discourses in which an educational understanding of the university is privileged would be more dominant.

Combining two databases was not an option because doubles (the same document appearing twice in the corpus) have a negative impact on the quality of the topic model. Doubles have all words in common which skews the outcome of topic modeling dramatically. Doubles are not avoidable when
combining databases in the collection of such a large corpus. Finding them takes a lot of time and you have to be absolutely certain that they are all gone.

**Designing the search query**

In order to collect the data, a search query had to be designed first. There were three inclusion criteria: (1) the publication is in English; (2) it is an academic publication; and (3) it is a publication about the university and sustainability. The language is important because text mining approaches are primarily based on identifying the same words, which means that the language of all texts should be in English. Hits in Spanish or German were thus excluded from the corpus.

The second inclusion criterion, the academic nature of the publication, was guaranteed by the database. It is important because the object of study is academic literature, but also because topic modeling requires a corpus which uses the same kind of jargon. For example, combining academic publications and love letters would not be a good combination, because a totally different jargon is used in both.

The third inclusion criterium is content-related and led to the specific design of the search query. The focus of the study on the university–sustainability nexus necessitated a query in two parts (cf. “AND”): every document has to deal with the university AND sustainability. This is represented in the Venn diagram in figure 4.1. If a publication does not deal with both, it should not be included in the corpus. Figure 4.2 represents this.

![Figure 4.2. Venn diagram representing the main inclusion criterium that lead to the rationale behind the design of the search query. The corpus of paper II is situated in the overlap (cf. AND).](image-url)
This led to the following search query:

<table>
<thead>
<tr>
<th>Search query:</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE ( ( &quot;higher education&quot; OR universit* OR campus* ) AND ( sustainab* OR eco* OR green* OR sdg* OR environmental* OR climate) )</td>
</tr>
</tbody>
</table>

The query only focuses on the title (and not also on abstracts for example) because the alternatives gave too many irrelevant hits. Sustainability as a buzz word and the university as the place where researchers do their research were often mentioned in the abstracts without making the document relevant for the study.

The designing of the query took place through trial and error and deliberations with colleagues, based on the inclusion criteria and guiding principles above. The iterative process of the design of the search query is represented in Figure 4.3, in which a sample of the first 100 hits (random order) was checked continuously to alter the search query. The general guiding principles for the search query were (1) to give as much relevant hits as possible, (2) to give as less irrelevant hits as possible, and (3) to avoid doubles because doubles are detrimental for topic modeling, as described above. The search query should make the data collection as effective and efficient as possible.

Running the search query
The actual search for publications in SCOPUS was done with the search query mentioned above.
**Downloading the documents**

All files were downloaded manually. This was to avoid systematic errors that might occur with automated web scraping tools. Systematic errors are errors that occur repetitively. Since topic modeling looks for patterns of similar word use between texts, systematic errors are detrimental for topic modeling. If the same words would automatically be omitted or added in multiple texts, this would skew the topic model. Individual manual mistakes do not have such an impact because they do not reoccur throughout the corpus in a way that is picked up by the topic modeling software.

The downloading took place in chronological order (oldest to newest). Ordering the hits chronologically is a possibility in SCOPUS. This helped to pick up where I left off the day before (the actual downloading took a lot of time) and allowed to end with the most recent publications.

The academic subscriptions of two university libraries (Uppsala University and Ghent University) were used to achieve optimal access to the publications. This did not lead to access to the full texts of all publications. ResearchGate was used to supplement this access. When the full text was not available on ResearchGate as well, I omitted the publication from the corpus. This was not deemed to lead to a selection bias.

Irrelevant documents were excluded during this download process. This was done based on the titles and abstracts of the documents. Irrelevant documents appeared in the search for example when the eco* in the search query led to “economical”.

**OCRing pdf files**

Because the documents were downloaded as pdf files, they had to be converted to txt files. Mallet, the topic modeling software, does not work with pdf files. A first step in making this conversion possible is to OCR the pdf files. OCR means optical character recognition, it is a process in which optical characters (i.e. letters, numbers, punctuation…) in a file become recognizable as such by the computer. OCRing is necessary to be able to extract the text from the pdf files in the next step. The OCRing was done with ocrmypdf in the Windows subsystem for Linux. 43 ocrmypdf was installed via Aptitude.

**Converting to txt files**

Once all pdf files were OCRed, they were converted to txt files to be able to import the corpus in the topic modeling software. This happened again in the Windows subsystem for Linux. pdftotext was used, which is part of the Poppler utils. The latter was also installed via Aptitude.

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Removing irrelevant sections

Once the entire corpus was available as txt files, irrelevant sections of the documents were manually removed. This was based on the idea that the discourse is in the main text, and that other sections (author affiliations, paper history, notes on the contributors, acknowledgements and declarations, reference lists…) do not contribute to this and would hence produce clutter in the topic model. These sections also tend to have a particular jargon which would also become dominant in the topic model. These sections were removed manually to avoid systematic errors and because the formats of the documents were not similar enough to allow an effective automation of the process.

Segmentation

The corpus at this point contained a variation of document lengths, and most were rather long for topic modeling. Jockers and Mimno (2012) state that “[f]or topic modeling purposes, the unit of analysis should be a segment of text that is large enough to measure word co-occurrences but small enough that it can reasonably be assumed to contain a small number of themes.” Or in other words: if documents in the corpus are too long, every document contains a lot of unique words, implying a natural larger overlap in word use. Documents are then less unique which leads to a fuzzier analysis. Since many files in the corpus were thus too long for topic modeling, documents had to be cut in pieces. With a script written in Julia, the files were split into smaller pieces of approximately 1000 words which allows more specific and fine-grained topics to be found. I compared models with different document lengths (i.e. 500, 750 and 1500 words) and 1000 words gave the clearest and sharpest topics in function of the research question. This number was confirmed in the study of Jockers and Mimno (2012). These split files were handled by the topic modeling software as separate documents, making these split files the unit of analysis (and no longer the full publications).

Data importation and pre-processing

The topic modeling itself was done with Mallet. Before this can be done, the data needs to be imported and further pre-processing needs to take place. This pre-processing can be done as part of the importation in MALLET. The final pre-processing settings were the result of an iterative process of running a topic model, changing the pre-processing and running the model again.

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44 I am grateful to Tom Van Acker for writing the script in Julia for me.
Import command in Mallet:

```
bin\mallet import-dir --input cleanerdata1000 --output cleanerdata1000.mallet --keep-sequence --remove-stopwords --extra-stopwords extrastopwords.txt --replacement-files replacements.txt --deletion-files deletionfile.txt
```

Explanation of the import command:

- **The input** of the command is the cleanerdata1000 folder, containing the cleaned corpus.
- **The output** of the command is the file cleanerdata1000.mallet which in its turn will form the input for the actual topic modeling.
- **Basic stopwords** are removed with a basic English stopwords list ("--remove-stopwords"). The removal of stopwords is a common component of any natural language processing technique, such as topic modeling (Sarica & Luo, 2021). Stopwords are uninformative components of the data. Because they are common words that appear in most texts without meaningful connection to the content, they would distort the topic model and prevent meaningful and sharp topics to be found. This list of stopwords is included in the Mallet software. For example, the ten first stopwords in the used list (alphabetically ordered) are: a, able, about, above, according, accordingly, across, actually, after, and afterwards.
- **Extra stop words.** A list of extra stop words that need to be removed was manually added (the "--extra-stopwords" command). These were format-related words, the names of authors, and some central concepts of the study that appeared to clutter the topic model (sustainability etc.) because they appear in every document. Because these words appear in all documents, they would consequently distort the topic model.
- **Clustering of specific strings of words.** Strings of words that have a distinct meaning when they appear together should be recognized as one word. This is done with the "--replacement-files" command which connects such strings of words with an underscore. An example of such a string is "living lab" becoming "living_lab". Another word for this is an n-gram. A list for the identification of such n-grams was made based on the Encyclopedia by Filho (2018) and the researcher’s affinity with the field.
- **Removal of multiword stop terms.** Multiword stop terms are specific strings of words that should be removed from the corpus. This is done with the "--deletion-files" command and a self-made list of such terms. This list contained mainly the names of journals, as...
these reappear in the headers and footers quite often and would consequently distort the outcome of the topic modeling.

A number of parameters have to be set in the topic modeling software Mallet. The most important ones are the number of topics the model should consist, the amount of times the software should run a model in order to find the best one (i.e. the one that predicts the corpus the best), and how often the parameters should be optimized during this process. After testing a large number of models, a topic model with 250 topics, 3000 iterations and a parameter optimization every 50 iterations was selected. This model had the right granularity and spread of size of topics to allow to answer the research question. In a model with less topics, for example, the topics would be larger and more complex. If you run more iterations and optimize the parameters more often, some topics become too small to be useful for the study. All this implies that every test topic model has to be analyzed to a certain extent in order to be able to evaluate it. This process led eventually to the following command which lets Mallet run the Topic Model. Running this model takes the computer approximately 3 hours.

Command to train the topic model:

```
```
Explanation of the command to train the topic model:

- The **input** of the command is the cleandata1000.mallet file which was output in the previous step: the pre-processed corpus.
- The next five commands define the **parameters**: number of topics in the model (a topic model of 250 topics), the number of key words for each topic that should be printed (the 40 most important key words for every topic), the number of iterations (i.e. the amount of times Mallet should run the model trying to find the best division of words into topics; 3000 iterations in this case), the number of iterations between every time Mallet should optimize its hyperparameters (every 50 iterations), the number of iterations before the hyperparameter optimization should start (after the first 50 iterations).
- The other commands relate to the desired **output**, that is: information about the topic model that will help in the analysis.

**Analysis of the final topic model**

Once the iterative process described in figure 4.4 is finished, the final model is then analyzed. This was done in four consecutive steps as described in detail in the paper under phase two of the analysis.

**Sensitizing concepts and educational theory**

The study in paper II was designed to be as inductively as possible. This means that the role of educational theory and earlier work on higher education and sustainability in the analysis was limited purposefully in order to keep open the meaning of education and the sustainable university in the study. However, this is not completely possible nor desirable, which is why sensitizing concepts (Blumer, 1954) were used to give guidance on where to look, without defining what to see. Six sensitizing concepts were used: education, campus, research, institutional framework, outreach & collaboration, and on-campus experience. These sensitizing concepts were selected based a number of typologies of how the university can engage with sustainability. This means that the specific meaning of what is education and what is not is kept explicitly open. This made it possible to let education appear in multiple forms and meanings throughout the discourses, as is described in the results and discussion section of paper II.
Relative weight of the discourses
The three discourses in paper II are presented as the dominant discourses in the field, but no comments have been made about their relative weight. This warrants a further explanation. While frequency and collocation tend to play a big role in corpus-based techniques, frequency, for instance, does not always mean dominance (Baker, 2006). Dominant discourses might be implied and hence not be made explicit. Just because of their dominance they are taken for granted. On another level, nodal points of a discourse (understood from a discourse theoretical framework), for example, might also be not explicit in a text, just because of the central role they play in that discourse. “Sometimes, what is not said or written is more important than what is there.” (Baker, 2006, p. 19) These are aspects that should be kept in mind while combining corpus-based techniques with discourse analysis, or combining quantitative and qualitative approaches in general.

4.2.5 Conclusion
The methodological approach described in this section led to the identification of three discourses on the sustainable university. This study is presented in paper II and summarized in section 5.2 of this manuscript. Similar to the findings of paper I, these findings are also used in this thesis as analytical model in a case study of a sustainable higher education change practice. This case study is presented in paper IV (see section 4.3.3 in this manuscript for a discussion of the analytical model).

