

Diversity in Complex Organizations

**The Triangle of Diversity Management, Change Management and
Organizational Culture from a System-Theoretical Perspective**

Von der Fakultät für Wirtschaftswissenschaften der
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vorgelegt von

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„The only constant is change.“

Heraclites of Ephesus (535 BC - 475 BC),
freely interpreted by Plato in Cratylus with “Πάντα χωρεῖ” (panta chōrei)

Vorwort

Diese Arbeit ist im Rahmen meiner Tätigkeit als wissenschaftliche Mitarbeiterin in den beiden Exzellenzclustern „Integrative Production Technology for High-Wage Countries“ sowie „Internet of Production“ der RWTH Aachen University entstanden. Die Wahrnehmung der Verantwortung, wissenschaftliche Prozesse und Projekte vor dem Hintergrund einer diversen Gesellschaft zu beleuchten, diente mir als Motivation und war Herausforderung und Reflexionskontext für die vorliegende Arbeit. Zu Beginn dieser Arbeit möchte ich meinen Dank an alle diejenigen richten, die mich während meiner Promotion begleitet und unterstützt haben.

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Zusammenfassung

Insbesondere im wirtschaftlichen Kontext wird die Diversität von Belegschaften zunehmend als ein kritischer Erfolgsfaktor gesehen. Neben dem Potenzial, welches sich laut Studien aus einem vielfältigen Team ergibt, werden jedoch ebenfalls die aus menschlicher Diversität resultierenden Herausforderungen thematisiert und wissenschaftlich untersucht. Sowohl aus dem Potenzial als auch aus den Herausforderungen ergibt sich dabei die Notwendigkeit der Implementierung eines organisationsspezifischen Diversity Managements, welches die Gewinnung neuer Mitarbeiter*innen einerseits und das Management der vorhandenen Vielfalt andererseits gleichermaßen unterstützt.

In der psychologischen, sozial- und wirtschaftswissenschaftlichen Literatur gibt es unterschiedliche Definitionen von Diversität, woraus sich verschiedene Perspektiven auf das Vorgehen bei der Gestaltung und Umsetzung eines Diversity Management Ansatzes ergeben. Insbesondere vor dem Hintergrund der Komplexität des Organisationsumfeldes und der steigenden Anforderungen an die organisationsinterne Agilität besteht die Notwendigkeit, Diversität in Organisationen stärker zu reflektieren und systemspezifische Ansätze zu entwickeln. Dies erfordert die Berücksichtigung organisationsspezifischer Strukturen und Prozesse sowie die Reflexion des Wandels der Organisationskultur durch die Umsetzung eines Diversity Management Ansatzes, der die gegebene Komplexität aufgreift und bewältigen kann. Darüber hinaus sind die psychologischen Auswirkungen solcher Veränderungen auf die Mitarbeiter*innen zu berücksichtigen, um Reaktanzen zu vermeiden und eine nachhaltige Umsetzung von Diversity Management zu ermöglichen.

In Ermangelung entsprechender Ansätze im Rahmen öffentlich finanzierte, komplexer Forschungsorganisationen, ist das Ziel dieser Dissertation die Entwicklung und Erprobung eines Forschungsdesigns, welches die Ansätze des Diversity- und Change Managements mit der Organisationskultur verknüpft, indem es eine systemtheoretische Perspektive einnimmt.

Dabei wird das Forschungsdesign auf eine komplexe wissenschaftliche Organisation angewendet.

Als Basis dient die in Teil A durchgeführte Betrachtung des aktuellen Forschungsstandes aus einer interdisziplinären Perspektive und die damit einhergehende umfassende Einführung in das Forschungsfeld. Im Zuge dessen wird detailliert auf die begriffliche Definition von Diversität eingegangen, bevor dann die psychologischen Konzepte im Diversitätskontext den Übergang zu einer differenzierten Auseinandersetzung mit dem Konzept des Diversity Managements bilden. Auf dieser Grundlage werden das Forschungsdesign sowie die daraus resultierenden Forschungsphasen abgeleitet. Teil A stellt somit die theoretische Grundlage für die in Teil B präsentierten Fachaufsätze dar. Jeder Fachaufsatz beleuchtet dabei in chronologischer Reihenfolge die unterschiedlichen Forschungsphasen.

Fachaufsatz I präsentiert den sechsstufigen Forschungsansatz und beleuchtet die besonderen Rahmenbedingungen des Forschungsobjektes aus einer theoretischen Perspektive. Im Anschluss werden die Ergebnisse der Organisationsanalyse, welche zugleich Phase I und II des Forschungskonzeptes darstellen, vorgestellt. Aufbauend auf diesen Forschungsergebnissen fokussiert Fachaufsatz II die Darlegung der Ergebnisse aus Forschungsphase III, der Befragung der Führungsebene. Die Befragung thematisierte dabei die Wahrnehmung von Diversity und Diversity Management auf Führungsebene, die Verknüpfung von Diversität mit Innovation sowie die Reflexion des eigenen Führungsstils. Als Ergebnis der Befragung konnten sechs Typen identifiziert werden, die das Führungsverständnis im Diversitätskontext widerspiegeln und somit den Ansatzpunkt für eine top-down gerichtete Diversity Management Strategie darstellen. Darauf aufbauend wird in Forschungsphase IV die Mitarbeiter*innenebene beforscht. Im Zentrum der quantitativen Befragung standen die vorherrschenden Einstellungen zum Themenkomplex Diversity und Diversity Management, die Wahrnehmung von Diversität sowie die Untersuchung des Einflusses der Führungsebene auf die Mitarbeiter*innenebene.

Forschungsaufsatz III präsentiert erste Ergebnisse dieser Untersuchung. Die Analyse weist auf eine unterschiedliche Gewichtung der verschiedenen Diversitätskategorien hinsichtlich der Verknüpfung mit Innovationen und somit der Reflexion des Kontextes zwischen Diversität und Innovationen hin. Vergleichbar mit den identifizierten Typen auf der Führungsebene, deutet die Analyse auf die Existenz unterschiedlicher Reflexionsgrade auf Mitarbeiter*innenebene hin. Auf Basis dessen wird im Rahmen von Forschungsaufsatz IV eine nähere Untersuchung des Reflexionsgrades auf Mitarbeiter*innenebene präsentiert und der Diversity Management Ansatz mit Elementen des Change Managements kombiniert. Besondere Berücksichtigung findet als Schlussfolgerung einer theoretischen Analyse die Organisationskultur als zentrales Element bei der Entwicklung und Einführung eines Diversity Management Ansatzes in eine komplexe Forschungsorganisation in Deutschland. Die Analyse zeigt, dass die Wahrnehmung von Diversität heterogen aber zunächst losgelöst vom individuellen Hintergrund ist (im Rahmen dieser Analyse lag der Fokus auf den Diversitätskategorien Gender und Herkunft). Hinsichtlich der Wertschätzung von Diversität zeigt sich dabei ebenfalls ein heterogenes Bild. In der Gesamtbetrachtung stimmen lediglich 17% der Mitarbeiter*innen zu, dass Diversitätskategorien wie Gender, Herkunft oder auch Alter einen Mehrwert darstellen können. Zugleich bewertet diese Gruppe die dem Thema beigemessene Wichtigkeit im CoE als ausreichend.

Zusammengefasst lassen sich folgende Erkenntnisse im Rahmen dieser Dissertation ableiten und dienen somit als Grundlage für die Entwicklung eines Diversity Management Ansatzes:

- (1) Die Entwicklung eines bedarfsoorientierten Diversity Management Ansatzes erfordert einen systemtheoretischen Prozess, der sowohl organisationsinterne als auch externe Einflussfaktoren berücksichtigt. Der im Rahmen des Forschungsprojektes entwickelte sechsstufige Forschungsprozess hat sich dabei als geeignetes Instrument erwiesen.

(2) Im Rahmen öffentlicher Forschungseinrichtungen lassen sich dabei drei zentrale Faktoren identifizieren: die individuelle Reflexionsebene, die Organisationskultur sowie extern beeinflusste Organisationsstrukturen, Prozesse und Systeme.

(3) Vergleichbar mit privatwirtschaftlichen Unternehmen hat auch in wissenschaftlichen Organisationen die Führungsebene einen maßgeblichen Einfluss auf die Wahrnehmung von Diversität und somit einen Einfluss auf die Umsetzung einer Diversity Management Strategie. Daher ist auch im wissenschaftlichen Kontext, bedingt durch die rechtlichen Rahmenbedingungen des Hochschulsystems, ein top-down Ansatz für eine nachhaltige Implementierung erforderlich.

(4) Diversity Management steht in einem engen Zusammenhang mit einem organisationalen Wandel, was die Reflexion von Veränderungsprozesse aus einer psychologischen Perspektive erfordert und eine Verknüpfung von Diversity und Change Management bedingt.

Aufbauend auf den im Rahmen des entwickelten Forschungskonzeptes gewonnenen zentralen Erkenntnissen wird ein Ansatz entwickelt, der die Ableitung theoretischer Implikationen sowie Implikationen für das Management ermöglicht. Insbesondere vor dem Hintergrund der Reflexion der besonderen Rahmenbedingungen öffentlich finanzierter Forschungsorganisationen werden darüber hinaus politische Implikationen abgeleitet, die auf die Veränderung struktureller Dimensionen abzielen.

Datenset 1: Quantitative Daten Analyse des DFG Erhebungsbogens (n = 381)

Datenset 2: Strukturiertes qualitatives Leitfadeninterview auf Führungsebene (n = 25)

Datenset 3: Teilstandardisierte quantitative Mitarbeiter*innenbefragung (n = 69)

Schlüsselbegriffe: Diversity Management, Change Management, Organisationsmanagement, Unternehmenskultur

Executive Summary

Especially in the economic context, workforce diversity is increasingly seen as a critical success factor. In addition to the potential which, according to studies, results from a diverse team, the challenges resulting from human diversity are also addressed and scientifically investigated. Both, the potential and the challenges result in the necessity of implementing an organization-specific diversity management, which supports the recruitment of new employees on the one hand and the management of existing diversity on the other hand.

There are different definitions of diversity in the psychological, social and economic literature, which results in different perspectives on the process of implementing and designing a diversity management approach. Particularly against the background of the complexity of the organizational environment and the increasing demands on internal agility, there is a need to reflect diversity in organizations more strongly and to develop system-specific approaches. This requires the consideration of organization-specific structures and processes as well as the reflection of changes in organizational culture through the implementation of a diversity management approach that includes and can cope with the given complexity. Furthermore, the psychological effects of such changes on employees must be taken into account in order to avoid reactances and to enable a sustainable implementation of diversity management.

In the absence of such approaches in the context of publicly funded complex research organizations, the aim of this dissertation is to develop and test a research design that links diversity and change management approaches to organizational culture by taking a systems-theoretical perspective. The research design is applied to a scientific organization. The basis for this is the examination of the current state of research from an interdisciplinary perspective and the accompanying comprehensive introduction to the field of research. In the course of this, the conceptual definition of diversity will be discussed in detail before the psychological concepts in the context of diversity form the transition to a differentiated examination of the concept of

diversity management. Subsequently, the research design as well as the resulting research phases are derived. Part A thus provides the theoretical basis for the papers presented in Part B. Each essay examines the different research phases in chronological order.

Research Paper I presents the six-step research approach and sheds light on the special conditions of the research object from a theoretical perspective. Following this, the results of the organizational analysis, which also represents phase I and II of the research concept, are presented. Based on these research results, Research Paper II focuses on the presentation of the results of research phase III, the survey of the management level. The survey focused on the perception of diversity and diversity management at management level, the linking of diversity with innovation, and the reflection of one's own management style. As a result of the survey, six types were identified which reflect the understanding of leadership in the context of diversity and, thus, represent the starting point for a top-down diversity management strategy. Building on this, research phase IV will focus on the employee level. The quantitative survey focused on the prevailing attitudes towards diversity and diversity management, the perception of diversity and the influence of management on the employee level. Research Paper III presents the first results of this study. The analysis points to a divergent weighting of different diversity categories with regard to the link to innovations and thus the reflection of the context between diversity and innovations. Comparable to the identified types on the management level, the analysis points to the existence of different degrees of reflection on the employee level. Based on this, Research Paper IV presents a closer examination of the degree of reflection on the employee level and combines the diversity management approach with elements of change management. As a conclusion of a theoretical analysis, special attention is paid to organizational culture as a central element in the development and introduction of a diversity management approach in a complex research organization in Germany. The analysis shows that the perception of diversity is initially detached from the individual background (in the context

of this analysis the focus was on the diversity categories gender and origin). With regard to the appreciation of diversity, the picture is also heterogeneous. However, only 17% of employees agree that diversity categories such as gender, origin or age can add value. At the same time, this group considers the importance attached to this topic in the CoE to be sufficient.

In summary, the following findings can be derived from this dissertation and, thus, serve as a basis for the development of a diversity management approach:

- (1) The development of a demand-oriented diversity management approach requires a system-theoretical process that takes into account both internal and external factors. The six-step research process developed within the research project has proven to be a suitable instrument for this purpose.
- (2) Three central factors can be identified in the context of public research institutions: the individual level of reflection, the organizational culture, and externally influenced organizational structures, processes, and systems.
- (3) Similar to private companies, the management level in scientific organizations has a high influence on the perception of diversity and, thus, on the implementation of a diversity management strategy. Therefore, a top-down approach for a sustainable implementation is necessary, also in the scientific context and due to the legal framework conditions of the university system in particular.
- (4) Diversity management is closely related to organizational change, which requires reflection from a psychological perspective on change processes and requires a combination of diversity and change management.

Based on the central insights gained within the framework of the developed research concept, an approach will be developed that enables the derivation of theoretical implications as well as implications for management. Especially against the background of the reflection of the special

framework conditions of publicly funded research institutions, political implications for action aimed at changing structural dimensions are derived.

Data set 1: Quantitative data analysis of the DFG data survey form (n = 381)

Data set 2: Semi-structured qualitative guideline interview on management level (n = 25)

Data set 3: Partially standardized quantitative employee survey (n = 69)

Key words: Diversity Management, Change Management, Organization Management,
Corporate Culture, Engineering

List of Appended Studies

This dissertation is based on the work described in the following studies:

Research Paper I:

Steuer, L., Sharma, M., Bleck, W. & Leicht-Scholten, C. (2017). Diversity and Innovation Management in Large Research Groups. *International Journal of Innovation in Management*, 5(2), 49–72.

Research Paper II:

Steuer, L. & Leicht-Scholten, C. (2017). Innovation and Diversity - Integrating New Perspectives into Research Associations. In: *Proceedings of the 12th European Conference on Innovation and Entrepreneurship*. Paris, France. 767-776.

Research Paper III:

Steuer-Dankert, L. & Leicht-Scholten, C. (2019). Diversity- and Innovation Management in Complex Engineering Organizations. In: *Proceedings of the 7th International OFEL Conference on Governance, Management and Entrepreneurship: Embracing Diversity in Organizations*. Dubrovnik, Croatia. 136-157.

Research Paper IV:

Steuer-Dankert, L. & Leicht-Scholten, C. (n.d.). The Influence of Organizational Culture on Diversity Management in Complex Organizations. *In preparation for submission to the Journal of Organizational Behavior (VHB Jourqual 3: A, Impact factor: 5.026)*.

Thesis Structure Overview

This thesis consists of two parts. The first part is the conceptional part, embedding the dissertation project in scientific discourses. In doing so, an overview of the research field, a clarification of the terms and concepts as well as an introduction into the theoretical background are given. Derived from the scientific discourse, the leading research questions are presented. These questions were answered in the different phases of the research project. The second part of the thesis represents the empirical element, including four research papers, which illuminate the development of a diversity management concept in a complex organization in the public science sector. The research papers have already been presented to the scientific community or are currently in the review process for publication in an academic journal. The research project follows a six-phase research plan conceived for the project. Consequently, the papers are to be understood as a chronological sequence of the individual research steps, which were developed within the framework of the project and thus built on each other. Since each paper deals with the same research project, repetitions and similarities are inevitable. The research contents represent the individual research steps in accordance to the research plan (chapter 1).

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List of Abbreviations

AGG	Allgemeines Gleichbehandlungsgesetz (General Equal Treatment Act)
BMWi	Bundesministerium für Wirtschaft und Energie (Federal Ministry for Economic Affairs and Energy Germany)
CEM	Categorization-Elaboration Model
CEO	Chief Executive Officer
CoE	Cluster of Excellence
CSP	Cross-Sectional Processes
DFG	Deutsche Forschungsgemeinschaft (German Research Foundation)
EU	European Union
HR	Human Resource
HRM	Human Resource Management
IAB	Industrial Advisory Board
ICD	Integrative Cluster Domain
IoP	Internet of Production
IPH	Integrative Production Technology for High-Wage Countries
NSF	National Science Foundation
RRI	Responsible Research and Innovation
RWTH	Rheinisch-Westfälische Technische Hochschule
SAB	Science Advisory Board
SC	Sub-codes
SDGs	Sustainable Development Goals
SFB	Sonderforschungsbereich (Special research area)
UN	United Nations
USA	United States of America
WR	Wissenschaftsrat (Council of Science and Humanities)
WissZeitVG	Wissenschaftszeitvertragsgesetz (Fixed-Term Contract)

Part A - Introduction to the Research Field

1 Introduction

"Excellent science needs diversity and originality."

(German Research Foundation (DFG) 2018a)

Already in 2012, the Hay Group (2012) identified in its study *Leaders for a New World - Leadership 2030* six megatrends that are ascribed to a significant impact on organizations and leadership. The analysis of the six megatrends (i) globalization 2.0, (ii) climate change and environmental impact, (iii) demographic change, (iv) individualization and pluralism of values, (v) digital lifestyle and digital working, and (vi) technology convergence revealed the necessity to redefine the competence profile of future managers and to create an organizational environment that provides supporting structures to cope with the identified challenges. Resulting from these findings, Hay Group (2012) concluded a context between entrepreneurial success, workforce diversity, and the ability to manage diversity by stating that “[...] the Top 20 [...] are becoming more effective by ensuring the diversity of their leaders and workforces reflect[ing] the growing diversity in [a]dapting to a world being rapidly reshaped by these six mega trends [...].” (Hay Group 2012:12). In accordance with this, in 2018, the *Diversity Management Study 2018* stressed the impact resulting from demographic change (Buslei *et al.* 2018), the lack of specialists (Federal Ministry for Economic Affairs and Energy Germany 2020) as well as the increasing diversity of generations, cultures and the globalization of sales markets. These impact factors result in a need to actively deal with heterogeneity, within and outside the organization (Page Group 2018).

Motivated by the above-mentioned megatrends, different entrepreneurial efforts can be identified to implement approaches of diversity management in organizations. Examples like Pixar (Solomon 2016), NASA (Montagnon 2012), Pinterest (Daft 2016) and the Ford-Werke GmbH (Kasztan 2017) show that this development extends across different industries and company sizes. This trend is supported by the results of the *Diversity Management Study 2018*,

where 91.9% of the 139 surveyed companies (all sizes, various sectors, company sizes <100 to 5000>) state that they consider diversity management important for the global success of their company (Page Group 2018). Based on that, 63.3% of the companies indicate that they had dealt with the topic of diversity and diversity management in the last two years (Page Group 2018). By comparison, in 2015 less than half of the respondents (45.1%) stated they had dealt with the complex of topics (Page Group 2018). In the frame of the study, further 18.7% indicate that diversity management will be an important topic in the near future, even if concrete measures are still lacking (18% indicated that the topic is not an issue in their company) (Page Group 2018) (figure 1-1).

Has your company dealt with diversity management in the last two years? (2015 vs. 2018)

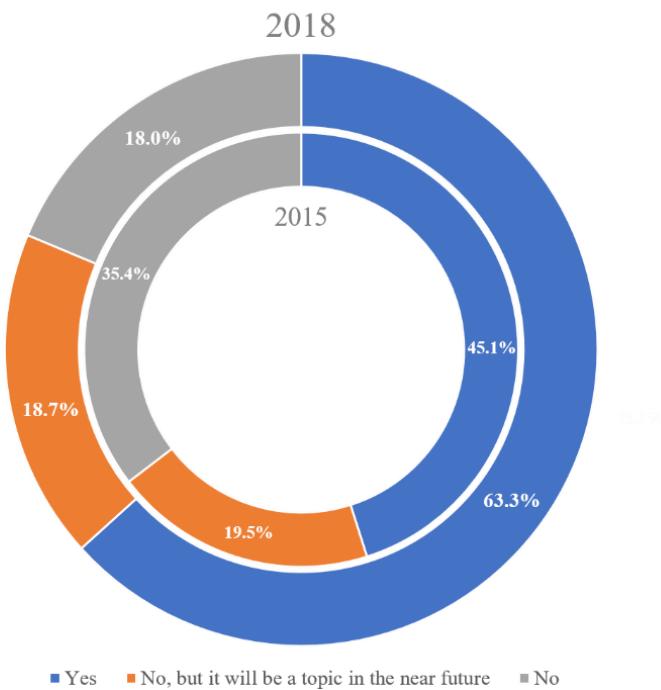


Figure 1.1: Development of dealing with diversity management in German-speaking companies in the last two years (2015 vs. 2018) (In accordance to Page Group 2018)

In conclusion, the outlined development suggests a trend in the private sector towards actively dealing with diversity and diversity management (figure 1.1). In order to be able to understand this development, the motives for making diversity a management topic will, therefore, be explored in more detail in the following.

Analyzing different studies dealing with the potential and the challenges of heterogeneous teams, two central drivers for these discourses and the efforts derived from them can be identified:

- i. The intention to achieve economically measurable effects through diverse teams (Vedder 2006; Cox 1993; Cox, JR. & Blake 1991; Bateman & Zeithaml 1993; Krell & Sieben 2011; Sepehri & Wagner 2002; ed. Plummer 2003; ed. Krell 2007; Bendl 2004).
- ii. The inclusion of different perspectives and backgrounds in development processes as a decisive factor in overcoming global challenges, satisfying the needs of a diverse society (Beacham & Shambaugh 2011; Sonntag 2014; López 2015; Uebernickel *et al.* 2015) and thus acting socially responsible (Leicht-Scholten 2018).

In order to provide a more detailed perspective on the intentions and effects of diversity and diversity management, the two central drivers are described separately below.

Considering the intention of achieving economically measurable effects, studies focus on the organization-internal investigation of diverse teams (e.g. Söllner 2010; van Beers & Zand 2013; Lungenanu & Contractor 2015; Pesch, Bouncken & Kraus 2015; Tortoriello, McEvily & Krackhardt 2015). In doing so, the focus lays on the employee as source for entrepreneurial success. In this context, diversity management is seen as a concept influencing the perception of diversity and making people feel accepted in their uniqueness, and, thus, enabling the development of the individual potential (Thomas & Ely 2019). Linked to this is job satisfaction and the assumption that employees maximize their work performance if certain criteria are met.

An overview of potential criteria is given by Herzberg's *Two-Factor Theory* (Herzberg 1966). Despite, the critical discourse about the application of classification systems and the connection of variables (Behling, Labovitz & Kosmo 1968; Schneider & Locke 1971), in the diversity context Herzberg's (1966) *Two-Factor Theory* gives a good overview over different factors that can influence employees work-satisfaction and thus have an impact on the work-performance

(figure 1.2). In the *Two-Factor Theory*, Herzberg differentiates between so-called *Hygiene Factors* as deficit motives, that prevent dissatisfaction but do not lead to more motivation, and *Motivators*, that directly lead to satisfaction and motivation (Herzberg, Mausner & Snyderman 1993; Pleier 2008).

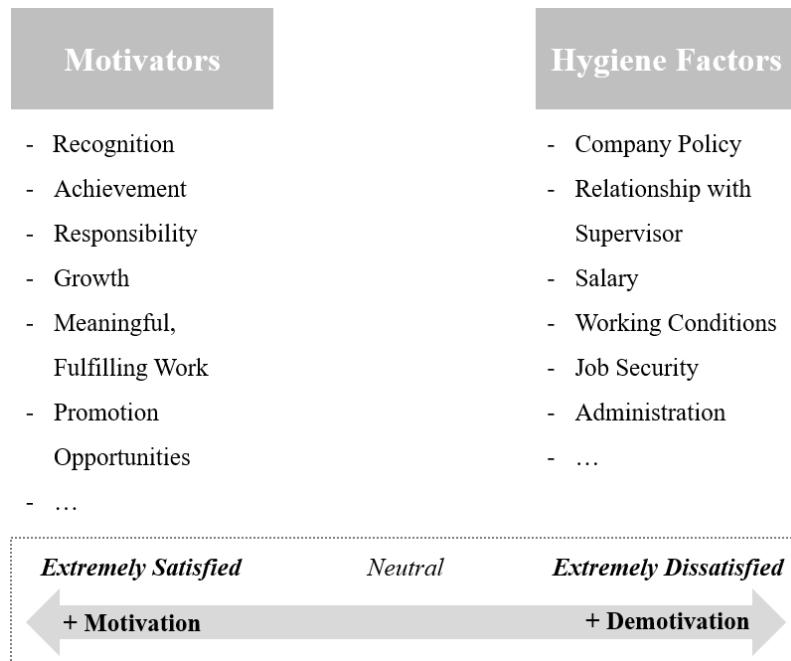


Figure 1.2: Two-factor theory (In accordance to Herzberg 1966; Herzberg et al. 1993)

Analyzing *Motivators* and *Hygiene Factors*, criteria like recognition, promotion opportunities, growth but also structural components like salary, company policy and working conditions (figure 1.2) stand in a direct context with the consideration of diversity and equal opportunities. Thus, Herzberg's model illustrates the different aspects standing in a direct context with job satisfaction. Reflected in a context with diversity management, Herzberg's model indicates indirectly the importance of diversity management since especially the factors summarized under *Motivators* are subject of diversity management approaches. Consequently, intragroup diversity management initiatives aim at improving employee satisfaction, acquiring skilled employees, motivating employees, retaining existing employees and to counteract employee fluctuation and the associated loss of knowledge and competence. Analyzing the pursued objectives of diversity management in industry, the *Diversity Management Study 2018* shows

a similar set of motivations. By implementing a diversity management concept, 32.6% of the investigated companies aim at preventing discrimination, 31.4% want to improve teamwork and employee satisfaction, and 29.1% mention the intention to strengthen employee loyalty through diversity management (Page Group 2018). Thereby, the objectives mentioned are characterized by being interrelated and mutually dependent.

Considering the assessment of perceived internal effects, 59.7% note improved team collaboration through their diversity management initiatives, 43.5% have succeeded in strengthening employee loyalty, and to shape a more exciting working atmosphere and working environment (Page Group 2018). 41.9% of the companies surveyed mention an explicit increase in employer satisfaction and a change in corporate culture (54.8 %) (Page Group 2018). (figure 1.3)

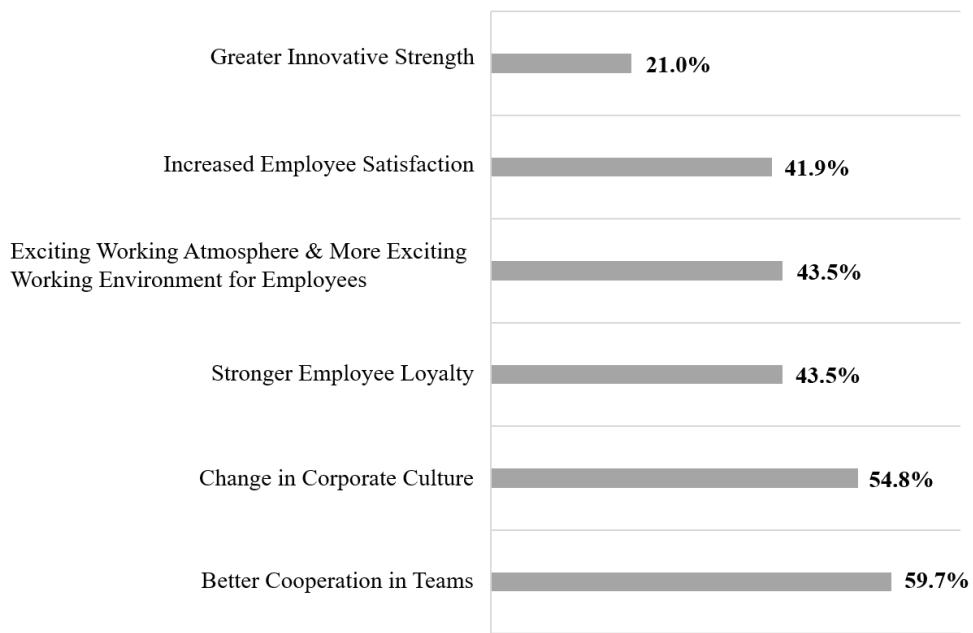


Figure 1.3: Internal success and change through diversity management (multiple answers possible)
(In accordance to Page Group 2018)

In addition to the organization-internal effects, which are focused in studies, effects external to the organization can also be registered in the diversity context. Considering the perception of organization-external effects, especially large companies with more than 500 employees

mention a positive improvement of being attractive to potential applicants (69.4%) and the improvement of the company's image (48.4%) through diversity management (Page Group 2018). Furthermore, 21% mention the development of innovative solutions and products and 17% the opening of new markets and customer groups (figure 1.4).

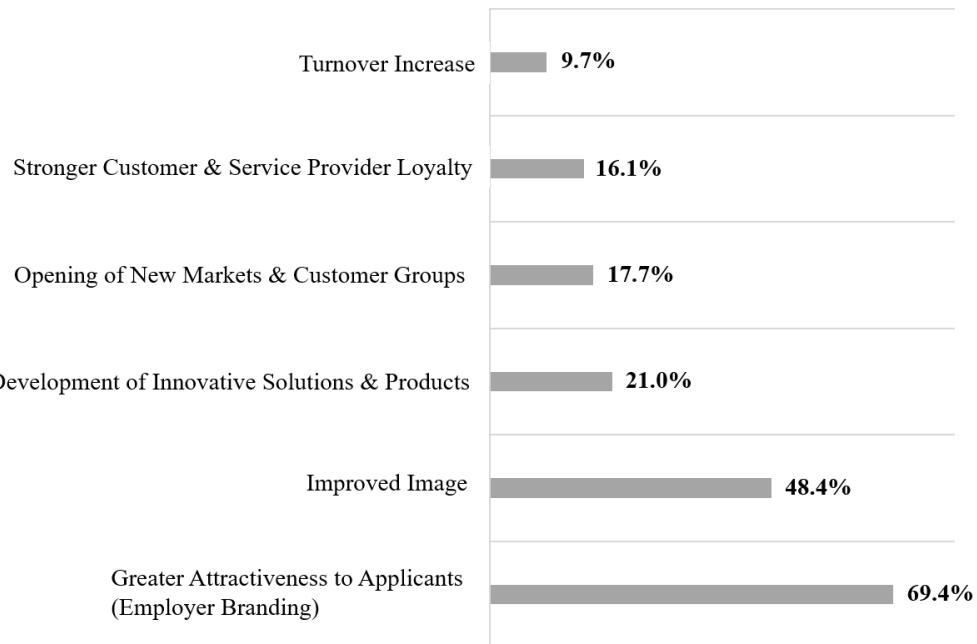


Figure 1.4: External success and change through diversity management (multiple answers possible)
(In accordance to Page Group 2018)

In summary, diversity management is strongly connected to employee satisfaction and, thus, seems to have a direct impact on economic success. This is implied in Herzberg's *Two-Factor Theory* and supported by the *Diversity Management Study 2018*, showing the multidimensional nature of effects of diversity management in business context. Although studies mainly refer to organization-internal factors with a focus on employees, effects external to the organization can also be identified. Following, the second motive is discussed in more detail.

Regarding the second motive – the inclusion of different perspectives and backgrounds in development processes – the need for a far-reaching consideration of global diversity in business processes, but also beyond, is emphasized by central organizations and intergovernmental alliances alike. On European level and in the context of scientific research

and technology development processes, the European Union's (EU) framework *Responsible Research and Innovation (RRI)* „[...] anticipates and assesses potential implications and societal expectations with regard to research and innovation, with the aim to foster the design of inclusive and sustainable research and innovation.“ (European Commission n.d.). In doing so, participatory elements ensure the implementation of diverse perspectives and the involvement of society in science and innovation processes (European Commission n.d.). For example, the innovation management strategy *Open Innovation*, that aims at integrating external knowledge into innovation processes (Piller, Lüttgens & Pollok 2013), is considered as a “[...] diversity-driven [...] management framework [...].” (Santonen 2016:634). In the *Open Innovation* context, from an organization-internal perspective, employee diversity is associated with firm level openness (Bogers, Foss & Lyngsie 2018), from an external perspective considered as a “[...] bridge between diverse actors [...]” (Simard & West 2006:231). Linked with the RRI mission, the need for diverse actors within the process dimensions and the reflection of diversity are necessary requirements for achieving the aspired sense of responsibility. This sense of responsibility is also mirrored in the so-called *Sustainable Development Goals* (SDGs) of the United Nations (UN), a framework of 17 goals for sustainable development representing political aims binding for all members of the UN. Particularly emphasized within the *goal no. 5 Gender Equality* and *goal no. 10 Reduced Inequalities* but reflected as a cross-sectional topic in all 17 goals, diversity must be considered comprehensively for being able to regard circumstances of and root causes for inequality and to take appropriate measures to achieve all goals (figure 1.5).

The RRI framework as well as the SDGs have a strong influence on the current discourse of reflecting diversity in different disciplines (eds. Ferri, *et al.* 2018) as well as industrial (Iatridis & Schroeder 2016), scientific and educational (Leicht-Scholten 2018) contexts. Thereby, economic as well as scientific fields of action are equally affected. This emphasizes on the one

hand the need to actively implement diversity in current discussions of sustainability and social responsibility, and stresses on the other hand the importance of the diversity topic.



Figure 1.5: Sustainable Development Goals (SDGs) (United Nations 2018:42)

In conclusion, both the striving for a form of economic success and the reflection of social diversity for developing socially responsible products and services can be motives for the implementation of diversity management for a range of corporate forms. In practice, both drivers can interact and interrelate and, therefore, be applied simultaneously. However, the analysis of the motives for the implementation of diversity management shows that the discourse is mainly conducted in the context of private business. Although the megatrends and the resulting need to address diversity represent a macrosocial need, the potential but also the challenges of diversity are discussed especially in an industrial context.

1.1 Motivation and Research Goal

In accordance to the RRI framework and the SDGs, the motivation of the research project is to bring diversity management more into the focus of research institutions in the higher education sector. Scientific organizations in Germany are characterized by specific factors influencing the relationship between science and society. As providers of the universities, the federal states ensure the basic funding of the universities. In total, almost 90% of university funding is

provided by the public sector (Hochschulrektorenkonferenz n.d.). Due to legal frameworks and due to public funding of scientific institutions such as public universities, scientific organizations are particularly obliged to conduct socially responsible research and to reflect the needs of a diverse society in a globalized world. As a result, central science organizations such as the *Deutsche Forschungsgemeinschaft (DFG)* (German Research Foundation) or the *American National Science Foundation (NSF)* emphasize the importance of diversity in education and science (National Science Foundation n.d., 2011; Deutsche Forschungsgemeinschaft 2017, 2018a, 2018b; National Science Foundation 2019; Deutsche Forschungsgemeinschaft 2020). For example, the DFG (2017) states that in order to ensure long-term engagement with all socially relevant areas, it is necessary that science also adequately represents all these areas. This is done not only abstractly through the subject structure developed in science, but also through the people who research and teach in these subjects (Deutsche Forschungsgemeinschaft 2017). In doing so, the DFG (2017) emphasizes the need for research groups that are characterized by heterogeneity.

Despite this need, the analysis of conducted studies shows that research projects on the integration of diversity into organizational structures are mainly carried out in the entrepreneurial environment (e.g. Pelled, Eisenhardt & Xin 1999; Voigt & Wagner 2006; Söllner 2010; Østergaard, Timmermans & Kristinsson 2011; Talke, Salomo & Kock 2011; van Dijk, van Engen & van Knippenberg 2012; Díaz-García, González-Moreno & Sáez-Martínez 2013; van Beers & Zand 2013; Lungenan & Contractor 2015; Pesch *et al.* 2015; Tortoriello *et al.* 2015; Ellemers & Rink 2016; Noland, Moran & Kotschwar 2016; Lorenzo *et al.* 2017). However, it is questionable whether best practice examples and the corresponding strategies of a diversity management approach in international companies are comparable and applicable to the processes and structures within an organization embedded in the German higher education system. This indicates the need for reflecting existing concepts in private sector context as well

as investigating organizational-external and -internal influencing factors on organizations in the public science sector that lead to structures and processes, that are representative for the sector and have an impact on the integration and perception of diversity.

For these reasons, this thesis aims at providing an integrative perspective on the development of a diversity management concept for a complex organization in the public higher education sector. This is realized by combining change management perspectives and the organizational culture with diversity management. Following this aim, a research concept (figure 1.6) was designed, that addresses central aspects of scientific discourses in diversity and diversity management context (cf. chapter 2.1, 2.2, 2.3) and transfers them to the public higher education sector (cf. chapter 2.4, 2.5, 2.6). In doing so, the research concept represents the structural frame of the project and, at the same time, is object of research.

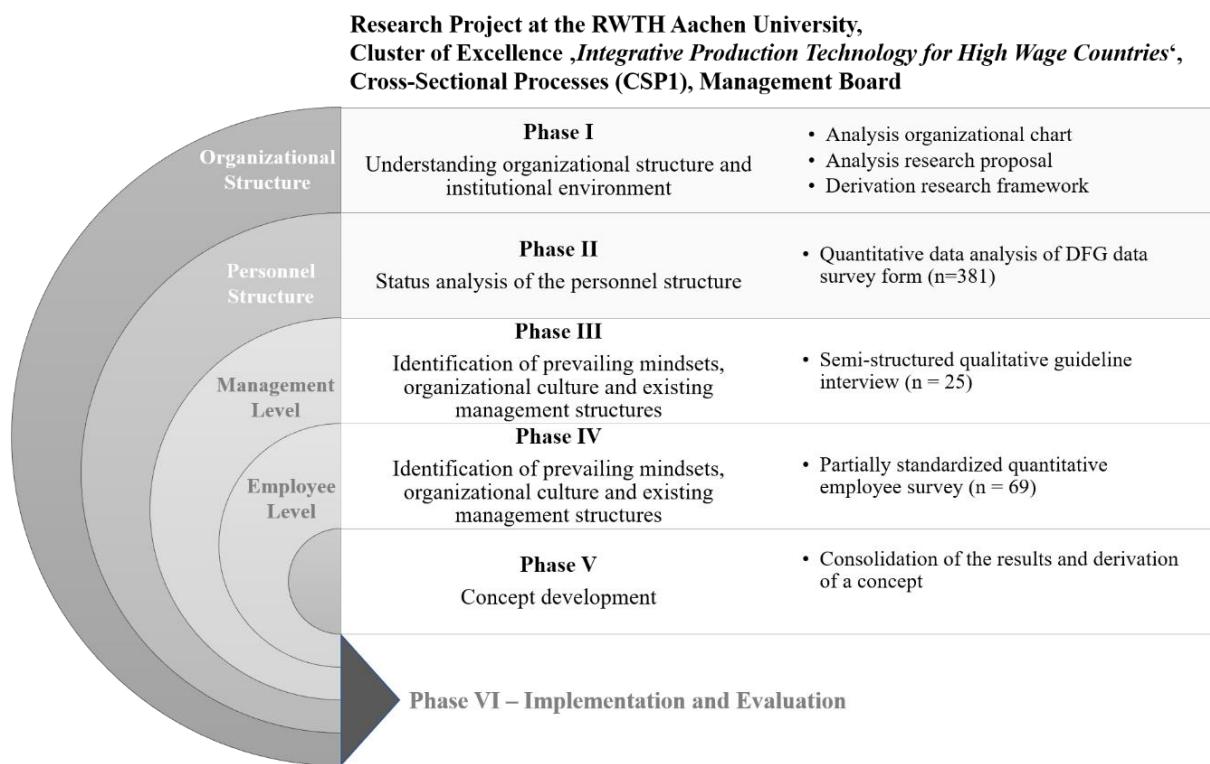


Figure 1.6: Research concept

The developed approach is characterized by the combination of a system-theoretical perspective with the targeted analysis of the legal framework, organizational environment and different

employee levels, and the psychological perspective of a change management process (Kotter 2011). This is mirrored in four key research questions (figure 1.7), which are investigated within the framework of the research design (figure 1.6). The four key research questions emphasize the influencing factors on the development of a diversity management approach and are applied within the phases of the research concept (figure 1.6).