4.3 Case studies of a sustainable higher education change practice
4.3.1 Introduction
Beside an MLP analysis and a discourse analysis (which both focus on more generalized patterns), this thesis also entails the analysis of a micro-level practice in which change is made (i.e. a change practice). In two case studies I analyze one innovation project in which a working group of mainly lecturers embed sustainability in the electromechanical engineering bachelor of a Flemish (North-Belgian) university. These two case studies are presented in papers III and IV and are summarized in sections 5.3 and 5.4. Besides a shared object of study, both case studies also share an overarching methodological

46 This makes the change practice in which sustainability is embedded in an electromechanical engineering bachelor the object of study of these two studies.
approach, building on pragmatist transactional theory (Dewey & Bentley, 1949; Garrison et al., 2022).

The third paper analyzes how those involved in the case act upon characteristics of the current dominant higher education system. To make this possible, the concept of transactant (Hofverberg, 2022), which builds on transactionalism, is used as analytical lens, together with an analytical model based on results of the MLP analysis (paper I). In the study, a tentative typology of ways in which those involved in a change practice can act upon characteristics of the current higher education system (i.e. regime characteristics) is constructed, each with its implications for the meaning of the regime characteristic in the practice and for the kind of educational practice that is developed in the end. In addition to this, the approach also gives a detailed insight into what kind of educational practice is developed in the case in terms of its novelty compared to the wider higher education system.

The fourth paper analyzes how the sustainable university is conceptualized and how it practically takes shape in the case. In order to achieve this, a methodological approach is developed which combines pragmatist transactionalism with an analytical model based on the results of the discourse analysis (paper II) and using the concepts of environing (Östman et al., 2019b) and privileging (Wertsch, 1993) as analytical lens. The developed methodological approach is designed to trace in a high-resolution manner how the sustainable university is conceptualized and how it takes shape in the practice beyond a mere deductive application of the analytical model.

The remainder of this section on the two case studies (4.3) elaborates on the justification for using transactionalism and how this differs between papers III and IV (section 4.3.2), discusses some points related to how transactionalism is employed in the case studies that are not highlighted in the papers (4.3.3), gives an overview of the data in the dataset (4.3.4) and ends with a short conclusion (4.3.5).

4.3.2 Rationale behind using transactionalism

There are strong methodological similarities between papers III and IV: They study the same case, both build on pragmatist transactionalist theory, and both are using models derived from analyses of more generalized patterns (i.e. respectively institutional and discursive patterns). However, the papers have a different object of knowledge: Paper III develops knowledge on the relation between the change practice and characteristics of the dominant higher education system. Paper IV explores if and how the three discourses (identified in paper II) have an effect on the process and the results of the change practice and connects this to what vision of a sustainable university is expressed. Because of this, different conceptual lenses are brought in and different analytical models are used. The models will be discussed in section 4.3.3, the lenses
were discussed in the theoretical framework chapter (section 3.2.3). However, because of these different objects of knowledge, there are also some differences in the rationale behind the choice for pragmatist transactionalism in these studies. In paper III, it was primarily chosen because it allows to address a number of criticisms on the MLP, which was the central framework in paper I. In paper IV, transactionalism was chosen because it offers a suited way to empirically analyze how the sustainable university is conceptualized and how it takes shape in a change practice by using an analytical model in a non-deductive way. Both are discussed more thoroughly in the following two subsections.

Addressing critique on the multi-level perspective (paper III)
The MLP is a well-established analytical framework and can generate interesting results in an educational context (as e.g. discussed in section 4.1.6). However, already in paper I, some limitations of and points of critique on the MLP are hinted at. Paper III offers a more thorough overview and discussion of how some assumptions in and limitations of the MLP are discussed in the wider transition literature and presents an attempt to address them.

In the case study presented in paper III, pragmatist transactionalism is used to actively respond to a number of these criticisms. The explicit intention was to not throw out the baby (i.e. the MLP) with the bathwater, but to use the MLP (i.e. results of an earlier MLP analysis) in such a way that these criticisms are met. What follows is a summary of the critique on the MLP that is further developed in paper III, and an elaboration on how these points are addressed in the case study.

The MLP is too structuralist (Fuenfschilling & Truffer, 2014; Smith et al., 2005; Upham et al., 2018).

- The transactionalist approach allows to counter the structuralism critique in two ways: (1) by taking as a point of departure that one can never know in beforehand what becomes of regime characteristics when they are used and (2) by looking for how the way they are acted upon affects what the regime characteristics come to mean and do in the change practice.

The MLP only explains reproduction and continuity but fails to adequately explain processes of change (Pesch, 2015).

- The study looks at both continuity and change by zooming in on how those involved in the change practice act upon the regime characteristics. Both continuity (e.g. the “conforming” category in
which a regime characteristic is conformed to\footnote{The results of paper III entail a typology of five ways in which characteristics of the dominant regime can be acted upon. See the summary of the results of paper III in section 5.3.}) and change (e.g. the “modifying” category in which a regime characteristic receives a new meaning) come to the fore in the results. Furthermore, the specific approach allows to study change in a way that acknowledges that in practice, change can also be closely intertwined with continuity. The “modifying” category is a good example of this, because it shows how a regime characteristic’s importance is confirmed while its meaning to a certain extent is altered.

Studies that use the MLP framework are “fuzzy and sometimes rather arbitrary” in how niche-regime-landscape dynamics are approached and the extent to which change is possible at each level is “assumed, rather than empirically assessed” (Fuenfschilling & Truffer, 2014, p. 773; see also Raven, 2006; Smith, 2007)

- The dynamics between niche and regime (or to be more precise: between change practice and regime) are at the heart of the study. The transactionalist approach allows to be specific about what these dynamics precisely entail and how they affect what happens in the change practice.

The MLP fails to offer an adequate understanding of how, and under which conditions change is (not) made (Farla et al., 2012; Pesch, 2015)

- By focusing on one practice and by being precise on the interactions with the regime (characteristics), the study produces knowledge on how change is made, which change is made, and what change is not made.

More attention to the micro-dynamics of reproduction and change in concrete, observable practices is needed (De Roeck & Van Poeck, 2023)

- The study zooms in on change in the making in one change practice, allowing a precise account of reproduction and change in that practice, but in relation to the dominant regime. The latter is operationalized through the regime characteristics.

There is a need to step away from an understanding of innovative niche practices and the regime as distinct entities and to look at the interaction between them (Hoffman & Loeber, 2016; Raven, 2006; Smith, 2007).
While we do not define the change practice as a niche innovation, the study does highlight the fluid border between the change practice and the regime. This is made possible in two ways. First of all, by operationalizing the regime through the 21 regime characteristics, we can be specific on how exactly the change practice is developing a novel educational practice, and in which ways it reproduces the current regime. Secondly, the entire aim of the paper is to identify ways in which to act upon regime characteristics, which implies a differentiation beyond merely change or reproduction. Taken together, these approaches problematize strict niche innovation – regime distinctions as it forces one to be specific on where the “innovation” (or novelty, or change) is situated (i.e. in relation to which aspect of the regime) and on how the practice is innovative (i.e. how it relates to that aspect of the regime).

The MLP builds on Giddens’ (1984) structuration theory (Fuenfschilling & Truffer, 2014) which implies a risk for what Archer (1995) called “central conflationism” in which actors are presented as reproducing existing structures or as independently and freely creating such structures.

The use of transactionalism together with the concept of transactant helps to focus on the interplay between those involved in the change practice and the regime characteristics, thus avoiding conflationism (Shilling, 2008).

**Non-deductive application of discourses as analytical model (paper IV)**

Paper IV empirically analyzes how the sustainable university is conceptualized and how it takes shape in the studied case. For this, the results of the discourse analysis (paper II) are used as analytical model. However, by doing this, we are facing the risk of applying the discourses as an external, pre-conceived typology that is forced upon the data in a way that (aspects of) the case are pigeonholed into these discourses. Furthermore, we run the risk of only looking for similarities between the discourses and the case. In order to avoid this, a specific methodological approach was developed in paper IV that combines the three discourses on the sustainable university as analytical model together with the concepts of “environing” (Östman et al., 2019b) and “privileging” (Wertsch, 1993) as analytical lenses and is underpinned by a pragmatist transactional approach (Dewey & Bentley, 1949). This approach allows to see the case as change in the making in which those involved transact with things in their environment. In this approach, the concepts of environing and privileging play a crucial role. First of all, environing (Östman et al., 2019b) refers to the process in which some things are included in the collective meaning-making whereas others are not. That is: what is “environed” from the – what in transactionalist terms is called – surroundings and what is not.
Through studying the process of environing in the case, we are able to trace which elements of the discourses are deemed relevant by the participants and which not. The second step builds on the concept of privileging (Wertsch, 1993) which shifts the lens to how some things are given a central role in the change practice while others are neglected. These two concepts as analytical lenses, in combination with the wider transactional approach, make it possible to avoid a pigeonholing approach and allow to use the analytical model as an external point of reference to empirically investigate the case in a detailed way.

4.3.3 Two analytical models

Papers III and IV both build on pragmatist transactional theory’s (Dewey & Bentley, 1949) focus on how change occurs through a dynamic interplay (or ‘transaction’) between actors and their physical and social surroundings (Garrison et al., 2022). However, this is combined with different analytical models. These analytical models are respectively based on the results of paper I (21 regime characteristics) and paper II (three discourses on the sustainable university). This warrants some further elaboration.

Paper III of this thesis entails an empirical analysis of how those involved in the case act upon the dominant Flemish higher education system. To make this possible, it is necessary to operationalize the dominant higher education system into something that is observable in the empirical data, preferably in a way that allows to differentiate between different characteristics of that system. For this, paper III builds on a part of the results of the MLP analysis in paper I: 21 regime characteristics. The regime is a central concept in the MLP and in paper I it refers to the dominant rules, technologies, infrastructures, ways of doing etc. of the Flemish higher education system. Paper I identified 21 characteristics of this regime that are relevant for the further integration of sustainability, for example a focus on employability, a lack of funding, or a monodisciplinary structure (see summary in section 5.1). These results constitute the analytical model. These regime characteristics are approached as potential transactants (Hofverberg, 2022) within a larger transactionalist approach. As discussed above (section 3.2.3), this transactionalist approach offers a way to analyze how those involved in the change practice act upon these regime characteristics, while the notion of transactants puts the focus on how the regime characteristics themselves do something in the change practice when they are acted upon, but that what they do is dependent of how they are used.

Paper IV empirically analyzes how the sustainable university is conceptualized and takes shape in the change practice. The primary analytical focus of the study lies on what is environed and privileged in the practice. However, in order to be able to analyze what is not environed, an external point of reference
is needed. For this, the paper uses the results of the discourse analysis of how the sustainable university is conceptualized in academic literature (paper II) as an analytical model. In that discourse analysis (summarized in section 5.2), I identified three discourses on how the sustainable university is conceptualized in academic literature: the sustainable higher education institution, the engaged community, and the green-tech campus. Every discourse consists of a number of elements (central concepts and phrases) which makes for a suited analytical model to use in the case study because it allows a more detailed analysis. The suitability of an analytical model derived from academic literature for an analysis of a micro-level change practice is discussed in section 4.2.4 in relation to the double object of knowledge of paper II.

4.3.4 Case and dataset

The central case in the two case studies of a sustainable higher education change practice centers around an innovation project in a Flemish (North-Belgian) university in which a collective consisting mainly of lecturers work together to embed sustainability in the electromechanical engineering bachelor program. The group has a changing composition and meets regularly between 2015 and 2021 in which they develop a teaching and learning track on sustainability and redesign a cross-curricular project course in the third year of the bachelor in which students have to design something and write a paper about it. The redesigned course pivots around sustainability: The students have to make a sustainable design (e.g. a wind turbine) and not only have to master the technical aspects but should also grasp the socio-political implications. This relates back to the discussion of the specificity of sustainability issues as complex or wicked (section 2.4.1) and the discussion of the specific didactical challenges for teaching and learning practices, in general and specifically for engineering education (section 2.4.2).

Throughout the meetings, a variety of topics are discussed, ranging from strategical considerations on how best to move forward to dealing with the didactical questions of what the purpose is of embedding sustainability in the program, what content should be addressed, and how this should be taught and assessed.

The dataset comprised of project proposals for funding of the innovation project, meeting reports, meeting recordings, observations of meetings, internal working documents, PowerPoint presentations used during the meetings,

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48 This does not mean that the analysis was limited to the inital coding scheme provided by the three discourses. As is explicated in the paper, also additional coding took place, for example in relation to “good engineering”.

49 A teaching and learning track is a coherent thematic thread throughout multiple consecutive courses and course meetings in a curriculum. This is a common didactical concept in Flanders (i.e. “leerlijn” in Dutch, literally a “learning line”).
surveys and survey results that played an important role in the change practice, PowerPoint presentations in which the change practice and its results were communicated, official administrative documents about the developed educational program, transcripts of student presentations and student papers, university-wide publications on sustainability projects, and interviews with key figures within the change practice.

4.3.5 Conclusion
This section presented the methodological approach of two case studies of a sustainable higher education change practice, highlighting their methodological similarities and differences. These case studies are presented in paper III and IV of this thesis and summarized in sections 5.3 and 5.4.

4.4 Ethical considerations
The entire research process of this PhD is in line with the ethical principles of Good Research Practice by the Swedish Research council (2017) and the fundamental principles of good research practice of the European Code of Conduct for Research Integrity (2017). The study is not interested in, and does not deal with sensitive personal data as listed in Section 13 of the Personal Data Act (SFS 1998:204). Consequently, an ethical review was not required by a Swedish ethics review board, as described by the Swedish Research council (2017, pp. 30-31). I will zoom in on the different sub studies to specify some of the ethical considerations made. When data was gathered abroad (Belgium), the local ethical guidelines for research were considered as well.

The data collection for the studies in paper I, III and IV took place in Belgium. All participants in the study were adults, participated voluntarily in the study, were thoroughly briefed about the purpose and nature of the study, and gave their informed consent. Participants were informed about their rights to withdraw from the study at any point and consequently have their data deleted without any required explanation. Furthermore, it was made clear that the collected data would only be used for research purposes. Because the data collection took part in Belgium, and as part of the Faculty of Political and Social Sciences at Ghent University, the Ghent University research ethics decision tree was followed. The Ghent University research ethics decision tree states that ethical vetting was not necessary because: the research did not take place in a medical context, no sensitive personal data was collected, participants

50 Research is ethically reviewed on the faculty/university level in Belgium. There is no national or regional equivalent of the Swedish Research Council that does this. My voluntary affiliation to Ghent University during my PhD allowed me to do this.
were not misled, participants did not risk being harmed by taking part nor by the handling of the data, and there was no real risk of gathering unwanted information. For some of the data collection in function of the final phase of the case study described in paper 3 and 4, an ethics approval request was submitted to and approved by the ethical review board of the Faculty of Political and Social Sciences at Ghent University as part of the TRANSPOSE project at Ghent University (ethics approval number 2023-03). This was not strictly necessary but done to anticipate the fact that more and more journals require ethics approval for publications reporting on empirical studies that involve human participants.

The data collection for the study in paper II did not involve human participants at all and just implied the gathering and analysis of published scientific works. No special ethical considerations were thus necessary for that study.
Chapter 5.
Summary and findings of the papers

This fifth chapter presents brief summaries of the four papers of this thesis. It highlights the most important aspects of the four papers and in doing so offers an overview and point of reference for the reader when diving into the papers. For the hurried reader, it might also function as a shortcut towards the discussion section. Each summary focuses on the purpose & approach, main results and key implications of the respective paper. For a more thorough discussion of the points raised in these summaries, I refer the reader to the respective papers and the other chapters of this manuscript.

5.1 Paper I: “Lock-ins and opportunities for sustainability transition. A multi-level analysis of the Flemish higher education system”

5.1.1 Purpose and approach
The first paper51 of the thesis analyzes how sustainability is embedded in the Flemish (North Belgian) higher education system and how this system can affect a further integration of sustainability. In doing this, the study connects closely to a topical trend in the literature on the university-sustainability nexus (see section 2.2.4). The study focuses specifically on the systemic level and not on, for example, individual higher education practices or institutions. The study builds on the multi-level perspective on sustainability transitions (MLP) (Geels, 2002, 2005), an analytical framework borrowed from the field of (sustainability) transition studies which is commonly used to study transitions of socio-technical systems towards a more sustainable configuration. As discussed in section 3.2.1 in the theory chapter, the MLP allows to make an

analytical distinction between the landscape (macro trends that affect the higher education system and its relationship to sustainability), the regime (the dominant structures, cultures and practices of the higher education system), and niche practices (small scale practices that innovate with sustainability in higher education). In summary, paper I has two purposes: to create knowledge on how sustainability is and can be embedded in the Flemish higher education system, and to test the MLP as a framework to understand how higher education systems might become more sustainable. The latter taps into the methodological purpose of the thesis (see section 1.4), whereas the former contributes to this thesis’ study of the institutionalized environment within which sustainable higher education change practices navigate. Paper I thus mainly traces more generalized (institutional) patterns. This is also an implication of using the MLP (see section 3.2.1).

The study consisted of four main steps. In a first step the landscape was studied through an explorative literature study and a content analysis of relevant policy documents. The regime was analyzed through a focused literature study, content analysis of local level policy documents, content analysis of the websites of higher education institutions, an explorative survey, and in-depth interviews with so called regime actors. The analysis of the niches consisted of twelve in-depth interviews with so-called niche actors: people involved in innovative sustainability practices at the university. The fourth step of the analysis focused on the multi-level dynamics through a meta-analysis and a focus group with a selection of regime and niche actors.

5.1.2 Main empirical findings

The main findings of the study include the identification of nine wider landscape trends that potentially affect the integration of sustainability in Flemish higher education, 21 characteristics of the regime that are relevant for the further integration of sustainability, and five types of niche practices that innovate with sustainability (see table 5.1). The 21 regime characteristics are the most important finding of the study and give a grasp of the institutionalized environment in which sustainable higher education (change) practices navigate. These characteristics are used as analytical model in a case study of the innovation project (paper III, see section 4.3.3 of this manuscript for a discussion of this use as analytical model).

Additionally, the paper also identifies five lock-ins in the regime that impede change, five internal contradictions in the regime that could serve as potential instigators of change and 16 opportunities for the further integration of sustainability in the Flemish higher education system. These can be understood as potential starting points and pathways for a sustainability transition of the regime.
Table 5.1. Overview of the results of paper I.

<table>
<thead>
<tr>
<th>9 Landscape Trends</th>
<th>21 Regime characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Global ecological challenges</td>
<td>• Research-education-services to society function</td>
</tr>
<tr>
<td>• Inequality within and between countries</td>
<td>• Expansion of higher education</td>
</tr>
<tr>
<td>• Globalization</td>
<td>• Financial scarcity</td>
</tr>
<tr>
<td>• Individualization</td>
<td>• Market logic and competition between institutions</td>
</tr>
<tr>
<td>• Complexity</td>
<td>• Competition between researchers</td>
</tr>
<tr>
<td>• Managerialism</td>
<td>• Monodisciplinarity</td>
</tr>
<tr>
<td>• Neoliberalism</td>
<td>• Heterogeneous nature of higher educations (intra institution)</td>
</tr>
<tr>
<td>• Focus on economic growth</td>
<td>• Quality care and bureaucracy</td>
</tr>
<tr>
<td>• Belief in technological solutions</td>
<td>• Societal relevance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5 Types of niches</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Greening the campus practices</td>
<td>• Education as a problem-solver</td>
</tr>
<tr>
<td>• Practices that frame sustainability issues as complex and normative issues</td>
<td>• Competence-oriented education</td>
</tr>
<tr>
<td>• Practices that approach students as equal partners</td>
<td>• Student centred education</td>
</tr>
<tr>
<td>• Practices that use higher education as space for experimenting on sustainability issues</td>
<td>• Employability</td>
</tr>
<tr>
<td>• Practices that focus on sustainability in the local context</td>
<td>• Entrepreneurship</td>
</tr>
</tbody>
</table>

5.1.3 Key implications
Paper I has three key implications.

- First of all, the paper shows that different characteristics of the dominant higher education system can affect the integration of sustainability in different ways and to a different extent. The studied higher education system has some distinctive features; some of which are identified as potentially enabling, others as potentially impeding a transition to a more sustainable configuration of the higher education system. An important point here, however, is that we do not know how this plays out in micro-level practices and whether or not this conducive-obstructive dualism of regime characteristics holds true when you zoom in beyond the systemic level.
This thesis addresses this gap by studying how aspects of this institutionalized environment comes into play in, is affected by, and has an effect on a sustainable higher education change practice (see paper III and section 5.3 of this chapter).

- Secondly, the paper shows that the multi-level perspective on sustainability transitions is a valuable resource to study educational change. By using the MLP, educational change is approached as a transition of a socio-technical system. This paves the way for an alternative understanding of educational change as an interplay between landscape, regime, and niches. The MLP brings a fruitful lens and jargon to the table that helps to understand how change happens, how it might be fostered, and by what it is impeded. The paper thus also offers a methodological contribution in line with the second purpose of the thesis (as presented in section 1.4).

- Thirdly, the paper shows the importance of taking the desired end-point of a sustainability transition of higher education in account when studying and discussing integrating sustainability in higher education. The paper offers valuable insights on how the current system might affect the integration of sustainability, but discussing how sustainability is or can be integrated into higher education and what might affect it only truly makes sense in relation to a clear purpose and desired endpoint of such a process. This issue is problematized throughout the thesis and is specifically addressed in paper II.

5.2 Paper II: “Which “sustainable university” are we actually talking about? A topic modelling-assisted discourse analysis of academic literature”

5.2.1 Purpose and approach

Paper II52 presents a discourse analysis of 4584 scientific publications that deal with the relationship between the university / higher education and sustainability. The purpose of the study is to investigate how the sustainable university is dominantly conceptualized in that literature. This purpose stems from the observation that different views on what a sustainable university actually is or should be run through this literature, but are rarely made explicit. In this way, this thesis also addresses the third key implication of paper I (see section 5.1.3)

which emphasizes the importance of carefully considering the purpose or desired endpoint of any attempt to integrate sustainability in the university.

For the analysis of such a large amount of publications, paper II combines a discourse theory (Laclau & Mouffe, 1985) (see section 3.2.3 in the theory chapter) with the powerful content analysis tool topic modeling (Blei et al., 2003; Jacobs & Tschotschel, 2019) (see section 4.2 for an elaboration of this combination). Topic modeling is a text mining technique that allows the study of a large corpus by tracing large patterns of word-use across documents (Jaworska & Nanda, 2018). Based on these patterns, topic modeling reduces the complexity of a corpus by finding topics, lists of words that have a high probability of occurring together in documents across the corpus. A topic model is thus a list of such topics that represents the content of the corpus. The use of topic modeling in combination with a discourse theoretical approach allowed to build and analyze such a topic model as a collection of fragments of discourse, enabling the identification of three dominant discourses on the sustainable university throughout the literature.