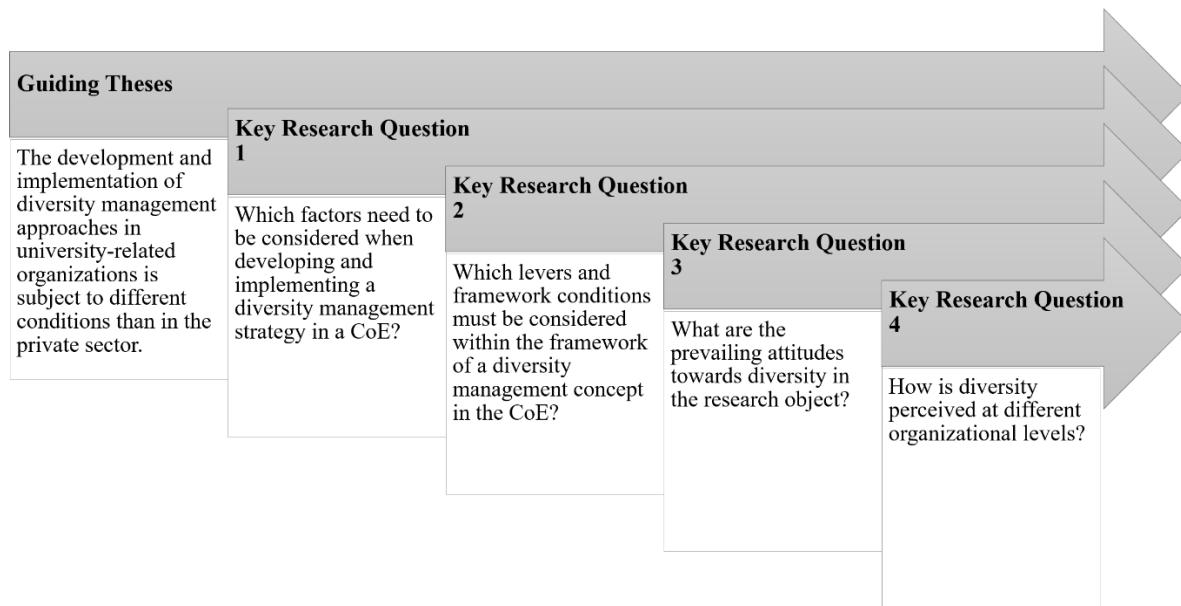


Figure 1.7: Guiding thesis and key research questions

This thesis is meant to shed light on the development of a diversity management concept in a scientific research organization in Germany with the vision of developing a strategy that is transferable to other organizations in the German public science sector especially in the technical field.

The dissertation consists of two parts (A and B) and nine chapters. In part A an introduction to the research field is given. Part B presents the corpus for the research papers.

Chapter 1 gives an introductory overview of the dissertation. The motivation and the research aim are discussed, and the approach and structure are described. **Chapter 2** represents the theoretical background. First, the concept of diversity (2.1) is presented and different approaches and paradigms are discussed. Based on this, different psychological concepts in the

context of dealing with diversity are discussed, which result in the need for diversity management (cf. chapter 2.2). Subsequently, the different perspectives on diversity management (cf. chapter 2.3) are presented. In chapter 2.4 the connection between diversity management, change management and organizational culture is discussed, before analyzing diversity management efforts in the university environment (cf. chapter 2.5). The analysis of the state of research results in the derivation of research needs and the detailed research questions based on these needs (cf. chapter 2.6). Basing on the examination of the theoretical background, the methodical approach is deduced in **chapter 3**. The field of research is presented and the characteristics of the research object, a Cluster of Excellence (CoE), are described and the organizational structures and personnel situation made transparent. Subsequently, the methodological concept is presented. It is illustrated how the case selection was conducted, how the data was collected and according to which standards the data material was evaluated. **Chapter 4** gives an overview over the research papers and summarizes the research highlights. **Chapter 5** concludes the central results and presents a diversity management approach derived from the scientific insights. In doing so, theoretical (cf. chapter 5.1.1), managerial (cf. chapter 5.1.2) and political implications (cf. chapter 5.1.3) are given. Limitations on the research approach are presented and reflected in chapter 5.2. Chapter 5.3 gives an outlook of further research needs. Part B, consisting of **chapter 6-9**, presents the four research papers.

1.2 Outline of the Research Project

The dissertation project follows a need expressed by different scientific organizations i.e. the DFG, to promote an active examination of the implementation of diversity in German research networks especially with a technical focus. The research project *Diversity Management* is located at the management level of the CoE as part of the *Equal Opportunities Division* and, thus, a central management element of the CoE *Integrative Production Technology for High-Wage Countries* (IPH) at RWTH Aachen University and the following CoE *Internet of*

Production (IoP) at RWTH Aachen University. This strategic decision has been made to be able to act cluster wide. Tied to the so-called *Cross-Sectional Processes* (CSP), the project was involved into a project group (CSP1), which dealt with the management of large research alliances from an interdisciplinary perspective (Müller-Abdelrazeq *et al.* 2018). The CSPs were established as an autonomous project, that focuses on research topics like scientific cooperation and the insurance of sustainability of the CoE (ed. RWTH Aachen University 2011).

The research concept was conducted from 2016-2019 (figure 1.6). In the context of a publicly funded research organization, this project is to be considered a one-off. The research papers represent the different research steps, conducted in the frame of the research plan (figure 1.6).

Results published in this thesis have been presented at scientific audits, national as well as international conferences, and internal management board meetings. Furthermore, similar versions of the research papers have been submitted to academic double-blind peer reviewed journals. Table 1.1 gives an overview over the project-relevant publications.

Table 1.1: Overview research publications in the frame of the dissertation project

Type	Authors	Titel	Year	Submitted to/ Presented at	Project reference
Journal Publications	Steuer-Dankert, L.; Leicht-Scholten, C	Organizational Culture as Key for Implementing Diversity Management in Complex Organizations	2020	Organization Science (submitted)	
	Steuer, L.; Sharma, M.; Bleck, W.; Leicht-Scholten, C.	Diversity and Innovation Management in Large Research Groups	2017	International Journal of Innovation in Management, 5(2), 49-72.	
Research Conferences	Steuer-Dankert, L.; Leicht-Scholten, C	Diversität und Innovation in ingenieurwissenschaftlich geprägten Forschungseinrichtungen	2019	VDI Conference 'Engineering Diversity'. 14th May 2019. Aachen, Germany.	
	Steuer-Dankert, L.; Leicht-Scholten, C	Diversity- and Innovation Management in Complex Engineering Organizations	2019	Proceedings of the 7th International Conference on Governance, Management and Entrepreneurship. Dubrovnik, Croatia. 136-157.	
	Steuer, L.; Sharma, M.; Bleck, W.; Leicht-Scholten, C.	Innovation through Diversity – Development of a Diversity and Innovation Management Concept	2017	International Conference on Innovation and Management. 4th-7th July 2017. Osaka, Japan.	
	Steuer, L.; Leicht-Scholten, C	Innovation Management & Diversity	2017	Symposium Spotlight Gender: 3rd February 2017. Aachen, Germany.	
	Steuer, L.; Leicht-Scholten, C	Innovation & Diversity - Integrating New Perspectives into Research Associations	2017	Proceedings of the 12th European Conference on Innovation and Entrepreneurship. Paris, France. 767-776.	
	Steuer, L.; Sharma, M.	CSP1: Diversity Management	2016	Cluster of Excellence 'Production Technology for High-Wage Countries' Conference 2016. 21st September 2016. Aachen, Germany.	
Management Reviews	Steuer, L.	CSP1: Diversity Management	2018	CSP1 Review 2018, Cluster of Excellence 'Production Technology for High-Wage Countries'. 16th August 2018. Aachen, Germany.	
	Steuer, L.	CSP1: Diversity Management	2017	CSP1 Review 2017, Cluster of Excellence 'Production Technology for High-Wage Countries'. 23rd August 2017. Aachen, Germany.	
	Steuer, L.	CSP1: Diversity Management	2016	CSP1 Review 2016, Cluster of Excellence 'Production Technology for High-Wage Countries'. 23rd June 2016. Aachen, Germany.	
Audits/ Supervisions	Steuer-Dankert, L.; Leicht-Scholten, C	Diversity Management at the Cluster of Excellence "Internet of Production"	2019	Lecture series, ACCESS Research College. 7th October 2019. Aachen, Germany	
	Steuer-Dankert, L.	GDI Projects at the Cluster of Excellence "Internet of Production"	2019	DFG Supervision at the Cluster of Excellence 'Internet of Production'. 10th September 2019. Aachen, Germany.	

In the following, the theoretical, scientifical derivation of the developed research concept presented in figure 1.6 is conducted.

2 State of Research and Terminology

To be able to develop appropriate diversity management measures, an in-depth consideration of the concept of *diversity* is of particular importance. Thomas and Ely (1996) emphasize “[...] that it is *how* a company defines diversity - and *what it does* with the experiences of being a diverse organization [...].” (Thomas & Ely 1996: n.p.). As mentioned before, selected concepts of diversity (cf. chapter 2.1, 2.2) and diversity management (cf. chapter 2.3) are discussed and the basis for the developed research concept is created. Derived from that analysis, the connection to organizational culture and change management approaches is established (cf. chapter 2.4). In accordance to the research aim, diversity management is considered in a higher education context (cf. chapter 2.5). As a result of the theoretical discourse, research needs and questions are identified and defined (cf. chapter 2.6).

2.1 Diversity

Despite the topicality of *diversity*, the definition of the term seems to be a difficult one to underpin, since definitions are still characterized by discipline-specific interpretations (Steuer-Dankert & Leicht-Scholten n.d.) and conflicting as well as overlapping meanings (Gotsis & Kortezi 2014; Qin, Muenjohn & Chhetri 2014). As a result, diversity research faces the challenge to combine different professional perspectives, research approaches and research results that deal with different forms of diversity or come to conflicting results (Milliken & Martins 1996; William Phillips & O'Reilly 1998; Voigt & Wagner 2006; Söllner 2010; Østergaard *et al.* 2011; Talke *et al.* 2011; Dezsò & Ross 2012; van Dijk *et al.* 2012; Díaz-García *et al.* 2013; van Beers & Zand 2013; Lungenan & Contractor 2015; Pesch *et al.* 2015; Tortoriello *et al.* 2015; Noland *et al.* 2016; Lorenzo *et al.* 2017).

In principle, the studies conducted can be differentiated on the basis of the considered diversity dimensions - the investigation of effects based on so-called *personal attributes* (surface-level

diversity) or *functional attributes* (deep-level diversity). *Personal attributes* are characteristics like personality and demographic variables (e.g. gender, race, age), whereas *functional attributes* are characterized by skills, abilities and knowledge that stand in a context with the work environment (Levi 2014). Despite this categorical differentiation, the diversity dimensions are interrelated, as “[...] surface-level diversity such as race is indicative of deeper-level differences, such as cognitive processes/schemas, differential knowledge base, different sets of experiences, and different views of the world.” (Shore *et al.* 2009:118). In accordance to that, research studies show that the research outcomes are not only a result of the considered diversity categories. They are also influenced by how diversity is conceptualized in the respective study (Bunderson & Sutcliffe 2002; Qin *et al.* 2014). Therefore, it is necessary to take a close look at the concept of diversity when analyzing conducted research studies. To capture the meaning of diversity, researchers have classified human diversity in different concepts that are influenced by the respective professional background. In the following, selected approaches are discussed that represent central definition attempts. Furthermore, a critical discourse of the different perspectives integrated in the approaches serves as basis for the developed conceptual approach (figure 1.6).

2.1.1 Primary and Secondary Dimensions Model

In 1991, Loden and Rosener (1991) started to define diversity with a two-dimensions model. Their definition of diversity focuses the point where a characteristic is developed. Consequently, they differentiate diversity in *primary dimensions* (surface-level diversity) and *secondary dimensions* (deep-level diversity). The *primary dimensions* are characterized by the predisposition that the individual possesses from birth “[...] and/or that exert an important impact on our early socialization and an ongoing impact throughout our lives.” (Loden & Rosener 1991:18). In this context, they mention characteristics like age, gender, physical abilities, sexual orientation, race and ethnicity (Loden & Rosener 1991). Reflecting the *primary*

dimensions, it is assumed that these characteristics are unchangeable. In contrast, Loden and Rosener (1991) perceive the characteristics assigned to the *secondary dimensions* as categories acquired later in life, influenced by the individual and, therefore, as dimensions that are subject to change (e.g. work experience, cognitive style, family status etc.). (figure 2.1)

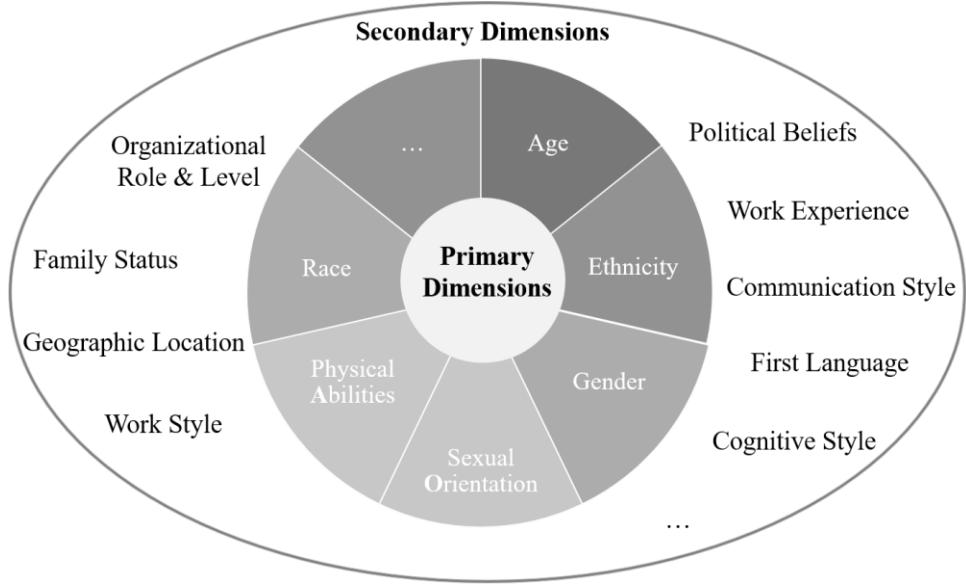


Figure 2.1: Diversity dimensions in accordance to Loden and Rosener (1991)
(In accordance to Loden 2010)

In accordance to their superficial perspective, Loden and Rosener (1991) derive a broad definition of diversity, that concludes “[...] diversity [a]s *otherness* or those human qualities that are different from our own and outside the groups to which we belong, yet present in other individuals and groups. *Others*, then, are people who are different from us along one or several dimensions [...].” (Loden & Rosener 1991:18). With this definition, they indicate that diversity is understood as an omnipresent element that can lead to social differentiation. Coming from this perspective, they indicate that individual characteristics define social membership or exclusion. This momentum of differentiation transferred into the context of working groups, thus, allows first conclusions to be drawn about the objects of investigation within the framework of a scientific analysis, setting the human being in an organization in the focus of consideration.

2.1.2 Observable versus Underlying Dimensions Model

While Loden and Rosener (1991) take an intrapersonal perspective and apply this to group membership, Milliken and Martins (1996) consider the construct of diversity from a societal perspective. In doing so, they focus on the (external) perception of diversity categories by the direct environment. Milliken and Martins (1996) distinguish between two diversity dimensions - *observable* (external, immediately perceptible) characteristics, related to surface-level diversity and *underlying* (internal, not immediately perceptible) characteristics, related to deep-level diversity. (figure 2.2)

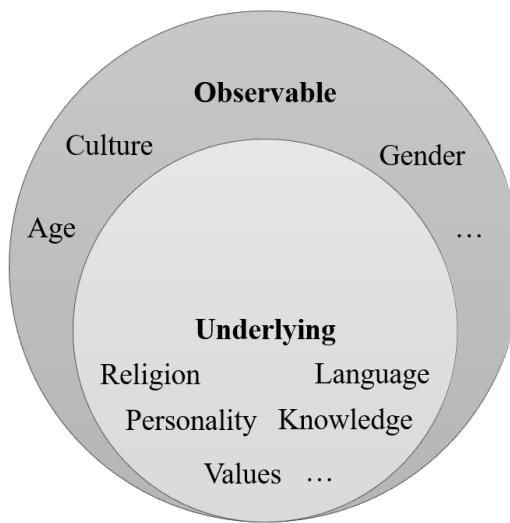


Figure 2.2: Diversity dimensions in accordance to Milliken and Martins (1996)
(In accordance to Watrinet 2008)

With this distinction, they emphasize that diversity and corresponding characteristics are subject to the perception by other people. The possibility to immediately perceive the characteristics of the *observable dimension* allows the individuals' social environment to simply categorize a person. Since this categorization is based on superficially perceptible characteristics, this process is described as *labelling* (Watrinet 2008). The characteristics of the *underlying dimension*, on the other hand, include the personal values and attitudes of an individual. These dimensions cannot be ascertained by the social environment without closer contact with the person. Milliken and Martins' (1996) perspective on diversity provides

important insights into essential components of diversity management. The definition of observable and underlying characteristics in a context with the external perception shows, that individuals underly constant evaluation processes by others. Those processes can lead to a certain behavior, that depends on the individual perception and evaluation of characteristics. In accordance to the identified need to put the human in the focus of the study, the necessity arises to investigate unconscious biases, mindsets and attitudes in diversity context. Building on these insights derived from Milliken and Martins (1996), the presented research concept brings the investigation of prevailing mindsets and the perception of diversity into focus (figure 1.6).

2.1.3 Job-Related versus Visibility Model

While Loden and Rosener (1991) and Milliken and Martins (1996) have a more general societal perspective on diversity, Pelled (1996) puts diversity into an organization-internal work context. Pelled (1996) proposes a concept that focuses on workgroup diversity. In this context, it is perceived that team members' diversity allows an access to more information and a better capacity for solving problems and recognizing opportunities. From Pelled's (1996) point of view, each diversity dimension can be classified regarding a certain level of *visibility* and *job-relatedness*. In accordance to Milliken and Martins' (1996) description of an *observable dimension*, *visibility* represents, accordingly to the surface-level diversity, how easily diversity can be observed. *Job-relatedness*, refers to the extent to which certain skills, experiences and views stand in a context with cognitive tasks and, thus, is related to deep-level diversity. In this context, Pelled (1996) distinguishes between *high job-related* versus *low job-related* and *high visible* versus *low visible* characteristics. In the frame of the model, for example, gender is classified as a highly visible characteristic, but low in job-relatedness. In contrast, organizational tenure is perceived as high in job-relatedness as it stands in a context with technical skills but is low in visibility (Pelled 1996; Stout-Rostrom 2017). (figure 2.3)

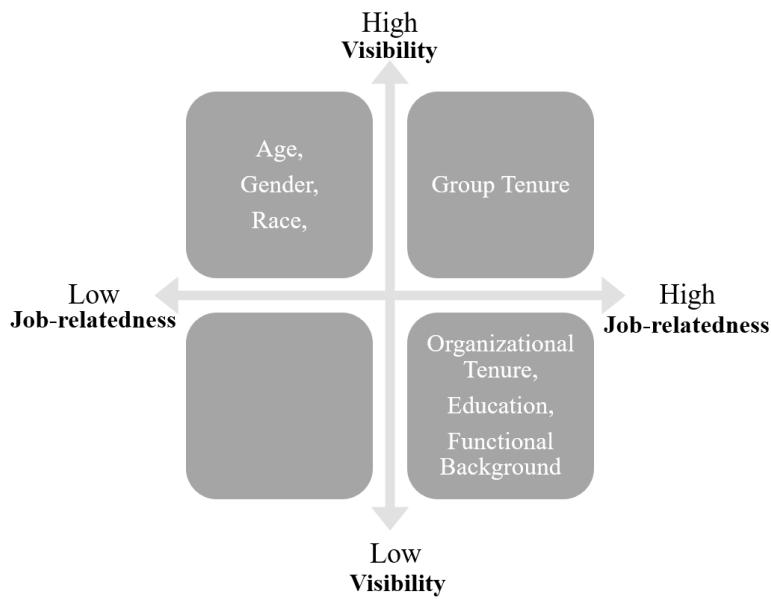


Figure 2.3: Diversity dimensions in accordance to Pelled (1996)
(In accordance to Stout-Rostrom 2017)

The focus on the visibility of characteristics is, similar to Milliken and Martins (1996), based on the assumption that the perception of characteristics results in a certain behavior of the environment. For this reason, the dimension of *visibility* is often associated with being the social aspect of diversity whereas *job-relatedness* represents the information dimension (Gotsis & Kortezi 2014). Although Pelled's (1996) model links essential aspects of Loden and Rosener (1991) as well as Milliken and Martins (1996), it is questionable to what extent the classification of the diversity dimensions corresponds to reality. For example, visible properties like *gender* may also have a high job-relatedness or diversity categories like *education* a high visibility. Apart from this limitation, Pelled (1996) places the perception of diversity and the resulting behavior in the work context, thus, suggesting that perceptible characteristics can have an influence on the work performance. In accordance to Milliken and Martins (1996), Pelled (1996) indicates the need to investigate the mindsets and attitudes towards diversity in a work context, as they can have an impact on collaboration and work performance.

2.1.4 4 Layers of Diversity Model

In accordance to Pelled (1996), Gardenswartz and Rowe (1998) apply a stronger focus on the work context when defining diversity. In doing so, they use the *4 Layers of Diversity* model to classify diversity dimensions. The subdivision of the dimensions is based on how influenceable, manageable, and malleable a characteristic is from company perspective, with the aim of being able to derive appropriate diversity management measures. From their perspective, the diversity of employees can be categorized into four dimensions - *the personality*, *the internal dimensions*, *the external dimensions* and *the organizational dimensions*. (Gardenswartz & Rowe 1998) (figure 2.4)



Figure 2.4: 4 Layers of Diversity (Gardenswartz & Rowe 2003). *Internal Dimensions and External Dimensions are adapted from Loden & Rosener (1991)

The *personality*, as a combination of individual characteristics, is the center of the model. In accordance to Loden and Rosener (1991), the characteristics of the *internal dimensions* are unchangeable characteristics of the person, which arrange themselves around the personality. The *external dimensions*, on the other hand, are changeable and, thus, influenceable and can be object of targeted management measures. Regarding the entrepreneurial context, this means

that, for example, external dimension factors, such as work experience and marital status, can be consciously considered in personnel practice. The *organizational dimensions* capture the status and position in the respective organizational context and are part of management strategies. Thus, from a company perspective, they are influenceable and manageable. (Gardenswartz & Rowe 1998)

Referring to the differentiated consideration of diversity in the frame of the *4 Layers of Diversity model*, Gardenswartz and Rowe (1998) define diversity as “[...] all of the ways that human beings are both similar and different.” (Gardenswartz & Rowe 1998:24). In doing so, they expand the concept of diversity by including the aspect of commonalities. Furthermore, through the integration of the organizational dimension and the simultaneous consideration of external and internal perspectives in combination with personality, the *4 Layers of Diversity* model represents a comprehensive perspective on the concept of diversity in combining surface-level and deep-level diversity. The model, thus, enables the reflection of a more differentiated set of diversity categories in an entrepreneurial context. This becomes evident, if combining the 4 layers with Herzberg’s *Two-Factor Theory*. The profound overlapping of the above-mentioned diversity characteristics of the *external dimension* and the *organizational dimension* with the *motivators* and *hygiene factors* illustrate the extent to which diversity is related to job satisfaction and, thus, performance in the work context. Extrapolated to the developed research concept (figure 1.6), diversity needs to be embedded in the working environment, too. In addition to the identified need of investigating people’ mindsets and attitudes towards diversity topics in an organization (cf. chapter 2.1.1, 2.1.2), it is, therefore, also necessary to analyze the working environment of these people. Moreover, an analysis of the organization, with its internal (cf. chapter 2.1.3) but also external influencing factors that might have an influence on the evaluation of diversity is required. Consequently, the developed research concept (figure

1.6) and thus the consideration of diversity in the CoE is essentially based on Herzberg's (1966) as well as Gardenswartz and Rowes (1998, 2003) models.

2.1.5 Transfer of the models into the research concept

Summarizing the definitions of diversity (cf. chapter 2.1.1 - 2.1.4) from a social psychological, intrapersonal perspective, van Knippenberg, de Dreu and Homan (2004) capture diversity as “[...] differences between individuals on any attribute that may lead to the perception that another person is different from self.” (van Knippenberg *et al.* 2004:1008). In accordance to van Knippenberg, de Dreu and Homan (2004), and transferred to the work environment, Rico *et al.* (2007) regard diversity as “[...] the compositional distribution of team members on any personal attribute that potentially leads to the perception that team members differ from one another.” (Rico *et al.* 2007:113). Building on the presented concepts of chapter 2.1.1 to 2.1.4, Rico *et al.* (2007), and van Knippenberg *et al.* (2004) emphasize the subjective perception of diversity as a decisive factor.

Perception is a process of subjective information acquisition (reception) and information processing of stimuli (Myers 2014). This can occur consciously as well as unconsciously. As a result, the perception of diversity can be understood as an individual process that leads to certain behavior patterns, which can also be unreflective. This perspective is supported by studies stating that there are stronger effects of perceived diversity compared to the objectively prevailing diversity (Hobman, Bordia & Gallois 2004). Thomas and Ely (1996) separate the definition of diversity from certain characteristics. From their point of view, it is necessary to decouple diversity from single diversity categories especially in the work context, as they see a too strong linkage between diversity and individual categories (especially on the surface-level) with related management approaches that focus on the promotion of selected diversity dimensions. Consequently, “[d]iversity should be understood as the *varied perspectives and*

approaches to work that members of different identity groups bring.” (Thomas & Ely 1996: n.p.). In doing so, they emphasize the prevalence of different perspectives and try to capture that those perspectives can result from a diverse set of characteristics and experiences. Consequently, they pursue a deep-level perspective on diversity. Considering the development of a research concept that aims at facilitating an integrative perspective on the development of a diversity management concept for a complex organization in the public higher education sector, different conclusions from the presented analysis can be drawn and transferred.

In summary, the different definitions indicate that the term has not yet been clearly defined. Despite the different approaches and concepts, there is general agreement that diversity can be regarded as being socially constructed (Gotsis & Kortezi 2014; Qin *et al.* 2014). Considered the other way around, this also implies the possibility of change. Furthermore, diversity stands in a context with human perception (Milliken & Martins 1996; Pelled 1996; William Phillips & O'Reilly 1998; van Knippenberg *et al.* 2004; Rico *et al.* 2007). Transferred to the research concept (figure 1.6) this means that, the perception of diversity must be investigated against the background of the working environment (phase I), while taking up the reality of life of the target groups (phase II), and, thus, applying target group-specific research formats in order to achieve a sustainable change. This is realized in the frame of a mixed method approach, combining qualitative (phase III) and quantitative (phase IV) research approaches and focusing on an in-depth examination of people's prevailing attitudes and mindsets regarding diversity within the target-organization. Figure 2.5 summarizes transfer of the gained insights into the research concept.

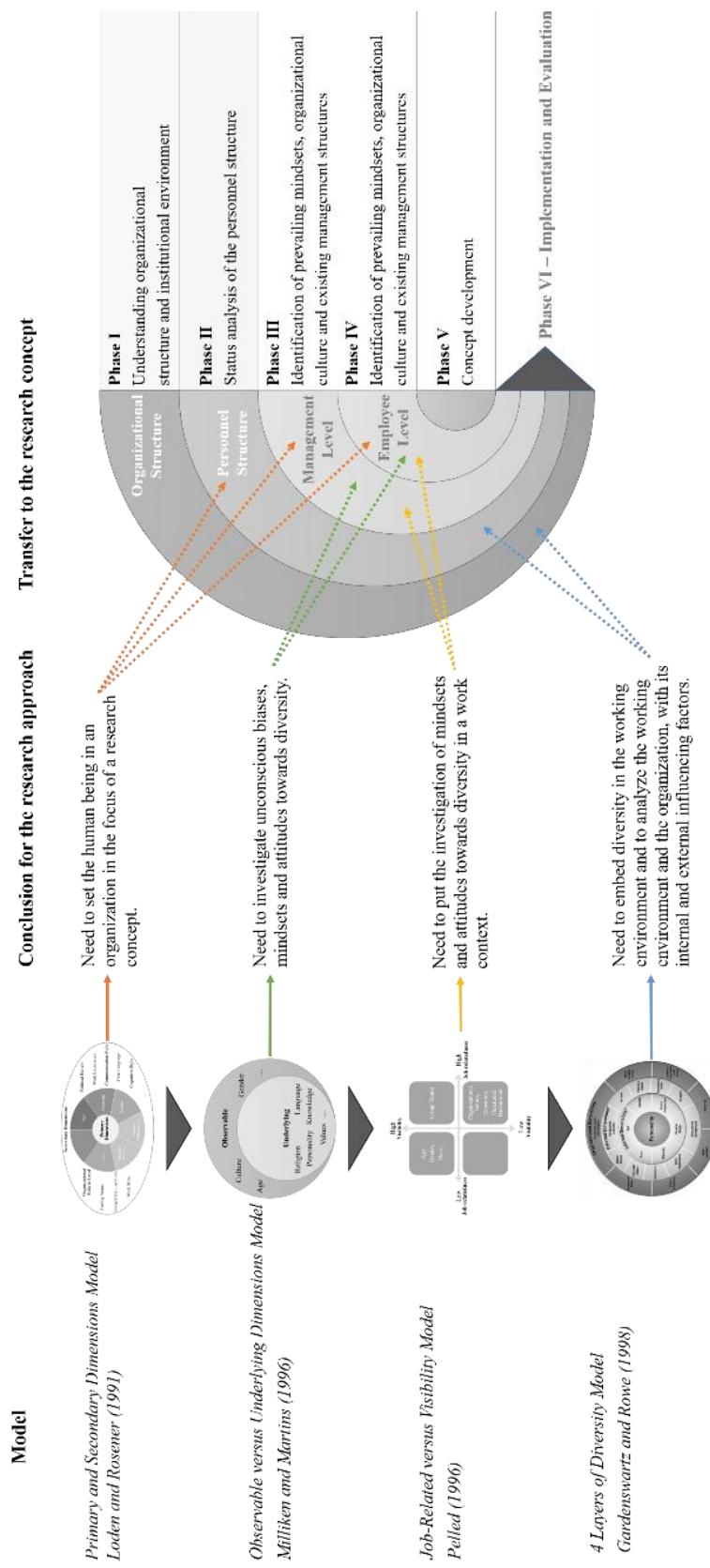


Figure 2.5: Transfer of models into the research concept

Concluding the definitions discussed above, and due to the motivation of the research project (cf. chapter 1.1), as well as the interdisciplinary setting, the term *diversity* is generally regarded as *a variety of human qualities, including everything in which people differ or are similar to each other* in the context of this work. However, against the background of the institutionalization of a diversity management approach in the CoE, a structural perspective on the diversity concept is necessary. With regard to the survey of demographic data, it is referred to the six core dimensions – gender, religion or ideology, race or ethnic, age, sexual identity and disability – of the so-called *Allgemeines Gleichbehandlungsgesetz (General Equal Treatment Act)* (AGG), which is legally binding in Germany (Bundesministerium der Justiz und für Verbraucherschutz 2006). Consequently, within the framework of the research project and against the background of the research object, the study focuses on the diversity dimensions *gender, origin/ culture*, extended by the organizational dimensions of Gardenswartz and Rowe (1998, 2003) summarized under *specialist background* and *status group*.

The emphasis on *perception* as an important factor in the context of diversity suggests that intrapersonal concepts have a significant influence on the development and implementation of a diversity management approach. For this reason, the scientific discourses on psychological concepts in the context of diversity are discussed as a basis for further engagement with people within the target organization.

2.2 Psychological Concepts and the Need for Managing Diversity

As chapter 1 shows, multiple drivers can be identified for the development of diversity management approaches, “[...] ranging from business and economic justifications to social and legal changes [...].” (Özbilgin *et al.* 2013:422). In 1989, Schreyögg already yielded that homogeneous organizations are confronted with negative effects such as the manifestation of stereotypical thinking, resulting in enforced conformity, a hindrance of creative problem solving, an adherence to old success strategies and the prevention of new strategies and

approaches (Schreyögg 1989). This is supported by the *Value-in-Diversity Hypothesis* (Cox, JR. & Blake 1991), stating that diversity has a positive value for organizational processes. Despite the associated positive effects of diversity, different studies have shown, that workforce diversity at organizational, team, and individual level also poses challenges as different perspectives, experiences, backgrounds and mindsets are tied to diversity (Pelled *et al.* 1999; Voigt & Wagner 2006; Díaz-García *et al.* 2013; Ellemers & Rink 2016). Therefore, an in-depth analysis of these challenges is necessary in order to develop strategies that consider the framework conditions of the organization on the one hand and enable an active management of the challenges of diversity on the other hand. For this reason, central theories and paradigms that explore the challenges in the context of diversity are discussed from an interdisciplinary perspective in the following.

2.2.1 Social Cognitive Psychology Theorems

Social cognition generally describes the mental steps that are conducted when people think about other people (Fiske 2009). In accordance to the process of *social cognition*, Bandura (1999, 2001b, 2001a) describes with the *Social Cognitive Theory* the human mind as an active system that creates its own reality. In doing so, he distinguishes three types of environmental structures – (i) *the imposed environment*, (ii) *the selected environment*, and (iii) *the constructed environment* - to express that the human environment “[...] is not a monolithic entity” (Bandura 1999:6), and perception as well as experiences have an influence on the individual reality. Rizzello and Turvani (2002) describe this process as “[...] perception of external stimuli which are spontaneously interpreted and classified by the mind according to previously existing innate mental structures and acquired interpretations of similar stimuli.” (Rizzello & Turvani 2002:204). In accordance to Rizzello and Turvani (2002), Rosken (2016) states that, as an essential characteristic of psychological and sociological theory, people use cognitive categories to understand and comprehend their environment. These categories are also

described as *schemata* (Kalin & Hodgins 1984), *prototypes* (Fiske & Taylor 1991) or *stereotypes* (Glick, Zion & Nelson 1988). While *schemata* are understood as overarching concepts for the processing of information through the assignment of meanings (associations of attributes resulting from a certain stimulus) (Fiske & Taylor 1991), *prototypes* are described as specific cognitive structures representing common and significant categories (Rosken 2016). *Stereotypes* are those that generalize knowledge about a certain group, about a certain phenomenon and, thus, lead to a judgement of the environment (Rosken 2016). In conclusion, *schemata*, *prototypes* and *stereotypes* are related and have in common that they are tools helping to process information of a complex environment. Without a concrete action, these are cognitive processes that do not result in immediate discriminatory effects. However, the categorization of people based on these cognitive concepts can lead to discriminatory behavior patterns if the associated stereotypes are not subject to critical self-reflection.

Especially the gender studies have investigated the impact of stereotypes. In the course of different studies, assignments of social roles have been investigated in different contexts. These assignments reach from investigations of labelling processes and stereotyping in early childhood to the perception of gender and managerial stereotypes (Stern & Hildebrandt Karraker 1989; Sanbonmatsu 2002; Powell, Butterfield & Parent 2008; Madden 2011; Lopez-Zafra & Garcia-Retamero 2012). Associated with this is the discourse on the concept of *heteronormativity*, defining heterosexuality as a norm of gender relations, life practice and symbolic order, pushing people into two forms of physically and socially clearly differentiated sexes (Wagenknecht 2007). In doing so, *heteronormativity* acts as an a-priori category setting a set of behavioral norms (Wagenknecht 2007) and resulting in discrimination if there is a deviation from standardized behavior. Referring to the presented research approach this means that automatisms of stereotyping need to be analyzed on a personal but also organizational level.

Building on this, it is possible to develop target group-specific measures that aim at sensitizing for individual categorization systems, and thus preventing discriminatory behavior.

While schemata, stereotypes and prototypes describe intrapersonal phenomena, the influence of diversity on interpersonal processes must be considered, too. In the course of different social categorization studies, Tajfel (1974) as well as Tajfel, Billig and Bundy (1971) investigated social psychological factors of intergroup behavior. Under *social categorization* Tajfel (1981) summarizes "[...] a process of bringing together social objects or events in groups which are equivalent with regard to an individual's actions, intentions and system of beliefs." (Tajfel 1981:254). The focus lays on value differentials that are socially derived and resulting from cognitive mechanisms of categorization. This process leads to a classification of humans in two groups – the individual's *own group* or the *outgroup* – which is described as the *Social Identity Theory* (Tajfel 1981). Referring to Turner's *et al.* (1987) *Self-Categorization Theory*, stating that people tend to assign themselves to a social group with individuals that have a high similarity, van Knippenberg (2000) summarizes: "Identification leads individuals to perceive themselves in terms of the characteristics they share with other members of their ingroups - their shared social identity - rather than in terms of the idiosyncratic characteristics that differentiate them from other individuals - their personal identity [...]." (van Knippenberg 2000:358). Their results show that people tend to favor groups to which they feel they belong, even if the characteristics leading to membership can be considered irrelevant and a direct subjective advantage is not apparent (Tajfel *et al.* 1971). This perceived membership of a particular social group implies discriminating behavior against the other group. Tajfel, Billig and Bundy (1971) conclude "[...] that discriminatory intergroup behavio[]r cannot be fully understood if it is considered solely in terms of an 'objective' conflict of interests or in terms of deep-seated motives that it may serve." (Tajfel *et al.* 1971:176). Against the background of a diverse workforce this is of particular importance, as the associated heterogeneity leads to

different world views and a division of the environment into people of the own group and people of the other group. Since worldviews are in the context of subjective identity, a distinction to other perspectives automatically results which can affect work processes. This is supported by Festinger's (1957) *Social Comparison Hypotheses* expressing that “[t]here exists, in the human organism, a drive to evaluate his opinions and his abilities [...] by comparison respectively with the opinion and abilities of others.” (Festinger 1957:1–2).