5.2.2 Main empirical findings

The main findings of paper II are the three identified dominant discourses on the sustainable university: three ways in which the sustainable university is conceptualized throughout this large quantity of publications.53

- The first discourse, the sustainable higher education institution, sees the sustainable university primarily as an education institution in which attention for sustainability is embedded throughout all layers of the organisational structure. Management plays an important role, as do institutional strategies, structures etc. Research is not relevant in this discourse.
- In the second discourse, the engaged community, the sustainable university appears as something entirely different. The university is not an institution but a community of people that are engaged with sustainability. The sustainable attitude and behavior of the people of the university is important here. Research comes in the picture in this discourse, but it is engaged, problem-solving, and related to societal change.
- The third discourse, the green-tech campus, shows a combination of two sub-discourses: a greening the campus discourse and a discourse of the university as creator of sustainable technological innovations. These two come together in this discourse: Research and

53 These three discourses together are referred to as the “sustainable university discourses framework” in paper IV.
campus (operations and the physical infrastructure) go hand in hand through a prime focus on technology. This discourse on the sustainable university does not focus on education, students are mere users of the campus.

The discourses primarily show how the sustainable university is commonly conceptualized in academic literature. In this way, they connect how the field was discussed in section 2.3 in relation to the fault lines to the concept of the sustainable university. In addition to this, these discourses also say something about practice because sustainable higher education practices are often the subject of the studied literature, and because the authors of this literature are themselves also often involved in sustainable higher education practices. This argument is substantiated in section 4.2.3 in relation to what I there frame as the double object of knowledge of this study.

5.2.3 Key implications
These findings have some important implications.

- First of all, paper II can be seen as a response to the gap identified by paper I by studying – and thus making explicit – what the sustainable university can look like.
- Secondly, by identifying three highly distinct discourses in the literature, I show that the sustainable university is an umbrella term that can cover many different understandings. A second key implication of paper II is thus that any notions of the sustainable university as universally accepted, straightforward and uncontested concept can be problematized. The discourse analysis thus offers empirical proof for the point made in sections 2.5.1 and 2.5.2 in relation to the (sustainable) university as being a contested concept.
- Thirdly, paper II shows three dominant ways in which the sustainable university is conceptualized in the academic literature, but this is by no means an exhaustive overview of how it is conceptualized, how it can be conceptualized, or how it should be conceptualized. A discourse analysis is a way to make institutionalized discursive patterns of similarities and differences explicit and thus open for debate, which is precisely what I intended to do with paper II. The third key implication of the paper is thus that what it means to be a sustainable university is very much open for discussion. Relating to the broader field of higher education studies and focusing on the relation between the university and sustainability could foster such a discussion.
• Fourthly, while I argued in section 4.2.3 that the discourses also have a link to practice, it is not clear based on this study if and how these discourses come to the fore in actual higher education (change) practices. This is something picked up in paper IV.

5.3 Paper III: “Beyond determinism. Towards a typology of ways to act upon the dominant higher education system while embedding sustainability in the curriculum”

5.3.1 Purpose and approach

Paper III\textsuperscript{54} presents a case study of a sustainable higher education change practice. This practice consists of a working group of primarily lecturers that redevelop the electromechanical engineering bachelor program of a Flemish university to embed more attention for sustainability. The focus of the case study is on if and how those involved in this change practice relate to and act upon characteristics of the dominant higher education system. The aim is thus to create empirical knowledge on the relationship between the change practice and the dominant higher education system, connecting what happens in a micro-level practice to aspects of a larger institutionalized environment (a connection which lies at the core of this thesis, as presented in section 1.3 and 1.4). In the literature, I observed a tendency to a-priori define characteristics of the dominant higher education system as either drivers or barriers and thus enabling or impeding change (see section 2.2.4 and 2.5.3). Paper III is an attempt to go beyond such determinism and beyond this dichotomy by looking at what actually takes place in practice.

Paper III repurposes the results of the systems analysis in paper I (i.e. the 21 regime characteristics) and operationalizes them as an analytical model (see section 4.3.3) to study a practice where change is in the making. It does this by combining the results of the MLP analysis in paper I with a transactional approach (Dewey & Bentley, 1949) in which change is understood as taking place \textit{in} the transaction between what happens in the change practice on the one hand, and the regime characteristics on the other. In the study, both are understood as so-called \textit{transactants} (see section 3.2.3 for the theoretical background and section 4.3 for a general overview of methodological approach). This implies that the meaning the regime characteristics have in and

\textsuperscript{54} Paper III is submitted to Environmental Education Research. The authors of the paper are Maarten Deleye, Katrien Van Poeck, & Leif Östman.
for the change practice arises when they are acted upon by the actors in that change practice. This allowed for the following results to be found.

5.3.2 Main empirical findings

The results of paper III show that the meaning a regime characteristic has in a change practice and the effect the characteristic has on the change practice’s outcome is closely related to how it is acted upon by those involved in that change practice. Furthermore, depending on how they are acted upon, the regime characteristics seem to do more than merely enabling or impeding change: they can also affect the type of change that is made.

The analysis in paper III shows that there is no uniform way in which the dominant higher education system is acted upon in the change practice. Different regime characteristics come to the fore in the dataset to a different extent and in different ways. This led to the identification of five ways in which characteristics of the dominant higher education system are acted upon in the change practice.

- **Conforming.** Some regime characteristics were present in the dataset, but were not questioned, challenged or reinterpreted. They were accepted in action as an existing framework and way of thinking, within which those involved then attempted to integrate attention for sustainability. The regime characteristic thus seemed to function as a mold.

- **Modifying.** Some regime characteristics were given an alternative meaning or twist within the change practice. They inspired action within the practice and offered a starting point for change, after which they were copied and their importance was built upon in order to do something else with them.

- **Circumventing.** Some regime characteristics were conceived of as a challenge or hindrance for embedding sustainability, but were not openly challenged or addressed. Those involved in the change practice developed specific strategies to circumvent them.

- **Utilizing.** Some regime characteristic are conceived of as a resource that can contribute to the change practice. This mean that it is tactically used to advance the own agenda. For example, by emphasizing how some future employers find sustainability important, playing into the focus on employability in the higher education institution.

- **Disregarding.** Finally, a number of regime characteristics from paper I were not present in the dataset at all. They were not acted upon and hence did not play a role in the practice.
5.3.3 Key implications

Paper III has a number of important implications.

- By identifying five ways in which the actors in the studied change practice act upon regime characteristics, the study presents a tentative typology of how change practices can relate to the higher education system. This is an important theoretical and methodological contribution because it lays the groundwork for future empirical research on how characteristics of the dominant higher education system are acted upon in change practices.

- The study also shows that engaging with and building on specific characteristics of the dominant higher education system in a change practice does not mean that the developed practice loses its novelty. The novelty in the studied case precisely came from – in a creative and imaginative way – relating to regime characteristics. It is thus an empirical argument against deterministic views on this matter.

- The study problematizes binary classifications of characteristics of the current higher education system into impeding or enabling change (as is often done in the research field, see section 2.2.4). On the one hand, the analysis shows that a regime characteristic can affect the type of change that is made. On the other hand, the analysis shows that the role of a regime characteristic not only depends on the characteristic itself, but also on how it is acted upon by those involved.

- The previous point implies that paper III also problematizes deterministic approaches to the effect characteristics of the dominant higher education system can have on change (as is also done by some in the field, see section 2.5.3). It is not possible to a-priori define the impact of a characteristics of the dominant system because its meaning and effect is affected by how it is acted upon.
5.4 Paper IV: “Embedding sustainability? A case study on how the sustainable university takes shape in a change practice on engineering education”

5.4.1 Purpose and approach

Paper IV\textsuperscript{55} presents an explorative case study in which the results of the discourse analysis of academic literature (paper II) are built upon to study how the sustainable university is conceptualized and takes shape in a concrete change practice on sustainability in higher education. The paper has three purposes: (1) exploring if and how the three discourses on the sustainable university identified in academic literature have an impact on the change practice, (2) to investigate which vision of a sustainable university emerges in the change practice, and (3) to test, illustrate, and discuss the potential of the developed analytical strategy.

The central case in the paper is the same as in paper III: a change practice in a Belgian university in which a working group comes together to embed sustainability in the electromechanical engineering bachelor program. This means that the dataset shows change “in the making” – that is, as it is made through participants’ actions in a specific context. More specifically, they redesign the curriculum through developing a sustainability teaching and learning track (a coherent thematic thread throughout the three years of the bachelor) and redesign a cross-curricular project course to focus primarily on sustainability. Throughout the meetings, a variety of topics are discussed, ranging from strategical considerations on how best to move forward, to dealing with the didactical questions of what the purpose is of embedding sustainability in the program, which content should be addressed, and how this should be taught and assessed (which also links back to the topic of the specific challenges for teaching and learning practices sustainability poses in section 2.4.2).

The methodological approach is similar to the one in paper III although there are important differences (see section 4.3 of this manuscript in which they are discussed side by side). It builds on a pragmatist transactional approach (Dewey & Bentley, 1949) with a focus on how change occurs through a dynamic interplay between actors and their surroundings (Garrison et al., 2022) and combines this with the concepts of “environing” (Östman et al., 2019b) and “privileging” (Wertsch, 1993) as analytical lenses. These lenses point at what is taken into account (environing) and what is given a central role (privileging) in the change practice. Within this approach, the sustainable university discourses framework is used as analytical model. Concretely, this means that the discourses as collections of elements and nodal points (see

\textsuperscript{55} Paper IV is included in this thesis as a manuscript. The authors of the paper are Maarten Deleye, Katrien Van Poeck, & Leif Östman.
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summary in section 5.2) function as an initial coding scheme, and that the specific structure of the discourses as connected constellations in which some elements are more important than others plays a role throughout the analytical procedure. This approach made it possible to avoid “pigeonholing” the case into the analytical model.

5.4.2 Main empirical findings

The analysis first of all showed that nodal points and elements related to the three discourses played an important role in the process and outcome of the case. Mainly elements and nodal points of the first two discourses (the sustainable higher education institution and the engaged community) are present in the meaning-making. However, the kind of practice that is developed in the case cannot be brought down to merely one or a combination of two discourses. Initially the case presents itself as devoted to embedding sustainability in a structural way within a pre-existing organizational and educational structure which is very much in line with discourse 1. However, in the change practice connections are made between elements of different discourses and with additional elements that are brought in. This makes that a vision of the sustainable university is expressed and given shape in the practice that shows clear connections to the discourses, but cannot be reduced to any one of them. For example, in the case a connection is made between employability (as an element of discourse 1) and societal impact (discourse 2), highlighting the societal role and responsibility the students will have in their future employment.

5.4.3 Key implications

Paper IV has the following important implications.

- The paper shows that many elements and nodal points of the three discourses are brought into the change practice and that they affect the kind of educational practice that is developed. This confirms the connection between the three discourses on the sustainable university and practice which this paper intended to explore.
- The paper confirms that the three discourses (paper II) should not be understood as three exhaustive categories within which practices (large and small) can be classified.
- The paper highlights the relevance of (1) empirically investigating what kind of sustainable university is conceptualized and given shape in concrete practices and (2) connecting this to overarching conceptions. Making this connection between empirical research on micro-level practices and more generalized patterns is also central in paper III.
• The developed methodological approach proved useful in achieving the paper’s purposes. The paper shows the benefits of using the three discourses as analytical model and shows how this fits with the transactional approach.
Chapter 6.
Discussion

This discussion chapter presents a synthesis of the findings of this thesis and discusses these in relation to the three purposes: Developing knowledge on the notion of “the sustainable university” and change processes towards it (section 6.1), exploring different ways of studying this (section 6.2), and inspiring the debate (scholarly and in practice) on what a sustainable university might entail (section 6.3). Thus, what follows provides an overview of the contributions of this thesis in three areas – theory, methodology, and practice – discussed in the light of how the findings build on and relate to prior research. The chapter ends with a discussion of pathways for further research (section 6.4).