Whereas the *Social Categorization Perspective* describes the effects of perceived similarities on social group level, the *Similarity-Attraction Paradigm* focuses on the interpersonal level with a focus on attitudes and values (Byrne 1971; Brewer 1979; William Phillips & O'Reilly 1998; Jackson, Joshi & Erhardt 2003). Concluding from his studies, Byrne (1971) derived in the context of the *Similarity-Attraction Paradigm* the so-called *Law of Attraction* - expressing that the greater the perceived similarity between two people (especially with regard to attitudes), the greater the mutual attraction. Also known as *Similar-to-Me Effect* or *Similarity Effect* the impact of perceived similarity is also discussed in gender studies (e.g. Turban, Dougherty & Lee 2002). Referred to as *Gender Bias Paradigm*, studies investigate prejudices especially against women (Roca *et al.* 2018). One of the most famous studies was conducted by Goldberg (1968) revealing that, in contrast to the statement of the *Similarity-Attraction Paradigm*, women tend to assess the scientific achievement (in this case publications) of other women worse than men, which is in gender studies also known as *Goldberg Paradigm* (Roca *et al.* 2018). Representing the ongoing discourse especially in gender studies, other studies come to conclusions contradicting the *Goldberg Paradigm* (e.g Levenson *et al.* 1975; Swim *et al.* 1989; Roca *et al.* 2018). Reflecting recruitment processes, the *Similarity-Attraction Paradigm* seems to be applied especially between male recruiters and male applicants. Also known as *homosocial reproduction* (Kanter 1977; Volpone 2013; Guttig 2015), a promotion praxis is

described expressing that male leaders promote a relatively homogeneous group that is similar to them in norms, values, interests and abilities (Müller & Sander 2005).

Concluding the *Similarity-Attraction Paradigm*, less diversity, thus, results in more similarity and more sympathy which has an influence on the course of interpersonal processes. Considered against the background of a diverse workforce, personnel decisions like recruitment, promotion and collaboration, the promotion of diversity poses a particular challenge, as similarity biases might occur (Leonard 1976), and, thus, must be object of investigation when analyzing organizational structures and processes. In the presented research approach (figure 1.6), this is realized in a descriptive approach in phase I (cf. chapter 3.1) and content of the qualitative investigation of the leadership level in phase III (cf. chapter 3.2). Comparable to the *Similarity-Attraction Paradigm*, the *Similarity Theory* and *Equity Theory* take a comparable social-psychological perspective (Byrne 1971; Tziner 1985). Whereas the *Similarity Theory* focuses on teamwork and associates a higher productivity based on homogeneity and shared values, the *Equity Theory* describes the tension and the resulting disadvantages of team member diversity (Tziner 1985). As a result, the effect of selected diversity categories summarized under Gardenswartz and Rowes' (1998) *internal dimensions* (cf. chapter 2.1.4) on interpersonal processes is object of investigation especially in phase III and IV.

2.2.2 Communication Science Perspective

Besides the sympathy caused by perceptible similarities between people, the ability to communicate between human beings plays a decisive role for the course of interpersonal working processes (Luthans 1988). Regarding the organization as a social system, disturbances of interpersonal interaction through communication problems can have a negative effect on cooperation (Liebrich 2008). The *Divergence Theory*, also called *Comparative Cultural Theory* (Silverthorne 2005), describes the prevalence of different worldviews, values and norms – often

in a context with culture – that lead to differentiation between people. The thesis behind states, that people retain their culture-based, diverse values, regardless of other ideologies in the direct environment (Silverthorne 2005). Hartung (2002) expands the approach to *perspective divergence* and links the effects of the differences between individual perspectives with a resulting disturbance of communication processes. From his view, the individual perspective and attitude is one of the basic conditions of human communication (Hartung 2002). Communicators are constantly confronted with divergences of perspective which can result in a considerable potential for disruption (Hartung 2002). The tension in communication processes resulting from diversity is also discussed under gender perspective. Related to the *Similarity-Attraction Paradigm*, the concept of *Homosociality* also known as *Homosocial Cooptation* “[...] describes and defines social bonds between persons of the same sex. It is, for example, frequently used in studies on men and masculinities, there defined as a mechanism and social dynamic that explains the maintenance of hegemonic masculinity.” (Hammarén & Johansson 2014:1). *Homosociality* is considered in a context with communication (Meuser 2004), as similarity simplifies human interaction and, thus, supports the *Divergence Theory* from gender studies perspective. Consequently, diverse teams are confronted with a high amount of differentiation and, thus, with disturbances of communication processes. This can already be the case with interdisciplinary work teams or between experts and laymen (Feith 2014). The resulting complication of communication processes can lead to interpersonal conflicts and hinder work processes and, thus, need to be considered especially in the project management of diverse teams. In the course of the study, the communication science perspective is integrated in the perceived impact of diversity categories on collaboration processes in phase III and IV.

2.2.3 Integrative Perspective on Diversity

Bringing chances and challenges of diversity together, van Knippenberg *et al.* (2004) and van Knippenberg and Schippers (2007) developed the *Categorization-Elaboration Modell (CEM)*.

The model describes under which conditions and through which processes diversity can lead to positive or negative consequences. From their point of view, information/ decision making interact with social categorization processes and, thus, must be considered together (van Knippenberg *et al.* 2004). Their model consists of eight interacting factors (figure 2.6).

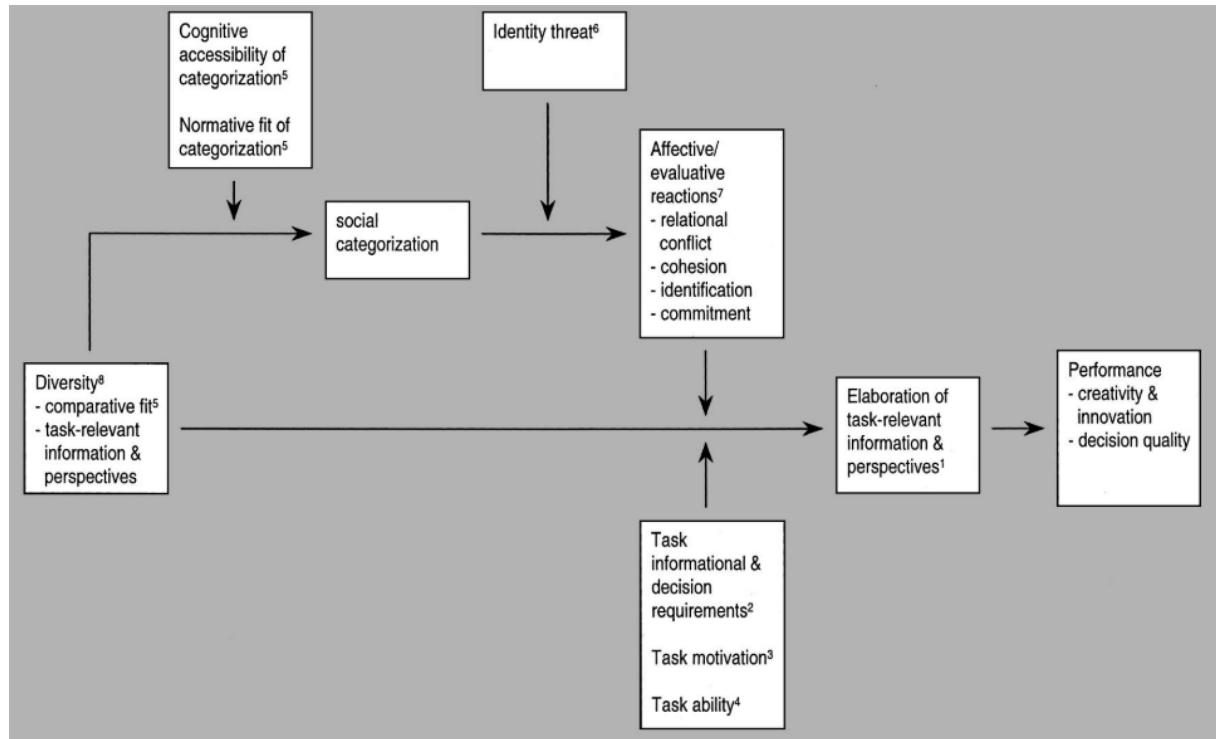


Figure 2.6: The categorization-elaboration model of work group diversity and group performance. (Superscripts refer to the correspondingly numbered propositions discussed in the text) (van Knippenberg *et al.* 2004)

Starting at the information/ decision-making perspective, van Knippenberg *et al.* (2004) state that „[...] diversity within a group is positively related to the elaboration of task-relevant information and perspectives within the group that is, to group members' exchange, discussion, and integration of ideas, knowledge, and insights relevant to the group's task. Elaboration of task-relevant information and perspectives, in turn, is proposed to be related to group performance, especially to group creativity, innovation, and decision quality. This is not to say, however, that diversity within a group will always lead to elaboration of task relevant information and perspectives.“ (van Knippenberg *et al.* 2004:1010). This is influenced by certain moderators. Van Knippenberg *et al.* (2004) assume that diversity only leads to sub-

groups, if a categorization according to the *Self-Categorization Theory* (cf. chapter 2.2.1) seems to be significant for the team members. Referring to the *comparative fit*, this requires a high team member similarity within a subgroup and a high dissimilarity between subgroups. Furthermore, group members should behave as expected of the group, which is described as the *normative fit*.

These categories become significant when they are perceived as important by the individual or when they are important for the group. In contrast to other approaches, van Knippenberg *et al.* (2004) assume that subgroups not automatically lead to conflicts. Only when there is a competitive moment between the sub-groups, affective/ evaluative reactions can result. (van Knippenberg *et al.* 2004). Finally, van Knippenberg *et al.* (2004) conclude that all kinds of diversity can have both, negative and positive impact. This results in a need for providing a framework that addresses on the one hand the negative and positive impacts of diversity and enables fruitful cooperation in diverse teams.

Summarizing the challenges described, Milliken and Martins (1996) conclude: "Diversity thus appears to be a double-edged sword, increasing the opportunity for creativity as well as the likelihood that group members will be dissatisfied and fail to identify with the group." (Milliken & Martins 1996:403). Cox (1993) likewise states that heterogeneity not automatically leads to better results. In accordance with the results in chapter 2.1, the analysis of psychological concepts and challenges that can arise in the diversity context support the need for a research approach that addresses all employee levels within an organization and allows the reflection of prevailing mindsets and attitudes and thus, the investigation of behavior patterns. In this context, Cox, JR. and Blake (1991) stress that diversity management provides a competitive advantage for organizations. Considering the research project and the identified need to investigate mindsets and attitudes (cf. chapter 2.2.1, 2.2.2, 2.2.3) in order to promote as well as manage diversity and to establish a structural environment that enables cooperation in diverse

teams (Bartz, Hillmann & Lehrer, S., Mayhugh, G.M. 1990; Aretz & Hansen 2003b; Bassett-Jones 2005; Nooteboom *et al.* 2007; Hagenhoff 2008; Günther 2014; Lorenzo *et al.* 2017), it requires a structured approach tailored to the organization-specific influencing factors. Consequently, an in-depth examination of the concept of diversity management is necessary. In addition, the transfer of diversity management to scientific organizations in the higher education must be realized, in order to analyze and reflect the framework conditions and influencing factors that might be differ from the private sector environment. Following, chapter 2.3. sheds light on different concepts of diversity management.

2.3 Diversity Management

Developed in the United States of America (USA), the active examination of diversity in the context of organizational development and scientific reflection took place in the early 1990s (Aretz & Hansen 2002; Vedder 2003; Dreas 2019). From then on, the concept was widely used in US companies of all sizes, large organizations as well as in small and medium-sized enterprises (Vedder 2003). In Europe, Great Britain, the Netherlands, and the Scandinavian countries started to deal with diversity management since the mid-1990s, followed by Germany in the course of diversity management strategies in U.S corporations (Dreas 2019). Thereby, in Germany and Europe, the emergence of diversity management has historically been closely linked to the category *gender* (Dreas 2019).

Although diversity management has been a topic of discussion for years, there is, similar to the different perspectives on diversity (cf. chapter 2.1), no uniform definition of the term. Considered from an international perspective, the OENORM S 2501:2008-01-01 (2008) defines diversity management as a strategically oriented management approach, intending the targeted perception and usage of human diversity as well as relevant organizational environments and/or stakeholders. By creating structural and social conditions that allow all employees to develop

and unfold individual capabilities, diversity management aims to motivate employees to increase the individual performance and, thus, the organizational success (OENORM S 2501:2008-01-01 2008).

Krell (2004) regards diversity management as a concept that creates good working conditions for all employees. In doing so, Krell (2004) assumes that good working conditions result in a higher commitment and leads to better performances. Sepehri and Wagner (2002) consider diversity management as a strategic management concept, consisting of a social and an economic-competitive element. The *social perspective* describes the promotion and positive connotation of diversity in organizations, whereas the *economic-competitive perspective* stresses the active utilization of diversity (Sepehri & Wagner 2002). Referring to Cox, JR. and Blake (1991) as well as Loden and Rosener (1991), Aretz and Hansen (2002) define diversity management as an active examination of the heterogeneity within organizations, with the intention to use the differences of individuals, cultures, strategies, functions and other characteristics as a strategic resource to solve complex problems. Liebrich (2008) concludes diversity management as a personnel and organizational orientation of management action, whereas Lederle (2007) regards diversity management as an abstract concept, developed in the frame of discourses, and consisting of concrete measures up to content-based patterns of interpretation. Summarizing the definition approaches, diversity management aims at linking workforce diversity with business goals through strategic measures.

A further distinction is made by Becker (2006) differentiating diversity management from *managing diversity*. From Becker's (2006) perspective, *managing diversity* focuses on the management of diversity already prevailing in the organization. Consequently, *managing diversity* aims the limitation of friction losses caused by diversity in the working environment, by agreeing on the smallest common denominator accommodating the homogeneous majority in dealing with heterogeneity (Becker 2006). On the contrary, diversity management takes a

market-based perspective, that focuses on the appreciation of diversity and considers it as a source of creativity and innovative capability (Becker 2006). In German-speaking countries, however, diversity management and *managing diversity* are often used synonymously (Krell, Ortlieb & Sieben 2018).

In the context of this work, the focus lays on diversity management considering the recruitment of a diverse set of employees but also on the management of prevailing diversity. At this point, however, it must be mentioned that both perspectives on diversity management interact with each other. In accordance to Sepehri (2002), diversity management is strongly dependent on the actual existence of diversity in the respective organizational environment. The more diverse a prevailing workforce, the more relevance is attributed to diversity management in the respective organization, or, to put it another way, a rather homogeneous workforce structure leads to a low level of understanding of diversity management (Liebrich 2008).

The amount and the complexity of human perspectives and characteristics, and the intention to actively integrate them into corporate processes indicates the huge challenge diversity management implies. Thus, Vedder (2003) states that there are no fixed guidelines for the implementation and design of diversity management concepts. This insight is supported by the variety of approaches and the scientific discourse of the basic understanding of diversity management. In order to capture the broader picture of diversity management's central approaches, perspectives and paradigms in the diversity management context are presented in the following.

2.3.1 Process Perspective

Koall (2003) as well as Krisor and Köster (2016) consider diversity management as part of human resource management (HRM) strategies. Whereas Koall (2003) ties diversity management superficially to HRM for being able to take advantage of human diversity in a

business-related way (Koall 2003 cited in eds. Bendl, Hanappi-Egger & Hofmann 2004), Krisor and Köster (2016) consider diversity management as a process dimension in HRM context. In doing so, they generally define diversity management in the business context as a conglomerate of measures, which is structurally realized by applying the four process steps (i) status quo analysis, (ii) planning, (iii) implementation, and (iv) evaluation. In addition to the structural component, diversity management can also be understood as a process that affects all areas of HRM. Figure 2.7 illustrates the interrelation between exemplary diversity management measures and the employee life cycle.

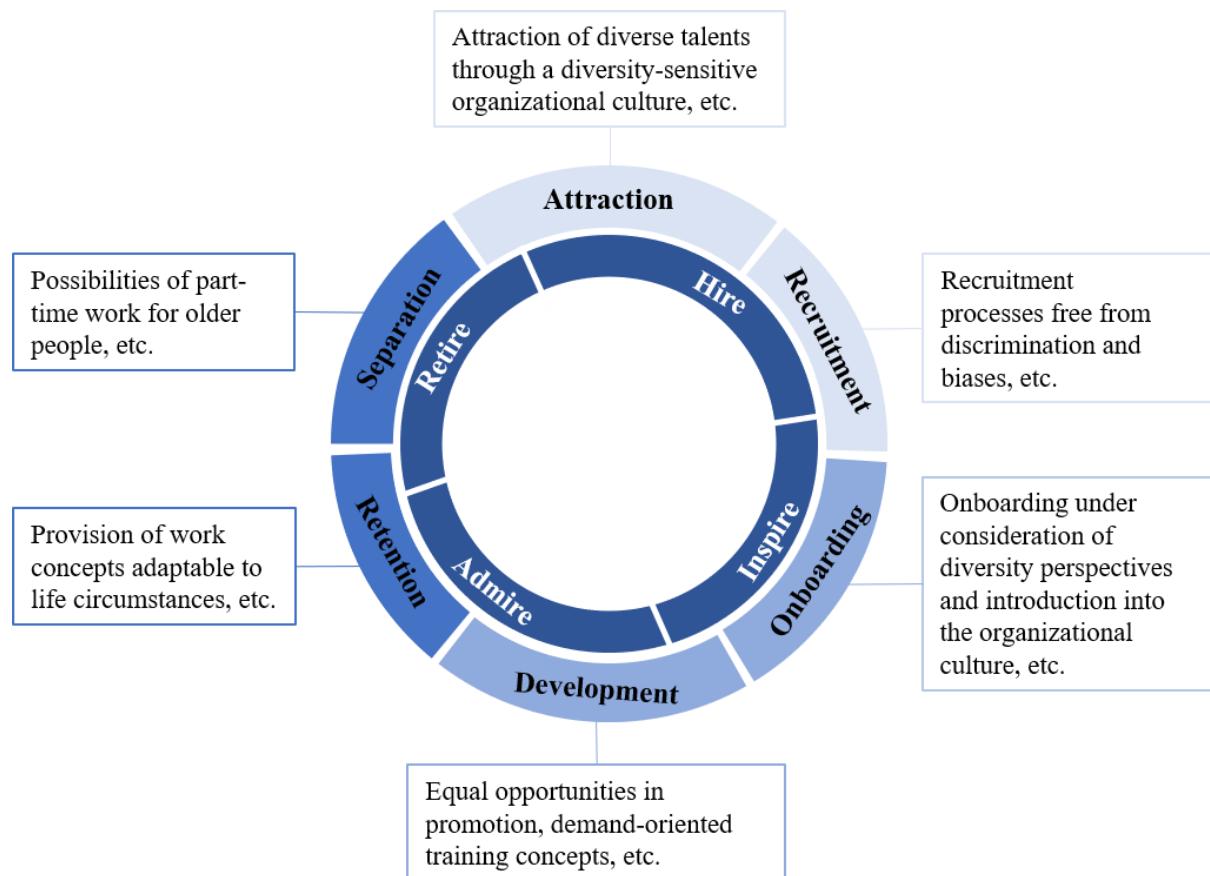


Figure 2.7: Employee life cycle and diversity management
(employee life cycle framework in accordance to Smither 2003)

The employee life cycle is understood as a process where employees but also the organizations themselves are constantly changing (Badgi 2012). Figure 2.7 illustrates, that, considered from a process perspective, diversity management represents a component of strategic HRM and,

thus, continuously interacts with the employee life cycle. Consequently, a research concept is required that reflects the changes in life phases or organizational factors and integrates the individual employee realities. Figure 2.7 shows exemplary measures tied to the employee life cycle and representing flexible responses to different life situations and, thus, components of diversity management. This results in a necessity to connect the diverse and individual employee needs with diversity management and to integrate it in continuous HRM processes.

With regard to the development of a diversity management concept for a complex research organization, it is therefore necessary to examine the prevailing HRM processes and structures within the organization. Applying this aspect to the presented research concept, an environmental analysis is realized in phase I and the perspective on HRM processes integrated in the survey of the leadership level in phase III.

2.3.2 Level Perspective

Krisor and Köster (2016) conclude, that diversity management approaches should be cascaded through the organizational levels – *(i) organization, (ii) teams, and (iii) individuals*, in accordance to the strategic concept. The intention is to establish a holistic diversity management concept instead of implementing individual measures that are not tailored to the organization and the prevailing needs of employees. At the *organizational level*, the focus lays on the definition of a diversity vision and the identification of fields of action, as well as measures that have an impact on the organizational culture and work design. At the *team level*, the establishment and management of diverse teams as well as the cooperation in diverse teams are focused. Regarding the *individual level*, raising awareness of important phenomena such as unconscious bias (cf. chapter 2.2), networking and a life-phase orientation in work design (cf. chapter 2.3.1) are considered. (Krisor & Köster 2016)

Krell, Ortlieb and Sieben (2018) as well as Leicht-Scholten (2008), also regard diversity management as a project of organizational change that starts at several levels. Following this perspective, they derive the need for different, strategically coordinated measures. Referring to Cox's, JR. (2001) *Model of Cultural Change*, which shows different fields of action and describes their interlocking from (i) *leadership* to (ii) *research & measurement*, (iii) *education*, (iv) *alignment of management systems*, and (v) *follow-up*, the leadership level is emphasized, as it has a significant influence on the success of diversity management. This relevance results from the management's understanding of leadership (Roberson 2003), as well as the exemplary behavior of managers, who must have both the necessary skills and motivation to implement diversity management (Cox, JR. 2001; Kossek, Lobel & Brown 2006; Krell *et al.* 2018). Due to the importance of the leadership level and based on the identified need to investigate prevailing mindsets and attitudes (cf. chapter 2.1), research phase III (figure 1.6) focuses on the investigation of the leadership level of the CoE and puts their perspective in the focus.

2.3.3 Personal and Behavioral Approaches

Considering diversity management, Krisor and Köster (2016) differentiate between *personal* and *behavioral approaches*. While *person-related approaches* focus on target-group-specific approaches to equal treatment (with regard to different diversity categories like culture and gender), *behavior-related approaches* focus on influencing attitudes that have an effect on behavior. Measures in this context are for example behavioral trainings and supportive framework conditions. (Krisor & Köster 2016). According to Vedder (2006), diversity management focuses less on the abstract management of diversity than on the influence, organization, and control of the behavior of diverse people (cf. chapter 2.2). In accordance to Cox, JR. (2001) *Model of Cultural Change* mentioned in chapter 2.3.2, the personal and behavioral approach is reflected in the aspect *education*. In this context, *education* refers to educational work, regarding diversity, stereotyping (cf. chapter 2.2.1) and discrimination as

well as persuasive efforts (Cox, JR. 2001). This can be realized in the frame of diversity trainings (Krell *et al.* 2018), coaching (Cox, JR. 2001), or mentoring (Leicht-Scholten 2005; Kossek *et al.* 2006; Leicht-Scholten 2009; Hartjen & Leicht-Scholten 2013). In order to develop and implement appropriate measures in the context of personal and behavioral approaches, it is necessary to investigate the needs on personal level. This investigation is linked to the need to survey prevailing mindsets and attitudes, described in chapter 2.1. Consequently, research phase IV focuses on the investigation of prevailing mindsets and attitudes on employee level.

2.3.4 Strategic Responses

Following Thomas and Ely's (1996) perception of diversity, Dass and Parker (1999) summarize different perspectives on diversity and describe strategic responses that adapt to the perspective prevailing in the organization (table 2.1). In doing so, they reflect the typology of strategic responses to institutional pressure developed by Oliver (1991).

Table 2.1: Managing diversity approaches (Dass & Parker 1999; adjusted after Hanappi-Egger 2004)

Diversity Perspectives	Problem Statement	Internal Definition	Organizational Culture	Objective	Strategic Response
Resistance Perspective	Diversity as non-issue or threat/ danger	Dominant ideal	Monoculture, sustain homogeneity	Defending the status quo	Reactive
Discrimination and Fairness Perspective	Diversity causes problems	Classical differences (disadvantaged groups), protected groups	Assimilation of individuals and equal opportunities	Level the playing field for members of protected groups	Defensive
Access and Legitimacy Perspective	Diversity leads to advantages, opportunities	All differences	Differentiation and positive appreciation of differences	Access to customers and markets	Accommodative
Learning, Effect Viability Perspective	Diversity and similarities offer opportunities and bear costs	Important differences and similarities	Acculturated, multicultural and pluralism	Individual and organizational learning, long-term effect	Proactive

The model shows an attempt at a structured perspective on diversity management. Conceived as an equation, a strategy is derived from a predominant diversity perspective which must be implemented in the company. This leads to the assumption that there is a dominant perspective on diversity within the organization. Applied to the presented research concept (figure 1.6), Dass and Parker's (1999) approach emphasizes the necessity to combine the results of research phase I, II, III, and IV in order to get a holistic picture of the organizational culture and, thus, the basis for the development of implications. It remains questionable whether a single dominant perspective prevails in an organization, or whether there is rather a set of perspectives which must be taken into account in the development of a diversity management concept (Steuer-Dankert & Leicht-Scholten n.d.). Consequently, the developed research concept aims at understanding interrelations between organizational and personnel structures, mindsets, and attitudes on leadership level as well as on employee level in combining research phase I-IV.

2.3.5 Diversity Management Paradigms

Thomas and Ely (1996) conclude that various diversity management efforts have failed in recent years. Reflecting the definition of the term diversity (cf. chapter 2.1), Thomas and Ely (1996) see a reason for this development in a “[...] thinking of diversity [in the context of diversity management] simply in terms of identity-group representation [...] [and] the assumption that the main virtue identity groups have to offer is a knowledge of their own people.” (Thomas & Ely 1996: n.p.). Consequently, diversity management approaches in recent years are characterized by a certain understanding and perception of diversity, which can be described with the *Discrimination-and-Fairness Paradigm* and the *Access-and-Legitimacy Paradigm* (Thomas & Ely 1996).

Regarding the *Discrimination-and-Fairness Paradigm*, diversity management pursues the aim of preventing discrimination by increasing the share of underrepresented groups through equal

opportunity measures (Thomas & Ely 1996). In contrast, the *Access-and-Legitimacy Paradigm* focuses the explicit promotion of the “[...] acceptance and celebration of differences” (Thomas & Ely 2019: n.p.) is realized. In conclusion, while the *Discrimination-and-Fairness Paradigm* strives for assimilation through equal treatment, the *Access-and-Legitimacy Paradigm* emphasizes heterogeneity (Thomas & Ely 2019). Concluded from different studies, Thomas and Ely (1996) see in both paradigms disadvantages, resulting from a unilateral consideration of diversity. In the course of Herzberg's (1966) *Two-Factor Theory* in chapter 1, it was already indicated that an in-depth consideration of diversity is necessary, especially if diversity management is understood as an enabler for motivation and aims at the development of employee potential. In accordance to that, Thomas and Ely (1996) identify in their studies, that companies dealing successfully with diversity are characterized by a management approach, that “[...] enables them to *incorporate* employees' perspectives into the main work of the organization and to enhance work by rethinking primary tasks and redefining markets, products, strategies, missions, business practices, and even cultures.” (Thomas & Ely 1996: n.p.). Related to the deep-level perspective on diversity (cf. chapter 2), they define, similar to Pellets (1996) perspective on diversity (cf. chapter 2.1.3), the *Learning-and-Effectiveness Paradigm* as, “[...] concretely connecting diversity to approaches to work.” (Thomas & Ely 1996: n.p.). Building on the *Learning-and-Effectiveness Paradigm*, Schulz (2009) supplements the *Strategic Responsibility and Sensitivity Paradigm*, which takes the continuously changing environmental conditions as an opportunity and pursues the goal of integrating existing personnel and cultural diversity into existing corporate strategies. Thus, the approach allows to react effectively to the dynamic changes in the internal and external conditions of the organization, which leads to competitive advantages (Schulz 2009). Comparing the four approaches outlined above, Bührmann (2016) notes that, like Thomas and Ely (1996), Schulz (2009) also focuses on companies in his typology formation.

2.3.6 Integrative Perspective on Diversity Management

In summary, diversity management can be considered from different perspectives. Comparable to the term *diversity*, the analysis of different perspectives on diversity management shows the fuzzy character of the concept and the absence of a concretely defined process that is applicable to all forms of organizations. However, a common aspect can be seen in the normative character, regarding the approaches and paradigms presented. Expressed in the aspiration towards an avoidance of disadvantages resulting from monolithic organizations (Cox 1993) or monocultural organizations (Krell 1996), the normative moment lies in the definition of behavior patterns and the goals and values that are to be aimed for. From an analytical point of view, the approaches focus on the dangers of egalitarianism and conformity, which can also result in exclusion (Krell *et al.* 2018) and its negative consequences for the organization. According to Krell, Ortlieb and Sieben (2018), the opposite represents organizations that are characterized by an assimilatory culture or a pluralistic perspective. However, the concepts shown in chapter 2.3 indicate, that diversity management implies to actively deal with people at different levels (cf. chapter 2.3.1 – 2.3.4) and is often accompanied by a change at the individual or organizational level (cf. chapter 2.3.5). Consequently, in order to successfully apply diversity management, the reflection of change processes is necessary. In this context, diversity management can be considered as a modern form of change management (Rosken 2016). In order to be able to explore the connections between diversity management and change management in more detail, the concept of change management is discussed in the following.

2.4 The Triangle between Change Management, Diversity Management and Organizational Culture

Considering the different perspectives, paradigms and approaches presented in chapter 2.3, diversity management aims at changing organizational processes and structures but also

attitudes and behavior patterns. In order to achieve this, a research concept is necessary that reflects the human as an actor in organizations (cf. chapter 2.1) and, thus, the challenges in diversity context (cf. chapter 2.2). In the course of a research approach that considers the organization as a whole, there is a need to reflect the impact of diversity management and, thus, the psychological effects of change, too. For example, the level perspective (cf. chapter 2.3.2) focuses on the realization of trainings, coaching or mentoring on different organizational levels in order to change “[...] attitudes (affective and cognitive) [...] and behaviors to ‘value diversity’ and reduce subtle forms of discrimination and exclusion that hinder effective working relationships.” (Kossek *et al.* 2006:63, see also Ford & Fisher 1996). This approach presupposes that the needs to which this measure relates are known. But even if this is the case, initiatives such as diversity trainings might fail. Analyzing the impact of diversity measures, Lobel (1999) comes to the conclusion that at first glance diversity trainings seem to have a positive effect on diversity attitudes. Considering the duration of the effect, studies show, that only one-third of the organizations perceive a long-term effect of those measures and a lasting change (Kossek *et al.* 2006). Regarding the success and sustainability of change processes, this development can be observed more often. Kotter (2011) also notes that transformation efforts have a high probability of failure, stating that “[...] over 50% of the companies [...] [already] fail in [the] first phase.” (Kotter 2011:5).

Reflecting the challenge of changing human behavior in the context of diversity management approaches, Lewin (1947a, 2009) describes the so-called *quasi-stationary social equilibrium*, expressing the prevalence of forces that are favorable to change and forces that are resisting change (Lewin 1947a; Miner 2007; Lewin 2009). Considering those forces, Lewin defines three steps to achieve a successful change - (i) *unfreezing*, (ii) *moving*, (iii) *refreezing* (Lewin 1947b, 2009). In the first step, the focus lies on the dissolution of the status quo, followed by the second step, a movement to the new status quo, and the third step, ensuring that the change will last.

In accordance to Lewin's (1947b, 2009) three steps of change, Kotter (2011) describes the same process of change applying eight steps (figure 2.8). While Lewin also considers social change processes and “[t]he idea of ‘social habit’ [which] seems to imply that [...] the level of the social process will not change because of some type of ‘inner resistance’ to change” (Lewin 1947b:209), Kotter (2011) focuses on entrepreneurial framework conditions.

Kotter's eight steps of change represent concrete fields of action, derived from observing behaviors in different enterprises. In the first step, Kotter focuses the development of a need for change by analyzing environmental factors and identifying (potential) crises or opportunities. After identifying an urgent need, a task force/ coalition should be developed that leads the change effort. In a third step, this team develops a vision that guides the change effort and supports the development of a change strategy. In a next step, the vision and the strategy are communicated, and the guiding coalition set as an example. The fifth step aims at empowering and motivating the whole workforce, reflecting and removing obstacles and actively changing structural barriers. The next step aims at the creation of short-term wins in order to visualize improvements and rewarding change activities. In the seventh step, the focus lays on the consolidation of the vision by taking measures on employee level and project level. The last step serves for the institutionalization of the change in connecting the corporate success with the achieved change. (Kotter 2011) (figure 2.8)

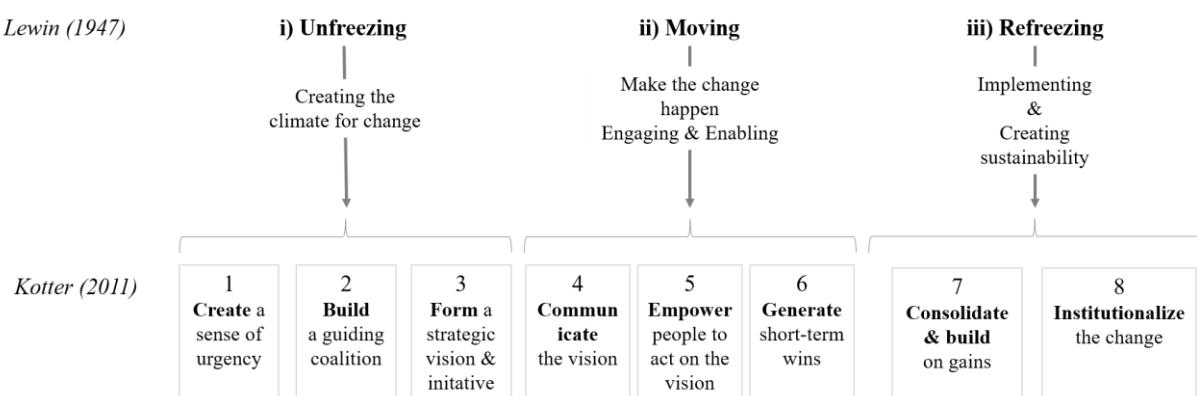


Figure 2.8: Change management processes (in accordance to Lewin 1947b; Kotter 2011)

Despite the different numbers of process steps, both perspectives are united by the focus on human behavior and in the aim “[t]o overcome [...] inner resistance [by] an additional force [...], a force sufficient to ‘break the habit’, to ‘unfreeze’ the custom.” (Lewin 1947b:209).

Regarding the aims of diversity management in change management context, the analysis of inner resistances in diversity context and, thus, the investigation of human mindsets and attitudes (phase III and IV) poses a main challenge. This is already indicated in the context of the different definitions on the term diversity (cf. chapter 2.1), the psychological concepts in diversity context (cf. chapter 2.2), and the presented paradigms, perspectives and approaches of diversity management (cf. chapter 2.3). Consequently, in addition to this investigation (phase III and IV), a linkage of diversity management with a structured change management process that accompanies the process of organizational change is required. In doing so, and corresponding to Kotter’s (2011) first step, that focuses on the creation of urgency by analyzing external and internal influencing factors that can result in crises or opportunities, a preceived need for action on all employee levels is aimed. In this context, the level perspective (cf. chapter 2.3.2) and the strategic response (cf. chapter 2.3.4) already indicate, that the organizational culture has a central role when implementing diversity management. Therefore, the development of such strategies must consider the organizational structures and the organizational environment on the one hand and the organizational culture and human behavior in the context of this culture on the other hand. In accordance to that, Überacker (2004) as well as Dwyer, Richard and Chadwick (2001) consider the organizational culture as a central element for realizing diversity management. Due to the importance of the organizational culture in the context with diversity- and change management, the concept will be discussed in more detail below.

There are different definitions and perspectives regarding the concept of organizational culture (Tharp 2009). Schein (1990, 2004) defines organizational culture, by focusing on the term

“[c]ulture [which] can [...] be defined as (a) a pattern of basic assumptions, (b) invented, discovered, or developed by a given group, (c) as it learns to cope with its problems of external adaptation and internal integration, (d) that has worked well enough to be considered valid and, therefore (e) is to be taught to new members as the (f) correct way to perceive, think, and feel in relation to those problems.” (Schein 1990:111). Schein’s (1990) definition indicates that culture is a human made phenomenon, accepted and adapted by humans because a certain function (coping with problems) is associated with it. Transferred to the organizational context, Homma and Bauschke (2014) connect Schein’s (2004) perspective with Sackmanns’ (2006) focus on organization internal values (figure 2.9).

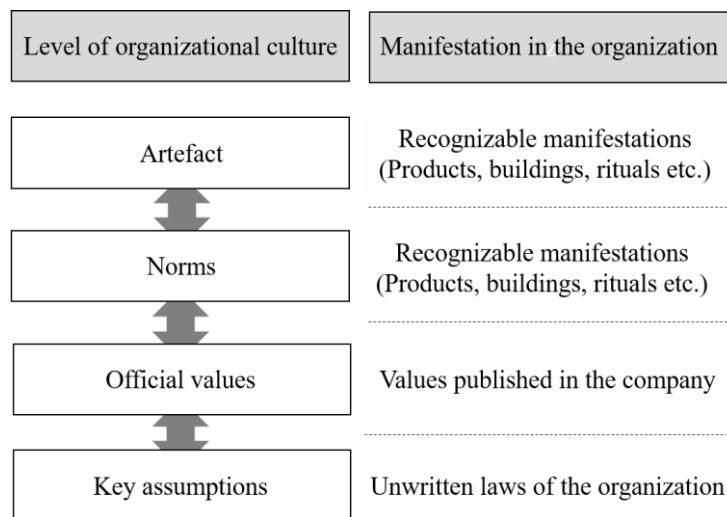


Figure 2.9: Organizational culture-model
(in accordance to Schein 2004; Sackmann 2006; Homma & Bauschke 2014)

In this context, *artefacts* are characteristics that create recognition value, whereas *norms* define rules and laws that help employees to distinguish between right and wrong activities (Homma & Bauschke 2014). In contrast, *official values* are postulated outwardly, which does not automatically mean that those values are lived reality in the organization (Homma & Bauschke 2014). The distinction between published and unpublished values already indicates that there seems to be a gap in this respect. *Key assumptions* represent an organization cultures’ core in representing basic guidelines, which have an impact on thinking and behavior patterns and are

followed unreflectively (Homma & Bauschke 2014). In this context, Strode, Huff and Tretiakov (2009) define culture in an organizational context as a “[...] shared belief system that permeates an organization or subunit and ultimately influences the actions of people and work groups.” (Strode, Huff & Tretiakov 2009:2). In doing so, they emphasize that culture has a direct influence on behavioral patterns and, thus, significantly influences interpersonal relationships (Strode *et al.* 2009). Following Homma and Bauschke (2014), the majority of organizational culture is characterized by elements that are not visible. Transferred to the research concept (figure 1.6) this results in the need to supplement the descriptive environmental analysis of structures and processes (phase I) and integrating the perspective on the organizational culture in the survey of employees (phase IV). Consequently, when interviewing employees with regard to their perception of diversity, it is also important to identify criteria that provide information about the prevailing organizational culture. In the course of this survey, first of all, it must be worked out to what extent the employees differentiate between the institution-related organizational culture and the culture of the CoE as an organization, in order to identify adjusting levers for implementing an integrative diversity management concept. This is realized by investigating the research institute and CoE environment separately.

Summarizing the relation between diversity and organizational culture, Tomervik (1995) states that “[...] (2) the meaningful aspects of diversity are how it affects the individual and the organization; (3) the broadened definition of diversity requires a culture change within organizations such as management styles, human resource systems, philosophies, and approaches; and (4) there is an emphasis in communicating a concept of diversity as more than race, gender, Affirmative Action and equal employment opportunity.” (Tomervik 1995 in eds. Bendl, Hanappi-Egger & Hofmann 2004:58). Discussing the impact of diversity on the organization and the individuals in an organization, Tomervik (1995) deviates a necessity for cultural change by actively involving central organizational elements (like human resource

systems, managements styles etc.) in diversity management processes (Tomervik 1995 in eds. Bendl, Hanappi-Egger & Hofmann). Reflected in the frame of the research concept, this supplements the approach chosen in the research concept (figure 1.6).