6.1 Purpose 1: Exploring the notion of “the sustainable university” and change processes towards it

6.1.1 Synthesis

The primary purpose of this thesis was to develop knowledge on the institutionalized environment in which sustainable higher education practices navigate, and how this environment comes into play in, is affected by, and has an effect on a sustainable higher education change practice. Differently said, the thesis develops knowledge on the current higher education system, conceptions of the sustainable university in research, and how both play a role in what happens in a micro-level practice in which change is made. The thesis as a whole thus paints a high-resolution picture of the way outcomes of sustainable higher education change practices are affected, but not determined, by their institutionalized environment. This purpose involves the study of two central issues: (1) how the notion of ‘the sustainable university’ is conceptualized in research and practice and (2) how change processes towards more sustainable higher education systems and practices take shape. This section is structured around these two central issues.

First, the conceptualization of “the sustainable university” in research and practice. This thesis has explored and empirically examined how the notion of “the sustainable university” is conceptualized in the academic literature on the
university–sustainability nexus (paper II). This has led to the identification of three dominant discourses on the sustainable university: the sustainable higher education institution, the engaged community, and the green-tech campus. Because of the size of the corpus, the nature of the object of study, and the discourse theoretical background of the study, this discourse analysis also offers insights into the institutionalized environment in which sustainable higher education (change) practices might navigate. More precisely, the three discourses are not only dominant discourses, but can also be understood as institutionalized ways of thinking and writing about the sustainable university that have a close connection to practice (see e.g. the discussion of the researcher–practitioner overlap in section 2.2.2). This was empirically investigated in paper IV, which offers an explorative case study on how the three identified discourses have an impact on the work process and the results and, through this, investigating how the sustainable university incrementally takes shape into a new educational practice. The fourth paper thus developed knowledge on how those involved in a change practice privilege certain elements of what a sustainable university practice can be and not privilege others, and how this affects the type of educational practice that is created in terms of purposes, content, and means (cf. the three didactical questions why, what, and how?).

The second central issue this thesis develops knowledge on how change processes towards a more sustainable configuration of higher education systems and practices take shape. The thesis first of all presents an overview of the characteristics of the current higher education system (i.e. “regime”) in Flanders that can potentially affect the further integration of sustainability in that system (paper I). The 21 regime characteristics are the most important finding of that systems analysis and give a grasp of the institutional environment in which sustainable higher education (change) practices navigate in Flanders. This was complemented by the results of a case study of a sustainable higher education change practice in which a working group embeds sustainability in a bachelor program. This case study (paper III) develops knowledge on what happens on the micro-level of a concrete change practice: If and how regime characteristics are acted upon and how this affects the kind of educational practice that is developed. The case study’s main findings are twofold. First, the analysis shows that some of the dominant regime characteristics are acted upon in the practice, but there is no uniform way in which it is done. This is made concrete by identifying five ways of acting upon regime characteristics: conforming, modifying, circumventing, utilizing, and disregarding. This shows that different regime characteristics come to the fore in the dataset to a different extent and in different ways. Secondly, the case study shows that the way a regime characteristic is acted upon affects the

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56 In the case of the fifth way of acting upon that was identified in the paper – disregarding – the regime characteristic does not come to the fore.
meaning of that regime characteristic in the change practice and hence also affects the outcome of that change practice.

6.1.2 Discussion in relation to prior research

The above-mentioned findings in function of purpose 1 connect to prior research in a number of ways. The discussion of these connections in the present subsection is structured in line with the two central issues of this thesis.

First of all, the academic literature that addresses the university–sustainability nexus has repeatedly been criticized for a lack of conceptual clarity and theoretical thoroughness (see e.g. Figueiro & Raufflet, 2015; Probst, 2022; Shephard et al., 2019; Viegas et al., 2016). Similar to a number of other studies that have aimed to clarify a central concept of the field (e.g. the notion of “competence” (Lozano et al., 2017; Shephard et al., 2019; Wiek et al., 2011)), this thesis has empirically investigated how arguably the pivotal concept of the field – the sustainable university – is conceptualized in the literature (paper II). In addition to tracing more general patterns in a discourse analysis of literature, this thesis also analyzes the findings’ connection to practice in an attempt to further clarify the possible meanings of the sustainable university and to further our understanding of how the concept can be approached and used. In addition to this, the identification of three discourses on the sustainable university can be understood as a response to the observation of Leal Filho et al. (2021) that there seems to be a “trend towards a fragmented discourse” (p. 7) in the literature in the field, referring to an increasing focus on sub-themes. This thesis can be understood as an attempt to transcend this fragmentation by empirically investigating how the sustainable university is conceptualized throughout this “fragmented discourse”.

The findings in relation to the second central issue – the change processes – offer several contributions to the field. While there is a significant body of literature on such integration and change processes (Hallinger & Chatpinyakoop, 2019), this literature tends to either offer dichotomous accounts of aspects or characteristics that impede or enable such integration and change (Blanco-Portela et al., 2017), or presents – often descriptive – case studies of how sustainability was integrated in individual practices (Barth & Rieckmann, 2016; Probst, 2022). Besides the methodological contributions of this thesis regarding this topic (see section 6.2.2), this thesis also offers a theoretical contribution. The case study in paper III, for example, problematizes such dichotomist accounts of the effect of system characteristics on change as summarized by Blanco-Portela et al. (2017). The study shows that such characteristics can do more than merely enabling or impeding change, they can also affect change. The case study also problematizes the determinism of such accounts by emphasizing that the way characteristics of the current system are acted upon affects their meaning. This means that it is not possible to a-priori
evaluate the impact. In this way, paper III also offers further empirical evidence to support a number of scholars’ claims that deterministic understandings of the effect of neoliberalism on attempts to embed sustainability in (higher) education should be nuanced (Bengtsson, 2016; Bessant, 2017; Maxey, 2009).

This brings us to how this thesis also confirms Bessant’s argument (2017) that practice is always way more complex than any possible ideological contradictions between sustainability and the way contemporary higher education is structured might make appear. While the MLP analysis in paper I offers an overview of which characteristics of the dominant higher education might have an effect on change practices, paper III shows that the outcome of a change practice is affected not only by these characteristics, but also by how those involved in that change practice act upon these characteristics. Further complicating the simple ideological contradictions Bessant discusses, the discourse analysis of academic literature in paper II shows not one but three dominant conceptions of the sustainable university. Paper IV further complicates this by providing insight into how a change practice can connect to but can also divert from these dominant conceptions.

A final point on how the first purpose contributes to prior research deals with the specificity of sustainability as educational content. As discussed in chapter 2, this is a recurring concern in the ESE literature (see e.g. Öhman & Östman, 2019a; Östman et al., 2019a; Shephard, 2015; Tauritz, 2019; Van Poeck et al., 2014). The case study in paper IV even confirms that integrating sustainability in a curriculum provides specific challenges for the lecturers involved, for example because the societal and political aspects of sustainability is no teaching content they are accustomed to, or because they need support on how to assess students’ argumentation. The thesis further contributes to this literature by developing knowledge on how such challenges come to the fore and are dealt with in relation to how the sustainable university is conceptualized and given shape in a change practice.

6.1.3 Summary of contributions

The theoretical contributions to the research field in this area can be broken down into the following points:

- Developing knowledge on the multi-level dynamics between landscape, regime and niches that could potentially affect the continuity and change (transition) of a higher education system towards a more sustainable future configuration. (paper I)

57 Neoliberalism is also identified as a relevant landscape trend in paper I of this thesis.
• Offering an overview of which characteristics of a higher education system (Flanders) might affect the further embedding of sustainability. (paper I)
• Offering a typology of three dominant and institutionalized discourses on how the sustainable university is conceptualized in the academic literature, providing the field with a way to situate new research and with a starting point for further discussions on which sustainable university is desirable and what for. (paper II)
• Offering empirical evidence for problematizing a-priori evaluations of system characteristics (regime characteristics) as either impeding or enabling the integration of sustainability. (paper III)
• Showing that if and how lecturers in higher education give shape to their educational practices is affected by a larger institutional environment and that the way they act upon that environment affects the latter’s meaning. (paper III)
• Offering a typology of how those involved in a sustainable higher education change practice can act upon regime characteristics, which forms an open invitation for further research on the topic. (paper III)
• Showing how three discourses identified in academic literature can have an impact on the process and results of implementing sustainability in higher education. (paper IV)
• Showing how a vision of a sustainable university is conceptualized and practically given shape in a sustainable higher education change practice. (paper IV)

6.2 Purpose 2: Exploring different ways of studying “the sustainable university” and change processes towards it

6.2.1 Synthesis
The second purpose of the thesis was methodological: To explore different ways in which the two central objects of knowledge can be studied and understood. With this, I refer to the how of doing empirical research. In this section, I will describe the methodological contributions of the thesis in line with the two central issues addressed by this thesis.

The first cluster of methodological contributions relates to the first central issue this thesis addresses: how the notion of “the sustainable university” is conceptualized in research and practice. Here the thesis first of all offers a methodological contribution by combining discourse theory and topic modeling as well as illustrating how the outcome can be used for an analysis of academic literature. The DT-TM combination is a novel approach overall and has never been used in the context of educational empirical research. The
paper and this kappa offer rich descriptions and critical reflections on this methodological approach in function of future use by others. In addition to this, the findings of the discourse analysis were used for an empirical analysis of a micro-level change practice (paper IV). A three-step analytical strategy which combines the sustainable university discourses framework with the concepts of ‘environing’ (Östman et al. 2019) and ‘privileging’ (Wertsch, 1993) and is underpinned by a pragmatist transactional approach (Dewey & Bentley, 1949; Garrison et al., 2022) is tested, illustrated and discussed. In the illustration it is also showed how the results of the discourse analysis not only offer an initial coding scheme but also provide extra analytical tools via the connections and nodal points.

The second cluster of methodological contributions relates to how change processes towards a more sustainable configuration of higher education systems and practices can be empirically analyzed. First of all, this thesis introduces the MLP into educational research by applying it in a study of an educational system (paper I). This implies that education is understood as a socio-technical system, an interwoven cluster of connected elements (technology, science, regulation, user practices, markets, cultural meanings, infrastructures, production and provision networks) that fulfill a specific societal function. As this was a novel approach within the field of education, paper I illustrates how the MLP can be useful for analyses of an educational system, and of sustainability in higher education more specifically. In connection to this illustration, the strengths and limitations of using the MLP for research in an educational context is discussed (see further below). Together with paper III, paper I also methodologically connects research on sustainability in higher education with the wider field of transition studies, which in itself also opens up pathways for further research (see section 6.4).

The methodological contribution of the case study in paper III is closely connected to paper I, precisely because paper III’s approach is developed to address a number of limitations and critiques on the MLP in a constructive way. This was done by describing and trying out how the MLP can be combined with the pragmatist theory of transaction (Dewey & Bentley, 1949; Garrison et al., 2022) in order to study a change practice in which higher education lecturers make change by redesigning an educational practice. The case study uses the results of the MLP analysis for research on a micro-level change practice in combination with the concept of transactant (Hofverberg, 2022). More precisely, by combining the MLP with this transactionalist approach, the black box of how change is made in the dynamic interplay between a change practice and the regime is opened up and explored. Because the paper explicitly addresses wider criticism on the MLP, it can also tentatively be read as offering a methodological contribution to the wider transition studies literature, although this is not addressed in depth in this thesis.
6.2.2 Discussion in relation to prior research

The thesis’ methodological contributions connect to the prior research in a number of ways. First of all, the methodological approach of paper II builds further on recent work on combining discourse theory and topic modeling (e.g. Jacobs & Tschotschel, 2019; Jaworska & Nanda, 2018) but adds the use of sensitizing concepts (Blumer, 1954; Carpentier, 2017) in the analytical process as a way to further develop this approach into a systematic analytical method. Furthermore, while academic literature had been the empirical object in discourse analyses (e.g. Onwuegbuzie & Frels, 2014) and topic modeling analyses (e.g. Asmussen & Møller, 2019), the study in paper II combines both into an analytical method for the analysis of literature.