Summarizing the central aspects of change management in relation to diversity management, three elements can be identified, in order to achieve sustainable change: (i) organizational structures, processes, and systems (like hierarchies, HRM, authorities to issue directives etc.), (ii) the individual level (affecting attitudes, skills, values, beliefs and behavior (Sharma 2007)), and (iii) organizational culture (leadership styles, decision making etc. (Sharma 2007)). These elements can be considered as levels on which a change is to be achieved within the different phases. Referring to the diversity management approaches presented in chapter 2.3, analogies to change management can be identified. Combined with the analysis of chapter 2.1, 2.2, and 2.3, a new model results (figure 2.10), providing an integrated perspective of the triangle of change management, diversity management, and organizational culture and representing the theoretical basis for the diversity management research concept (figure 1.6).

Figure 2.10 shows the presented diversity management approaches, paradigms and perspectives in relation to the identified change management elements, implemented and realized in phase I-IV of the developed research concept. This perspective has not been realized in research yet.

In conclusion, diversity management aims to change the organizational culture in a way that managers and employees take diversity for granted and appreciate its value for the working climate and economic success (Leicht-Scholten 2011; Charta der Vielfalt e. V. 2017). Thus, diversity management stands in a direct context with change management. This results in the necessity to combine both approaches and to reflect reactances resulting from change. Although, as already indicated in chapter 1, there is a need to reflect diversity on all social levels and across organizations and branches, studies and analyses on change management and the interdependency between diversity management and organizational culture are mostly applied

in the economically sector, referring to the framework conditions of companies in business context. Consequently, there is a need to embed diversity management in the higher education sector. For this reason, the following chapter focuses on an analysis of diversity management concepts in university environment.

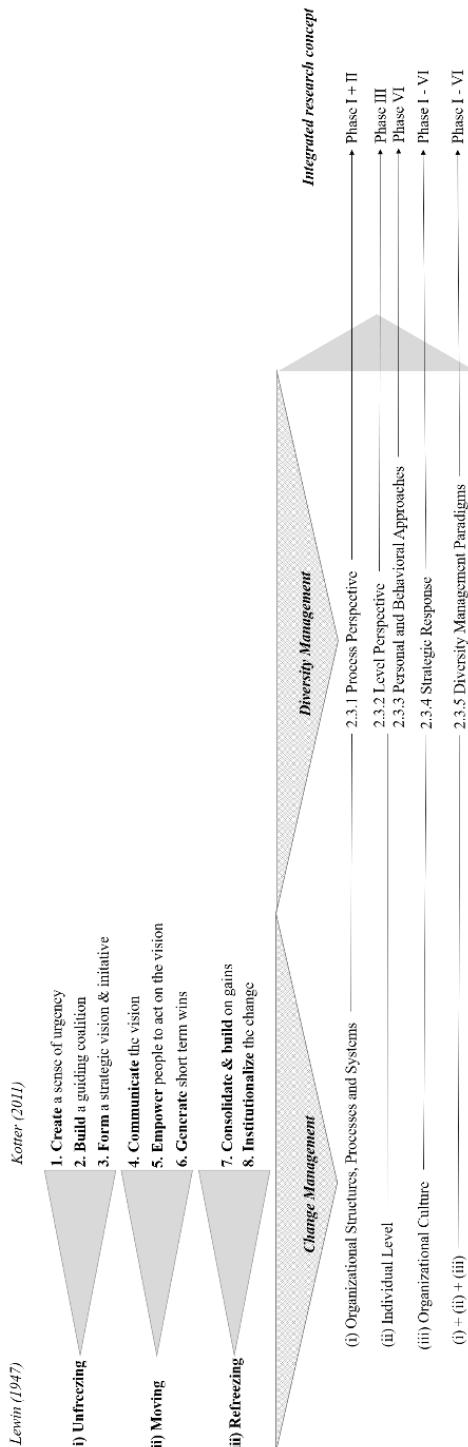


Figure 2.10: Analogies between change management and diversity management

2.5 Diversity Management in Higher Education

In recent years, diversity management has gained importance also in public institutions as well as universities in the US (Milem, Chang & Antonio 2005; Lipson 2007; U.S. Department of Education 2016) and Europe (Klammer & Ganseuer 2015; eds. Claeys-Kulik & Jørgensen 2018; Buitendijk, Curry & Maes 2019; Wieczorek-Szymánska 2020). Regarding diversity management in higher education, the central aim is to establish the implementation of equal opportunities and diversity as fundamental principles in the process of university management (Leicht-Scholten 2011). In organizational theory, universities are understood as loosely coupled systems, which are designed by rules that guide action (Orton & Weick 1990; Maurer & Schmid 2002). Characterized by a permanent order, universities in Germany are controlled and changed by their actors (Leicht-Scholten & Wolffram 2010a; Kehr & Leicht-Scholten 2013). Pellert (1999) classifies universities as the organizational type of an expert organization. Consequently, Leicht-Scholten (2007) identifies the necessity for a reorganization of universities as entire organizations at all hierarchical levels, aiming the integration of diversity perspectives in universities' mainstream and, thus, in central decision-making processes of the universities (ed. Leicht-Scholten 2007, 2011). This results in the need to consider all fields of action and duty of the higher education institutions from a diversity perspective (Leicht-Scholten 2011). Thereby, Leicht-Scholten (2008, 2011) and Leicht-Scholten and Wolffram (2010b) identify five major fields of action: *(i) university management* (organization development), *(ii) personnel development and promotion of junior staff*, *(iii) research*, *(iv) teaching and studies* as well as *(v) social conditions* (work-life balance), indicating the need for a broad implementation of diversity topics.

Despite the widest possible consistency on possible fields of action, the concepts of diversity management are as diverse (cf. chapter 2.3) as their institutional embedding in the structures of universities in Germany (Leicht-Scholten 2012). In the frame of an attempt at structuring

diversity management at universities, Auferkorte-Michaelis and Linde (2016), Leicht-Scholten (2008) as well as Kehr and Leicht-Scholten (2013) define four phases for the implementation of corresponding strategies at universities: *(i) analysis and diagnosis, (ii) vision and aim, (iii) competence development and implementation, (iv) evaluation and documentation*. In doing so, a system-theoretical approach is pursued. A system-theoretical reorganization approach (Aretz & Hansen 2002, 2003a, 2003b; Degele 2005) enables diversity management to be integrated into the logic of the organizational system in terms of structure and content, i.e. the respective partial logics of the university sub-systems, in the five fields of action defined by Leicht-Scholten (2008, 2011) as well as Leicht-Scholten and Wolffram (2010b). In reference to Luhmann (1986), Degele (2005) points out that, from a system-theoretical perspective, such fields of action are sub-systems acting according to different rules and striving for different aims. This results in the need for a differentiated approach. Leicht-Scholten and Wolffram (2010b) derive that structure-changing mechanisms can only work if they cause a resonance in the university, i.e. if they trigger reactions within the sub-system logics or adapt to the core topics of the sub-systems. This means, for example, that the sub-system of university control, which is essentially operated by the *Rectorate*, the center of power and higher education policy, must use the given opportunities for participation to extend its influence (Leicht-Scholten & Wolffram 2010b). Reflecting the legal frameworks of the education sector and universities as closed systems, this is of particular importance.

Considering universities in Germany as organizations with inflexible structures and steep hierarchies, Schulz (2009) defines nine problem fields of diversity management (figure 2.11). Based on a lack of knowledge about the strategic approach to diversity, which is manifested by the range of definitions of diversity (cf. chapter 2.1) and the different perspectives on diversity management (cf. chapter 2.3), Schulz (2009) concludes an *awareness problem* of diversity management in organizations, which is accompanied by a *problem of comprehension*. Resulting

in a *problem of relevance*, Schulz (2009) indicates that diversity in practice is insufficiently perceived and the possibility of strategic diversity management is not yet understood.

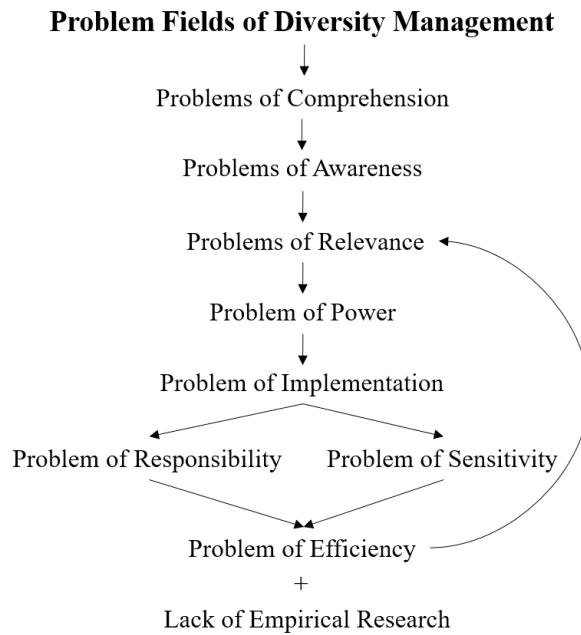


Figure 2.11: Problem fields of diversity management (In accordance to Schulz 2009)

This conclusion is supported by a study conducted by Jaffé, Rudert and Greifeneder (2019), investigating if social distance has an influence on individuals' decisions for or against diversity. Their studies show, that there is an interrelation as "[...] when deciding for themselves and being socially proximate, individuals prefer to work with similar others. However, when deciding for others and thus being socially distant, individuals are more likely to show an increased preference for diversity." (Jaffé *et al.* 2019:12). In the context of equal opportunities, Schulz (2009) derives a *power problem* which must be solved after the reservations of relevance have been overcome. In this context, the need for an organizational paradigm shift described in chapter 2.4 and the reflection of psychological concepts described in chapter 2.2 is emphasized. Schulz (2009) summarizes that especially the reservations about change and associated losses, due to the change of power-equipped people, cause management concepts to fail. If successfully *implemented*, external *responsibility* for the topic and internal *sensitization* are required. The *efficiency problem* is caused by the length of the relevant

processes and the lack of uniform performance measurement procedures. This results in a feedback to the *relevance problem* and a *need for research*. Originally applied on international enterprises, Schulz' (2009) approach can be transferred to the university context as it indicates the effect of mindsets and attitudes toward diversity resulting in challenges when implementing diversity management. This is of particular importance as university are shaped by their actors, as mentioned above.

As university environments are characterized by complex structures and specific power relations, there is a particular need for the implementation of structured diversity management approach that reflects the five identified fields of action in universities. In this context, Leicht-Scholten and Wolffram (2010b) point out, that the successful implementation of diversity management in the respective system logic will be more effective the more comprehensively the sub-system logics are reflected in an overall system. Summarizing, Leicht-Scholten (2012) emphasizes that the implementation of diversity management, thus, becomes an indicator for the future viability of universities and a motor for innovation in science. Consequently, the developed research approach is characterized by implementing structures and processes (phase I) as well as the human in the CoE (phase II-IV) and, thus, the application of a system-theoretical perspective. Against the background of the research object, the research areas (*i*) *management* (organization development) as well as (*ii*) *personnel development and promotion of junior staff* are focused. Following, based on the derivation of the research concept for the investigation of the CoE (figure 1.6) and based on the key research questions (figure 1.7), the detailed research questions are presented and connected to the publications of this dissertation.

2.6 Derivation of Research Needs and Research Questions

The Wissenschaftsrat (WR) (Council of Science and Humanities) declares significant changes in the higher education landscape in Germany since the 1990s. This change is indicated by

numerous programs and initiatives launched by the Federal Government and the federal states. The *Excellence Initiative* (Deutsche Forschungsgemeinschaft 2013, 2016) and the *Pact for Research and Innovation* (Bundesministerium für Bildung und Forschung n.d.) but also the *Bologna Process* (Bundesministerium für Bildung und Forschung n.d.) have initiated complex processes of change with far-reaching consequences in Germany. In addition, demographic change, the need for skilled employees, international competition for students and student diversity indicate the context in which the science system faces a multitude of sometimes contradictory demands. (Wissenschaftsrat 2013)

Despite this development, the analyses of the previous chapters show that most studies and implications of action relate to private enterprises and that there are only a few studies dealing with universities as organizations (cf. chapter 2.5). The special structures of the university environment suggest that diversity management approaches from the economic environment (cf. chapter 2.3) can only be transferred to the publicly funded education sector to a limited extent. From this the general thesis is derived:

The development and implementation of diversity management approaches in university-related organizations is different to those in the private sector.

Due to the increasing promotion of interdisciplinary research associations and not least due to the importance of the CoEs as essential components of the German science landscape (Deutsche Forschungsgemeinschaft 2016, 2019b, 2019a), there is an urgent need for research in this field. Especially against the background of the social responsibility of publicly funded research institutions and the reflection of social diversity in research projects, the necessity to scientifically investigate the implementation of diversity management approaches is evident.

Based on the analysis of the state of research and the combination of the change management and diversity approach with a focus on organizational culture as a central lever (cf. chapter 2.4), the following research questions can be derived (figure 2.12):

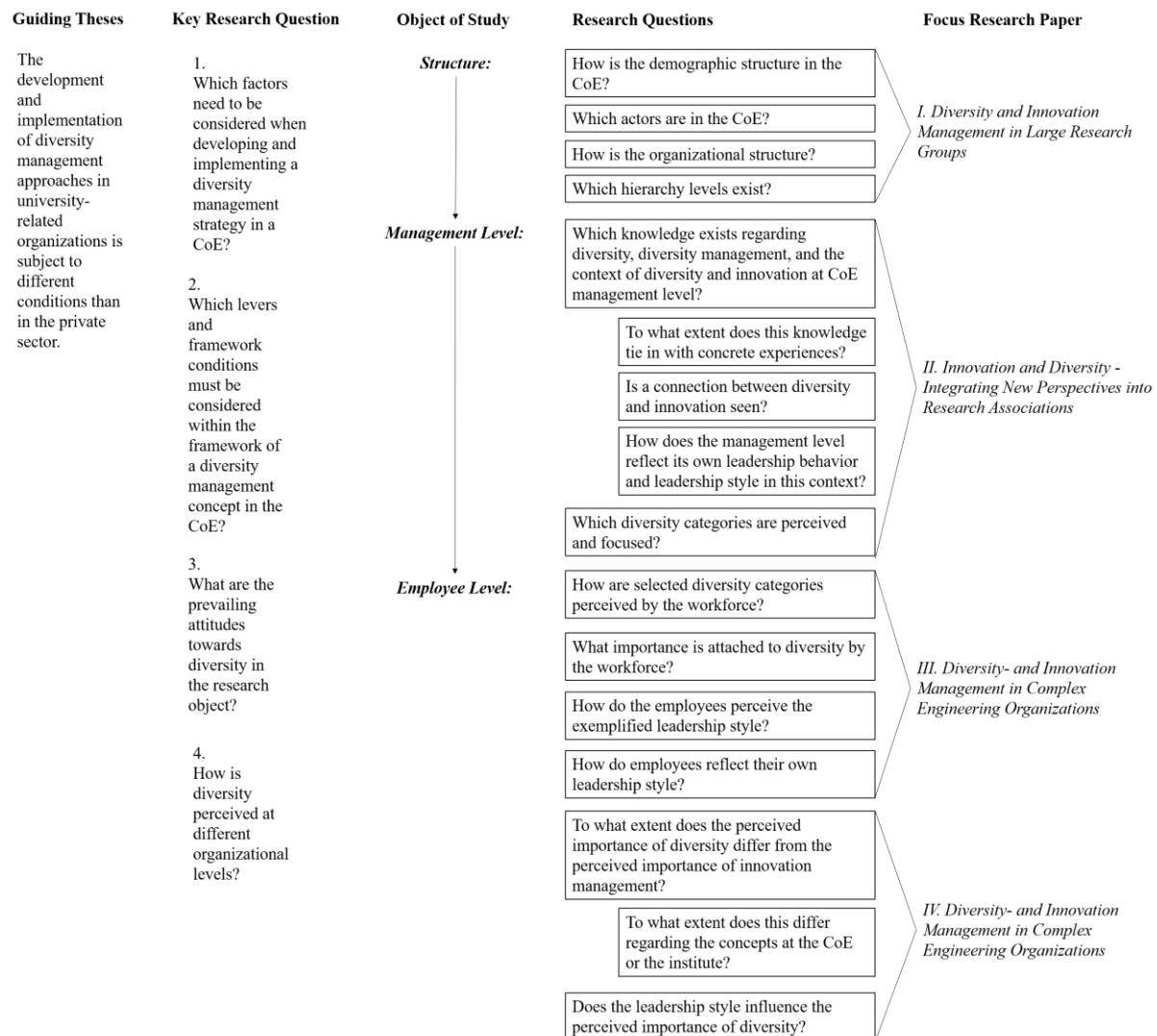


Figure 2.12: Detailed research questions

3 Research Field and Methodical Approach

Based on the status quo analysis and the derivation of the research concept and research questions, chapter 3 gives an overview of the research field and the applied methodical approaches. Chapter 3.1 deals with the research object and the environment that influences the development of a management concept. As phase I represents the investigation of the structural environment and processes, and phase II the investigation of the personnel structures, chapter 3.1 presents the results of phase I and II. Based on the analysis in chapter 3.1, in chapter 3.2 the data sets of phases II, III and IV are made transparent and the applied methods are described.

3.1 Phase I, II - Description and Classification of the Object of Investigation

The field of research is significantly influenced by the research object as the object of investigation. In order to develop a diversity management concept which reflects the organization-specific framework, it is crucial to reflect the organization with its structures and processes as well as the organizational environment. For this reason, the CoE will be described first, presenting its objectives, organizational structure as well as personnel structure (cf. chapter 3.1.1). Subsequently, the organization is embedded in the scientifically shaped educational sector in Germany (cf. chapter 3.1.2).

3.1.1 Phase I, II - Description of the Object of Investigation

The CoE *Integrative Production Technology for High-Wage Countries* (IPH) of the RWTH Aachen University represents the research object of the study described. Defined as large, competitive research and educational institutions, CoEs represent an important component of the German research landscape, as they collaborate on central scientific issues (Deutsche Forschungsgemeinschaft 2019b). Established in the frame of the so-called *Excellence Initiative* of the German federal and state governments, the DFG and the German Council of Science and

Humanities (Deutsche Forschungsgemeinschaft 2016), CoEs represent central public research organizations. The DFG defines CoEs as “[...] internationally visible, competitive research and training facilities, thereby enhancing scientific networking and cooperation among the participating institutions.” (Deutsche Forschungsgemeinschaft 2019a: n.p.).

Within the frame of a second funding phase (2012-2017), the CoE IPH has set itself the goal of continuously expanding key technologies, design and layout tools as well as description and explanation models, which were developed within the framework of the first funding phase (2006-2012), and to supplement them with ecological and social aspects with regard to a holistic production theory (ed. RWTH Aachen University 2011). Furthermore, the aim was to achieve a paradigm shift in research theory towards the penetration of production technology (ed. RWTH Aachen University 2011). The described objective of the corresponding CoE but also the objectives and the complex visions already indicate that the CoE as subject of research requires an organizational structure that reflects these requirements.

Phase I - Organizational Structure

The organizational structure of the CoE results from experiences gathered in the frame of national as well as international large research projects (ed. RWTH Aachen University 2011). The CoE management aims at a “[...] comprehensive scientific coordination of the whole CoE and the development of personnel, scientific and structural sustainability at RWTH Aachen University.” (ed. RWTH Aachen University 2011:29). To achieve these aims, a corresponding management structure was established.

Figure 3.1 illustrates the organizational structure with the different hierarchical levels as well as the cross-sectional tasks of the CSPs in which the described research project is located. In total, four research areas, the so-called *Integrative Cluster Domains* (ICDs), are united under the so-called *Aachen House of Integrative Production*. The three cross-sectional areas of the

CSPs affect all four core research areas. Thus, they have a cross-ICD function. Since the CSP contents are topics of the higher management and sustainable personnel and organizational developments are aimed as well as a support of the interdisciplinary cooperation process (ed. RWTH Aachen University 2011), a correspondingly close cooperation with the management is structurally anchored. In addition to the management consulting function, the CSPs represent a separate research area to enable a scientific view on the management issues mentioned above.

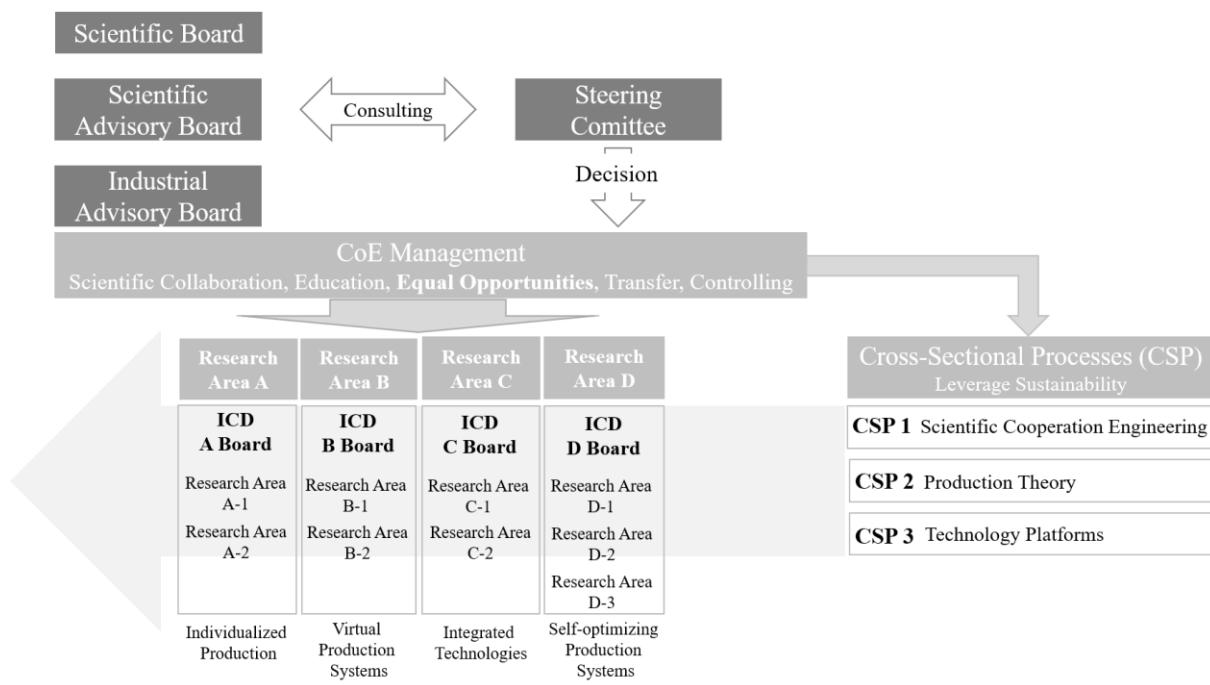


Figure 3.1: Organizational structure of the second funding phase (in accordance to ed. RWTH Aachen University 2011; Steuer-Dankert & Leicht-Scholten 2019)

In the following, the different hierarchical levels are described in accordance to Jooß (2014), which are at the same time the research subject of the different research steps of this work (figure 1.6). A total of five different hierarchical levels are distinguished. The *(i) research associates*, *(ii) project managers*, *(iii) department managers and senior engineers*, *(iv) CoE management/ executive board* and *(v) professors*. The first level of hierarchy is represented by the *research associates*. Coming from different research institutes, research associates are assigned to different projects in which they are operationally active. The group of *project leaders* consists of leading scientific staff and postdocs who lead the project teams.

Furthermore, the project leaders bundle research results, communicate the project results to other hierarchical levels and represent the project group in the project leader meetings. From an internal project perspective, they channel the information and instructions of other hierarchical levels. The third hierarchical level represents the *department managers and senior engineers*. *Senior engineers* represent a special level of research institutions in the field of engineering sciences. Analyzing job descriptions, senior engineers support the institute's management and take on management tasks. The position is filled by experienced scientific staff or post-docs. The *executive board* is responsible for the strategic and operative design of the CoE and the management of the scientific orientation. Consisting of a spokesperson and *Steering Committee* it has distinct possibilities for shaping the organization. It is supported by an CoE office which bundles processes, relieves the researchers of administrative tasks and, together with these, develops and implements new instruments for internal communication, (cross-disciplinary and cross-institutional) cooperation, financial planning, recruitment, further development of research platforms, promotion of young researchers, gender equality, career planning, internationalization, events, guest programs, monitoring, knowledge transfer and public relations are developed and implemented (Deutsche Forschungsgemeinschaft & Wissenschaftsrat 2015). The fifth level of the hierarchy is the *professorial level*. This level consists of the chair holders and institute directors who have scientific management functions.

Supervisory functions are implemented by three committees – the *Industrial Advisory Board* (IAB), the *Scientific Advisory Board* (SAB) and the already mentioned Steering Committee. The IAB and the SAB represent CoE external committees, consisting of experts from research and industry, that take an advisory function. The Steering Committee has an interims position. Its main task is to decide on necessary measures for all management fields of the CoE. For this reason, the Steering Committee is chaired by the CEO. Further members of the Steering

Committee are the ICD coordinators as well as two elected professors. The Steering Committee focuses on the supervision of the research strategy. (ed. RWTH Aachen University 2011)

Phase II - Personnel Structure

The research object is characterized by a strong connection to engineering topics with a focus on production technology. Brecher, Karman and Kozielski (2012) summarize the motivation of the CoE as: “More than ever, German companies have to compete in an environment of increasing global competition. [...] It therefore has to be the concern of high-wage countries to evaluate and define the conditions under which domestic business can successfully develop and produce [...].” (Brecher, Karman & Kozielski 2012:1). Building on this mission, a focus on business and mechanical engineering topics can be identified which has an influence on the organizational culture. This is also mirrored in the personnel structure (figure 3.2).

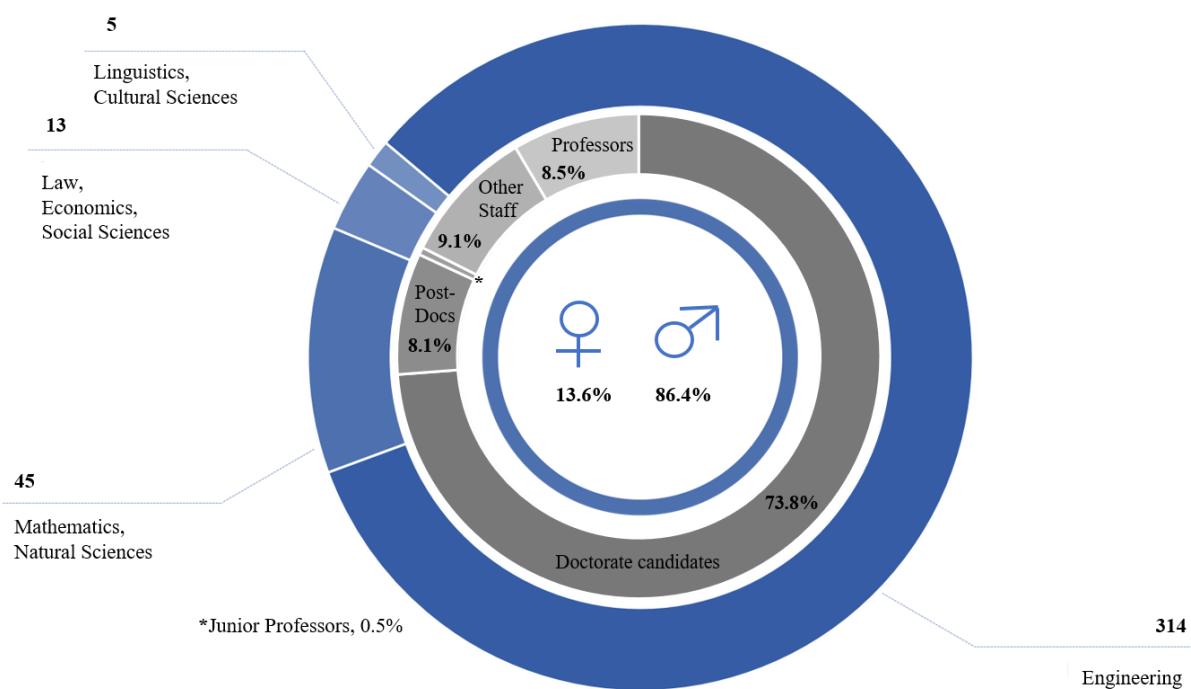


Figure 3.2: Personnel structure of the CoE "Integrative Production Technology for High-Wage Countries"

The personnel structure is surveyed centrally every year using a questionnaire provided by the DFG. Analyzing the data collected with the annual employee survey (data set 1), a high number of employees are located at research institutes related to the engineering faculty (82.4%). At

the time of the investigation, 11.8% of the employees were located at the faculty for natural sciences and mathematics, 3.4% at the faculty for economics and 1.3% at the faculty for linguistic and cultural sciences. 1.1% gave no indication concerning the professional background. Considering the demographic data of the CoE employees, 86.4% classified themselves as male and 13.6% as female. Regarding internationality, 9.7% of the surveyed indicated a non-German-background. Regarding the status group, 73.8% of researchers working in the network are doctorate candidates, 8.1% post-doctorates, 0.5% junior professors, and 8.5% professors. At the time where the surveys were conducted, the CoE had approximately 381 members. Due to fluctuations, the number of employees may differ from the number at the time of the survey.

The personnel structure of the CoE seems to be representative for the technical field, both at national and international level. Reports like the NSF report *Women, Minorities, and Persons with Disabilities in Science and Engineering* (National Science Foundation 2019) in the USA and the *Gender Report 2019* in Germany (Kortendiek *et al.* 2019), indicate the prevalence of minorities in the engineering field especially with regard to gender.

The analysis indicates that there is a need to address these diversity categories and to investigate the imbalance of proportion. Consequently, in accordance to the AGG, the diversity categories gender and origin/culture as well as organizational dimensions like different status groups and specialist background are recorded within the framework of the research approach. This is applied with target group-specific research approaches in phase III, the survey of demographic data and evaluation schemata that put these diversity categories in the focus.

3.1.2 Phase I - Embedding the CoE in the Scientific Environment

The CoE IPH was located at RWTH Aachen University in Germany until 2019 (ed. Brecher 2012). It was established in the frame of the German Excellence Initiative of the German federal

and state governments, the DFG and German Council of Science and Humanities (Deutsche Forschungsgemeinschaft 2016). The foundation of CoEs as big interdisciplinary research associations intends the development and creation of “[...] internationally visible, competitive research and training facilities, thereby enhancing scientific networking and cooperation among the participating institutions. CoEs should form an important part of a university's strategic and thematic planning, significantly raise its profile and reflect its considered long-term priorities. They should also create an excellent training environment for early career researchers. In conjunction with the other two funding lines, i.e. graduate schools and institutional strategies to promote top-level research, clusters of excellence will help to increase Germany's attraction as a research location in the long term and improve its international competitiveness.” (Deutsche Forschungsgemeinschaft 2019a: n.p.). In the second funding phase (2012-2019), 45 graduate schools, 43 CoEs and 11 institutional strategies were funded, which were located at a total of 44 universities (Deutsche Forschungsgemeinschaft 2013). In the process of the third excellence initiative, the CoE was realigned and is now called Internet of Production (IoP) (RWTH Aachen University n.d.).

By dispensing with structural specifications, the DFG and the WR have granted a wide range of options regarding the form of organization (Deutsche Forschungsgemeinschaft & Wissenschaftsrat 2015). Both, DFG and the WR (2015), consider a well-functioning internal organization as an important factor for the performance of such large research networks. Following the intention for the establishment of CoEs, research-friendly structures are to be created, that promote intensive, interdisciplinary and cross-faculty cooperation both within the university and with the private sector. Consequently, organizational structures are required that reflect the university's environment, German public science system framework as well as science sector practices and fulfill the requirements mentioned above.

At RWTH Aachen University, the CoE is managed as a scientific institution and linked to a formal status as a central institution of the university with direct subordination to the rectorate.

In accordance with state legislation, the CoE is tied to the university's basic order and other higher education-specific regulations. Consequently, different factors and framework conditions have a direct influence on the CoE as organization and its members. As those influencing factors have an impact on the employees, leadership, hierarchies and structures, they represent a central element in the development of an organization-specific diversity management approach that is accompanied by a change management process (cf. chapter 2.4).

As already indicated in the context with the process perspective on diversity management (cf. chapter 2.3.1), phase I of the developed research concept aims at the investigation of external and internal influencing factors by analyzing prevailing structures and the institutional environment. Following, the CoEs structure is analyzed using the perspective on the internal and the external level.

In general, it can be stated that external and internal factors shape an organizations' complexity.

Potgieter, April and Bishop (2005), Scheinpflug and Stolzenberg (2017) as well as Hartung (2014), associate an organization's complexity with *external factors* like the network of markets and people (Hartung 2014), an increasingly volatile, dynamic, interconnected and ambiguous entrepreneurial environment (eds. Scheinpflug & Stolzenberg 2017) as well as uncertainties and changing customer profiles (Potgieter *et al.* 2005). Regarding the *internal factors*, Op't Land and Dietz (2012) mention the increase of complex transformations in companies (e.g. mergers, splits, sharing), whereas Seiter (2006) focuses on the forms of cooperation (e.g. company networks). Rieble (2014) emphasizes the volatile organizational units and decision-making authorities, whereas Hirsch-Kreinsen (1995) regards the processes of internal decentralization. Canitz (2013) considers the reasons for organizational complexity on the structural macro and the micro level. Regarding the *macro level*, complexity is determined by

factors like the organizational structure, the degree of decentralization, and the number of company locations. The *micro level* is characterized by the complexity of individual business processes.

Transferred to the CoE as a research objective which is located in the higher education sector, an *external factor* represents the legal framework that influences the employment relationship between CoE members and the CoE organization. The employment contract partner is the university or research organizations like the Fraunhofer-Gesellschaft and not the CoE as an organization. As the research associates and thus, the majority of scientific staff, strive for the doctoral degree, they are linked to the so-called Wissenschaftszeitvertragsgesetz (WissZeitVG) in the majority of cases (Bundesministerium für Bildung und Forschung n.d.c). Since 2007, the framework conditions of the Wissenschaftszeitvertragsgesetz (Law on Temporary Employment Contracts for Academics) provide the basis for fixed-term contracts for academic staff at state-owned universities and research institutions, as these academic positions (research associate and post-doc) represent opportunities for further qualification (Bundesministerium für Bildung und Forschung n.d.c). This results in a continuous fluctuation of employees at the CoE. Furthermore, the contractually regulated further qualification of scientists is accompanied by different obligations. In addition to research projects, scientific work includes teaching duties, the writing of proposals, publications and presence in the respective research community. In many cases, these tasks arise independently of the respective project affiliation. With regard to accountability, project results and progress in the individual projects must be reported to the respective funding institution. This need results in interaction with non-university institutions such as ministries and research societies that follows certain procedures. In summary, the CoE as an organization is strongly influenced by the scientific environment and the general conditions of the German system of Higher Education.

From an *internal perspective*, especially the authorities to issue directives need to be considered. Although the employment contract is concluded between the university and the employee, job interviews take place decentral in the research institutes. The employees' workplaces are located in the research institutes, so that the institute management is directly authorized to issue instructions and provides scientific guidance. From an internal perspective, this means that the primary working environment of the scientific staff is the research institute and its recruitment processes, organizational culture, hierarchy structure, work processes and management culture, which have a decisive influence on the working environment. Although the CoE, thus, has a physical center, its employees are distributed decentral. This results in the challenge of a common organizational culture, especially with regard to a diversity management. Added to this are subject-specific cultures that can be contrary due to the interdisciplinary nature. This means that, in comparison with companies that have a corporate culture and a superior common goal, these research groups consist of members who have heterogeneous specialist cultures, have been socialized in different organizations and represent the individual interests of the respective units.

Following Jones and Lichtenstein (2008), a high degree of complexity results from the heterogeneity of the participating organizations and actors in the sense of a meeting of different goals, areas of responsibility, levels of experience and hierarchy. In summary, scientific CoEs are to be understood as systems whose interdisciplinary actors aim to generate new knowledge in a spatially concentrated network and are thus characterized by high complexity and dynamics (Welter 2013). As a consequence, the research object can be described as a special form of coordination of interorganizational networks (Jooß 2014).

The described internal and external factors show the complexity of the CoE as an organization. This is accompanied by challenges resulting from these structural conditions and differing organizational cultures, which, especially against the background of the implementation of a

diversity management strategy, must be reflected within the framework of the research approach. In the following, the methodological approach will, therefore, be discussed against the background of the described hierarchical levels as well as personnel and organizational structures.

3.2 Phase II, III, IV - Survey and Analysis Methodology

Following Lewin's (1947a, 2009) quasi stationary equilibrium (cf. chapter 2.4), a “[...] study of the conditions for change begins appropriately with an analysis of the conditions for ‘no change’, that is, for the state of equilibrium.” (Lewin 2009:74). Transferred to the identified research needs (cf. chapter 2.6), approaches are necessary that focus on the individual in the organization (cf. chapter 2.1), in order to be able to grasp the attitudes and perceptions on diversity and diversity management as well as the prevailing organizational culture. In doing so, a differentiation between leadership level and employees allows to understand the perception on different hierarchical levels and the investigation of the impact of the leadership level on the organizational culture as well as the application of management strategies. Consequently, both levels are considered separately and divided in phase III and IV.

The selection of the empirical approach is directly related to the goal of the research (Bortz & Döring 2007). To capture the different perspectives and interpretations that influence the development of a diversity management approach, the underlying research design of this thesis is based on a mixed-methods approach (figure 3.3). Mixed-method approaches use qualitative as well as quantitative gained perspectives, analysis techniques and data collection in a single study in order to get a more comprehensive perspective on the research problem (Creswell 2014) and to “[...] [draw] from the strengths and minimiz[e] the weaknesses of both methods in a single research study [...].” (Opoku & Ahmed 2013:136). The presented research project follows a *convergent parallel mixed method approach* with elements from an *explanatory*

sequential mixed-method approach, as a quantitative analysis of employee data (data set 1) was used as basis for the following studies on management level (data set 2) and employee level (data set 3). Based on the analysis of data set 1, the identification of organization-specific circumstances and target groups was possible, which corresponds to the *explanatory sequential mixed-method approach*. The *convergent parallel mixed-method approach* is characterized by the merging of quantitative and qualitative data and gaining both forms of data roughly at the same time (Creswell 2014). Furthermore, the approach is characterized by applying open- and closed-ended questions, gaining multiple forms of data, the application of statistical and text analysis and the interpretation across all databases (Creswell 2014).