Secondly, the thesis uses what many have described as a weakness in the field as a methodological opportunity. Many have problematized the descriptive nature of research in the field (Barth & Rieckmann, 2016; Figueiro & Raufflet, 2015; Probst, 2022), the predominance of case studies (Barth & Rieckmann, 2016; Corcoran et al., 2004; Findler et al., 2019; Menon & Suresh, 2020; Probst, 2022), and what I labeled the researcher-practitioner overlap (Figueiro & Raufflet, 2015; Probst, 2022). In this thesis, this is used as an opportunity to connect the results of a discourse analysis of this academic literature to what happens in practice (see section 4.2.3). This connection is empirically analyzed through combining a transactionalist approach (Dewey & Bentley, 1949) with the concepts of environing (Östman et al., 2019b) and privileging (Wertsch, 1993) as analytical lens and the sustainable university discourses framework (paper II) as analytical model. This approach allowed to connect general patterns regarding the conceptualization of the sustainable university (i.e. the three discourses) to what happens in a concrete change practice. Although the thesis contributes with two case studies to a field that has been criticized multiple times for containing too many (descriptive) case studies (Barth & Rieckmann, 2016; Corcoran et al., 2004; Figueiro & Raufflet, 2015; Findler et al., 2019; Probst, 2022), the case studies in papers III and IV and the thesis as a whole are intended to supersede the level of mere description of the cases. The focus is on making the connection between what happens on the micro-level of a change practice to more generalized patterns. Doing so allows to contribute to a growing knowledge base on how sustainability is integrated in higher education practice and it facilitates cross-case comparison.

The MLP is designed to analyze the bigger picture of system change while allowing to focus on the role of small alternative practices and the actions of individuals (Geels, 2020). However, it has been criticised for not fully realising these ambitions (see e.g. De Roeck & Van Poeck, 2023; Fuenfschilling & Truffer, 2014; Pesch, 2015). Many of these criticisms have been taken into account when designing the analytical approach of paper III (see section 4.3.2), especially by focusing the analysis on the micro-dynamics of reproduction and change in a concrete, observable practice (cf. De Roeck & Van Poeck,
Besides addressing some methodological concerns in the transition studies literature, the third paper also entails some methodological connections to the literature on sustainability in higher education. As mentioned before, identifying drivers and barriers for embedding sustainability in higher education is a recurring research topic in the literature (Blanco-Portela et al., 2017). The thesis shows that a characteristic can do a wider variety of things in a change practice than merely enabling or impeding it, and that this has to be verified in the empirical analysis, which means that empirical research should take this into account from the onset. This means that paper III offers a methodological contribution in two areas: It constructively addresses criticisms on the MLP in the transitions studies literature and it offers a methodological contribution in relation to research on sustainability in higher education.

6.2.3 Summary of contributions

The methodological contributions to the research field in this area can be broken down into the following points:

- Connecting education research to the wider transitions studies by applying the multi-level perspective to an educational system as a new approach to studying the implementation of sustainability in higher education, and educational change in general. (paper I, paper III)
- Integrating the results of an MLP analysis into a developed analytical method for research on a micro-level change practice in which higher education lecturers make change by designing a new curriculum. (paper III)
- Combining discourse theory and topic modeling through the use of sensitizing concepts. (paper II)
- Developing and testing an analytical method that combined discourse theory and topic modeling for an analysis of academic literature. (paper II)
- Integrating the sustainable university discourses framework into a developed analytical method for investigating if and how institutionalized discourses have an impact on the work process and the results of implementing sustainability in higher education. (paper IV)
- Developing an approach that allows to reveal how, in concrete change practices, the sustainable university incrementally takes shape into new educational practices and, thus, which visions of a sustainable university are expressed. (paper IV)

58 To some extent, paper I can also be seen in that light.
6.3 Purpose 3: Inspiring debate on what a sustainable university might entail

6.3.1 Synthesis

The thesis’ third purpose was more practice-oriented: to inspire and facilitate a well-informed, in-depth and more precise debate ( Scholarly and in practice) on what a sustainable university might entail. The thesis’ findings lend themselves to this purpose in a number of ways.

First of all, the three discourses could offer a fruitful starting point for discussions on what a sustainable university actually could be or should be. It shows that the sustainable university as concept is not unequivocal and should hence not be taken to be self-evident: it is an umbrella term that has to be made explicit when used. From this starting point, the discourses allow to position oneself in relation to them, to question what is not but perhaps should be present in these discourses, and discuss what the ideal relationship between the university and sustainability issues might be. The fact that the discourses consist of elements makes it possible to be more precise in these discussions.

Secondly, the results of the MLP analysis in paper I, and especially the description of the regime in terms of regime characteristics, offers practitioners a comprehensible display of the dominant higher education system in Flanders, which again offers a starting point to discuss what change is desirable, what change is feasible, what a desirable sustainable university might be, and what the change process towards that sustainable university might look like.59

Thirdly, the tentative typology of ways to act upon regime characteristics might offer those involved in higher education change practices a vocabulary to conceptualize how they act, can act, and want to act upon characteristics of the current higher education system in their ambitions to embed sustainability within their university.

6.3.2 Summary of contributions

The thesis’ main contributions to practice can be summarized as follows:

- The three discourses on the sustainable university can offer a fruitful starting point for discussions on what a sustainable university actually could be or should be. The fact that the discourses consist of elements makes it possible to be more precise in these discussions.

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59 As part of the data analysis for the first paper I organized a focus group with people who are involved in sustainability initiatives and practices in Flemish higher education institutions. I started by presenting the preliminary results which led to a very interesting discussion in which those involved also acknowledged the benefits of the MLP.
• The results of the MLP analysis, and especially the description of the regime in terms of 21 regime characteristics, offers practitioners in Flanders a comprehensible display of the dominant higher education system, which again offers a starting point to discuss what change is desirable, what change is feasible.
• The tentative typology of ways to act upon regime characteristics offers practitioners involved in higher education change practices a vocabulary to conceptualize how they act, can act, and want to act upon characteristics of the current higher education system.

6.4 Pathways for further research

Based on the findings and methodological contributions discussed in the previous sections, it is possible to identify a number of pathways for further research.

First of all, the findings of the discourse analysis in paper II and the developed knowledge on the kind of sustainable university that was given shape in the case in paper IV can help to open up the scholarly debate on what kind of sustainable university is desirable (as touched upon in the previous section) and are an invitation for further research on the matter. Paper IV builds upon these discourses to investigate what kind of sustainable university is conceptualized and given shape in one particular sustainable higher education change practice. Replicating this study in other cases is not only an interesting way to study what is going on in a practice, it would also add to a growing knowledge base on different conceptions of the sustainable university. This would allow to compare and critically scrutinize cases and advance the field. Paper II also offers a methodological contribution of which I hope it will lay the foundation for future research: The discourse analysis in paper II introduces the DT-TM combination into educational research. The elaborate descriptions and discussions of that methodology in this kappa are specifically intended for others to take up the glove and use this approach in other studies. The possibilities are manifold. For example, it could be possible to study discourses in a large corpus of educational material, explore discourses in student papers, or trace changes within educational material before and after the introduction of new education policy.

Paper I’s results pivot around the overview of regime characteristics that might affect the further embedding of sustainability. My intention is that the paper can inspire similar studies in different national contexts as that would allow to compare different higher education systems, to investigate how change practices in other higher education systems act upon regime characteristics, and further advance the methodological approach in light of the criticism discussed in this thesis. Building further on the findings and approach of paper I, this thesis also offers a tentative typology of how those involved in a
sustainable higher education change practice can act upon regime characteristics (paper III). The fact that I describe them as tentative, makes clear that they are intended as an open invitation for further research on the topic. Building on this work by doing similar studies in other change practices in other national contexts would make it possible to develop further knowledge on this topic, and in doing so advancing the field. This thesis has also tried to illustrate the added value of connecting to the wider transition studies literature for understanding and investigating change in educational contexts. The hope is that this can lay the foundation for future work in which the MLP and other concepts and approaches from the transition studies literature are used and further developed in research on education. Doing this could allow to develop further knowledge on how higher education systems embed sustainability, but it could also enrich the wider field of educational change research, as touched upon in section 6.2.2.

A final suggested pathway for further research lies in the combination of papers III and IV. An empirical analysis of a sustainable higher education change practice in which the way the current higher education system is acted upon is connected to how the sustainable university is conceptualized and given shape would foster a deeper understanding of how change is made in such a practice. It would allow to connect the current higher education system and a redesigned higher education practice through what happens in a micro-level practice.

6.5 Concluding remark

This PhD started with the big questions on what the sustainable university is, can be, and should be. A strive for conceptual clarity on how the university’s relationship to sustainability is approached and understood functioned as a guiding star throughout this journey. Paper II did this by identifying the three discourses and especially by understanding these discourses as constellations of elements. In papers III and IV, this strive to clarify and be precise led me to looking at practice by studying a so-called sustainable higher education change practice. This means that where in the beginning of this thesis, the focus was on the big questions on universities and higher education systems, in the second half I ended up looking at what happens in micro-level practice. However, this is not a dismissal of the value of discussing overarching conceptions of the sustainable university. On the contrary! This thesis is an argument for connecting overarching conceptions of what the sustainable university can or should be to what happens in practice and vice versa. Indeed, paper I showed the need for discussing the concept of the sustainable university as possible desirable endpoint of change processes in higher education. And more needs to be done than to merely look at practices in case studies without
superseding the level of idiosyncratic descriptions (as discussed and criticized in chapter 2). This implies there is a need to actively connect case studies to larger overarching discussions on what the sustainable university could or should be. The fourth paper, for example, showed how introducing overarching conceptions can enrich a case study, but also showed how looking at one case can generate new insights on such overarching conceptions of the sustainable university as well. This thesis is an open invitation to, further make the connection between the overarching idea of the sustainable university and theory-based empirical work on sustainable higher education practices. While the (sustainable) university is an idea, in the end, as papers III and IV also illustrate, the university is something that takes place in practice. The university is what people do. It is what people make of it.
I det här kapitlet presenterar jag en sammanfattning av avhandlingen på svenska. Sammanfattningen följer kappans struktur.

7.1 Inledning och syfte

Universitet och lärosäten anses vara viktiga aktörer i samhällets strävan mot hållbar utveckling. Faktum är att det moderna universitetet kännetecknas av en mängd rörelser, initiativ och krav på att integrera (ytterligare) hållbarhet för att bli ett "hållbart universitet". I dessa rörelser, initiativ och krav återfinns en mängd olika föreställningar om vad ett hållbart universitet är eller skulle kunna bli, vilket även återspeglas i den vetenskapliga litteraturen. Denna mångtydighet är inte problematisk i sig. Det som problematiseras i den här avhandlingen är att det som kan sägas vara det centrala begreppet inom forskningsfältet är underutforskat och underteoretiserat. Även om det finns en mängd aktörer som uppmanar universiteten att ta sin roll i relation till hållbarhet, är själva iden och konceptualiseringen av det hållbara universitetet inte tillräckligt vetenskapligt diskuterad och empiriskt analyserad. Därtill saknas till stor del empirisk forskning på förändringsprocesser som syftar till att integrera hållbarhet inom högre utbildningssystem och praktiker. Sålunda, det behövs mer forskning om hur förändringsprocesser mot mer hållbara högre utbildningssystem och praktiker tar form.