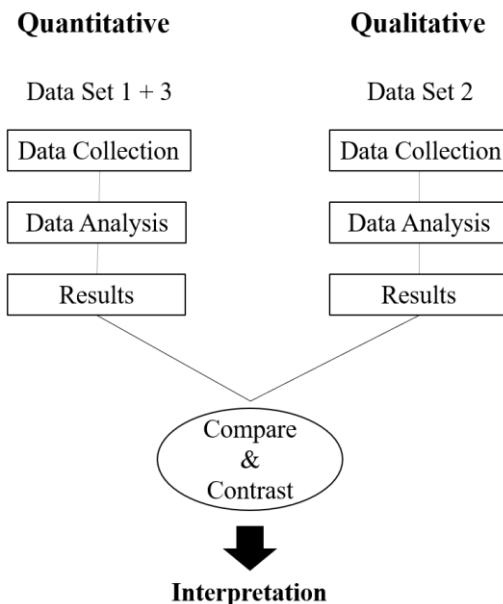


Figure 3.3: Mixed-method research design approach (in accordance to Creswell 2014)

In doing so, the research concept follows a system-theoretical approach (Aretz & Hansen 2002, 2003b, 2003a; Leicht-Scholten & Wolffram 2010b), that tries to holistically reflect the organization-specific influencing factors on a diversity management strategy and strives for adapting a concept to prevailing framework conditions (cf. chapter 2.6).

The following levels were surveyed during the multi-methodological data collection process (figure 3.4):

Data set 1: Phase II - Quantitative data analysis of the DFG data survey form (n=381)

Data set 2: Phase III - Semi-structured qualitative guideline interview with the management level (n = 25)

Data set 3: Phase IV - Partially standardized quantitative employee survey (n = 69)

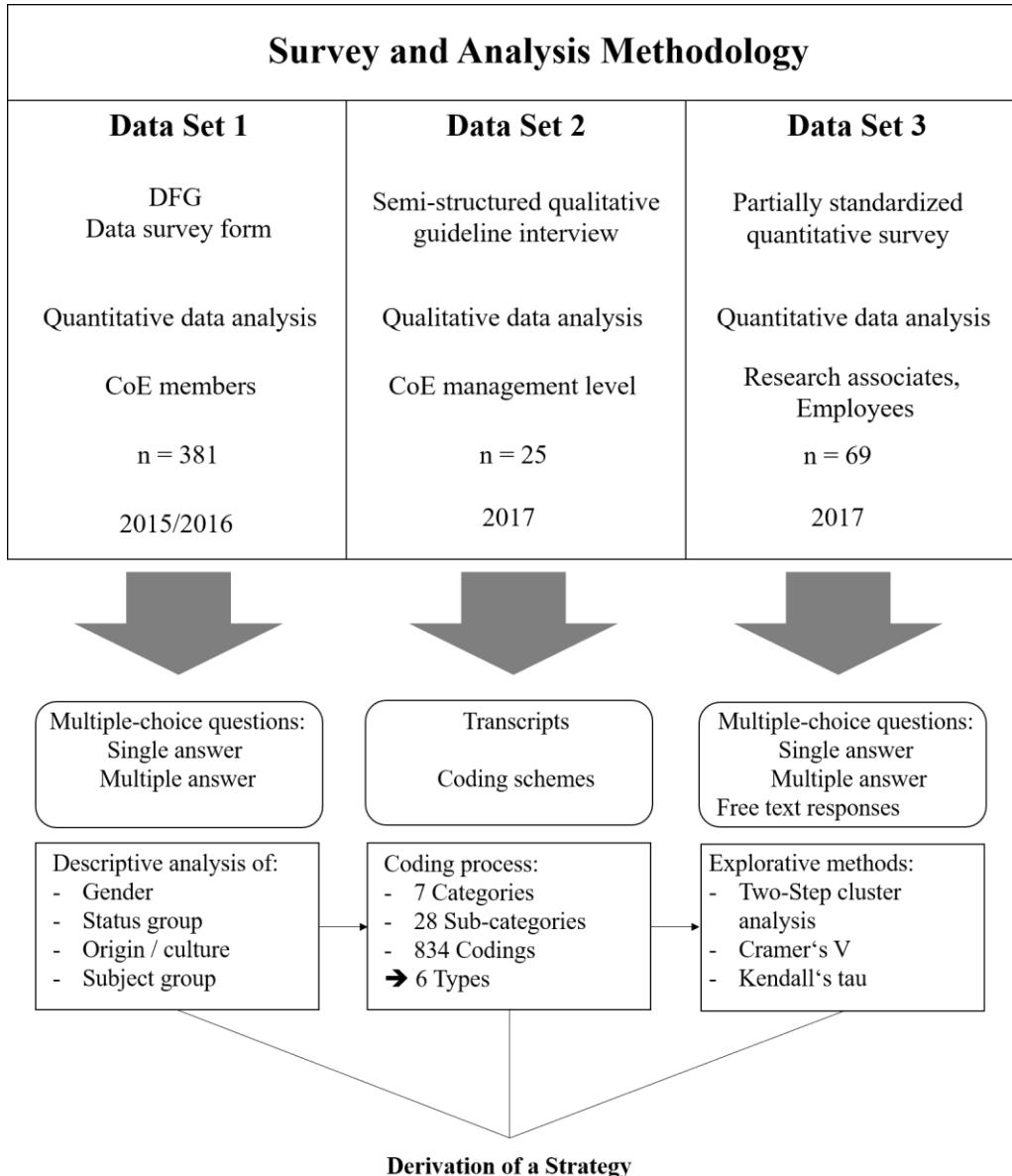


Figure 3.4: Survey and analysis methodology

The triangulation of different types of data allows a more diverse perspective on the object of research, which results in the possibility to increase the generalizability (Creswell 2014; Seeger 2014). Within the framework of the research approach, explorative and hypothesis testing research methods were combined. The explorative character is particularly present in the first

research phase, as insights were to be gained into a not yet well researched research field and open questions were asked in order to develop a theory. In the second phase, the basic goal was hypothesis testing research. With the help of the interviews and own theories based on the literature, the interrelations were analyzed.

3.2.1 Data Set 1: Phase II

Quantitative Analysis of the DFG Data Survey Form (n = 381)

Every year, the CoE is requested by the DFG to report the demographic data of the CoE's employees. Therefore, data set 1 can be characterized as a secondary analysis (ed. Goodwin 2012). In order to fill out the standardized questionnaire, the research institutes are usually asked by the CoE management to make transparent who is working on the project and is, thus, financed. The subject of the survey is in accordance to Gardenswartz and Rowe (1998):

- Status group
- Gender
- Date of birth
- Nationality
- Subject group
- Specialization

The analysis of these demographic data allows to understand the organization's personnel structure. In addition, it allows conclusion on the prevailing diversity and hierarchical levels. The design of the questionnaire also makes clear which diversity categories are focused by the DFG. Basing on this focus, the described research project emphasizes on the diversity categories gender, status group, discipline and culture. The diversity category age cannot be validly evaluated in the context of the first data set, as the data were not stringently specified in the frame of the questionnaire.

The evaluation of the survey was carried out applying IBMs SPSS Statistics software. The descriptive analyze tools, especially (stratified) cross-tabulations, were focused. Although cross-tabulations usually have a hypothesis-testing character, namely, to check whether the distribution of characteristic values of specified characteristics is random or over-random, cross-tabulations were also used exploratively in the context of data analysis to find further focal points for subsequent analyzes. In the process, combinations of characteristics were also looked at where no connection was suspected. In addition, multiple answer sets were focused, for example, the perception of diversity in the workplace and gender differences among respondents. In this context, the approach can be described as hypothesis testing, since the correlations were implied, such as: Do men and women perceive diversity differently?

As the explanation of the personnel structure shows, the CoE is characterized by being strongly male dominated (86.4%) and shaped by an engineering habitus (82.4%). For further information, see chapter 3.1. It should be added that the collection and publication of the data is time-delayed, so that the data from 2016 represented the analysis basis at the beginning of the research project.

3.2.2 Data Set 2: Phase III

Semi-structured Qualitative Guideline Interview (n = 25)

A qualitative approach was selected for the survey of the management level (data set 2, phase III), since the answers to the research questions have an exploratory character, the social framework is almost unexplored and only vague assumptions about the social structures exist (Diekmann 2007). Methods of qualitative social research are characterized by dealing with a high complexity, depth of meaning and a need for interpretation of transcript material (Mayring 2015). Following Mayring (2015) and Kuckartz *et al.* (2008), techniques are needed which are systematic and intersubjectively verifiable. Thus, the conducted research approach follows

Mayring's (2015) structuring (qualitative) content analysis. The description of the process is realized in accordance to Kuckartz *et al.* (2008).

Kuckartz *et al.* (2008) define seven phases of qualitative evaluation, which were applied in the frame of the second data survey: *(i) definition of the object of evaluation and evaluation goal, (ii) developing interview guidelines, (iii) conducting interviews, recording, transcripts, (iv) exploring data, (v) creating category systems and encoding interviews, (vi) evaluation on the basis of categories and compilation of evaluation reports, (vii) drawing conclusions.*

Following, the phases of qualitative evaluation (Kuckartz *et al.* 2008) are applied on the data set 2 and described in more detail.

- i. In the frame of the second data survey, the aim was to get a comprehensive perspective on the attitudes, perceptions and knowledge regarding diversity and diversity management as well as on the relation between diversity and innovation, from the perspective of CoE members with leadership skills and authority. Consequently, the identified target group were the CoE management level, professors, junior professors, supervisors and group leaders. Target persons coming from these status groups are characterized by human resource responsibilities and a decisive role in research recruitment processes in the respective research institute. The analysis of data set 1 allowed the identification of 35 persons (29 professors, two junior professors, four group leaders/ senior engineers/ managers). 17.1% of the target group are female researchers.

- ii. In reference to the identified research need (cf. chapter 2.6) and the theses derived from literature (cf. chapter 2), an explorative research approach was taken. In accordance to Mayring (2015), an interview guideline was developed with categories, including explorative question types. To ensure the investigation of all topics identified, primary and secondary questions were developed to guide the interview. The type of questions

was open, with few closed questions, which allowed a moderate flexibility in the interview. In doing so, interviewees had the chance to discuss their own answers and to capture subjective perceptions in relation to a specific stimulus. Thus, the guideline can be characterized as a semi-structured one, having a medium degree of standardization, which allows a medium scope of action for the interviewer, but a large scope of development for the interviewee. The categories of the guideline were developed deductively following the concepts and insights gained in the frame of the literature analyses (cf. chapter 2) (Mayring 2015). Based on the theoretical analysis and the deductive approach six survey topics were identified:

- a. Presentation of the person, position / function and specialist background
- b. Definitions of diversity, innovation, diversity management, innovation management
- c. Perception of diversity- and innovation management structures
- d. Experiences with diversity
- e. Perception of the individual leadership style and hierarchy
- f. Vision

Through the partial structuring, qualitative statements as well as descriptive data were generated.

- iii. The target group was invited to the study by the project supervising professors of the project. The first invitation was sent as an official letter. The second recruiting phase was conducted by the research associate via phone calls and E-Mail. The participation was voluntary. All interviews were conducted by one person in a duration of 15 minutes to two hours, with the average being one hour. The interviews were recorded. Consent to the recording was obtained in advance by means of an information sheet. The response rate laid at 71.4%. A total of 25 people, coming from 23 institutions took part

in the survey. Considering the demographics of participants (n=25), the distribution among the identified status groups is as follows: 19 professors, two junior professors and four group leaders/ senior engineers/ managers participated. Women's quota laid at 24% as all contacted women participated.

- iv. After each interview, a sequence of reflections was recorded by the research associate to capture the mood, the specifics and framework of the interview.
- v. For the evaluation of the conducted interviews, a qualitative structured (qualitative) content analysis according to Mayring (2015) was applied. This enables a systematic and rule-guided approach. In the context of this work, this is realized by a deductive category definition, which is based on the results of the theoretical analysis in chapter 2, as well as the research questions (cf. chapter 2.6) reflected in the interview guideline. In a next step, based on the interviews, supplemented categories were derived inductively (Mayring 2015). As the abstraction level was aligned to the above-mentioned topics, categories were first listed in order of their occurrence in the evaluation units. In the course of a second analysis of the transcribed interviews, prototypical passages were identified, that allowed to supplement the deductive derived categories. All categories were specified with sub-codes. The interviews were coded using a coding guideline handbook, which was developed for the research project. Sample codings were made to ensure intercoder reliability (Mayring 2015). A total of seven categories were developed in a first category system, with 22 sub-codes. The coding was realized using the analysis software MAXQDA. In the course of the coding, 28 sub-categories with a total of 834 codings were identified.

- vi. In a next step, quotations were paraphrased and generalized to ensure an independent and neutral conclusion of comparable statements. Furthermore, this process allowed the development of specific sub-types and the combination of different sub-types to superordinate types that represent specific mindsets and perceptions. Considering the research question, specific sub-codes (SC) were selected and focused in the frame of the analysis (SC 2.3: Definition diversity, SC 3.1: Definition diversity management, SC 3.2: Integration of diversity management SC 3.3: Definition of innovation management, SC 4.3: Need to manage diversity, SC 5.1: Description individual leadership style, SC 5.2: Importance of hierarchy, SC 3.4: Context diversity and innovation, SC 5.3: Context leadership style and innovation). Based on the (qualitative) structured content analysis after Mayring (2015), Kluges type-identification method (1999, 2000) served as methodical basis for identifying types derived from the developed categories. In accordance to Kluge (1999, 2000) the analysis approach focused on the identification of extremes, interests as well as empirical frequency. In order to visualize the statements, a color code was developed indicating a certain defined answer category for each sub-code (figure 3.5). In a next step, an interdisciplinary analysis based on a first typing system was carried out. This procedure based on the assumption of the prevalence of extreme manifestations regarding the perception and appreciation of diversity. As a result, a clustering could be realized indicating six types.

- vii. Based on the six types, conclusions can be drawn, giving an overview over already implemented diversity management strategies and prevailing mindsets on leadership level. At the same time, the different types indicate the need to develop a diversity management strategy for a CoE that takes the diversity of mindsets and attitudes up and connects them with a structural change.

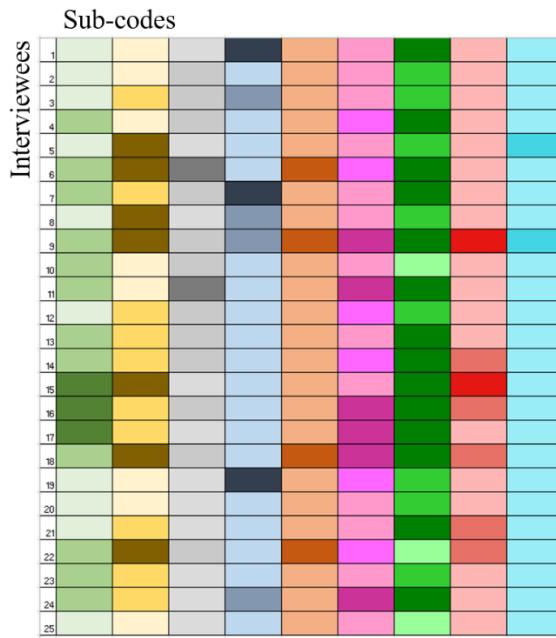


Figure 3.5: Coding system in step (v)

Mayring (2016) summarizes six general quality criteria for qualitative research: (i) *procedure documentation*, (ii) *argumentative interpretation support*, (iii) *communicative validation*, (iv) *rule-guided*, (v) *triangulation* and (vi) *proximity to the object*. The *process documentation* is guaranteed by the description of the methods and examination steps used. The *argumentative interpretation* is secured by the abstraction of the statements within the framework of paraphrasing and the assignment of a categorical evaluation system. The *communicative validation* serves to ensure the stability of the statements or results. This is done by critically reflecting on the results in internal workshops. Furthermore, the code book and the procedure after the structured content analysis enabled a *rule-guided* and systematic approach. As member of the CoE, integrated in processes and structures the *proximity to the object* was ensured by tying the survey questions to the CoE.

Like Mayring (2016), Seeger (2014) states that triangulation of different data sources enables a multi-perspective view of the researched object. For this reason, the qualitative survey was supplemented by a quantitative survey of the status group of employees with a focus on the research associates.

3.2.3 Data Set 3: Phase IV

Partially Standardized Quantitative Employee Survey (n = 69)

The analysis of the employee survey resulted in a target group of 149 (N) employees. The survey was provided in English and German, and individually sent via the survey software Qualtrics. The aim of the survey is to obtain a perception and assessment of the topic complex of diversity/ diversity management from an employee perspective. The survey, thus, represents the counterpart of the survey of the management level (data set 2, phase III). The perception of diversity, mirrored by the real existing diversity in the organizations, should become transparent and provide information regarding the organizational culture. Based on this, it is then possible to develop an organization-specific diversity management concept.

69 (n) employees took part in the survey (response rate 46.3%). It should be emphasized that the aim of the study is to research the CoE as a specific research institution and that the research results must, therefore, be representative for this institution only. Thus, no claim is made to be representative for other organizations. Furthermore, it must be added that 149 is only an estimate of the actual population of the survey. After sending out the invitation to participate, a total of three responses were received that the employee is no longer active in the CoE and indicating the high fluctuation and the time-delay between the collection of employee data.

A six-tiered Likert scale was realized in the frame of the survey. The Likert scale was selected because it is an appropriate instrument for measuring attitudes, as it assesses attitudes by giving a set of statements and asking respondents to indicate their attitude from 'strongly agree' to 'strongly disagree' (Ary *et al.* 2010). In this context, *attitude* is reflected in the sense of Albers *et al.* (2009) as the emotional, mental and action disposition towards an environmental aspect. The environmental aspect is seen in the diversity prevailing in the CoE and the research institutes. To get an impression of the perception and attitudes, statements (items) which are evaluated by the test persons are set in a continuum from *extremely positive* to *extremely*

negative (Stier 2013). The applied Likert scale is ordinally scaled. This results from the assumption that interviewees consider the intervals between the answers as equal (Völkl & Korb 2017). For being able to use all statistical operations for data analysis, Likert scales are often referred as quasi-metric and treated like an interval scale (Urban & Mayerl 2011). Following Urban and Mayerl (2011), a prerequisite for a quasi-metric interpretation is seen in two factors – the creation of variables with at least five expressions and a semantically interpretation of distances between the answers with a numerical value assignment that can be classified as equal (Urban & Mayerl 2011). For this reason, the response specifications are graded, but can be divided dichotomously. Building on the state of research (cf. chapter 2), four categories were identified that allow the investigation of mindsets and influencing factors:

- a. Sociographic information (categories in accordance to Gardenswartz & Rowe 1998)
- b. Innovation factors
- c. Management structures
- d. Leadership style and hierarchy

In total, 27 questions and 135 sub-questions were developed for the survey. Regarding the demographic data, participants classified themselves as either female (8.7%) or male (91.3%). The average age of the interviewees was 32.58 years, with an indicated minimum of 26 and a maximum of 64 years. Considering the origin, 13.24% came from a non-European, non-German-speaking country, 1.47% from a European, non-German-speaking country, and 85.29% from a German speaking country. Within the framework of assignment to a specialist background, multiple answers as well as giving information in free text were possible. The selection options were designed in accordance with the employee survey of the DFG (compare data set 1). 52 surveyed associated themselves with the engineering sciences. 13 indicated an affiliation to the natural sciences/ mathematics/ informatics, three stated an affiliation to the humanities. One time the affiliation to the social sciences was mentioned and two times the economic sciences. One-time others were given. Considering the educational background with

regard to the educational institution, 76.81% of the respondents completed their studies at the RWTH Aachen University and 23.19% at a different university. No detailed information was provided in this respect. The opportunity for free text information, with the possibility to add missing indicators, was only used in one case, mentioning an interdisciplinary course of study.

The quantitative data were analyzed applying Two-Step cluster analysis, rank correlation and contingency correlation. Considering the scale, rank correlations (ordinal scaled data) and contingency correlations (nominal scaled data) were used for the preliminary analysis of highly correlating variables. Highly correlating variables affect the significance of the cluster analysis. For this reason, Kendall's tau-b and Cramer's V are applied on highly correlating variables, whereas less correlating variables were analyzed using the Two-Step cluster analysis.

The multiple response sets Cramer's V and Kendall's Tau were used to examine employees' perceptions. Considering the multiple answer set, dichotomies (consent and rejection) were built. The dichotomization allows the combination of variables into a multiple answer set, whereby the agreement (= perceived diversity in a feature category) is recorded as a counted value. The application of this approach allows a direct comparison of the individual answer options. Considering Cramer's V, the calculation bases on the chi-square statistic (David & Sutton 2004), and is applicable at any table size (Warner 2013). The contingency coefficient provides information in respect to the strength of correlations (Arndt, Turvey & Andreasen 1999). In addition, a rank correlation coefficient analysis was conducted. Rank correlations are used to describe the systematic derivation of two ranks from each other (Arndt *et al.* 1999). For this purpose, the respective ranks of the ordinally scaled data are used instead of the interval-scaled measured values. As a rank correlation coefficient, Kendall's tau was used in the presented study because of its insensitivity to associate ranks. In a next step, a Two-Step cluster analysis, as exploratory procedure, was conducted, in order to reveal patterns and structures in the data.

4 Research Papers

Chapter 4 presents the research papers published or submitted over the course of the project.

4.1 Overview of the Research Papers

In the frame of this thesis, the perception of diversity, diversity management the interrelation between diversity and innovation, and the relation to prevailing leadership philosophies were investigated and the organizational culture of a CoE in Germany derived. Based on this, the findings were combined with the change management approach to develop a sustainable and holistic diversity management approach for the CoE as a research object. To achieve this, a research design was developed (figure 1.6), that aims at integrating the different employee level perspectives, supports the investigation of prevailing concepts and attitudes regarding the complex of topics and follows a system-theoretic approach. As outlined in chapter 3.2, the mixed-methods approach represents the appropriate instrument for ensuring the integration of different perspectives into the research project, and to address the research questions developed.

As identified in the frame of the state of research analysis in chapter 2, the following overarching research questions are focused in this thesis (figure 2.12):

- *Which factors need to be considered when implementing a diversity management strategy in a CoE?*
- *Which levers and framework conditions must be considered within the framework of a diversity management concept at a CoE?*
- *What are the prevailing attitudes towards diversity?*
- *How is diversity perceived at different organizational levels?*

In accordance to the research questions, the research papers address the issues at different hierarchical levels. The first research paper *Diversity and Innovation Management in Large Research Groups* presents the research concept basing on literature review and environmental

analysis. The results of research steps I and II (data set 1) are presented as a basis for the organization-specific approach, that reflects the scientific engineering environment. The second paper *Innovation and Diversity - Integrating New Perspectives into Research Associations* focuses on the results gained in research phase III (data set 2), presenting the prevailing attitudes and perceptions on management level. As counterpart, the third and the fourth paper focus on the prevailing mindsets and attitudes on employee level (phase IV, data set 3). The papers are structured consecutively. While the third paper *Diversity- and Innovation Management in Complex Engineering Organizations* establishes hypothesis-related relations between the diversity categories, the fourth paper *Organizational Culture as Key for Implementing Diversity Management Approaches in Complex Organizations* presents an explorative approach in applying a Two-Step cluster analysis.

Table 4.1: Overview research papers

No	Titel	Research Phases	Data Sets	Research Focus	Applied Research Methods	Type
I	<i>Diversity and Innovation Management in Large Research Groups</i>	I + II + III	Data Set 1 Data Set 2	Derivation of the research plan Development of an organization-specific model of influencing factors	- Literature review - Quantitative survey form CoE workforce - Semi-structured qualitative guideline interview on management level	Conceptual Empirical
II	<i>Innovation and Diversity - Integrating New Perspectives into Research Associations</i>	I + II + III	Data Set 1 Data Set 2	Perception & Mindsets - Diversity - Diversity Management - Diversity & Innovation - Leadership style - Hierarchy → Management level	- Literature review - Quantitative survey form CoE workforce - Semi-structured qualitative guideline interview on management level	Empirical
III	<i>Diversity- and Innovation Management in Complex Engineering Organizations</i>	I + II + IV	Data Set 1 Data Set 3	Perception & Mindsets - Diversity - Diversity Management - Diversity & Innovation - Leadership style - Hierarchy → Employee level	- Literature review - Quantitative survey form CoE workforce - Partially standardized quantitative employee survey on employee level	Empirical
IV	<i>Organizational Culture as Key for Implementing Diversity Management Approaches in Complex Organizations</i>	I + II + IV	Data Set 1 Data Set 3	Further analysis of perception and mindsets on employee level	- Literature review - Quantitative survey form CoE workforce - Partially standardized quantitative employee survey on employee level	Empirical

4.2 Summaries of the Research Papers

Chapter 4.2 provides an overview and summary over the research papers, published and/or submitted in the course of the presented research project.

4.2.1 Research Paper I

Diversity and Innovation Management in Large Research Groups

Research has shown evidence on the positive impact of selected diversity categories in different entrepreneurial contexts (Østergaard *et al.* 2011; Hewlett *et al.* 2013; Hoogendoorn *et al.* 2013; McKinsey 2015). Despite the potential of a diverse workforce, studies also suggest the necessity for diversity management strategies that are tailored to the organization's needs (Aretz and Hansen 2003). However, concepts that reflect the external as well as internal influencing factors especially of large research associations are virtually non-existent.

Taking the different definitions of diversity into account, the authors conducted a literature review on the potential as well as the challenging aspects of workforce diversity. The analysis of the studies shows that a diverse workforce brings benefits such as the reflection of different customer needs and solving cognitively complex tasks (Hoffmann 1958), greater creativity (Triandis, Hall & Ewen 1965), increased productivity (Santandreu Calonge & Safiullin 2015) and team performance (Pitt-Catsouphes, Mirvis & Berzin 2013), to mention just a few examples. However, studies also show that diversity poses a potpourri of challenges, too. For example, the more diverse a team, the greater the need for coordinating the potential for conflict and the resulting negative effects (Pelled *et al.* 1999; Basset-Jones 2005; Díaz-García *et al.* 2013; Ribberstrom 2013). The authors conclude, that, both the positive effects and the challenges of diversity, demonstrate the need for an active management of diversity.

A research concept was developed which supports the analysis of the target organization in order to create an organization-specific diversity management strategy. In doing so, the authors

combine Klaffke's (2009) *3-S-Diversity Model* with Aretz and Hansen's (2003b) *Modell zur Systemstruktur von Organisationen (System Structure of Organizations Model)*. Klaffke's (2009) *3-S-Diversity Model* focuses on the three elements skills, structure and strategy and places them in relation to the organization's diversity culture. Aretz and Hansen's (2003b) System Structure of Organizations Model considers organizations as systems with different sub-systems. In doing so, Aretz and Hansen (2003b) define the *internal and external organizational environment* and divide them into an *instrumental* and a *consumeral perspective*. Basing on the findings from the analysis, the authors develop a six-step research plan that aims at developing a sustainable and holistic diversity management strategy for the CoE and follows a system-theoretical approach (Aretz & Hansen 2003a, 2003b). In the following course of the paper, the six steps are explained in more detail.

Phase I focuses on the analysis of the organizational structure and environment. Combined with Klaffke's (2009) 3-S-Diversity Model, the authors apply Artez and Hansen's (2003b) model as an analysis tool for the CoE as organization. To achieve this, the authors adapt the analyzed models to the CoE-specific environment and develop a CoE-specific model. The CoE-specific categories include, (i) cluster-external patterns and frameworks, (ii) organization-external patterns and frameworks, and (iii) system-external patterns and frameworks. Following, the three categories are defined and further discussed.

Phase II puts emphasize on the descriptive analysis of the CoE workforce based on data set 1. In this publication, the personnel structure of the CoE is made transparent on the basis of demographic data. Regarding phase III, the research concept of a qualitative investigation of the management level is introduced. First, results of the qualitative survey of the management level (data set 2) are presented. Findings indicate that research groups claim to be an inherent organization (qua organizational chart) with diffuse hierarchical structures. Consequently, it is concluded that the development of diversity management in a research organization differs from

entrepreneurial approaches. Furthermore, the need for a common corporate culture and a common understanding of diversity management are derived. Based on the analysis, the linkage to the following research steps and studies – phase IV - Mindset of employee on diversity and innovation, phase V - Strategy development, and phase VI – Implementation - is further described theoretically. Finally, an outlook on the further research process is issued.

In summary, the following research highlights can be identified.

Research Paper I:

- Gives an overview of the potential and challenges of a diverse workforce.
- Points out the need for a system-theoretical approach within the framework of a diversity management strategy.
- Discusses different models in the context of diversity management.
- Combines these models and uses them as a basis for the development of a research plan tailored to the research project.
- Develops and discusses a further developed model, which is tailored to the research object.
- Gives first implications, basing on research realized in the frame of phase I-III.
- Gives an overview over the next research steps.

4.2.2 Research Paper II

Innovation and Diversity - Integrating new Perspectives into Research Associations

Different research studies highlight the positive and challenging effects caused by a diverse workforce on organizations. On the basis of Research Paper I, Research Paper II focuses on identified influencing factors such as organizational structure (Caye *et al.* 2011), management styles (Thompson 1965), hierarchical levels (Hull & Hage 1982) and the number of team

members (Weiss & Hoegl 2015). In doing so, the emphasis lays on the diversity categories gender, status group, discipline and culture. Following on a short analysis of the organizational environment and workforce demographics (data set 1), the second paper takes a closer look at the management level (data set 2). The exploration of this target group is guided by the following theses:

- There are different levels of knowledge, definitions and experiences on the subject of diversity, diversity management, and the context of diversity and innovation at the CoE management level.
- Organizations with an engineering focus require a top-down implementation concept, especially with respect to diversity management.
- The management level has a significant influence on the success of the implementation of a diversity management approach.

The aim of the study conducted in phase III (data set 2), focusses the assessment of the prevailing mindsets, perceptions and states of knowledge at management level and to implement the results into the strategy development process. In accordance to Mayring (2015), a qualitative content analysis was conducted. The qualitative study reveals six different types at management level – (i) the superficially informed, (ii) the active follower, (iii) the passive follower, (iv) the intentional refuser, (v) the sceptics and (vi) the reflected user. These are described in more detail in this paper and put in relation to each other. The key findings of the study are the very different levels of knowledge regarding diversity, diversity management and the relation between diversity and innovation. Furthermore, different attitudes towards diversity and innovation could be identified. Based on this, the authors identified a first set of factors, that focuses on a top-down strategy. The findings from the study serve as a basis for the survey of employees in the fourth research phase.

In summary, the following research highlights can be identified.

Research Paper II:

- Contextualizes research phase I, II and III.
- Presents the sub-code system as basis for the derived types (4 topics, 9 sub-codes, 25 sub-code types).
- Presents and discusses the six types - (i) the superficially informed, (ii) the active follower, (iii) the passive follower, (iv) the intentional refuser, (v) the sceptics and (vi) the reflected user - identified on management level.
- Derives first implications for the development and implementation of a diversity management approach.

4.2.3 Research Paper III

Diversity- and Innovation Management in Complex Engineering Organizations

Considering the structural analysis in phase I, in addition to the management level, the employees of the CoE were identified as a central target group. In the sense of a change management approach (cf. chapter 2.4) that includes all employees of the organization; the survey of the employees is, therefore, the subject of the third paper. In doing so, the paper focuses on the theoretical analysis on a broader set of studies. Basing on this, a connection between diversity and change management is made. Based on the examination of the mindsets and attitudes of the management level, the examination of the mindsets and attitudes to the complex of topics of diversity management and diversity at employee level is then presented. In the context of this paper, the authors focus on the diversity categories gender and origin and explain them in more detail.

In this paper the results of a descriptive as well as multivariate analysis, focusing on multiple response sets, Kendall's tau and Cramer's V, are presented. The study reveals different central

findings. The authors bring out that the employees are significantly influenced by the research institutes as a daily working-environment. However, there is no differentiation in the perception of diversity in the CoE and the institutes. Considering the different diversity categories, reflected in the frame of this study, the authors show that some diversity categories are perceived as barriers, whereas other categories are associated with advantages in the innovation creation context. Further insights are gained regarding the perceived significance of diversity. Considering the diversity category 'gender', the significance of diversity is rated as 'too high', although a connection is seen between the diversity category 'gender' and innovation. Furthermore, comparing the measured gender diversity within the framework of the distribution of women and men in the CoE with the perceived gender diversity, results show a gap between the perception and the existing workforce structure. As a result, the impact of strategic answers and behaving politically correct in the frame of those studies is discussed.

In summary, the following research highlights can be identified.

Research Paper III:

- Concludes studies in the diversity and innovation context and lists them according to the focused diversity categories.
- Sheds light on the interdependency of Diversity Management and Change Management.
- Reveals insights into central results gained in the frame of phase IV (data set 3).

4.2.4 Research Paper IV

The Influence of Organizational Culture on Diversity Management in Complex Organizations

The results published in paper three suggested that further analytical procedures could provide new insights into the perception of diversity and diversity management at the employee level.

After a subject-related view on diversity, and the definition of the term diversity, the economical perspective on diversity management is presented. In total, nine arguments (i) Workforce Structure (ii) Cost Argument (iii) Personnel Marketing Argument (iv) Marketing Argument (v) Flexibility and Innovation Argument (vi) Creativity Argument (vii) Problem-Solving Argument (viii) Financing Argument, and (ix) Internationalization Argument are scientifically discussed. Following, the authors reflect diversity management in complex organizations, by defining the complexity in organizational structures and discussing the influence of agile methods on complexity. The authors point out the interdependencies between organizational culture and diversity management and derive a model that combines the described factors. Basing on that, the research object is presented, and the analysis of data set 3 applying a Two-Step cluster analysis, Kendall's tau and Cramer's V.

In summary, the following research highlights can be identified.

Research Paper IV:

- Presents a new perspective on conducted diversity studies.
- Reflects nine arguments for diversity management.
- Presents systems for defining the organizational complexity.
- Discusses the relation between complex organizational structures, diversity management, organizational culture and change management and provides a corresponding model.
- Reveals insights into central results gained in the frame of phase IV (data set 3).
- Provides first implications for an integrated diversity management approach in a complex organization.

5 General Discussion and Conclusion

The aim of this thesis is to shed light on the development of a diversity management concept in a complex research organization in Germany, under the consideration of a change management process. In the absence of corresponding approaches for research organizations such as the CoE but, at the same time motivated by the importance of these organizations for the international research landscape a conclusion of the findings and a derivation of a corresponding concept that is transferable to comparable institutions, are conducted in this section.

In chapter 5, the last two steps in the frame of the research concept presented in chapter 1 (figure 1.6) – *V. Concept development* – are discussed. Hence, a diversity management concept is presented in chapter 5.1 derived from the findings in research phase I-IV. Based on the insights, a new theoretical perspective on the development of diversity management in complex research organizations is presented in chapter 5.1.1. Building on this, concrete implications from the management perspective are summarized (cf. chapter 5.1.2). Since the education sector and public science organizations are influenced by political decisions, implications of action are also derived for the institutions that evaluate scientific calls for proposals and, thus, make decisions regarding the topics to be funded in the future (cf. chapter 5.1.3). This is followed by a reflection on the limitations (cf. chapter 5.2) and an outlook especially regarding phase VI - *Implementation and Evaluation* (cf. chapter 5.3). In the final chapter, a conclusion of the dissertation project is given (cf. chapter 5.4).

5.1 Phase V – Diversity Management Concept for Complex Organizations

Based on the state of research (cf. chapter 2), four research questions were derived (figure 2.12), which served as a central element for pursuing the research objective. Illuminating the research questions within the framework of the research approach enables the conclusion of a diversity

management concept for the research object on the one hand and the derivation of generally valid action implications for comparable organizations on the other hand.

5.1.1 Theoretical Implications

From the theoretical combination of diversity management and change management (cf. chapter 2.4), considering the psychological effects of diversity (cf. chapter 2.2) and the central role of organizational culture (cf. chapter 2.4), there is a need to consider diversity management from a more differentiated perspective. Based on the status quo analysis and against the background of the CoE as a research organization, the following theoretical concept emerges (figure 5.1).

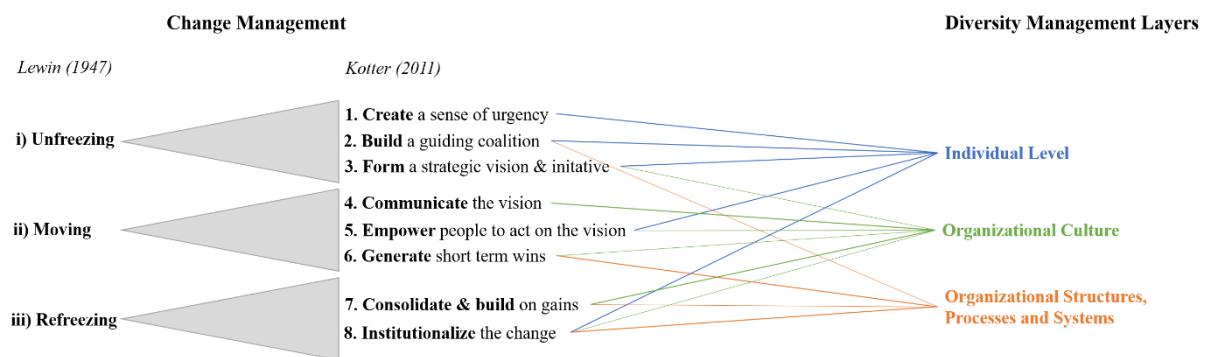


Figure 5.1: Change management and diversity management layers

As a theoretical key insight, there is a need for a closer link between change management processes and diversity management. Reflecting research question one – *Which factors need to be considered when implementing a diversity management strategy in a CoE?* – the individual level, the organizational culture and organizational structures, processes, and systems represent the central identified elements (figure 5.1).

The combination of change management phases and the diversity management layers reveals the necessity to prioritize different elements in different phases. Thus, the analysis shows that, especially at the beginning of the process, the focus must be on the individual and that the connection to the individual needs triggers the change process. The conducted studies (phase I, II, III, IV) show that to achieve a sense of urgency and for being able to find a guiding coalition,

it is necessary to investigate prevailing mindsets and perceptions of diversity on the individual level. This also enables the identification of key persons, especially for developing a guiding coalition that has an impact on the organization's employees. For this reason, especially when building a guiding coalition, it is also necessary to reflect organizational structures as an indicator for identifying key actors. The change of organizational structures, processes, and systems supports the consolidation of change in a manifestation of a new order and measures. For this reason, the identification of structures, processes, and systems and the adjustment of those structures especially through the management level and key persons, consolidates achieved changes and institutionalizes change. As a connecting element between the individual level and the structures, processes, and systems, the organizational culture is at the center of the model and is particularly important in the *moving* phase(s). As adjusting lever for the realization of a diversity management concept, the organizational culture communicates the new vision and represents the lived mission statement. It is shaped and influenced by the individuals on the one hand and shapes and influences the human behavior but also processes and systems on the other hand. Consequently, from a theoretical perspective, the organizational culture needs to be reflected as a central construct that influences the lasting change. (figure 5.1)

The complexity of the theoretical implications (figure 5.1) shows the necessity of systematically investigating the target organization for being able to identify key persons, key structures, and the prevailing organizational culture. Within the framework of the study carried out, a system-theoretical approach has proved to be successful. The system-theoretical approach allows the identification of levers and framework conditions and, thus, the development of targeted organization-specific measures. The six-stage research plan (figure 1.6) developed and conducted in the frame of this study transpired to be an appropriate approach for the investigation of influencing factors. In order to capture the different levels of the organization and to fathom the different prevailing perceptions and attitudes on the different personnel levels,

a mixed-method research approach can be applied that allows an appropriate investigation of mindsets and attitudes. Especially against the background of the complexity in large research networks, the analysis of experiences and resulting behavior patterns is necessary in order to be able to develop a concept of measures that reflects the organization-specific needs.

However, the application of a system-theoretical approach also indicates that this is a long-term process. This, therefore, also represents a restriction of the approach and should be taken into account when considering the establishment of diversity management.

Based on this theoretical consideration of conceptual approaches, concrete managerial implications arise. These are discussed in more detail in chapter 5.1.2.

5.1.2 Managerial Implications

Based on the theoretical model, numerous managerial implications arise from the studies carried out. In the following, the central findings based on the studies conducted in the frame of the research plan are discussed.

1) Conducting a top-down approach

In the frame of the conducted system-theoretical approach, the analysis of the organizational framework conditions and the structures inside and outside the research object indicate rigid structures and hierarchies. These are manifested by the legal framework conditions of the scientific system. Reflecting research question two – *Which levers and framework conditions must be considered within the framework of a diversity management concept at a CoE?* – the fixed-term contracts for scientific staff, resulting fluctuations, and the constant staffing in the form of the (professorial) management level, indicate the necessity of a top-down approach, that enables the development and sustainable implementation of diversity management approaches in the university environment. This perspective is supported by research results, pointing to a strong role model function of the management level on the level of the scientific

staff. This manifests itself in the reflection of the lived and perceived leadership styles but also in the adaption of the individual to the exemplified leadership style.

With regard to the individual level, it is therefore important, especially in the context of higher education, to actively involve the management level and to regard it as a key for change. In doing so, measures are necessary to sensitize the leaders for the topic of diversity. Given the time constraints of this target group, this could be realized by an official statement of the CoE management and short but regular impulses within the framework of regular meetings.

Based on the survey of the management level, a different level of knowledge on the one hand and a different level of experience on the other hand can be determined, defined in the frame of the six identified types. A transparent handling of diversity, therefore, requires not only the emphasis on the potential of diversity but also the communication of the challenges of diversity and the connection to concrete experiences as well as the development of appropriate solution strategies. Therefore, a further measure could be a central diversity consulting from the umbrella organization of the CoE for the respective research institutes. In the frame of a first step of change, the CoE management can emphasize the need for actively dealing with diversity and then developing a vision together with the professorial level. This vision can then be transferred to the research institutes. To achieve this, it is, in accordance to Schulz (2009), necessary to solve the relevance problem. Appropriate instruments would be networking-workshops on the level that emphasize the relevance of diversity and an exchange with actors from the industry that can present best-practice models on the topic.

In addition, an emphasis on the relationship between diversity management and the CoEs core business is necessary in order to manifest the strategic orientation of the measure. A further instrument to communicate a strong signal effect and to initiate a top-down change are leadership commitments that transparently indicate a support of the diversity management approach by the management level.

2) Reflecting the organizational culture as a central element

The theoretical implications already point to the organizational culture as one of three key elements. For this reason, it is necessary to pay special attention to the organizational culture in the frame of concrete management implications, too. Connected to implication one – *Conducting a top-down approach* – the study results reveal the impact of the professorial level, as management level in research institutes, within the organizational culture. Regarding the legal framework and power structures, the scientific system in Germany is characterized by a special situation, as outlined in chapter 3.1. Within this system, the professors have a position of power, not least through the individual dependency relationship based on the framework conditions of the scientific system (cf. chapter 3.1) (for the ongoing discourse see e.g. Würmseer 2010; eds. Zimmermann, Metz-Göckel & Huter 2013; Agarwala 2015; Scholz 2017; Agarwala & Scholz 2017), that significantly influences the implementation of a diversity management approach. This is also indicated by the results of the studies carried out in this research project. Especially in the respective research institute, the professors shape the organizational culture. Consequently, an impact on the organizational culture of the CoE is suggested, as the study at staff level indicates that CoE members hardly distinguish between the CoE and the institutes as organizations. This makes it even more important to develop an organizational culture that reflects diversity critically and is exemplified accordingly by the management level.

As a result, existing structures must be rethought, especially at the level of the institutions. To achieve this, a transparent and open exchange between professorial level and CoE management is necessary in order to develop and implement cross-institutional processes and structures. As an example, hiring processes can be mentioned in this context. In order to promote diversity and address a broader pool of candidates, recruitment procedures could be restructured. This includes the reformulation of job advertisements and the adaptation of the application and

selection process. Furthermore, incentive systems could be established by the CoE management for supporting restructuring processes.

3) Participating employee level

Regarding the analysis of influencing factors, the implementation of diversity management must be considered from two perspectives. On the one hand, the topic must be credibly represented by the management level (see implication one). However, in order to achieve broad acceptance of the approach within the organization, an active debate of the topic on employee level is necessary, too. Hartmann (2004) emphasizes that a successful implementation can only be achieved if there is a uniform awareness and understanding of diversity management on both the management and the employee level (cited in Ditzel 2015). To achieve this, the investigation of prevailing mindsets and attitudes on employee level in the frame of a system-theoretical approach is required.

Reflecting the overarching research question three – *How is diversity perceived at different organizational levels?* – the study results indicate that the subjective perception of diversity exceeds the existing diversity. The presented study shows that the perception of diversity in the organization does not correspond to the actual prevailing diversity. Accordingly, no great importance is attached to the topic by the surveyed. This provides information about the perception of the topic and suggests a strong need for sensitization.

Petty and Cacioppo (1990) argue that persuasive strategies that are tied to emotional appeals and values (like fairness and equality), are less likely to achieve a long-lasting change. In contrast, appeals that are tied to recipient's goals and outcomes are more effective for a sustainable change (Kossek *et al.* 2006). Considering diversity management as a tool for stimulating the personal development, aspects of employee branding could be part of human resource management at scientific organizations as an added offer to the individual training

portfolio. Furthermore, the active participation of the staff level and a reflection of the vision exemplified at management level through a continuous participation of the scientific staff is required. The individual reflection of the topic as well as the understanding of the meaning are central starting points for a change process (figure 5.1). Implementing the sensitization for diversity and offering collaboration workshops could stimulate the topic and the importance of the issue at the employee level.

Figure 5.2 gives an overview over the proposed framework for implementing diversity management in research organizations.



Figure 5.2: Summary implementation framework

5.1.3 Political Implications

The investigation of the second research question – *Which levers and framework conditions must be considered within the framework of a diversity management concept at a CoE?* – revealed the impact of influencing factors external to the research object. This concerns both, education policy and organizations that have an influence on the scientific landscape. The analysis of the legal framework of the research object suggests that academic careers in Germany are highly individualized and strongly influenced by the respective institutional framework. In the absence of a uniformly structured process, an individual relationship between executive and employee results, which is also manifested by the leadership culture lived in the respective institute. The central driver for the implementation of processes and changes is, therefore, the management level and its ability to act freely. Per

Considered from an international perspective, a look at procedures in other European countries is instructive. Already in 2015, the ministers of EU member countries committed “[...] to promote social inclusion and cultural diversity and to foster education of disadvantaged young people, by ensuring that education systems address their needs.” (eds. Claeys-Kulik & Jørgensen 2018:3). Also, in 2015, in the course of the Bologna Process, ministers of higher education committed to make the system more inclusive. In 2017, the European Commission reiterated this aim in renewing the agenda for higher education, supported on a global level by the UN in the frame of the SDGs (chapter 1). To achieve this aim, Ireland set quantitative targets and measures in the frame of the third National Access Plan for higher education (2015-2019), in order to ensure more diversity in higher education. In doing so, strategies on the institutional level and the definition of indicators for data collection and measure evaluation oblige the institutions itself. A comparable concept is applied in the Netherlands, in stimulating diversity by implementing measures in gender and disability context. This national program is supported by the labor law in the Netherlands. In 2017, Austria developed a national strategy with the aim

to strengthen “[...] the social dimension of higher education which formulates specific targets for ministries, universities and other relevant actors.” (eds. Claeys-Kulik & Jørgensen 2018:3).

In doing so, stakeholders and experts are involved in shaping a framework that integrates the social dimension in performance agreements with the universities and systems that support students. Sweden makes diversity a focus in higher education policy, by changing the admission system, integrating the topic in the validation of learning, and developing structures and supporting students. Furthermore, gender mainstreaming represents a main priority in research and policy, which is realized through requiring gender mainstreaming in national research funding programs. (eds. Claeys-Kulik & Jørgensen 2018)

Against the background of the variety of approaches in the European area and considering the described organizational system in higher education in Germany, in a first step, a stronger political position regarding the need for structured diversity management in science organizations as a cross-disciplinary cross-cutting issue, can initially emphasize the importance and necessity of actively addressing diversity. In accordance to Sweden’s approach, in Germany the DFG represents an actor in the science system in Germany, having the possibility to give future-oriented impulses in science. Thus, a stronger link between the respective scientific disciplines with diversity perspectives can be demanded in scientific calls and reviews of research projects. So far, this has been done in the form of so-called gender funds, which often focus on individual packages of measures. The measures are often applied at the level of the scientific staff. In the absence of social science accompanying research, due to the low financial resources of the gender funds, the evaluation of corresponding measures does not gain any insight into scientific reality. The extent to which these selective measures achieve sustainable effects is, therefore, questionable and not scientifically proven. However, a study carried out within the framework of a special research area funded by the DFG indicates that individual measures carried out annually, in this case anti-bias training, have no effect at the level of

scientific staff (Berg, Steuer-Dankert & Leicht-Scholten n.d.). Accordingly, if the implementation of diversity management is to be pursued seriously, the topic must be anchored more broadly in research projects and the implementation of system-theoretical approaches and adequate funding of corresponding projects must be made possible. If the arguments and motivations for reflecting diversity and implementing appropriate diversity management concepts are not accepted (cf. chapter 1), ultimately, it is, then, the financial incentives that make the implementation of diversity management in the science system worthwhile. At the same time, the DFG can function as a control instrument, for ensuring a sustainable change in scientific organizations. In the context of regular audits, the changes could be examined more closely. This requires the prevalence of in-depth expertise also in the institutions that have a controlling function.

From a political perspective, it should be questionable to what extent structural processes and power systems of public science institutions need to be revised in order to enable a broader integration of diversity. Against the background of the study carried out, this also includes the reflection on the power relationship between academic staff and professorial level and the exemplary function of the professorial level and its influence on the respective organizational culture.

5.2 Limitations, Future Research and Outlook on Phase VI

The discussion of the concepts of diversity and diversity management and the identification of different approaches, perspectives, and paradigms points to the complexity of the topic and the manifold possibilities of interpretation (cf. chapter 2). In the context of this work this resulted in a comparatively broad definition of diversity. In order to provide a structural framework for the broad definition of diversity (cf. chapter 2.1), which enables a targeted examination of diversity, the six factors mentioned centrally in the AGG have been taken as a basis,

complemented by organizational categories of Gardenswartz and Rowes (1998) model. As described in chapter 2 the focus in this research project laid on the diversity dimensions gender, origin/ culture, extended by the dimensions specialist background and status group. These categories were defined as organization-relevant against the background of the scientific organization as research object. Initially, no deeper focus was placed on other diversity categories or the construct of intersectionality. Consequently, the perception of these categories and the interrelation between diversity categories could be investigated in more detail in the future.

Reflecting the process of investigating personal mindsets and perceptions, there are some further limitations. On the one hand, the survey formats are approaches that record a perception that is reflected at the moment of the survey. The timeframe of the survey represents an individual snapshot, which may be subject to change over time. Consequently, on the other hand, no explicit statement can be made about the development of this perception in the further course of the project, as the interview situation represents a snapshot of thoughts. Furthermore, especially the quantitative survey of the employees does not allow a closer examination of concrete experiences or factors influencing perception. In a further step, a qualitative approach could, therefore, be carried out on the employees (e.g. focus groups) in order to validate the results of the quantitative approach presented in the context of this work and to gain insight into personal motives and backgrounds. The personal contact to the interview partner in the interview situation as well as the representative function of the management level can, despite the explicit respect of data protection, lead to politically correct answers. As a result, biases conditioned by socially desirable response patterns can occur, called the common-method bias (Tehseen, Ramayah & Sajilan 2017). Therefore, the answering behavior has to be reflected and the interview situation has to be taken into account in the context of the survey. Furthermore,

insights gained in phase I and II allow the involvement of additional information in order to improve the bias.

A further limitation results from the anonymization of the data and the consideration of the data protection framework conditions. Thus, the statements of the scientific staff could not be explicitly assigned to individual institutes and a comparison between the perception of the management level and the perception of the staff level could not be carried out. Consequently, institute-specific deviations in perception could not be derived and were not subject of the investigation.

Furthermore, a limiting element is to be seen in the fluctuation of employees and the resulting changes in the workforce. Although 149 target persons could be identified in the frame of the quantitative study, it is questionable which actual number of CoE members can be assumed. However, the study gives a valid overview over prevailing mindsets and attitudes and fluctuation is expected to have a minor influence. This high fluctuation makes it necessary to regularly survey the prevailing mindsets and attitudes towards diversity in order to be able to examine bottom-up changes in the organizational culture.

When transferring the concept to other organizations, the specific framework conditions of the taken research object must also be taken into account. As the analysis of the research object shows (cf. chapter 3.1), the investigated organization is characterized by an engineering habitus. This is accompanied by the influence of a disciplinary culture, which strongly influences the organizational culture. Consequently, when developing an appropriate approach, the dominant disciplinary culture of the target organization should, therefore, be examined and reflected when investigating prevailing mindsets and attitudes towards diversity.

In addition, there are several possible points of reference for further research. In the frame of the realization of phase VI, and in addition to the regular examination of changes in the organizational culture caused by employee fluctuation, qualitative approaches could be

examined, especially at the employee level, that enable a closer examination of the differentiation of research institutes as an organizational reference framework or of the CoE as a superordinate organization. For strengthening the cooperation of different employees from different organizations under the umbrella of the CoE, further measures could be derived to establish a corresponding interdisciplinary network more strongly. Further approaches could also be investigated, especially if the direct working environment exerts an influence on perception and represents a starting point for further measures.

Especially in the case of motivation by an external organization such as the DFG, the application of controlling instruments is required that provide a more sustainable performance review than the collection of demographic data of the CoE staff, as the presented study reveals. In the controlling context, it should be noted that the effects of measures tend to be of qualitative and long-term nature (Vedder 2006) and, thus, quickly elude quantitatively structured controlling instruments. In outlining the different implications in chapter 5.1 it becomes evident that a demanding approach is taken in order to implement diversity management. Furthermore, the success of the approach hinges largely on the key persons involved. In order to control the success of the presented implications in the course of the implementation phase the development of an evaluation concept is necessary that is tied to the organization-specific framework conditions. In the frame of the sixth phase, the implementation and continuous improvement could be subject of further investigations. In doing so, the undertaking would fill a present research gap resulting from the lack of appropriate concepts for the target organization.

Considered beyond the CoE as a research object, it could be examined whether the research concept developed and its implications are transferable to other organizational formats, for example to so-called *Sonderforschungsbereiche* (SFB) (special research areas). In doing so, trans-organizational benchmarks would be possible.

5.3 Conclusion

In the frame of the dissertation, a six-step research plan was presented that aimed at the development of a framework for a diversity management concept for a German research organization. Based on the state of research and an analysis of the conceptual discourse on the topics of diversity and diversity management, the connection between diversity management, organizational culture and change management processes was established and explained.

Based on this, three studies were carried out in order to investigate the organizational structure as well as the prevailing mindsets and attitudes with regard to the topic complex of diversity and innovation. The surveys were examined both on the employee level as well as on the management level. From this analysis, central insights were gained regarding the development of a diversity management concept for the target organization.

The analysis reveals several aspects that were merged in a diversity management concept in this thesis. The implementation of diversity management in a CoE requires the involvement of individuals, organizational culture as well as structures, processes, and systems on the one hand and the structural process of change management on the other hand. Combining the central elements of diversity management with the change management process and applying a system-theoretical perspective on the organization allows a change of prevailing mindsets and attitudes and an active involvement of diversity as a stimulating factor. Nevertheless, it must be borne in mind that in order to achieve a sustainable culture change, significant commitment of resources but also leadership is required (Cox, JR. 2001). Furthermore, diversity poses huge challenges that need to be reflected in an appropriate concept that actively takes up these challenges and supports the revelation of the potentials of a diverse workforce.

In order to achieve a sustainable change, the reflection of structural frameworks needs to be considered at the same time. The analysis of framework conditions of the CoE has shown different factors that have a high influence when dealing with diversity. In combination with

the six research steps, investigating the target organization, actors, and influencing factors that have an impact on the prevailing mindsets and attitudes towards diversity have been derived. Considered from another way around it could be questionable if a change of these framework conditions could lead to a structural anchoring and a broader consideration and implementation of the topic. In order to achieve this, the factors mentioned in the policy implications could make a valuable contribution.

Despite the challenges and the development costs of an appropriate diversity management concept for a complex research organization, a successful implementation that permeates the structures and culture of an organization can lead to better results and specifically enables publicly funded institutions with a resulting social responsibility to reflect the heterogeneity of society.

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Part B - Research Papers I - IV

Research Paper I

Diversity and Innovation Management in Large Research Groups

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I Abstract

Contemporary research appreciates a diverse workforce as a potential source of innovation. Researchers explore the fine details of why diversity management is central for generating innovations in heterogeneous research groups and how it could be effectively implemented into organizations. Complex research associations that discuss topics with a high impact on society increasingly address the necessity of establishing a diverse workforce to confront the challenges of tomorrow. Characterized by complex management structures as well as hierarchies, research associations have not been a subject of investigation until now. For this reason, the presented research project aims to develop a diversity and innovation management strategy with the ultimate goal of inducing change in the corporate culture. The proposed approach consists of six phases; the first two phases investigate the status quo of diversity in the existing organizational structures of member institutes and the variety of particular working cultures within the research association. The third and the fourth phase utilize qualitative and quantitative studies. The third phase focuses on the connection of management level to diversity and innovation, and the need for diversity and innovation management, and tailor-made methods of implementing them. The first three phases have been accomplished successfully; preliminary results are already available. The fourth phase will mainly focus on exploring the mindset of the employees. The fifth phase will consolidate the findings in the first four phases into an implementable strategy. The final phase will address the implementation of this strategy into the organization. Phases 4 to 6 have not yet been undertaken.

Keywords: Diversity Management, Innovation Management, Research Association, Change Management, Engineering

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1 Introduction

The potential of a diverse workforce and its positive effect on innovation processes is broadly scientifically discussed. Various studies have shown evidence on the positive impact of different forms of diversity (Østergaard *et al.* 2011; Hewlett *et al.* 2013; Hoogendoorn *et al.* 2013; McKinsey 2015). For this reason, companies of the private sector increasingly strive to incorporate and implement a diversity management strategy as part of their corporate governance (Aretz & Hansen 2002; Aretz & Hansen 2003a; Köppel 2012). Scientific organizations also increasingly make the potential of diversity a topic of discussion. Further, the German Research Foundation (DFG) promotes diversity in the scientific system as an indicator for excellent research (DFG 2015). Since the focus of scientific organizations is mostly on scientific issues that have a high impact on all social levels, there seems to be a need for diverse perspectives, especially when it comes to scientific development processes. For this reason, large research organizations increasingly address the need for establishing a diverse workforce to be more innovative (Philips 2014). One example is the establishment of the Clusters of Excellence (CoE) in Germany. Jointly initiated by the German Council of Science and Humanities together with the DFG, the Clusters of Excellence are interdisciplinary research organizations that involve topics with a high social and economic impact. In addition to their importance for society, they are key drivers of the Excellence Initiative and German elite universities. The Excellence Initiative represents a central element of the German scientific system (DFG 2016).

Despite the potential of diversity in the context of innovation, studies that suggest implementation of management strategies tailored to the needs, external such as internal influencing factors of research associations, are virtually non-existent. This results from the fact that concepts for the implementation of strategies for diversity and innovation management are focused on specific organizational structures and are based on the requirements of the private

sector (Walther 2004; Dömötör 2011; Strobel & Kratzer 2017). Furthermore, organizational efforts to manage diversity focus almost exclusively on equal opportunity measures, and neglect to take measures that would actively stimulate the realization of the potential of diversity and lead to innovation (Ely & Thomas 2001; van Knippenberg *et al.* 2012). With regard to the challenges posed by globalization as well as the resulting need for diverse competencies and profiles, global-acting institutions with mono-cultural attitudes appear to be rigid, past-oriented, and not adaptable (Hansen 2002; Horx 2011). With respect to accelerated economic dynamics with growing change and innovation pressure, there is a necessity to use the resources of human capital effectively and efficiently.

The proposed project *Diversity and Innovation Management in Large Research Groups* is designed to put a greater emphasis on actively pursuing the benefits of gender, cultural/ethnical and disciplinary diversity as an informational resource resulting in greater team innovation. These diversity categories are from the results of the educational tasks of the Clusters of Excellence and from the streamlining of scientific working groups. This project is a part of the Cluster of Excellence *Integrative Production Technology for High-Wage Countries* at the Rhine Westphalia University of Technology Aachen University (RWTH). It aims to develop a strategy that will lead to a corporate cultural change towards the reflection of diversity as a driver for innovation. The underlying thesis is that due to the scientific system, cluster-specific frameworks and structures require an approach that will strongly consider all influencing factors to achieve long-term success.

To establish a continuous improvement process, specific measures tailored to the organization and its structures are needed. Furthermore, evaluation tools must be developed to ensure a sustainable change from a long-term perspective. This is to pursue the goal of improving and increasing gender, cultural/ethnical, and disciplinary diversities.

This paper chose a conceptual approach for its research design. After the presentation of the current state of research, the diversity and innovation management approach as well as the different steps of strategy development will be discussed. Next, initial tendencies, which refer to the first research results, will be shown and an outlook will be presented.

2 Literature Review

A large part of innovative work in the present business world is not carried out by individuals, but by teams (Edmondson & Nembhard 2009). Any group in business or in research is assessed based on its success. Depending on the type of work, success is measured differently. For numerous enterprises, innovations represent a central element of their corporate strategy (von Ahsen *et al.* 2009; Götzenauer 2010). In addition to economic indicators such as profit, productivity and competitiveness, innovation is the one characteristic that defines successful businesses (Staroske 2000; Schmeisser *et al.* 2008; Hauschmidt *et al.* 2016).

To understand the challenges of implementing diversity and innovation management into an organization, it is essential to keep the different dimensions of the term *diversity* in mind. Diversity itself is a complex, eclectic parameter that can be defined in several different ways. At least two main types of diversity attributes are commonly distinguished: more visible ones such as race, ethnicity, age, gender and physical disabilities; and less visible ones such as education, skills and abilities, values and attitudes, tenure in organization, functional background, personality differences and sexual orientation (Jackson *et al.* 1995).

A study by Gardenswartz and Rowe (1998) provided another perspective and came up with the *Four Layers of Diversity*. In their framework, they divided diversity categories into: (1) dimensions of personality; (2) internal dimensions (e.g. age, race, gender); (3) external dimensions (income, religion); and (4) organizational dimensions (department, work location). Dimensions of personality include an individual's values and beliefs; the internal dimension

includes characteristics which are not changeable or require a high amount of effort to change; the external dimension involves aspects that are controllable; and the organizational dimensions are those aspects that are easily changeable (Collins 2009).

Following, research on the potential, as well as challenging aspects of diversity is briefly presented in the section. The context between diversity and structural factors that have an impact on the diversity and innovation management strategy will also be discussed.

2.1 Potential of Diverse Work Force

The reports of Caye *et al.* (2011), the European Community (Focus Consultancy 2010), and Rizy *et al.* (2011), argued that there is a need for diversity in business and that benefits can be earned from it. Modern customers vary strongly in their behaviors, values, priorities, age, gender and other dimensions of diversity; therefore, a good mix of employees is necessary to cater to them. Additionally, scarcity of talent makes it indispensable to recruit from diverse groups. Heterogeneous teams are of special value when the tasks are cognitively complex and demand multiple viewpoints because such teams have a broader range of knowledge, expertise and perspectives (Hoffman 1958). Diverse teams also exhibit greater creativity (Triandis *et al.* 1965). With a focus on innovation, the presence of women in the top management can improve the company's performance due to information and social diversity which can increase motivation in women in the middle management (Dezsò & Ross 2014). Studies in science and higher education have indicated an increase in productivity and creativity in culturally diverse teams, whose members differ in education and academic discipline (Santandreu Calonge & Safiulli 2015). Age diversity can be a valuable asset and resource, influencing both individual and team performance (Pitt-Catsouphes *et al.* 2013). Baldridge and Burnham (1975) indicated the positive effects of functional differentiation in organizations which lead to the collaboration of professionals from different fields resulting to improvements in the administrative systems.

Functional diversity in teams in terms of specialists working together can lead to much improved products compared to isolated work (Ribberstrom 2013).

Team diversity in organizations ultimately influences turnover and performance via its effect on cognitive, communicative, and symbolic processes (Milliken & Martins 1996). Diversity has been reported to be beneficial in encouraging innovation in business and in education which have been mentioned frequently in literature. An example is the study by Bantel and Jackson (1989), who examined the relationship between social composition of top management teams and innovation adoptions in a sample of 199 banks. However, not all forms of diversity have the same effects. Based on econometric analysis in the study by Østergaard *et al.* (2011), gender diversity and educationally diverse backgrounds can lead to innovation, but age diversity does not. Moreover, ethnicity as a single diversity category does not significantly affect the innovation potential of companies. To implement a diversity and innovation management strategy it is necessary to reflect on the potential challenges and on how to address these challenges.

2.2 Challenging Aspects of Diversity

Despite the abovementioned potential of diversity, heterogeneity also involves challenges that must be considered; employee diversity correlates with the need for active exchange and coordination to avoid misunderstandings and conflicts in order for the team to become successful (Díaz-García *et al.* 2013). It requires overcoming initial friction and conflicts resulting from different points of view (Ribberstrom 2013). This is consistent with the work of Pelled *et al.* (1999), suggesting that diversity in functional background can cause task conflicts. The need for the management of available diverse workforce is also pointed out by Bassett-Jones (2005), stating that diversity, although being a source of creativity and innovation leading to competitive advantages, could also cause misunderstanding, suspicion and conflict in the

workplace, resulting in absenteeism, poor output quality, low morale and loss of competitiveness; hence, Andersen and Moynihan (2016) described diversity as a double-edged sword. Pelled *et al.* (1999) found that different forms of diversity shape different types of conflicts, and that conflict ultimately shapes team performance. Depending on task routineness and group longevity (mediators), diversity in race and tenure could lead to emotional conflict; whereas, age diversity does not.

Because diversity management is often accompanied by a change (Davis *et al.* 2016), it is important to consider the psychological aspects of change management (Graetz *et al.* 2012). For this reason, the active communication of the project goal by the management, as well as the involvement of employees in achieving the same goal, play an important role in integrating a diversity and innovation management strategy into research networks and enterprises (Kotter 2011; Leicht-Scholten 2012).

2.3 Structural Influencing Factors

The role of leaders in managing diverse groups cannot be undermined. Irrespective of whether a group is ethnically homogeneous or heterogeneous, innovation of a team is at its highest when supervisors are perceived as being highly collaborative in conflict management (Reade & Lee 2016). Multicultural team leaders with high global identity encourage better team communication and inclusion in diverse working groups, and thus gain the benefits of diversity (Lisak *et al.* 2016). Sánchez *et al.* (2010) state that managerial team heterogeneity has a positive impact on strategic changes. They argue that the identification of existing misfits between the enterprise and its environment is easier in these teams. With increasing diversity in the workforce, the command-and-control leadership will become outdated, and modern leaders will have to be influential rather than hierarchical in order to be effective enablers (Caye *et al.* 2011). Presence of hierarchical levels in an organization can hinder the flow of innovative ideas

because of the increase in the number of communication links, resulting in lower innovation (Hull & Hage 1982). Centralization of decision-making is also known to prevent innovation (Thompson 1965). On the other hand, less rigorous working rules (Burns & Stalker 1961; Thompson 1965), flexibility and openness (Pierce & Delbecq 1977) encourage the generation of novel ideas. Effects of diversity on innovation also depend on the group size (Weiss & Hoegl 2015). Studies show that team effectiveness as well as team processes are significantly related to the size of the team (Díaz-García *et al.* 2013).

Communication, both external and internal, is another parameter that influences innovation. Internal communication helps to disperse novel ideas within an organization and to combine them with other ideas (Aiken & Hage 1971) which helps them to be sustained (Ross 1974). External communication can promote exchange of innovative ideas between organizations (Tushman 1977). Drach-Zahavy and Somech (2001) conclude that mutual willingness among heterogeneous team members to interact (via information exchange, learning, motivating and negotiating) is one of the keys to develop innovations, that are based on team diversity.

3 Method: Developing a Diversity and Innovation Management Strategy for a Research Association

The development of a diversity and innovation management strategy for a research organization such as the CoE, requires a framework that considers the aforementioned potentials, challenges and structural influencing factors. As the literature review shows, diversity dimensions have an impact on organizational structures such as teamwork and leadership. Conversely, this means that the successful implementation of a strategy requires the consideration of existing values, norms and beliefs that characterize an organization.

In the following, the conceptual framework for developing a diversity and innovation management strategy for a research association will be described. Based on different diversity

management approaches, key indicators that allow the development of a diversity and innovation management strategy with a holistic system and theoretically oriented focus will be identified.

3.1 Conceptual Framework for Investigating a Complex Research Association

Klaffke (2009) notes that in the light of their individual strategic objectives, organizations must consider how competitive advantages can be created by a diversified workforce. This means that management strategies must be developed in a manner that is specific to the organization, taking circumstances into account to ensure a successful implementation.

Klaffke's approach, the *3-S-Diversity Model*, consists of the following elements: *skills*, *structure* and *strategy*, which stand in an equivalent relation to the culture of diversity. The element *skills* summarizes an appreciative attitude with a corresponding mindset and appropriate measures. This also encompasses the assignment of competences regarding leadership and cooperation in the frame of structures that are characterized by a diverse workforce. The intention is that employees understand the range of possible individuality among the differentiated aspects of personality and competence under the influence of cultural, social, private, and organizational environments (Aretz & Hansen 2003b). The pillar *structure* stands for the targeted adjustment of instruments and processes such as recruitment policies. This element requires a strong integration in the management level. The commitment to the diversity strategy is manifested by defining target values and measurable goals. The third component *strategy* stands for implemented concepts that lead to an organization considering both the organization's need for diversity, and an individual's need to be included in a diverse organization. (Klaffke 2009)

Aretz and Hansen (2002) state that a system-theoretically oriented approach takes organization-specific structures like hierarchy levels, recruitment processes and leadership concepts into

account. They pointed out that diversity management goes beyond merely increasing diversity quotas and tolerance; it should aim at achieving long-term changes in appreciating diversity and its subsequent potentials. They also regard diversity management in the perspective of entrepreneurial structures by assuming that the impact of a complex environment requires internal complexity. This internal complexity is mirrored in a functional differentiation of sub-systems that are tailored to the external environment while other sub-systems are focused on the internal environment. Furthermore, these systems can be distinguished in those which provide intangible resources and those which supply tangible ones. (Aretz & Hansen 2002, 2003b)

This results in the four types of sub-systems (shown in figure I.1) which are commonly used in the private industry and are described in detail below.

Capital, Work, Know-how	External-instrumental	External-consumeral	Management of Organization
	<ul style="list-style-type: none">• Adaptation to external environment• Provision of resources	<ul style="list-style-type: none">• Usage of system resources for goal attainment• Focus on feasible objectives under the consideration of a complex environment	
	<ul style="list-style-type: none">• Latent pattern maintenance for creating a resistance of the system against changes	<ul style="list-style-type: none">• Integration of internal system components using the system resources to create a stability of the overall system	

Figure I.1: Entrepreneurial frame: Sub-systems and their functional tasks (Aretz & Hansen 2003b)

External-instrumental subsystem describes the provision of resources to establish diversity. Employees need both time and knowledge to actively deal with changes and new requirements. It is suggested that both resources could be provided through employee trainings that enhances

knowledge and internal competencies. Furthermore, establishment of incentive systems and target agreements are other ways that could provide resources that support the implementation of diversity management and an appropriate corporate culture. (Aretz & Hansen 2003b)

The *External-consumeral* subsystem deals with the active and effective usage of resources to fulfill intended goals. The core of this dimension is the organizational action and thus, the management. The top-down representation of corporate values and culture is highly important especially for the implementation of diversity management. Measures should be linked to corporate strategies and targets since diversity management depends on the institutions' organizational framework. In this context, conflicts and challenges in human-resource, market access, creativity, costs and problem-solving have to be considered. (Aretz & Hansen 2003b)

The *Internal-instrumental* subsystem states that diversity management should be a part of the corporate's vision and values to become fully integrated. As part of the corporate's identity, a clear definition of diversity and diversity management is necessary to enable its members to work together under those specific corporate structures. Especially at the beginning of the implementation process, it is necessary to train employees and to stimulate a critical reflection of the management strategy; therefore, it is essential to make potentials, as well as challenges in the context of diversity, a subject of discussion. (Aretz & Hansen 2003b)

The *Internal-consumeral* subsystem describes that diversity management will be successful when measures are internalized by the system. This means that diversity must be integrated holistically into the entire organization in a context-sensitive way by considering processes, corporate strategies and organizational structures. To avoid the formation of subgroups, the management level represents a central element. (Aretz & Hansen 2003b)

Lastly, the *Internal-consumeral* subsystem states that the management level has to objectively justify the strategy and connect it with the stakeholders' and shareholders' perspectives. (Aretz & Hansen 2003b)

Cox (2001) considers the process in a more human-centered perspective. In his model, he defines different elements that need to be considered when implementing diversity management in an enterprise. From his point of view, a successful change requires the involvement of the following elements: (1) Leadership; (2) Research and Measurement; (3) Education; (4) Alignment of Management; and (5) Follow-up. These elements are further discussed in the succeeding paragraphs. (Cox 2001)

Under *Leadership*, Cox (2001) states that change must be introduced by the management in a top-down approach. Managers must exemplify and define corporate values, aims and directions. In the staff level, a recent theoretical analysis suggests that the key to benefit from diversity, such as gender, lies in the team members' diversity mindsets. In this context, mindset refers to employees' mental representation of diversity which is reflected on how they engage and interact with a team composed of diverse members (van Knippenberg *et al.* 2013). The corporate culture shapes the mindsets of its employees. Specific behaviors exhibited by the management lead to imitation of the same behaviors by employees of all hierarchy levels (Marshall & McLean 1985). Especially with regard to a change of an existing corporate culture, prevailing mindsets need to be considered to prevent reactance and rejection; therefore, diversity management should be linked to corporate strategies and guiding principles. The active communication of the necessity to establish a management strategy that takes diversity into consideration is an important milestone for its successful implementation (Schwarz-Wölzl & Maad 2014).

The *Research & Measurement* element aims at data collection that allows the quantitative structure of an enterprise to be captured (Cox 2001). For example, the demographic data of employees as well as the confidence of customers and employees are analyzed and used as a basis for a diversity management strategy that is tailored to the organization. This allows the reflection of prevailing management strategies and personnel policies (Ditzel 2015).

All factors identified from specific indicators during the research phase and characterized by the need for immediate action, must be realized by employees throughout all hierarchical levels in order to achieve a successful organizational change (Kotter 2011).

The *Alignment of Management* considers structures and processes of human resource management (Cox 2001). To achieve a sustainable benefit of the potential of diversity, processes have to be adjusted to this strategy. This implies the adaption of recruitment processes, employee branding and marketing (Ditzel 2015).

The *Follow-Up* element aims to achieve a continuous improvement process and to control all measures (Cox 2001). According to Cox (2001), the change process is “[...] continually accessed and refined over time in a process of continuous loop learning.” (Cox 2001: 18). The establishment of tools that measure the success of diversity management are important to identify barriers and adjust measures accordingly during the early phase of implementation. Instruments such as the Diversity Scorecard, the development of enterprise-specific key figures and an Open Balanced Scorecard are appropriate to measure success (Hermann-Pillath 2009).

Taking the described aspects into account, a structured and transparent development and implementation of a management strategy is of particular importance.

3.2 Research Design for Developing a Diversity Management Strategy for a Research Association

Based on Cox (2001), Aretz and Hansen (2002, 2003a, b), and Klaffke (2009), diversity management in organizations must be understood and anchored as a leadership task. The transparent integration of a corresponding project into the organizational structure and the explicit support of the organizational management are important to achieve openness towards the project (Vedder 2009). Because of their specific environmental requirements, this is even more challenging to implement in a research institution (Leicht-Scholten 2011). For this reason,

this project is structurally supported by the Management Board of the Cluster of Excellence (CoE) *Integrative Production Technology for High-Wage Countries* which advocates for the implementation of a diversity management strategy for promoting innovation. Due to the structural as well as conceptual role of the project and the consideration of the CoE as a unified organization, the project was assessed in the so-called Cross-Sectional Processes (CSP), which mainly focus on collaboration processes within the CoE (CoE Integrative Production Technology for High-Wage Countries 2017). In the frame of the project, collaboration, employees, structures and results were analyzed. The conceptual framework of the research project focuses on the following diversity categories: (1) gender, (2) specialization and educational background/ discipline, and (3) interculturality. These diversity categories indicated a positive impact in the innovation context (Østergaard *et al.* 2011; Díaz-García *et al.* 2013; Lisak *et al.* 2016).

The different steps of an approach that lead to an organization specific diversity management strategy for a large research association are described in the following paragraphs (see figure I.2). The concept is based on the approaches of Cox (2001), Aretz and Hansen (2002, 2003a, b), and Klaffke (2009).

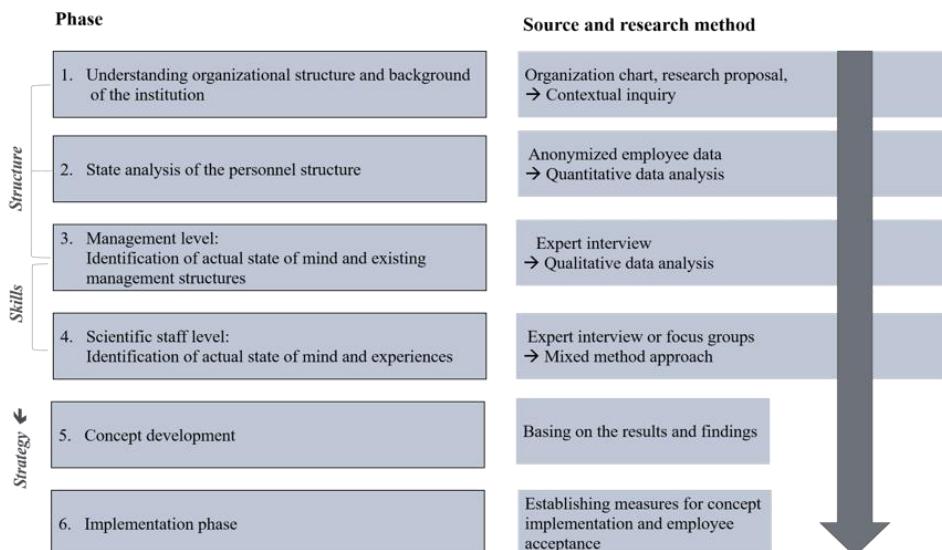


Figure I.2: Six phases of corporate culture change

It must be added that Cox' (2001) *Research and Measurement* perspective, as the special requirement for a large research association, is not entirely comparable to those of an enterprise and thus needs a detailed investigation.

3.2.1 Phase 1: Organizational Structure and Background of the Institution

To develop a customized diversity management strategy, it is crucial to understand not only the whole research association with its given structures and processes, but also the background and environment of the institution.