Det primära syftet med den här avhandlingen är att utforska och utveckla kunskap om dessa två centrala frågor, mer specifikt (1) hur begreppet "det hållbara universitetet" konceptualiseras i forskning och praxis och (2) hur förändringsprocesser mot en mer hållbar konfiguration av högre utbildningssystem och utbildningspraxis tar form. Först och främst utvecklar avhandlingen kunskap om vilka egenskaper hos ett högre utbildningssystem som är relevanta för försöken att integrera hållbarhet i det systemet och exakt vilken roll dessa egenskaper spelar för hur hållbarhet är integrerad i utbildningspraxis i det systemet (artikel I och III). För det andra utvecklar avhandlingen kunskap om hur det hållbara universitetet konceptualiseras i den akademiska litteraturen och hur dessa koncept kommer fram i integreringen av hållbarhet i utbildningspraxis (artikel II och IV). Utöver (och starkt sammanvärt med) detta har
avhandlingen också till syfte att erbjuda ett metodologiskt bidrag genom att utforska olika sätt att studera och förstå de två centrala frågorna. Slutligen hoppas jag med avhandlingen också kunna inspirera till en välinformerad, för- djupad och mer (vetenskapligt och praktiskt) precis debatt om vad ett hållbart universitet kan innebära.

7.2 Tidigare forskning om sambandet mellan universitet och hållbarhet

Förhållandet mellan universitetet och hållbarhet tas upp inom ett antal närliggande områden. Denna avhandling är främst fokuserad på miljö- och hållbarhetsdidaktisk forskning med fokus på högre utbildning. I en metagenomgång av detta område identifierar jag två återkommande kritiska teoretisk-metodologiska punkter samt tre viktiga trender när det gäller forskningsteman och fokus för studier. Först och främst har den akademiska litteratur som behandlar sambandet mellan universitetet och hållbarhet upprepade gånger kritisierats för bristen på begreppsmässig tydlighet och teoretisk grundlighet (see e.g. Figueiro & Raufflet, 2015; Lambrechts & Van Petegem, 2016; Probst, 2022; Shephard et al., 2019; Viegas et al., 2016). Denna avhandling har för avsikt att adressera denna kritik genom att empiriskt studera hur det kanske mest centrala begreppet konceptualiseras i litteraturen – det hållbara universitetet. En annan punkt som kommer starkt fram i genomgången av studier berör det metodologiska: många studier ifrågasätter den stora mängden beskrivande empirisk forskning (Barth & Rieckmann, 2016; Figueiro & Raufflet, 2015; Probst, 2022), att många studier är fallstudier (Barth & Rieckmann, 2016; Corcoran et al., 2004; Findler et al., 2019; Hoover & Harder, 2015; Lozano et al., 2015; Menon & Suresh, 2020; Probst, 2022) samt att många författare också verkar vara ”praktiker” i de fall de beskriver (Figueiro & Raufflet, 2015; Probst, 2022). Genom avhandlingens metodologiska bidrag hoppas jag att kunna bidra till fältet på detta område. En tredje punkt som kommer fram i metagranskningen är en "trend mot en fragmenterad diskurs" (Leal Filho et al., 2021, p. 7), vilket avser ett ökat fokus på undertecken inom forskningsområdet. Denna avhandling går emot denna trend och behandlar empiriskt den mer övergripande frågan om vad universitetets förhållande till hållbarhet är, kan bli eller bör vara. En fjärde trend handlar relateras till det dominerande fokus i litteraturen på integrerings- och förändringsprocesser. Tematiskt knyter denna avhandling an till denna trend, men på ett systematiskt och teoribaserat sätt, till exempel genom att introducera en analysram (se nedan) för att möjliggöra ett systemperspektiv på förändring i högre utbildning. Slutligen, många författare i fältet står bakom vådjan om att integrera hållbarhet i universitetet.
Sambandet mellan universitet och hållbarhet tas inte bara upp i forskning inom miljö- och hållbarhetsutbildning med inriktning på högre utbildning. I den bredare litteraturen om sambandet mellan universitet och hållbarhet kan man finna två skiljelinjer. En första skiljelinje går mellan pedagogiska och icke-pedagogiska perspektiv på ämnet. Detta återspeglas exempelvis i de många redogörelserna för hur hållbarhet kan integreras inom universitetet, med listor över aspekter, varav vissa är pedagogiska och andra inte (t.ex. campusverksamhet, kunskapsproduktion, styrning...) (see e.g. Filho, 2011, 2018; Findler et al., 2019; Henderson et al., 2017; Leal Filho et al., 2021; Lozano et al., 2015; McCowan, 2020; Sedlacek, 2013). En andra skiljelinje berör hur man förhåller sig till utbildning och här kan man finna en åtskillnad mellan så kallad instrumentell respektive öppen utbildning i förhållande till miljö och/eller hållbarhet (som också är en återkommande tematik inom forskningsfältet, se exempelvis Kopnina, 2012; Wildemeersch, 1998). Dessa skiljelinjer ger insikt i hur tematiskt utspridd forskningen är, vilket denna avhandling empiriskt undersöker vidare i förhållande till begreppet hållbart universitet.

Ett återkommande ämne inom det bredare området miljö- och hållbarhetsutbildning är hållbarhetens specificitet som innehåll i utbildning. Denna specificitet kan skapa specifika utmaningar för undervisnings- och lärandepraxis: didaktiska utmaningar som rör den tillgängliga kunskapsbasen om hållbarhetsfrågor (see e.g. Block et al., 2019; Öhman & Östman, 2019a; Östman et al., 2019), didaktiska utmaningar som rör den politiska och etiska karaktären hos många hållbarhetsfrågor (Öhman, 2008; Öhman & Östman, 2019a, 2019b; Shephard, 2015; Van Poeck et al., 2014), och de känslomässiga utmaningar som hållbarhetsfrågor kan skapa (Bergdahl & Langmann, 2022; Hickman et al., 2021; Ojala, 2012). Detta komplicerar integrationen av hållbarhet i (högre) utbildningspraxis, vilket analyseras i de två fallstudierna i denna avhandling.

Ett antal begrepp från den bredare litteraturen inom högre utbildning används i denna avhandling. Denna avhandling handlar delvis om förståelsen av det hållbara universitetet som ett omtvistat begrepp, vilket knyter an till en bredare vetenskaplig debatt om tanken på universitetet som "en plats för motstridiga idéer" (Peters & Barnett, 2018, p. XXIX). För det andra är förhållandet mellan universitet och hållbarhet, vilket innebär ett förhållande mellan universitetet och samhället/omvärlden, centralt i denna avhandling. I linje med tanken på hållbarhet är detta också föremål för motstridiga idéer, från universitetet som elfenbenstorn i ena änden till aktivistiska och starkt engagerade universitet i den andra. Slutligen tar en betydande del av den akademiska litteraturen upp ett antal trender och utvecklingar inom högre utbildning som kan kopplas till nyliberalismen, vilket också sipprar in i miljö- och hållbarhetsforskningen inom högre utbildning. Tyngdpunkten i denna litteratur ligger på nyliberalismens skadliga effekt på försöken att integrera hållbarhet i högre utbildning. En del personer på området nyanserar dock deterministiska uppfattningar om nyliberalismens effekt på försöken att integrera hållbarhet i

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7.3 Teoretisk ram

Denna avhandling är förankrad i teoretisk och metodologisk pluralism. Som framgår av avsnitt 7.1 är det primära syftet med avhandlingen att utforska och utveckla kunskap i förhållande till två centrala frågor: (1) hur "det hållbara universitetet" konceptualiseras i forskning och i utbildningspraxis och (2) hur förändringsprocesser mot en mer hållbar konfiguration av högre utbildnings- system och utbildningspraxis tar form. Avhandlingen bygger på tre teoretiska och analytiska ramar och som används i relation till dessa frågor.


För det andra bygger denna avhandling på en pragmatisk användning av Laclau & Mouffes (1985) poststruktura diskursteori. Enligt diskursteorin är en diskurs "a social and political construction that establishes a system of relations between different objects and practices". (Howarth & Stavrakakis, 2000, p. 3). Det innebär att diskursteorin bygger på en bred definition av text som en materialisering av mening och/eller ideologi. Diskursteorin gör det möjligt att betrakta förkningsfältet som bestående av olika diskurser som ständigt reproduceras och/eller utmanas genom akademiska publikationer.

MLP och diskursteorin fokuserar på en högre nivå av strukturering (den institutionaliserade och diskursiva miljön), men syftet med denna avhandling är att relatera detta till vad som händer i konkret praxis när förändring är målet. För detta bygger jag vidare på den pragmatiska transaktionsteorin (Dewey & Bentley, 1949) vilket gör det möjligt att studera vad som händer i en
arbetsgrupp som arbetar för att integrera hållbarhet i högre utbildning genom att fokusera på samspelet mellan gruppens konkreta arbete och den institutionella och diskursiva miljön. Den transaktionella teorin gör det därmed möjligt för mig att förstå och empiriskt analysera hur det som händer i en sådan arbetsgrupp som ägnar sig åt att integrera hållbarhet i utbildningen är relaterad till denna institutionaliserade och diskursiva miljö.

7.4 Metodbeskrivning

Ett av huvudsyftena med denna avhandling (se avsnitt 7.1) är att erbjuda ett metodologiskt bidrag till forskningen om hur det hållbara universitetet konceptualiseras och tar form. Det innebär att jag aktivt utforskar nya sätt att studera (aspekter av) detta objekt, genom att antingen kombinera tillvägagångssätt eller introducera tillvägagångssätt från olika fält. Avhandlingen innehåller tre huvudsakliga metodologiska tillvägagångssätt – en systemanalys av det flamländska högre utbildningssystemet, en diskursanalys av den akademiska litteraturen och två fallstudier av en arbetsgrupp som ägnar sig åt att integrera hållbarhet i elektromekaniska ingenjörsstudier vid ett flamländska (nordbelgiskt) universitet. Denna arbetsgrupp studeras som en "förändringspraxis" – en praxis där förändring görs.

För en systemanalys av det flamländska högre utbildningssystemet (artikel I) använde jag MLP (Geels, 2002). Analysen riktades mot det högre utbildningssystemets landskap, regim och nischpraxis samt interaktionen däremellan. Fokus i analysen låg på potentialen för en hållbarhetsomställning (dvs. ytterligare integrering av hållbarhet) i det högre utbildningssystemet. Det material som analyserades för denna studie bestod av policydokument, texter på alla flamländska lärosätens webbplatser, intervjuer med 21 aktörer inom högre utbildning, en explorativ survey och en fokusgruppsintervju. För diskursanalysen av hur det hållbara universitetet konceptualiseras i den akademiska litteraturen (artikel II) kombinerade jag poststrukturell diskursanalys (Laclau & Mouffe, 1985) med topic modelling baserad på datautvinning (Jacobs & Tschotschel, 2019). Detta gjorde det möjligt att analysera 4 584 akademiska publikationer. För de två fallstudierna (artikel III och IV) av en arbetsgrupp som integrerar hållbarhet i ingenjörsprogrammet för elektromekanik vid ett belgiskt universitet utgick jag från pragmatisk transaktionalism (Dewey & Bentley, 1949). Det gjorde det möjligt för mig att analysera (1) hur gruppen relaterar till det dominerande högre utbildningssystemets egenskaper i arbetet och (2) hur det hållbara universitetet konceptualiseras och tar form i arbetsgruppen. För detta användes slutsatserna från MLP-analysen (artikel I) och diskursanalysen (artikel II) som analyssmall i artikel III respektive IV. Det material som analyserades för dessa studier sträckte sig över tiden mellan 2015 och 2021 och bestod av interna arbetsdokument, PowerPoint-
presentationer, utbildningsdokument, officiella sammanträdesanteckningar, observationer och inspelningar från sammanträden samt studentuppsatser, presentationer och diskussioner.

7.5 Sammanfattningar av de fyra artiklarna

*Artikel I:* "Lock-ins and opportunities for sustainability transition. A multi-level analysis of the Flemish higher education system"

I den första artikeln i avhandlingen analyseras hur hållbarhet är integrerat i det flamländska (nordbelgiska) högre utbildningssystemet och hur detta system kan potentiellt påverka en vidare integrering av hållbarhet. Studien bygger på MLP (Geels, 2002), en analysram lånad från fältet (hållbarhets)omställningsstudier och som vanligtvis används för att studera omställningar av sociotekniska system mot en mer hållbar konfiguration. Bland de viktigaste resultaten återfinns identifieringen av nio bredare landskapstrender som potentiellt påverkar integreringen av hållbarhet inom den flamländska högre utbildningen, 21 egenskaper hos regimen som är relevanta för den fortsatta integreringen av hållbarhet och fem typer av nischpraxis som innoverar med hållbarhet. Artikeln visar att olika aspekter av det dominerande högre utbildningssystemet kan påverka integreringen av hållbarhet på olika sätt och i olika utsträckning. Det studerade högre utbildningssystemet har vissa särdrag. En del av dessa anses vara potentiellt möjliggörande, medan andra potentiellt kan utgöra hinder för omställningen till en mer hållbar utformning av det högre utbildningsystemet. Artikeln visar också att ”Multi-level perspective” på hållbarhetsomställningar är en värdefull resurs för att studera utbildningsrelaterade förändringar. Med hjälp av MLP kan betrakta utbildningsförändring som en omställning av ett sociotekniskt system. Det banar väg för en alternativ förståelse av utbildningsförändring i form av ett samspel mellan landskap, regimen och nischer.

*Artikel II:* "Which sustainable university are we actually talking about? A topic modelling-assisted discourse analysis of academic literature"

I artikel II presenteras en diskursanalys av 4 584 vetenskapliga publikationer som berör förhållandet mellan högre utbildning och hållbarhet. Syftet med studien är att undersöka hur "det hållbara universitetet" konceptualiseras i den undersökta litteraturen. För att analysera en så stor mängd publikationer kombineras diskursteorin (Laclau & Mouffe, 1985) med det kraftfulla innehållsanalysverktyget ”topic modeling” (Jacobs & Tschotschel, 2019). Den främsta slutsatsen i artikel II är att det hållbara universitetet konceptualiseras på tre olika sätt i litteraturen. Den första diskursen, det hållbara lärosätet, ser det

**Artikel III: “Beyond determinism. Towards a typology of ways to act upon the dominant higher education system while embedding sustainability in the curriculum”**


Resultaten från artikel III visar att den betydelse som en egenskap i det dominerande högre utbildningssystemet har i en förändringsprocess och dess effekt på utfallet av denna process har ett nära samband med hur aktörerna i förändringspraxis relaterar till och agerar på dessa egenskaper. Beroende på deras agerande verkar egenskaperna göra mer än att bara möjliggöra eller förhindra förändring – de påverkar också vilken typ av förändring som görs. På detta sätt problematiserar resultaten i artikel III perspektiv där betydelsen och
effekten av det dominerande högskolesystemets egenskaper a priori beskrivs som antingen möjliggörande eller förhindrande. Analysen i artikel III visar att det inte finns något enhetligt sätt att agera utifrån det dominerande högre utbildningssystemet i en förändringspraxis. Olika egenskaper hos systemet (t.ex. bristande ekonomi, fokus på anställningsbarhet, akademisk frihet...) hamnar i förgrunden i empirin i olika utsträckning och på olika sätt. Det ledde till att vi identifierade fem olika sätt på vilka aktörer i en förändringspraxis relaterar till och agerar på egenskaper hos det dominerande högre utbildningssystemet:

1) Anpassning till egenskaperna hos det högre utbildningssystemet.
2) Modifiering av egenskaperna hos det högre utbildningssystemet.
3) Kringgående av egenskaperna hos det högre utbildningssystemet.
4) Utnyttjande av egenskaperna hos det högre utbildningssystemet.
5) Bortseende från egenskaperna hos det högre utbildningssystemet.

Dessa fem olika sätt kan betraktas som en tentativ typologi för hur aktörer i en förändringspraxis kan relatera till det dominerande högre utbildningssystemet.

Artikel IV: “Embedding sustainability? A case study on how the sustainable university takes shape in a change practice on engineering education”

I artikel IV presenteras en explorativ fallstudie där vi empiriskt undersöker hur det hållbara universitetet konceptualiseras och tar form i en arbetsgrupp som ägnar sig åt att integrera hållbarhet i elektromekaniska ingenjörsstudier vid ett flamländskt universitet (samma fall som studeras i artikel III). För detta ändamål används resultaten från diskursanalysen av den akademiska litteraturen (artikel II) som analysmodell tillsammans med ett pragmatiskt transaktionsperspektiv på förändring och kontinuitet i handling (Dewey & Bentley, 1949).

De empiriska slutsatserna i artikel IV visar att hur det hållbara universitetet konceptualiseras och tar form i det undersökta fallet inte kan förstås fullt ut genom någon av de tre diskurserna i analysmodellen, och inte heller genom en enkel kombination av dem. Ett antal hybridiseringar ägde rum i fallet mellan element som hör samman med diskurs 1 och 2. I artikeln utforskas potentialen i de tre diskurserna om det hållbara universitetet som analysmodell. Genom att ställa diskurserna mot varandra i analysen kan man vara precis och nyanserad när det gäller vilken typ av hållbart universitet som konceptualiseras och tar form i praktiken. Det öppnar upp för framtida empiriska arbeten där denna ram tillämpas. Slutligen bidrar uppsatsen också till vår förståelse av begreppet hållbart universitet i sig genom att betona vikten av att vara precis och nyanserad och genom att belysa värden av att koppla samman det som händer i specifik praxis inom hållbara universitet och övergripande idéer om vad (det hållbara) universitetet handlar om.
7.6 Diskussion

Syftet med denna avhandling är att bidra med kunskap om två frågor: (1) hur "det hållbara universitetet" konceptualiseras i forskning och utbildningspraxis och (2) hur förändringsprocesser mot en mer hållbar konfiguration av högre utbildningssystem och utbildningspraxis tar form. Detta görs i fyra artiklar där avhandlingen kopplar samman tre kunskapsobjekt: hur det nuvarande högskoleystemet påverkar integreringen av hållbarhet, hur det hållbara universitetet konceptualiseras och hur och vilken förändring som görs i en konkret förändringspraxis inom högre utbildning.

I avhandlingen presenteras för det första en översikt över de egenskaper i det nuvarande högre utbildningssystemet i Flandern som potentiellt kan påverka den fortsatta integreringen av hållbarhet i det systemet (artikel I). Dessa 21 regimegenskaper är den viktigaste slutsatsen i artikel I och ger en bild av den institutionella miljö som hållbar (förändrings)praxis inom högre utbildning måste eller förväntas navigera i. Artikel I fokuserar främst på det högre utbildningssystemets nivå och därmed på systemförändring, vilket exemplifierar värdet av ett sådant tillvägagångssätt.

För det andra hör detta samman med hur en arbetsgrupp (eller förändringspraxis) bestående av främst universitetsadjunkter integrerar hållbarhet i ett elektromekaniskt ingenjörsprogram (artikel III). Fokus för fallstudien i artikel III ligger på hur man relaterar till och agerar på egenskaper hos det dominerande högre utbildningssystemet i denna förändringspraxis och hur detta påverkar betydelsen hos dessa egenskaper samt vilken typ av förändring som görs. Det innebär att jag kopplar det som händer på mikronivå i en konkret förändringspraxis till den övergripande institutionella miljön. Samtidigt som artikel I visar att olika egenskaper hos det dominerande högre utbildningssystemet kan potentiellt påverka integreringen av hållbarhet på olika sätt och i olika utsträckning bidrar artikel III till denna kunskapsbas. Den visar att hur man relaterar till agerar på en egenskap hos det dominerande högre utbildningssystemet, som kan betraktas som en del av en regim, påverkar betydelsen av denna regimegenskap och därmed också resultatet av denna förändringspraxis. Det innebär att effekten av det dominerande systemets egenskaper på hållbar förändringspraxis inom högre utbildning bör studeras i denna praxis för att skapa en nyanserad kunskap om hur relationen mellan praxis och system kan se ut. Resultaten av analyserna, de fem identifierade sätten att relatera till och agera på regimegenskaper, visar resultaten att det inte finns något enhetligt sätt att agera i relation till det dominerande högre utbildningssystemet i en och samma förändringspraxis. Faktum är att olika regimegenskaper kommer fram i empirin i olika utsträckning och på olika sätt.

För det tredje har jag gjort en empirisk undersökning av hur "det hållbara universitetet" konceptualiseras i den akademiska litteraturen om sambandet mellan universitet och hållbarhet (artikel II). Detta har lett till att tre dominerande diskurser om det hållbara universitetet har identifierats – det hållbara

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lärosätet, den engagerade gemenskapen och green-tech campus. På grund av textmassans omfattning, studieobjektets karaktär och studiens diskursteor-tiska bakgrund, ger artikel II också insikter i den institutionaliserade miljö som hållbar (förändrings)praxis inom högre utbildning navigerar i. Närmare be-stämt är de tre diskurserna inte bara dominerande diskurer, utan också in-stitutionaliserade sätt att tänka och skriva om det hållbara universitetet som har en nära koppling till praxis. Artikel II visar att det hållbara universitetet som begrepp inte är entydigt och därför inte ska tas för givet – det är ett paraplybegrepp som måste förtydligas när det används. Dessutom ger Artikel II inte i något avseende en uttömmande översikt över hur det hållbara universitetet konceptualiseras, hur det kan konceptualiseras eller hur det bör konceptualiseras. Artikel II öppnar upp för alternativa föreställningar om det hållbara universitetet.

Med utgångspunkt i denna uppfattning om det hållbara universitetet närmar sig avhandlingen i ett fjärde bidrag en arbetsgrupp som ägnar sig åt att inte-gra hällbarhet i elektromekaniska ingenjörsstudier som en praxis där det hållbara universitetet konceptualiserar och tar form. I artikel IV utvecklas kunskap om hur de som är involverade i en sådan förändringspraxis privilegerar i handling vissa delar av vad en hållbar utbildning är och inte andra, vilket påverkar hur det ”hållbara universitetet” tar form. Fokus ligger i analyserna på hur privilegieringen påverkar vilken typ av pedagogisk praxis som skapas. Artikel IV visar också värdet av att koppla samman det som händer specifikt i en idiosynkratisk hällbar högre utbildningspraxis och bredare föreställningar om vad det hållbara universitetet kan vara.

Denna avhandling utvecklar och kopplar samman kunskap om hur det nuvarande högskoleensystemet i en region i Belgien påverkar integreringen av hållbarhet, hur det hållbara universitetet konceptualiserar samt hur och vilken förändring som görs i en konkret förändringspraxis inom högre utbildning. Avhandlingen som helhet målar därmed upp en nyanserad bild av hur resultaten av förändringspraxis inom hållbar högre utbildning påverkas men inte deter-mernas av den institutionella och diskursiva miljö som denna praxis är situe-rad inom. Avhandlingen kopplar därmed också samman två struktureringsni-våer. Systemanalysen och diskursanalysen i artikel I och II är fokuserade på vad som kan kallas en ”institutionaliserad miljö” (med hänvisning till en högre struktureringsnivå), medan artikel III och IV är fokuserade på dess relation till en förändringspraxis på mikronivå. Baserat på denna avhandling argumenterar jag för att det är nödvändigt att titta på båda för att förstå vad det hållbara universitetet är och kan bli och hur det tar form.
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