Considering Aretz and Hansen's (2002, 2003a, b) model of a system-theoretically oriented approach, in company's context, sub-systems that are applicable to a research institution can be derived and are shown in Figure I.3. The first phase was focused on the external factors which can hardly or cannot be influenced by the Cluster Management at all. Internal structures were considered in Phase 2 and Phase 3.

Cluster-external patterns and frames are based on the existence of sub management levels in institutions. Defined as competitive research and educational institutions, the Clusters of Excellence are conglomerates of different specialists and researchers coming from various faculties and research institutions (DFG 2014). They have been established in the frame of the so-called Excellence Initiative of the German federal and state governments, the German Research Foundation (DFG) and German Council of Science and Humanities (DFG 2016). These research networks are often highly complex, especially with regard to authorities assigned to issue directives. Furthermore, the university chairs and research organizations are characterized by their individual leadership styles and management structures and a great autonomy in structure and management which results from the independency of science. This aspect represents a fundamental structural difference from the implementation of diversity and innovation management strategies in research groups as individualized personnel management

and open and learnable corporate structures represent core aspects of applied diversity management (Aretz & Hansen 2003b). The independency of these institutions results in inconsistent recruitment processes, approaches in human resource management and handling of diversity and innovation processes. The heterogeneity of existing approaches requires a detailed investigation to enable a link to existing structures.

In addition, the Clusters are established as organizations with a high international visibility, and function as scientific networks among the participating institutions such as universities, professorial chairs and research institutes (DFG 2014). Due to the organizational anchorage of professorial chairs to specific faculties, the entrepreneurial background of research institutes, such as the Fraunhofer-Gesellschaft (2017), and the strong linkage to universities, Clusters are characterized by complex organizational structures. These structures differ from entrepreneurial structures especially with regard to authority in the underlying *habitus'* and working routines, accountability and corporate culture. Consequently, the conditions for the establishment of a diversity and innovation management strategy differ considerably from those of private enterprises. The complexity of the CoE at RWTH Aachen University is comparable to multi-layered organizational structures of economic enterprises.

Organization-external patterns and frameworks include the influence of university management and faculties of organizational. Embedded into the educational sector, Clusters of Excellence are influenced by the requirements of their environment. In Germany, lectureship and research are combined and must be conducted by each institute. This results in a variety of task-fields for the workers. Because of this, researchers must fulfill educational tasks, train junior managers, and fulfill duties for their research assignment.

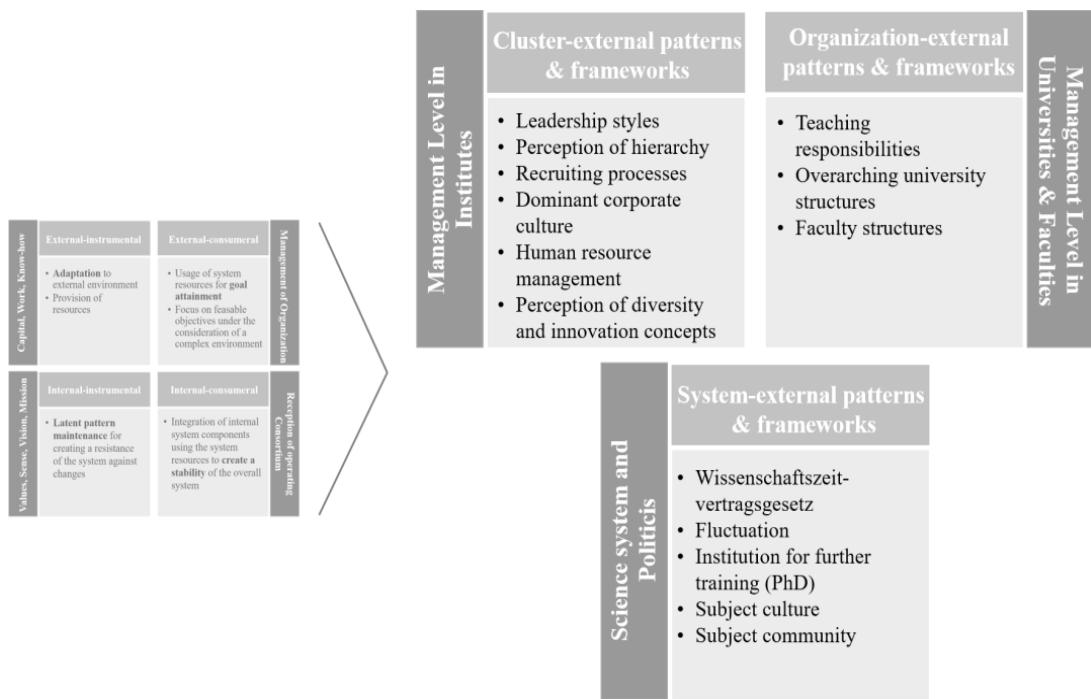


Figure I.3: Sub-systems of research organizations

Regarding *System-external* aspects, it must be considered that employees are embedded in their respective specialist/ scientific culture. This means that, in comparison with companies that have a corporate culture and a superior common goal, these research groups consist of members who have heterogeneous specialist cultures, have been socialized in different organizations, and are representative of the individual interests of their respective units. The majority of scientific staff are striving to achieve their doctorate degree. For this reason, working at a research institute can be considered as further training that aims at archiving the next step of a career path. This perspective is supported by the statutory framework called *Wissenschaftszeitvertragsgesetz* (*WissZeitVG*). The law dictates that working in a scientific institution must be considered as an individual scientific qualification phase; therefore, the law modifies the possibility of fixed terms for employment. Research assistants can be employed at institutions for a maximum of six years (§ 2 Abs. I *Wissenschaftszeitvertragsgesetz* (*WissZeitVG*)). This influencing factor leads to a natural fluctuation and allocation of

resources. The resulting effects must be considered in the development of the strategy, as staff structure underlies a continuous change.

The three categories discussed above represent external influencing factors which need to be considered in the development of a diversity and innovation management strategy for a research association. The analysis shows that predominantly external influencing factors shape the landscape of cultures, visions and attitudes. Considering Cox' (2001) step of *Research & Measurement*, a research plan that allows the detection of all hidden structures and mindsets is necessary.

3.2.2 Phase 2: Status Quo of Personnel Structure

After the analysis of structures, it is important to gain an impression of the existing diversity in the research alliance. This is important to develop a needs-oriented strategy that promotes diversity as a driver for innovation. Aretz and Hansen (2003b) pointed out that a suitable approach for handling diversity in a company depends on the specific diversity mix which each company must determine. Despite differences in conditions, this is also applicable to research facilities. To be able to identify the profile of a research association, it is necessary to analyze the structure of the company's personnel.

For this reason, a quantitative data analysis of anonymized employee data was the first step to get an impression of the personnel body of the organization. The focus of this first analysis was on the diversity categories of gender, status group, discipline and culture. An elicitation of the diversity category *age* was not possible in this project due to inconclusive data indications.

The descriptive data analysis of the diversity category *gender* shows that the majority of the 381 employed Cluster members coming from 23 institutions are male (86.4%); while 73.8% of researchers working in the network are doctorate candidates (research assistants), 8.1% post-doctorates, 0.5% are junior professors, and 8.5% are professors (see figure I.4). Considering the

aspect of interdisciplinary, the analysis shows that 82.4% are from engineering sciences, 11.8% from the faculty of natural sciences and mathematics, 3.4% from economics and social sciences and only 1.3% from linguistic and cultural sciences. The remaining 1.1% have not given any indication regarding their disciplinary affiliation. For the diversity category *culture*, 9.7% of the members employed in the Cluster of Excellence have a non-German background. Since this is a quantitative analysis, it must be added that the migrational background and thus, the extent of interculturality cannot be determined.

To sum up, the first results show the need to increase gender and cultural diversity. A higher heterogeneity with regard to the professional orientation would be desirable; however, the high proportion of engineers is based on the thematic orientation of the research group and is difficult to change.

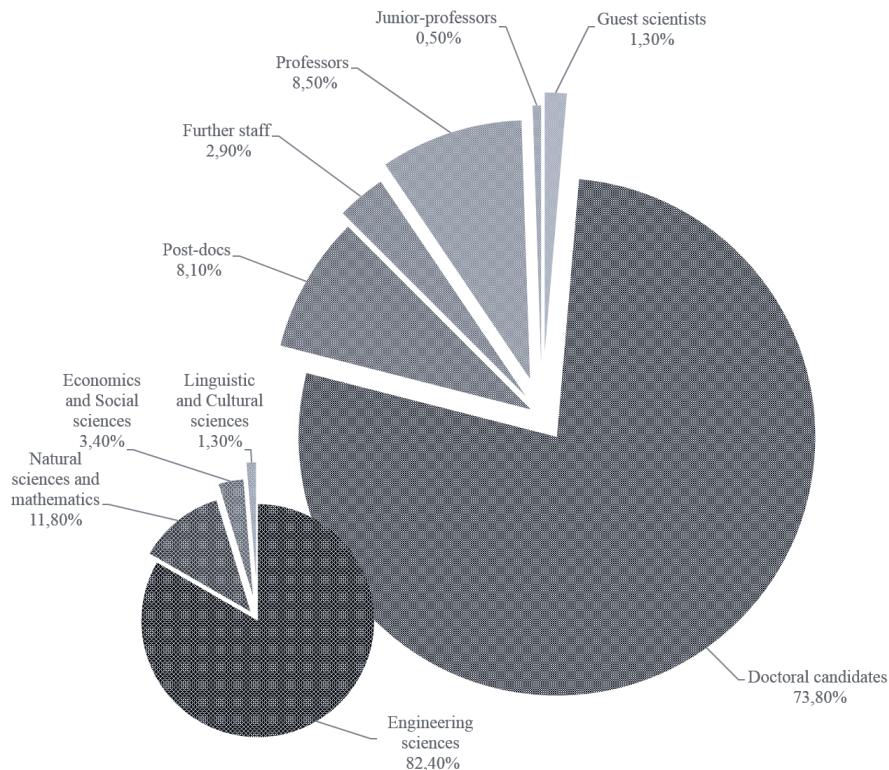


Figure I.4: Personnel structure of the CoE

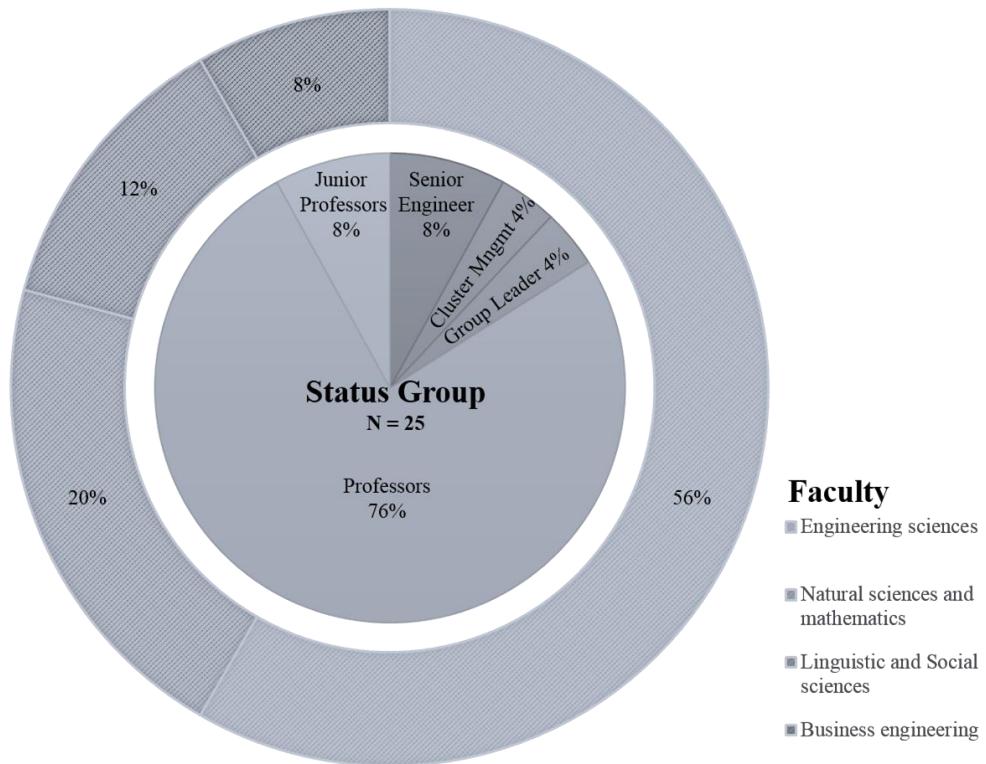


Figure I.5: Status group and faculty data of interview partners

3.2.3 Phase 3: Mindset of Management on Diversity and Innovation

Starting from this initial situation, the next step is to analyze the existing management concepts. The intention is to gather and understand the existing management approaches and mindsets on the subject of diversity and innovation in order to connect the new strategy with the current state and thus, be able to develop a strategy tailored to the institution. This refers to the internal perspective of Aretz and Hansen (2003b) model (figure I.1).

To reveal prevailing mindsets, experiences and attitudes, a research design that allows a detailed discussion of the research object is necessary; therefore, a qualitative analysis was carried out based on Mayring (2015). The interviews were based on a partly structured interview guide including open questions, which vary in concrete form and sequence. This allowed to consider the individuality of the interviewee.

In order to get an insight into the different institutions it is necessary to deal with each institution and the prevailing mindsets of the management level. The professors, junior professors, supervisors and group leaders of the institutions integrated in the CoE were the determined sample population. These status groups are characterized by a direct human resource responsibility, a decisive role in the recruitment process and experiences with the processes of the cluster.

After the analysis of employee data, the sample group was identified which consisted of 35 individuals including 29 professors, two junior professors and four persons from group leading, senior engineering and cluster management level. The sample consisted of 17.1% female researchers. A total of 25 individuals consisting of 19 professors, two junior professors, and four group leaders, senior engineers and managers were chosen to participate in the interview (refer to figure I.5). The response rate was 71.4%; where 24% of which are women.

To get an insight into the internal structures and sub-systems of the research object, a qualitative approach was conducted. This approach promotes broad acceptance in the research group through personal encounter and allows a reflection process on the individual policy of the institutions. The results have shown that the qualitative survey supported the self-reflection on diversity and innovation as well as the management approaches of the directors of the institutes. Through communication of the project, the topics of diversity and innovation became subjects of discussion which caused a renewed active analysis.

The interviewees can be characterized as leaders of their respective research groups. They either lead an entire research unit or a team; thus, they all have corporate responsibility as well as a strong integration into the institute's internal recruitment processes. The participants were asked about their understanding of diversity and innovation, the existence of management structures, and their individual experiences with diversity. Furthermore, questions about hierarchical structures and their importance were included in the questionnaire. As already mentioned, steep

hierarchies can hinder the innovation process (Hull & Hage 1982). This category allowed the different organizational structures to be analyzed and helped to understand the reason for their existence. These aspects are important in a qualitative interview because both, the causes of the current diversity profile as well as the structures for the management of human resources, were part of the investigation. The interviews were based on a semi-structured questionnaire in order to ensure a comparability of the statements.

The analysis of the 25 types identified in sub-codes led to the identification of 6 super-ordinated types (Steuer & Leicht-Scholten 2017). In each case, these types stand for a group of interviewees, who represent equal or comparable attitudes. The six types are described briefly below.

The *superficially informed* are individuals with basic knowledge of diversity strategies. Most does not have or have a vague idea of the strategies on how to manage diversity. They assume that diversity does not have to be managed and therefore, handling of diversity is driven by the unanimous opinion that it happens consequentially. This becomes evident through statements such as: “I do not like the term [diversity management] because I do not distinguish. I believe that universities are much more subject to social influences, which we, as institutions, can only conditionally change.” (Interviewee No. 6). On the basis of the preferred management style and attitude towards hierarchy, the assumption suggests that the interviewees have not yet been able to make any concrete experiences with diversity, and thus do not link them with a positive potential, As a result, the majority of the *superficially informed* do not see a connection between diversity and innovation or is unsure about it.

The *active follower* has a basic idea of diversity and diversity management. They see a connection between diversity and innovation and foster activities that in their opinion support processes of innovation creation. Although they do not have a deeper knowledge of diversity and innovation, this group pursues approaches of active diversity management, as they think

that diversity has to be managed in order to have a positive impact. “I would say that you have to worry about it; and that is often implicit. And they go hand in hand.” (Interviewee No. 5).

The *passive follower* is fundamentally or basically informed about diversity and diversity management. The majority applies forms of diversity management as they see a need to manage it. In contrast, they do not see innovation management as part of their scientific management task and therefore, use either a passive approach, or no approach at all.

The *intentional refusers* are fundamentally informed about diversity concepts; however, they have a specific idea of diversity management. They reflect the context between diversity and innovation but take a passive approach of diversity management or decide actively not to integrate any approach.

The *sceptics* are well-informed about diversity, but they show reluctance with regard to the implementation of diversity management approaches for different reasons. Consequently, in the description of concrete diversity management approaches, they showed an understanding that can be considered as basic knowledge. Nevertheless, they see the need to manage diversity; especially the environmental factors that may lead to scepticism of implementing diversity and innovation management strategies. In this context, an interviewee mentioned: “You just asked for the management, how should I deal with it? This is indeed a trade-off, it is a contradiction a bit, those are two conflicting goals. You are trying to reach a research result - in the shortest possible time, with as good result as possible, as measured by publications, publications, etc. But that you may no longer only act in your own community [...]; will not be rated but is rather a shortcoming.” (Interviewee No. 17). This statement elucidates the perspective of the *sceptics*, as they strongly see management approaches like diversity and innovation management in the context of their environment. Based on structural barriers in this environment, they see the need to manage diversity to be more innovative; but they are hindered by restrictions and structural disadvantages.

The *reflected users* have a profound knowledge of diversity and diversity management. The majority of them are actively pursuing a diversity management strategy. With regard to interdisciplinarity, one of the interviewees mentioned, “[t]he most important capability [...] is this - as I say - interdisciplinary openness. Or I’ll formulate it another way. The tolerance and acceptance of other specialized cultures as at least equal to themselves.” (Interviewee No. 12). Another participant stated that: “[...] because I believe that it is obviously also the presence and the introduction of arguments and aspects from the holistic view of society that leads us all much further.” (Interviewee No. 3).

The identified types allowed the authors of this paper to form conclusions on the prevailing mindsets and institutional cultures in this research organization. In this context, managers function as role models and must embody the institution’s norms and values, and corporate culture (Sackmann, 2014). To compare the identified types with the employees, it is necessary to actively involve employees into the research concept (for further discussion see Steuer & Leicht-Scholten 2017).

3.2.4 Phase 4: Mindset of Employees on Diversity and Innovation

Team characteristics are not to be equated with the characteristics of team members. The individual group dynamic is influenced by its individual team members which in turn also influences the individuals’ way of thinking and behavior (Díaz-García *et al.* 2013); therefore, it is important to understand the dynamics in the Cluster of Excellence. To do so, the project investigated the understanding of the organization’s members on diversity and innovation.

Based on the quantitative analysis, research assistants (doctorate candidates) are the biggest group of employees in the Cluster of Excellence (73.8%). For this reason, it is crucial to integrate this group into the process to avoid reactance against the diversity and innovation management strategy. In order to obtain a broad perspective of the prevailing attitude towards

the topic and a detailed reflection of experiences, a mixed measure approach was conducted in this phase.

A qualitative employee survey was done to allow a deeper insight into the mindset of research assistants. In addition to the identification of previously dominant attitudes, the aim of this phase is to supplement the data obtained from the interview of the management with that of the perspective of the employees. The results will be used to identify which approaches might be successful and which aspects do not lead to the desired results. Furthermore, the qualitative approach will allow comparisons of the mentioned existing approaches and strategies from management perspective with the expectations and perceptions of employees. This will allow to identify the gap and will assist in the development of a concept for a strategy that combines both perspectives that will have a long-term impact.

For the qualitative survey, focus groups will be identified which will consist of subsets of the entire institution that has already been studied quantitatively. The application of focus groups has advantages and disadvantages (Litosseliti 2003). There is a possibility that employees might influence each other (false consensus), and especially in this case, they might know each other, which could, as a consequence, lead to a non-safe environment. On the other hand, focus group discussion will allow a critical dispute on the topic (Raab *et al.* 2008). Furthermore, Gibbs (1997) mentioned that although focus groups are not empowered to make decisions, participants appreciate that they are allowed to be actively involved. Nevertheless, it is important to take into account the extent to which interactions and mood effects can have an impact on the survey, especially against the topic diversity and innovation.

This phase is currently being planned. Results will be published as soon as possible.

3.2.5 Phase 5 and 6: Strategy Development and Sustainable Implementation

Based on the analysis of the given structure and skills, a tailored strategy can be developed (see figure I.3). As already mentioned, this methodology is important because of the given structure of the Cluster of Excellence and the associated dominant engineering habitus (Bourdieu 1982). In the framework of the strategy, the different findings in phases one to four are summarized and interwoven into a concept which aims at increasing diversity and fostering innovation through a diverse workforce.

Considering the implementation phase, the approach should be exemplified by the Cluster Management, but also by the leaders of institutions; however, it is particularly important not to sell diversity from a top-down perspective, but to listen to criticism and rejection, and to be sensitive to the specific approach (Aretz & Hansen 2003b). In this context, employees' can be actively interwoven in a participatory approach that reflects the needs and barriers of a diverse workforce. With regard to the results of the qualitative interviews of professors (phase 3), the goal is to develop measures that actively convince and integrate members of the *superficially informed, intentional refusers, and sceptics* (Steuer & Leicht-Scholten 2017). Against the background of numerous institutions that are included in the Cluster of Excellence, the exemplary function of the executives is of particular importance.

Regarding the enforcement of diversity, it is essential to integrate learning environments that encourage the practical handling of diversity. This strategy features an *Innovation Lab* (Steuer *et al.* 2017) that allows institutionalized meetings of groups with diverse and frequently changing members under a specific research question and thereby, symbolizes a spirit of practiced diversity in the innovation context. In addition, the integration of strategic metrics, such as the Balanced Score Card, will allow a sustainable evaluation of measures which could result in a continuous qualitative improvement (Müller *et al.* 2016).

3.3 Challenges and Limitations

The system-theoretically oriented approach allows a fundamental perspective on structures and strategies of the research association. It represents the basis for a sustainable reorganization process under the consideration of sub-systems and influencing factors (Aretz & Hansen 2003b). The presented approach is based on the approaches of Aretz and Hansen (2003a, b), Klaffke (2009) and Cox (2001) that considered the implementation of diversity management in an entrepreneurial frame. The limitation of transmitting these systems to an organization embedded in a scientific environment, makes adjustments necessary; especially factors such as the fluctuation of scientific staff which has to be considered in phase 4, the limitation of company affiliation which is reasoned by the *Wissenschaftszeitvertragsgesetz* (*WissZeitVG*), and the high independency of research groups and institutions. All these require a specific approach.

The challenge is to develop strategies that will enable an organizational change through all levels of the research organization, taking into account the mentioned variables of insecurities. The aim is to implement a broad understanding of diversity and to avoid reactance against linked measures. Nevertheless, diversity results in higher complexity and requires good management and transparent communication processes to be successful. Based on the findings in phase 1, this is of particular importance as homogeneous and mono-cultural personnel structures have a higher probability of reactance. Furthermore, the high complexity of big research associations is accompanied by high efforts in understanding the enterprise and its members which aggravates the development of a suitable approach.

4 Conclusion and Outlook

The presented project followed a conceptual approach that deals with the implementation of a diversity management strategy with a strong focus on innovation creation in a research

association with a very high complexity. Consequently, there is a lack of comparable concepts dealing with this topic which leads to a lack of comparisons to other projects and experience reports. It would be highly interesting to discuss the experiences and results in the international community.

Although research groups claim to be an inherent organization (qua organizational chart), diffuse hierarchical structures exist; therefore, the development of diversity management in a research organization faces different challenges than the implementation of a corresponding strategy in companies with a stringent top-down management. For this reason, it is important to establish a common corporate culture and, based on that, a common understanding of diversity management.

The implementation of the first three phases of the process has shown the necessity to actively deal with the workforce of research associations and to analyze the underlying structures and mindsets. In the first phase, the analysis of the organizational structure revealed key areas that can positively or negatively influence the integration of a diversity management system. As diversity management is always accompanied by a change in management approach, the identification of sub-systems allowed the conscious integration of possible barriers or promoters. Phase 2 allowed the detection of individual needs that require action, which could serve as the basis for developing a strategy that could answer the specific requirements. Furthermore, the amount of an organization's diversity indicates how much of the team processes, which are influenced by diversity, are part of an employee's daily life. This will help understand if mindsets and experiences are based on concrete situations in the working environment or are influenced by theoretical assumptions. To further investigate this, an employee survey is necessary which will be conducted in phase 4. Phase 3 connected the barriers or promoters identified in phase 1 with specific persons. The qualitative approach made it possible to experience mindsets as well as attitudes in the context of diversity and innovation

management. As a consequence, the results of the third phase allowed integration of the key personas according to their type into the implementation process. On the other hand, the concept needs to be tied to the prevailing mindsets and strategies to actively follow-up on the different previous management approaches, and thus to actively integrate the management level and its perspective. This aims to minimize denials of new approaches and allow a broadly accepted change towards a joint strategy. Subsequent to the implementation, further delicate adjustments of the strategy will be carried out. This opportunity will allow detailed aspects of the association between diversity management and innovation be identified.

With regard to the presented Cluster of Excellence, the next step will be to develop and implement customized measures. Further research could investigate which measures work and why they work, in order to understand the logic, structures and control lever of such a big research organization. To achieve this, it is necessary to anchor controlling elements and measurement methods in the research approach. A corresponding need to adjust methods and instruments of control or a re-development might be required. In doing so, the research could contribute in the discussion of the development of tools which will allow measurement of the competitive advantage of diversity in an innovation context.

The analysis points out that the existing structures and mindsets of research networks have a significant influence on the use of diversity as an innovation factor. This results in the need to break down these structures and thinking patterns in order to integrate them into a management strategy. The potential of the presented approach lays in its transferability on other complex research organizations. It represents a basic approach for achieving a long-term integration of diversity for aiming socially responsible research and innovation creation.

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Research Paper II

Innovation & Diversity - Integrating new Perspectives into Research Associations

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I Abstract

The link between diversity and innovation is broadly discussed in the context of research and innovation processes. Many institutions and enterprises, specifically in commerce, have already tried to establish sustainable diversity management concepts, in order to increase the diversity of their workforce in addition to establishing a corporate culture of openness. Alongside the creation of a working place where different experiences and skills are valued equally, the entrepreneurial intention is to transfer diversity into economically relevant advantages. Considering the potential of diversity in research and innovation processes, the project *Diversity- and Innovation Management* was incorporated within a large interdisciplinary research Cluster. The project's purpose was to study the context between diversity and innovation in research associations and to later develop a customized management concept into an interdisciplinary research Cluster on integrative production technology with full integration. The challenge of such research associations lays in an organizational structure which is often described as being decentralized. Researchers coming from different academic disciplines, while having diverse habitus, conduct research on large scientific issues and challenges. In addition, these researchers are socialized in different institutions and university chairs. These differences in leadership styles, business cultures and organizational strategies, follow into their research teamwork. Taking a closer look into the management of human resources suggests that decentralized organized recruitment processes, as well as allocation of human resources, lead to a lacking overview in regard to missing competencies, perspectives and backgrounds in research networks. These circumstances are comparable to big corporate groups. While developing a management concept for research associations, these characteristics must be considered. To ensure this, the project follows a human-centered approach, which considers top-down, as well as bottom-up perspectives. This paper presents the applied mixed-method approach in the scientific issue described above. In the frame of the Cluster of Excellence (CoE) *Integrative Production Technology for High-Wage Countries* research results based on quantitative, as well

as qualitative studies, were presented as an application example. This paper provides a new perspective on the innovation and diversity context. Against the background of complex research organizations, the development approach of a management concept is particularly interesting.

Keywords: Innovation, Diversity, Innovation Management, Diversity Management, Leadership, Qualitative Research

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1 Introduction and Background

Research and development (R&D) teams, both in the scientific and economic context, are subject to similar conditions. Their aim is the development and advancement of products and services. Following OECD's (2011) definition of research and development, it can be understood as “[...] creative work undertaken on a systematic basis to increase the stock of scientific and technical knowledge and to use this stock of knowledge to devise new applications.” (OECD 2011: 15). In this context, the concept of innovation plays an important role. Baregheh *et al.* (2009) define innovation as “[...] the multi-stage process whereby organizations transform ideas into new/improved products, services or processes, in order to advance, compete and differentiate themselves successfully in their marketplace.” (Baregheh *et al.* 2009: 1335). Commencing from these definitions, the difference between innovation and invention lies in the marketability of an output (Vahs & Burmester 2002). What seems to be self-evident for R&D teams in economy, is gaining importance in science as well. Particularly in engineering sciences, there is a strong connection to economically relevant questions (Jain & Triandis 1990). So-called Clusters of Excellence are “[...] internationally visible, competitive research and training facilities, thereby enhancing scientific networking and cooperation among the participating institutions.” (DFG 2014: n.p.) and application examples which precisely reflect these aspects. The strong link between scientific research and economy is reflected in close cooperation with various companies and industrial advisory boards, which are implemented into and cross-linked in the organizational structure. The demands, and thus the needs, of potential users, stand in context of marketability. In order to take account of the complex necessities of a diverse society, a workforce is required to reflect this very diversity. To be able to effectively utilize the scientifically proven positive effects of diversity on different corporate processes (Santandreu Calonge & Safiulli 2015; McKinsey 2015; Díaz-García *et al.* 2013; Hewlett *et al.* 2013; Hoogendoorn *et al.* 2013; Østergaard *et al.* 2011), numerous

companies have established diversity management, which brings diversity into the innovation context (European Commission 2011). As one of the first research groups, Díaz-García *et al.* (2013) examined the context between diversity and innovation under the consideration of a R&D environment. In the process, they focused on the impact of gender diversity on radical innovation. They found out that there is a positive and significant correlation between radical innovation and gender diversity in R&D teams (Díaz-García *et al.* 2013). Despite the advantages of managed diversity and the parallel between R&D teams in both economic and scientific contexts, there are still few attempts at targeted and customized diversity management concepts, especially in large research associations (Leicht-Scholten *et al.* 2011). In contrast, Jain and Triandis (1990) emphasize that R&D organizations, in particular, need a special coordination due to complex requirements and organizational structures, as well as interdisciplinary issues. This is particularly important against the background point that diversity alone is no guarantor for innovation (Bartz *et al.* 1990; Aretz & Hansen 1992). The need to manage diversity results from the complex processes of team cooperation. The aim of diversity management in this context is to create an environment of optimal cognitive distance (Nooteboom *et al.* 2007; Günther 2014), which on the one hand results from diverse team members but on the other requires a framework that allows mutual understanding (Hagenhoff 2008).

To use the advantages of a diverse workforce especially in the R&D relation, the Cluster of Excellence (CoE) *Integrative Production Technology for High-Wage Countries* at RWTH Aachen University has established a project named *Diversity- and Innovation Management* whose core aim is to develop a customized diversity and innovation management strategy that leads to an increase of diversity on the one hand and to a higher innovation potential on the other. The project is part of the so-called *Cross Sectional Processes* (CSP) which deal with the

organization of collaboration, within the CoE, to transfer the contributions of the individual sub-projects into a holistic approach.

2 Research Design

The success of diversity management, in the innovation context, depends on different factors. The organizational structure (Caye *et al.* 2011), management styles (Thompson, 1965), hierarchical levels (Hull & Hage 1982) and the number of team members (Weiss & Hoegl 2016) are influencing factors to be mentioned in this context (Steuer *et al.* 2017). To ensure a sustainable and holistic diversity management concept, these influencing factors must be considered as the theoretical framework for applied research approaches. In order to build a concept that increases the innovation potential, it is necessary to consider the research association as a system that consists of different sub-institutions. As a result, the research approach is based on a quantitative environmental analysis of the organization. In order to take hidden structures, institutional cultures and diverse mindsets into account, it also requires a supplementary qualitative analysis. As a result, a mixed-method approach is applied within the framework of this project.

2.1 Environmental Analysis

The aim of the environmental analysis is to understand the organizational structure and to capture the actual state of the cluster, with regard to diversity and hierarchical levels. Consequently, based on a quantitative analysis of anonymized employee data, the human resource profile of the cluster is first ascertained. The evaluation of data is focused on the diversity categories gender, status group, discipline and culture.

The evaluation of the data of 381 employees shows a research alliance that is strongly male dominated. 86.4% of the employees working in the Cluster are male. Looking at the data of the

research level, including professors, junior professors, junior group leader, postdocs, research assistants, guest scientists, 86.5% are male researchers. The evaluation of the data with regard to the status groups research assistants, post docs and professors, the analysis shows that in each individual status group the proportion of women is only 10-15%. Reflecting the research content, this is not surprising, as 82.4% of all employees are located at engineering faculties. Due to the subject of the cluster it is not astonishing. Based in engineering the male female ratio represents the actual situation in mechanical engineering schools in Germany. The absolute majority of employees can be allocated at the faculty of mechanical engineering. Due to the anonymous data, as well as fluctuation, an exact percentage is not determinable. Concerning the amount of interdisciplinarity, 11.8% are from the faculty of natural sciences and mathematics, 3.4% are assigned to the faculties of economics and social sciences and only 1.3% are located at linguistic and cultural sciences. 1.1% of the employees could not be allocated to a faculty. In respect of the diversity category status group, the biggest group represented in the cluster are research assistants, with a share of 73.8%. Combining the diversity categories status group and discipline, it becomes clear that the representation of all subject areas is only represented in the status groups research assistants and professors. The status groups in between are characterized by employees from engineering and mathematics. Analyzing the diversity category culture, results show that the majority of the cluster members has a German cultural background (90.3%). Especially professors and the group research assistants are distinguished by a rather German background with a share of 92.5% Germans, while postdocs represent the internationally most mixed group (22.6% with a non-German background). Since the evaluation is based on quantitative data, there is no further information on migration background or other cultural influences. Nevertheless, the data on the cultural diversity are significant. Looking only at the organizational structure of the cluster, it could be considered as a simple divisional organization, which is divided into research areas with a specific focus. Although the management level is clearly defined in the organizational chart, staff-like units such as the so-

called *Steering Committee*, which consists of professors and other management personnel, lead to a fairly broad management level. In the frame of the application example, the complexity lies in the fact that 35 professors/junior professors from 23 institutions/university chairs and five faculties, form and influence the corporate culture of this research association. In order to be able to understand these complex structures and the hidden processes, it is necessary to use approaches that allow a more detailed perspective. Business processes are particularly encouraged to be top-down processes with regards to corporate culture, especially if diversity management is understood as an organizational development process rather than a HR development process, (Russell 2006; Aretz & Hansen 2002). This is also accompanied by changes in structures and management systems. Although these changes have to be lived and reflected bottom-up, the communication and direction is going top-down. Therefore, it is necessary to capture the prevailing state of mind in the management level.

2.2 Top-Down Analysis

In order to be able to analyze the prevailing mindsets of the management level, an instrument is needed, which permits a deeper analysis. Therefore, a qualitative analysis was carried out in the frame of the second step. In the frame of the following sections the research process after Mayring (2015) is illustrated.

2.2.1 Determination of the Target Group

In order to obtain a comprehensive perspective in the prevailing mindsets of the management level, professors, junior professors, supervisors and group leaders were consulted for the qualitative interviews. These status groups are characterized by a direct human resource responsibility, a decisive role in the recruitment process and experiences with the processes of the cluster. After the analysis of the provided employee data, the target group covered 35 persons, including 29 professors, two junior professors and four persons from group leading,

senior engineering and management. With regard to the quota of women, 17.1% of the target group were female researchers. In the frame of the interview phase, the response rate laid at 71.4% and 25 interviews have been conducted. Considering the conducted interviews, 19 professors, two junior professors and four group leaders, senior engineers and managers participated. Following from the group of participants the women's quota laid at 24% which results from the fact that all contacted women participated.

2.2.2 Description of the Situation

The participants were informed about the project in various instances. In the frame of the cluster-intern conference and management statements the intention was published. The target group was invited to the study by supervising professors of the project, who are in the faculty of civil engineering, as well as social sciences (bridging professorship), georessources and material sciences. The first invitation was given as an official letter. The second recruiting phase was conducted via phone calls and E-Mail. The participation was voluntary, and interviews were held at the respective institute. The interviews were based on a semi-structured guide including open questions, which vary in concrete form and sequence. The interviews were all conducted by one person in a duration of 15 minutes to two hours, with the average being one hour.

2.2.3 Formal Characteristics

The interviews were recorded and then transcribed into digital word-form. A transcription handbook was further developed that transparently manifests transcription instructions.

2.2.4 Analysis

As already indicated, the analysis unit of the first qualitative survey is derived from the state of research with regard to the influencing factors on innovation processes. As a consequence, the

management level of the Cluster of Excellence, represents the object of the first qualitative investigation. The research topic results from the scientific question and the objective of the project. The research of this first phase aims to identify specific mindsets, which can also be seen as types. For this reason, the conducted qualitative analysis can be characterized as structuring content analysis that is classified as type casting structuring and is based on a deductive definition of categories. The deductive approach results from the theoretical analysis of impact factors on an innovation-aiming diversity management system. The different types were deduced by analyzing extremes, interests as well as empirical frequency, which is based on the thesis that there are extreme manifestations of the perception and appreciation of diversity in the innovation context. In order to capture further types categories were developed that are related to the earlier mentioned influencing factors leadership style and insights of hierarchical structures, but also to aspects like habitus and subject culture. As a result, the subjects of the survey were:

- Presentation of the person, position / function and specialist background
- Definitions of Diversity, Innovation, Diversity Management, Innovation Management
- Perception of Diversity- and Innovation Management Structures
- Experiences with Diversity
- Perception of the individual leadership style and hierarchy
- Vision

Building on these survey chapters the first category system was built. The abstraction level of this category system was aligned to the above-mentioned topics of the semi-structured questionnaire. As a result, the categories were first listed in order of their occurrence in the evaluation units. In the frame of a second material analysis prototypical passages were identified, to build a new category system based on the theoretical assumptions. All categories

were specified further with sub-codes. Following the process of a deductive classification, coding rules were defined. Content that doesn't belong to this category scheme was screened and allocated to newly developed categories. First sample encodings were carried out at the example of one interview, in which the individual categories were assigned to the coding units. Anchor examples were used for a clear thematic allocation of content. In order to ensure the semantic validity, several discussions were held with members of the project group, in which the categories were discussed, and questionable texts were analyzed and clarified. Following, the analysis of all evaluation units was conducted. The verification of intercoder reliability and extension of the coding guide followed. During the encoding phase, the new encoding rules and anchor examples among the encodings were interrelated several times. In order to increase the reliability of the analysis, the interviews were encoded at four different times. In the case of unsafe category assignments, the relevant text areas were compared with the remaining citations of the individual categories and then clearly assigned. Subsequently, the encodings were examined by other project members and unclear encodings were discussed in order to guarantee a uniform coding scheme. Consequently, further anchor examples were added. In the frame of the first category system, a total of 7 categories with 28 sub-categories were found. A total of 834 codings were identified in the frame of the coding process.

To ensure an accurate analysis of potential types, methods of the inductive category development system were used (Mayring 2015). The process of paraphrasing and generalizing the quotations allows a neutral summary of comparable statements and the development of specific sub-types that, as a result, allow the combination of different sub-types to superordinate types that stand for specific mindsets. With regard to the research question specific sub-codes were chosen that include information about influencing aspects on diversity management. A result the sub-codes: SC 2.3: Definition Diversity, SC 3.1: Definition diversity management and SC 3.2: Integration of diversity management were considered in the further process. The

sub-code SC 3.3: Definition of Innovation Management is the basis to define the prevailing ideas of innovation management. To discover the influencing factors on the implementation of diversity management the sub-codes SC 4.3: Need to manage diversity, SC 5.1: Description individual leadership style and SC 5.2: Importance of hierarchy were summarized. To understand the intentions and behavioral patterns of the interviewed leaders the reflection of advantages through diversity was considered by taking into account the sub-codes SC 3.4: Context diversity and innovation and SC 5.3: Context leadership style and innovation. The methodical approach of Kluge (2000, 1999) serves as basis for the development of types. To simplify the identification of types, a first clustering of sub-code statements that leads to an identification of sub-code related types was undertaken. The types were determined according to the expressions of extremes, theoretical views and empirical frequency. The identification of specific types is based on the already mentioned influencing factors on innovation processes. In a next step, an interdisciplinary analysis based on causal connections and a first typing system is carried out. The included sub-codes and the extracted categories within the sub-codes are explained in the table II.1.

Table II.1: Sub-code types clustered in topics

Topic 1: Mindsets on Specific Concepts in the Diversity Context		
SC 2.3: Definition Diversity		
Category 1: The Reflected Classifier	Cat. 2: Fundamentally Informed	Cat. 3: The Well-Informed Sceptics
The reflected classifier has a specific idea of the diversity concept. The person is able to contextualize different diversity categories with the potential of diversity. Chances and challenges are reflected and transferred to the own field of action.	In this category people are summarized that have a rough idea of the diversity concept. They are able to list a number of diversity categories. These categories are part of their everyday life and are not based on a deeper understanding of the theoretical framework.	They have an idea of the diversity concept. Before mentioning their individual definition or any diversity category, they argue that diversity should not be imposed on the institutions and should be compatible with the daily business. In this context they mention categories they are confronted with.
SC 3.1: Definition of Diversity Management		

Category 1: The Reflected Classifier	Cat. 2: Fundamentally Informed	Cat. 3: The Inexperienced
In this category people are outlined that have a comprehensive understanding of diversity management. For those persons the intelligent use of personality profiles and the development of a corresponding environment as well as business culture are the main aspects of diversity management.	Persons in this category can classify activities that support diversity in an abstract way. The mentioned approaches are not anticipated in a holistic strategy and appear more in the context of affective behavior that differs depending on the situation.	The inexperienced have not been in touch with diversity management yet. They have a very rough or no idea which activities can be defined by the concept. They mention that certain steps are necessary to achieve specific diversity aims but cannot describe or elaborate these steps or activities.

SC 3.2: Integration of Diversity Management

Category 1: The Active Ones	Cat. 2: The Passive Ones	Cat. 3: The Resistors
They practice different forms of diversity management activities. The scope of diversity management approaches ranges from initial, affective activities up to strategical forms with a differentiated objective. The focus in this category lies on the active handling of diversity without differentiating the quality of the individual approach.	The passive ones recognise diversity at their institutions but do not deal with this diversity. For these persons diversity is not part of their management concept. They see the responsibility for diversity management in the higher education management. Activities with regard to teambuilding processes are restricted to observations.	The resistors do not see a valuable advantage in diversity. As a consequence, they don't integrate approaches of diversity management in their institutions.

Topic 2: Mindset on Innovation Management

SC 3.3: Definition Innovation Management

Cat. 1: The Active Applier	Cat. 2: The Active Denier	Cat. 3: The Passive Ones
This group sees the need to integrate innovation management into the scientific everyday life. For these persons it is necessary to motivate and sensitize employees/research assistants for certain topics and to keep an eye on new developments and trends.	People in this group think that innovation management is no management task of institutions at universities. They see a strong context between innovation management and economy.	The passive ones in this sub-code see innovation management not as an active management task. In their opinion innovation management cannot be managed actively, as it is defined as a subconscious process which is motivated merely intrinsic.

Topic 3: Influencing Factors on the Implementation of Diversity Management

SC 4.3: Need to Manage Diversity

Category 1: There is a Need to Manage Diversity	Category 2: There is No Need to Manage Diversity
People in this group see a need to manage diversity because diversity bears challenges. From this perspective the need to manage diversity is seen as a continuous management task. This is accompanied by the recognition that diversity alone is no warranty for success.	People in this group don't see the necessity to manage diversity. They shift this management task to the superior system and see themselves as dependent to the scientific circumstances without possibility/need to change something.

SC 5.1: Description Individual Leadership Style (Classification after Tannenbaum & Schmidt, 1958)		
Cat. 1: Authoritarian Style (including patriarchal, consultant)	Cat. 2: Consultative Style	Cat. 3: Cooperative Style (including participative, delegate)
The authoritarian leaders make decisions on their own. Employees are informed about decisions but the final decision lays at the management level.	The consultative leaders give a direction but let employees the chance to share their opinion.	This group let employees participate. They accept and foster decisions and ideas from bottom up and see a potential in this approach. Their main task is to function as filter and final decision giver. Employees have a high level of freedom in the generation of new ideas.
SC 5.2: Importance of Hierarchy		
Cat. 1: Anticipated Importance of Hierarchy	Cat. 2: Differentiated Consideration	Cat. 3: No Relevance of Hierarchy
Executives in this category think that hierarchy is an important construct to make decisions. They see it as an instrument to provide a strategic direction and an organizational frame. In addition, hierarchy for these people is an element to put responsibility on employees in a transparent way.	This group is characterized by its differentiated consideration of hierarchy. They think that hierarchy is only important in specific situations. From their personal point of view, they reject hierarchy, but reflect that it is necessary to use such structures to make decisions. In daily teamwork it is not important.	For participants in this group hierarchy is not relevant. They focus on a collaborative that is not influenced by specific orders or status.
Topic 4: Impact Factors on Innovation Creation Process		
SC 3.4: Context Diversity and Innovation		
Cat. 1: There is a Context	Cat. 2: There is No Context	Cat. 3: Unsure
Participants see a clear context in diversity and innovation. They are able to mention concrete examples that stand for this context. The mentioned advantage is seen in the diverse perspectives and approaches.	Participants in this group see no or no strong context between diversity and innovation. From their point of view innovation is based on an individual performance and is not influenced by group work.	Participants in this group are unsure about the context. In their opinion it is possible that there is a context but on the same time there is a higher chance that the advantages of diversity appear coincidental.
SC 5.3: Context Leadership Style and Innovation		
Cat. 1: There is a Context	Cat. 2: Unsure	
Interviewees see a context between leadership style and innovation. In their opinion leaders are responsible when it comes to creating an environment that supports the creation of innovation. In this context the most frequently mentioned aims of leadership are: Encouraging an intrinsic motivation and the creation of an environment that allows employees to experiment and to have responsibility	Interviewed people in this group mention that there are diverse influencing factors that lead to innovation. For them it cannot be clearly defined if leadership is an influencing factor	

Based on the 25 sub-code types, identified in 9 sub-code categories, superordinate types can be identified. Giving each sub-code type an individual code for every interviewed person, the developed system serves as basis to discover overarching types that represent specific mindsets. During this process the aim is to identify types that show an internal homogeneity on the type level on the one hand and an external heterogeneity on the typology level on the other hand (Kluge 2000). This leads to a hypothesis-derived analysis of inter- as well as intra-individual differences and changes with every single dimension. To validate the identified types, case analyzes were carried out for typical variable configurations that allow the elucidation of contexts.

3 Findings

The analysis of the 25 types identified in the sub-codes leads to the identification of 6 superordinate types. In each case, these types stand for a group of interviewees, who represent equal or comparable attitudes.

3.1 The Superficially Informed

The superficially informed is characterized by a basic knowledge about diversity concepts. Regarding diversity management approaches they have no, or only a vague idea, of concepts of how to manage diversity. Concerning management approaches mentioned during interviews, the answers indicate that there are forms of diversity management measures, but that these measures are neither chosen conscious nor identified as part of diversity management strategies. They assume that diversity has not to be managed and therefore handling of diversity is driven by the unanimous opinion that it happens incidental. In this context it is interesting that half of the study participants in this group is classified as leadership personalities, with an authoritarian leadership style with the fundamental attitude that hierarchy, is a necessary instrument (see figure II.1). Based on the preferred management style as well as the attitude towards hierarchy,

the assumption suggests that the interviewees have not yet been able to make any concrete experiences with diversity, and thus do not link them with a positive potential. As a result, the majority of the superficially informed do not see a connection between diversity and innovation or is unsure about it. With regard to innovation management, they see a value in managing innovation and apply different approaches to foster innovation creation in their institutions. This policy is supported by the broad opinion that there is a context between the leadership style and innovation.

3.2 The Active Follower

The active follower has a basic idea of the terms diversity and diversity management (see figure II.1). As they see a context between diversity and innovation, they foster activities that in their opinion support processes of innovation creation. Although they have no deeper knowledge of diversity and innovation, this group pursues approaches of active diversity management, as they think that diversity has to be managed in order to have a positive impact. They also see innovation management as part of their management tasks. The active follower describes themselves as cooperative leaders who try to involve their employees. This specific leadership style seems to be the most effective way to lead innovative institutions for this group, as the majority sees a context between leadership style and innovation. In this context, the majority in this group has a differentiated opinion about hierarchies.

3.3 The Passive Follower

The passive follower is fundamentally or basically informed about the concepts of diversity and diversity management. The majority applies forms of diversity management as they see a context between diversity and innovation with the need to manage diversity. In contrast to diversity management, they do not see innovation management as part of their scientific

management task and therefore use either a passive approach, or no approach at all. Considering the leadership style, there are diverse preferences with tendency to consultative.

Figure II.1 illustrates the interrelation of the described types in the categories SC 2.3: Definition Diversity, SC 3.1: Definition diversity management, SC 5.1: Description individual leadership style, SC 5.2: Importance of hierarchy, 3.4: Context diversity and innovation and SC 5.3: Context leadership style and innovation.

3.4 The Intentional Refuser

The intentional refuser is fundamentally informed about the diversity concept but has a specific idea of diversity management (see figure II.2). He/ she reflects the context between diversity and innovation. However, he/she takes a passive approach of diversity management or decides actively to not integrate an according approach. It is interesting to mention that all leadership styles are represented in this type which leads to an average classification to the consultative style.

3.5 The Sceptic

The sceptic is well-informed about diversity but shows reactance with regard to the implementation of diversity management approaches. However, in the description of concrete diversity management approaches he/she shows an understanding which is to be classified as basis knowledge. Nevertheless, this group sees the need to manage diversity. Despite the very diverse opinions on the subject of innovation and diversity, participants in this group are active users of innovation management approaches and consider it to be part of the individual scientific management portfolio. The majority of this group follows an authoritarian leadership style. All members of this group see a context between leadership and innovation but are in the average unsure about the context of diversity and innovation (see figure II.2).

3.6 The Reflected User

The reflected user has a profound knowledge of diversity and diversity management. With respect to the implementation of diversity management the majority of this group pursues an active approach. Despite this, many of people within this type can classify concepts of innovation management. Consequently, he/she has diverse opinions whether innovation management is a part of scientific management profiles or not. Furthermore, this group is indicated by a high diversity. Different leadership styles, as well as diverse opinions on the context of innovation and diversity, are represented. But tendencies show that within this group a cooperative leadership style prevails and a context between diversity and innovation is seen.

Nevertheless, the consensus is that diversity needs to be managed.

Figure II.2 shows the delimitation of the intentional refuser, the sceptics and the reflected users in the chosen sub-codes.

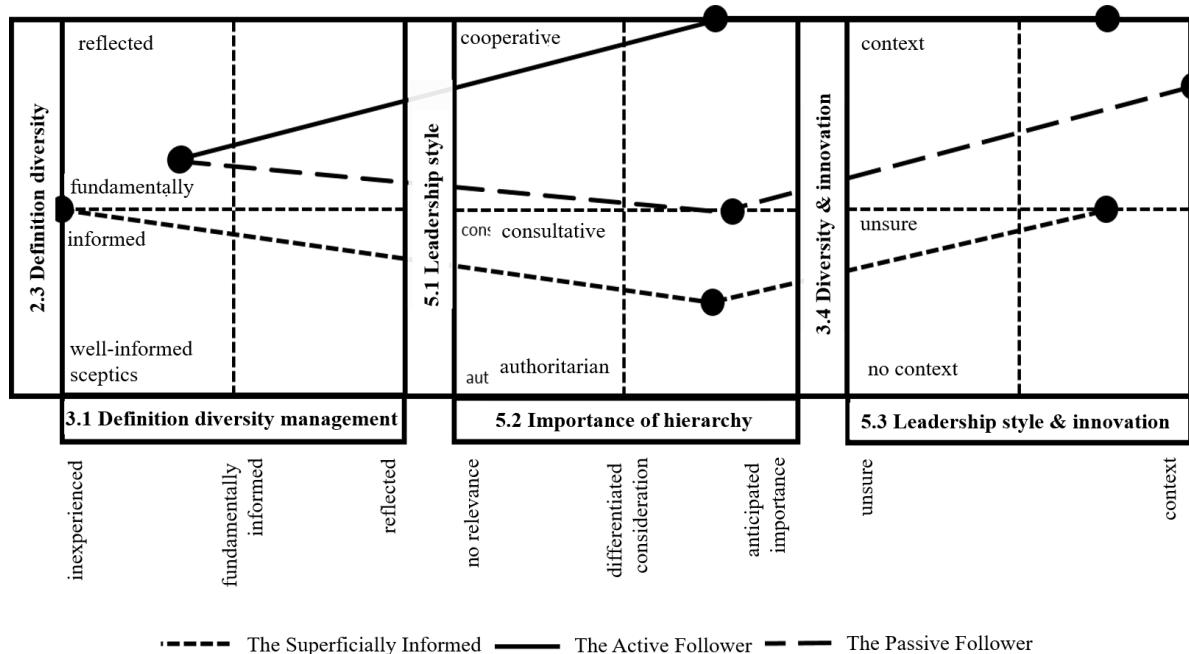


Figure II.1: Interrelation of the superficially informed, the active follower and the passive follower

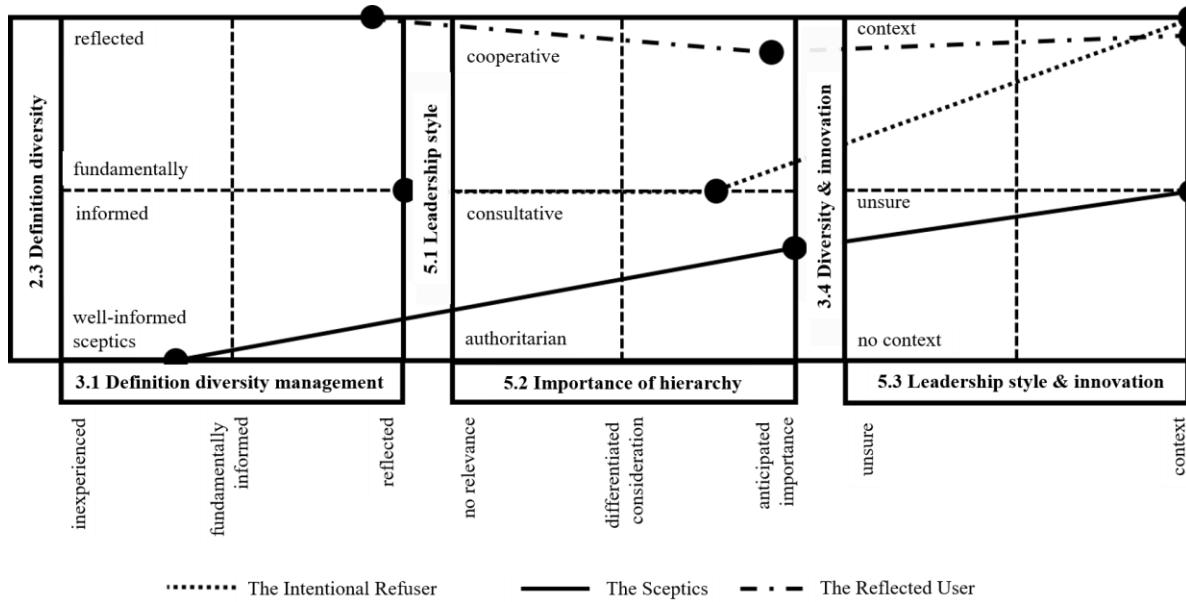


Figure II.2: Interrelation of the intentional refuser, the sceptics and the reflected user

4 Conclusion

Looking at the sub-codes of all types shows that the majority of respondents have a basic idea of diversity as well as diversity management. The majority also assumes a link between diversity and innovation that diversity must be managed and exists. In addition, the majority sees a link between the style of leadership and innovation, pursues a cooperative style of leadership but prefers clear hierarchies. Nevertheless, there is no connection between the advocacy of a steep hierarchy and the size of the institution to be governed.

Considering the institutional affiliation, it can be noted that interviewees from the same institution can often be classified under the same type. This result support coincides with studies who state that the professional education, as well as the subject culture and the associated institute culture lead to a specific socialization and therefore have an impact on the individual mindsets and therefore on the research and development processes.

With regard to the diversity of topics that were a subject of discussion it becomes clear that the determination of superordinate types needs a defined anchor category that allows a

classification. Within this study the main category was the 2.3 *Definition of diversity*. Based on this category further categories were included, and assorted characteristics were derived.

5 Outlook

As already discussed, research associations can be defined as highly complex. In particular large research alliances with a strong hierarchical structure and a broad horizontal management level, are challenged to develop a joint organizational culture. On the one hand, the quantitative data analysis shows a male dominated Cluster workforce that consists of research assistants of engineering with a German background. On the other hand, study shows a great variety of mindsets, management approaches and leadership styles within the different institutes. As a result, decentralized management tasks, like recruiting processes and working cultures, lead to a conglomerate of researchers with different states of mind. In addition, different habitus, subject cultures and backgrounds contribute to a further differentiation. In the frame of a deeper analysis the focus could lay on the correlation of subject cultures and managing diversity. In this context it could be interesting to analyze the impact of the individual experiences with diversity on the implementation of diversity management. Furthermore, the impact of the institutional culture and the related socialization process could be a subject of further investigation.

In order to increase and manage diversity, a customized diversity management approach, with a common understanding is necessary. The knowledge, reflection and management of differences in mindsets, subject or institutional culture have to be recognized within the Cluster on a broader frame. To achieve this, after having started with the principal investigators and management level, the huge group of research assistance has to be involved. Therefore, the next step of the study will involve all researchers in order to develop a holistic picture coming from a complementary perspective.

II Appendix

II 1 Invitation (in German)

Sehr geehrte/r XXX

Im Excellence Cluster „Integrative Production Technology for High-Wage Countries“ werden im Rahmen eines Kooperationsprojektes zwischen IEHK und GDI die Auswirkung sowie das Management von Diversität und Interdisziplinarität untersucht.

Wenn Diversität als ein wertschöpfender Faktor und wichtiges Element wissenschaftlicher sowie wirtschaftlicher Exzellenz verstanden werden soll, gilt es Indikatoren zu entwickeln, die erfassen inwiefern Diversität und Interdisziplinarität in Innovationen münden.

Als Führungskraft und Entscheidungsträgerin, die/der Einfluss auf das Diversitätsprofil unserer Universität ausübt, legen wir Wert auf Ihre Meinung und Ansichten zu diesem Thema. Aus diesem Grund möchten wir Sie um ein Interview bitten, um einen Einblick auf Ihre Sichtweise auf den Themenkomplex Diversity-Management und Innovationsmanagement zu erhalten. Die Interviews sind Teil des Exzellenzcluster-Projekts „Querschnittsprozesse-1“ (Diversity Management) und werden im Rahmen einer Kooperation zwischen IEHK und GDI durchgeführt.

Die leitfadengestützten Interviews haben eine Dauer von 45 Minuten und werden bei Ihnen vor Ort durchgeführt. Der Leitfaden umfasst u. a. die Themenfelder: Strukturen des Diversity Managements sowie Strukturen des Innovationsmanagements. Alle personenbezogenen Daten werden gem. Datenschutzbestimmungen anonymisiert. Hierzu lassen wir Ihnen bei Teilnahme gern weitere Informationen zum Auswertungsverfahren zukommen. Detaillierte Informationen über das Projekt erhalten Sie bei Frau Linda Steuer (GDI) und Frau Mamta Sharma (IEHK), die ebenfalls die Interviews durchführen werden.

Es ist vorgesehen, die Interviews im Zeitraum zwischen 01.03.2016 und 31.07.2016 vorzunehmen. Bei Interesse an einer Mitwirkung wenden Sie sich bitte an Frau Steuer (linda.steuer@gdi.rwth-aachen.de) und Frau Sharma (mamta.sharma@iehk.rwth-aachen.de) mit Nennung ihrer Terminpräferenz.

Wir freuen uns auf Ihre Teilnahme und danken Ihnen sehr für Ihre Zeit.

Univ.-Prof. Dr. phil. Carmen Leicht-Scholten

Univ.-Prof. Dr.-Ing. Wolfgang Bleck

Figure II.3: Invitation to participate in the study (sent by letter)

II 2 Main Research Questions

Research Question:

- Understanding the current diversity profiles of various institutes at the university
- How are these different from one another and from that of the university as a whole
- Identification of factors that promote / hinder diversity measures
- Recognizing the 'healthiest' forms of diversity, which could be specific to a certain institute...analyzing why that is so...
- Putting together the knowledge / learnings related to 'diversity management' from different institutes and making it available and usable to all by coming up with measures for better diversity management.

1. What does 'Diversity' mean to you?

→ This question is the ice breaker, getting the interview started. We intend to understand what the interviewee thinks about diversity, without knowing the 'textbook' definition of diversity. This could bring out interesting ideas or implications in an indirect way, as to which aspects the interviewee automatically relates with diversity.

We do expect that the interviewee might flow a bit too freely in answering this question, but this is intended. At the end of the answer, we would appreciate their view and prepare them for the next question by introducing the 'classic' definitions of diversity, which says that diversity is defined mainly into two ways – one based on the surface level aspects of individuals like their race, ethnicity, gender, age, etc. which are more visible and other based on deep level characteristics like personality, skills, experience etc.. Now that the interviewee knows about different forms of diversity, we are prepared for the next question.

2. Which forms of diversity do you see in your institute?

→ As a homework for the interview, we would already get the data on diversity profile for each of the institutes.

It would be interesting to compare the interviewee's perception of the extent of diversity in his / her institute with the actual figures. Ideally, these should not differ. If they do, then it could show the diversity-form, which the interviewee is more in contact with or has greater interaction with. For example, if the interviewee interacts on a daily basis with individuals from cultures different from his / her own, then he might perceive a higher cultural diversity and so on...

3. Is there a certain form more common in your institute?

Similar to 2...

4. Has this diversity profile been consciously chosen or has it developed itself over time? (Owing to other factors like university's vision and policies, exchange programs with certain universities / countries ...)

→ As an example, we at IEHK have a cooperation with the University of Beijing, as a result of which, we in Faculty 5 receive about 35 master students from this university every year for the English taught course 'Masters in Metallurgical Engineering'. We observe that after completion of Masters, some of the scientists continue with Ph.D. at one of the institutes in the faculty.

5. How has your experience been with different forms of diversity, both positive and negative... ?

6. What leads to these positive and negative effects from your perspective?

→ This would really helpful to get insights into how diversity could be better managed. One of the central aims of these interviews is to come with measures for diversity management and the answer to this question would help in that.

7. So do you feel the need for diversity in your institute (Is diversity necessary...)?

- Yes → all forms or any one or two in particular?
- No → Why do you think so?

8. Do you think it is necessary to 'manage' diversity?

- Instead of putting the interviewee on the line by asking whether 'you' manage diversity or not, we simply ask in a more general way if the interviewee feels the need for diversity management.
- Yes → How do you do that?
- No → Why do you think so?

9. a. Did you have the opportunity to work or interact with or simply have experiences with 'diverse' teams?

b. What was 'diverse' in such teams?

c. Did you observe any differences between teams that are more homogeneous compared with those that are not?

d. Is one better or worse in performance than the other?

10. How do you see / visualize the future diversity at your institute and at the university?

Figure II.4: Definition of the main research questions

II 3 Interview Guideline



Strategie-Analyse: Leitfaden der Qualitativen Einzelbefragung

Vielen Dank, dass Sie sich Zeit genommen haben für das Interview

Vorstellung der Position der/des Interviewten

- Zunächst würde ich Sie bitten sich, sowie Ihre **Funktionen** und das **Lehrgebiet** in dem Sie tätig sind vorzustellen
- Sie tragen ja Teamverantwortung und in diesem Kontext würde mich interessieren inwiefern Sie zu der Teamzusammensetzung in Ihrem Institut beitragen?
 - ⊕ Wie gestaltet sich in Ihrem Institut/Fachbereich typischerweise die Personalauswahl (Rekrutement)? Gibt es einen Prozess? Wenn ja, welchen?
 - Auf welche **Eigenschaften** legen Sie bei Ihren Mitarbeitenden Wert?
 - Würden Sie Ihre Institution als **typisch „Ingenieurwissenschaftlich“** beschreiben?
 - Was ist für Sie eine ingenieurwissenschaftlich geprägte Institution?

Vorbereitende Begriffsklärung

- Wie würden Sie "Diversität" definieren?
- Welche **Formen von Diversität** sehen Sie an Ihrer Einrichtung?
- Überwiegt Ihrer Ansicht nach eine Diversitätskategorie?
- Wurde dieses Diversitätsprofil bewusst gewählt oder beruht es auf einer **zufälligen Entwicklung**?

Diversity und Innovationsmanagement (Strukturen)

- Was verstehen Sie unter „**Diversity Management**“?
 - ⊕ Gibt es bei Ihnen ein Diversity Management?
 - Wenn ja, wie gestaltet sich dieses?
 - ⊕ Falls ja: Wie läuft das Diversity-Management bei Ihnen am Institut ab?
- Was verstehen Sie unter „**Innovationsmanagement**“?
 - ⊕ Gibt es bei Ihnen ein Innovationsmanagement?
 - Wenn ja, wie gestaltet sich dieses?
 - ⊕ Falls ja: Wie läuft dieses bei Ihnen am Institut ab?

- Sehen Sie einen **Zusammenhang** zwischen Diversität und Innovation?
- Gibt es Teambildungsprozesse in Ihrer Institution?
 - ✚ Wie gestalten sich diese?
 - ✚ Gibt es feste Rituale, Veranstaltungen?
 - ✚ Inwieweit und in welcher Form wird in Ihrer Institution für Diversität sensibilisiert?

Erfahrung und Erfolgskriterien

- Welche **Erfahrungen** haben Sie bisher mit Diversität gemacht (positive / Herausforderungen)?
 - ✚ Was führt zu diesen positiven/herausfordernden Aspekten aus Ihrer Perspektive?
 - ✚ Hätte es eine Möglichkeit gegeben Situationen anders zu gestalten? Wie bewerten Sie dies im Nachhinein?
- Sehen Sie in Ihrer **Einrichtung** eine **Bedarf** oder Veränderungsbedarf hinsichtlich der Diversität des Teams oder der Handhabung des Themas Diversität?
- Ist es Ihrer Auffassung nach erforderlich **Diversität** zu „managen“?
- Haben Sie während Ihrer **eigenen Qualifizierungsphase** selbst in diversen Teams gearbeitet?
 - ✚ Inwiefern waren diese Teams „divers“?
 - ✚ Haben Sie einen Unterschied zu homogenen Team beobachten können?
 - ✚ Haben Sie einen Unterschied hinsichtlich der „Performance“ beobachten können?
 - ✚ Was war förderlich? Was war ggf. hinderlich hinsichtlich der „Performance“ des Teams?

Führungsstil

- Wie würden Sie Ihren **Führungsstil** beschreiben?
- Wie wichtig ist Ihnen in diesem Zusammenhang **Hierarchie** bzw. hierarchischen Strukturen?
- Sehen Sie einen **Zusammenhang** zwischen Ihrem **Führungsstil** und der **Innovationsfähigkeit** in Ihrer Institution?
- Inwieweit glauben Sie **beeinflusst** der Führungsstil Innovationsfähigkeit?
- Inwieweit hat die **Diversität** Ihrer Mitarbeitenden einen **Einfluss** auf Ihren **Führungsstil**?

Vision:

- Wie sehen Sie Diversität zukünftig in Ihrem Institut und der Hochschule?

Vielen Dank!! (Einverständniserklärung)

Figure II.5: Interview guideline

II 4 Declaration of Consent

1. Hintergrund und Ziel der Interviews

Das Exzellenzclusters „Integrative Production Technology for High-Wage Countries“ hat ein Projekt entwickelt, in dessen Rahmen die Durchführung von Diversity Management und Innovationsmanagement untersucht werden soll. Im Zuge des Gemeinschaftsprojektes untersuchen IEHK und GDI die Durchführung von Maßnahmen und die Verfolgung entsprechender Strategien. Aufbauend auf den Ergebnissen sollen Ansätze vorgestellt werden, um Diversität und Innovationsprozesse produktiv zusammenzubringen.

2. Organisation und Ablauf der Interviews

Die Befragung erfolgt in Form von leitfadengestützten Expertinnen- bzw. Experteninterviews mit Vertreterinnen und Vertretern der am Projekt beteiligten Einrichtungen. Hierfür werden in Absprache mit den jeweiligen Partnerorganisationen Themen-Verantwortliche in den Bereichen ›Personalmanagement und Innovationsmanagement‹ ausgewählt. Die Teilnahme an den Interviews ist selbstverständlich freiwillig.

Vor dem Hintergrund der in Punkt 1 beschriebenen Ziele, sind folgende Themenkomplexe Gegenstand der Interviews: aktuelle Strategien und bisherige Maßnahmen der Organisation in den Bereichen ›Diversity Management‹ und ›Innovationsmanagement‹, Motivation und Ziele des Engagements, sowie Fach- und Organisations-besonderheiten in der jeweiligen Einrichtung. Ein Interview wird ca. 45 Minuten dauern. Um die wissenschaftliche Dokumentation und Auswertung der Gespräche zu ermöglichen, werden die Interviews elektronisch aufgezeichnet und anschließend verschriftlicht.

3. Durchführungszeitraum und -ort

Die Interviews werden im Zeitraum vom 15. Mai 2016 bis 31. August 2016 vor Ort in den Einrichtungen der jeweiligen Gesprächspartner/-innen durchgeführt.

4. Anonymität

Die Dokumentation und Veröffentlichung der Untersuchungsergebnisse erfolgt ausschließlich in anonymisierter Form, ohne namentliche Nennung der Gesprächspartner/-innen und ohne Angabe von Informationen, die einen Rückschluss auf die Person zulassen. Ergebnisse werden stets nur in aufbereiteter, aggregierter Form dargestellt. Vereinzelt werden wörtliche Zitate aus den Interviews genutzt, um die dargestellten Sachverhalte zu veranschaulichen. Diese Aussagen werden ebenfalls anonymisiert. Dabei wird sichergestellt, dass eine Identifikation der einzelnen Interviewten weder über persönliche Daten noch über Inhalte möglich ist.

5. Verwendung der Projektergebnisse

Die Projektergebnisse sollen dazu genutzt werden, um

- einen Ist-Bestand hinsichtlich der Durchführung von Diversity Management und entsprechenden Maßnahmen zu erstellen,
- Maßnahmen im Kontext Diversität und Innovation zu entwickeln.

Darüber hinaus ist die Veröffentlichung der Untersuchungsergebnisse geplant. Zu den Veröffentlichungen zählen neben der Ergebnisdokumentation in Berichtsform auch Präsentationen bzw. Vorträge, Veröffentlichungen in verschiedenen Printmedien sowie weitere wissenschaftliche Analysen und Publikationen.

6. Personenbezogene Daten

Die Erhebung und Auswertung der personenbezogenen Daten wird nach den gesetzlichen Bestimmungen des Datenschutzes durchgeführt. Personenbezogene Angaben werden streng vertraulich behandelt. Unter keinen Umständen werden personenbe-

zogene Daten an Ihren Arbeitgeber oder Mitarbeitende weitergegeben. Eine Weitergabe der Daten an nicht am Projekt beteiligte Dritte ist ausgeschlossen.

Die Erhebung, Verarbeitung und Nutzung der personenbezogenen Daten erfolgt durch das IEHK und GDI (RWTH Aachen) ausschließlich für die in diesem Dokument beschriebenen Zwecke.

Zum Schutz der personenbezogenen Daten werden geeignete technische und organisatorische Maßnahmen seitens IEHK und GDI (RWTH Aachen) getroffen. Die personenbezogenen Daten werden gelöscht, sobald der Verwendungszweck entfällt und sie nicht mehr benötigt werden. Die Löschung erfolgt spätestens zum Ende des Projekts.

Als verantwortliche Stellen sind IEHK und GDI (RWTH Aachen) für die Einhaltung der datenschutzrechtlichen Anforderungen verantwortlich und stehen Ihnen daher jederzeit als Adressat Ihrer gesetzlichen Auskunfts-, Benachrichtigungs-, Berichtigungs-, Löschungs- und Sperrungsansprüche zur Verfügung. Sie können Ihre gesetzlichen Rechte schriftlich an den Lehrstuhl für Eisenhüttenkunde, Intzestrasse 1, 52072 Aachen oder an das Lehr- und Forschungsgebiet Gender und Diversity in den Ingenieurwissenschaften, Kackerstraße 9, 52072 geltend machen.

7. Kenntnisnahme und Einwilligung

Ich habe die vorstehenden Informationen zur Kenntnis genommen und stimme der Nutzung der Interviewinhalte und -ergebnisse in dem vorbezeichneten Umfang zu. Zugleich willige ich in die Erhebung, Verarbeitung und Nutzung meiner oben beschriebenen personenbezogenen Daten durch IEHK und GDI (RWTH Aachen) im Rahmen des oben bezeichneten Zwecks ein.

Name in Druckbuchstaben

Ort, Datum

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Figure II.6: Declaration of consent

II 5 Category Development (in German)

2	reflektierte Einordnung	reflektierte Einordnung	Aktiv	reflektierte Einordnung	erforderlich	autoritär	wichtig	Zusammenhang	Zusammenhang
3	grundlegende Idee	grundlegende Idee	Passiv	grundlegende Idee	nicht erforderlich	kooperativ	unwichtig	unsicher	unsicher
4	informierte Skeptiker	Ahnungslose	Verweigerer						
5									
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			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
KAT. 1	1 - (2.3)	A	reflektierte Einordnung																									
		B	grundlegende Idee																									
		C	informierte Skeptiker																									
	2 - (3.1)	A	reflektierte Einordnung																									
		B	grundlegende Idee																									
		C	Informierte Skeptiker																									
	3 - (3.2)	D	Ahnungslose																									
		A	Aktiv																									
		B	Passiv																									
KAT. 2	1 - (3.3)	C	Verweigerer																									
		A	reflektierte Einordnung (A)																									
		B	reflektierte Einordnung (P)																									
		C	grundlegende Idee (A)																									
		D	grundlegende Idee (P)																									
KAT. 3	1 - (4.3)	E	grundlegende Idee																									
		A	erforderlich																									
		B	nicht erforderlich																									
		A	beratend																									
		B	patriarchalisch																									
KAT. 3	2 - (5.1)	C	kooperativ																									
		D	partizipativ																									
		A	wichtig																									
		B	unwichtig																									
		A	Zusammenhang																									
KAT. 4	1 - (3.4)	B	unsicher																									
		C	kein Zusammenhang																									
		A	Zusammenhang																									
	2 - (5.3)	B	unsicher																									
		C	kein Zusammenhang																									

Figure II.7: Category development

II 6 Relation between Types

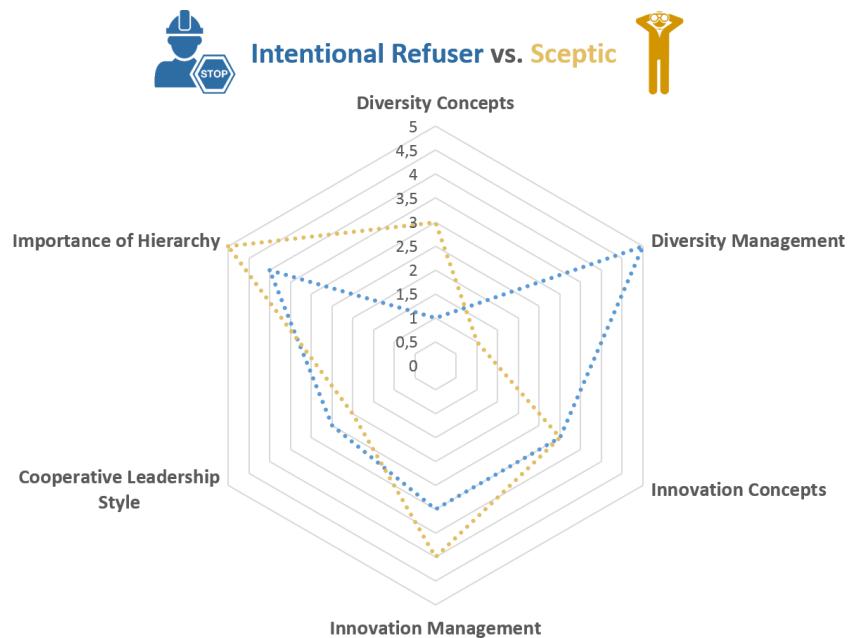


Figure II.8: Relation between intentional refuser vs. sceptic

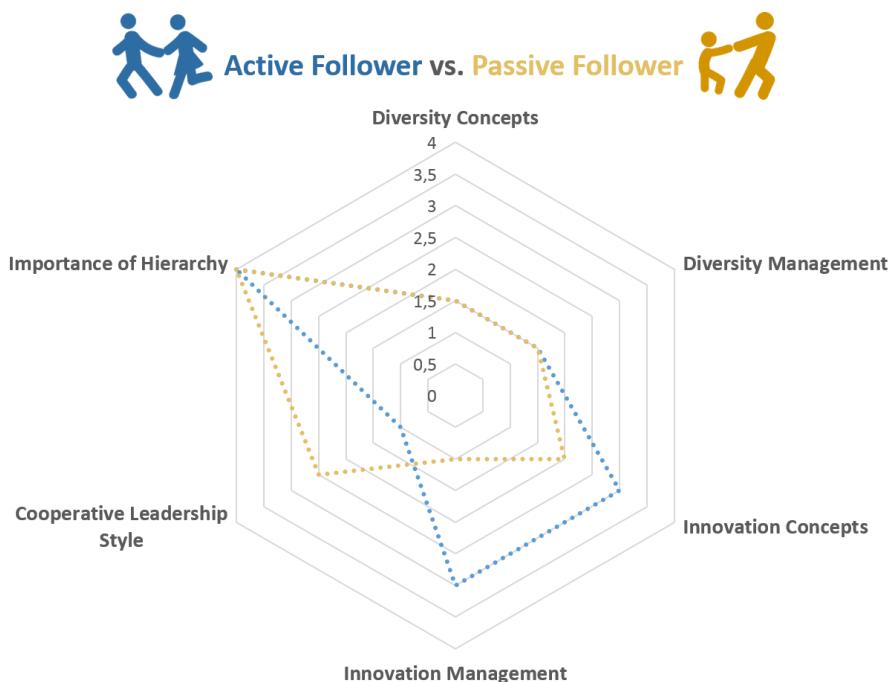


Figure II.9: Relation between active follower vs. passive follower

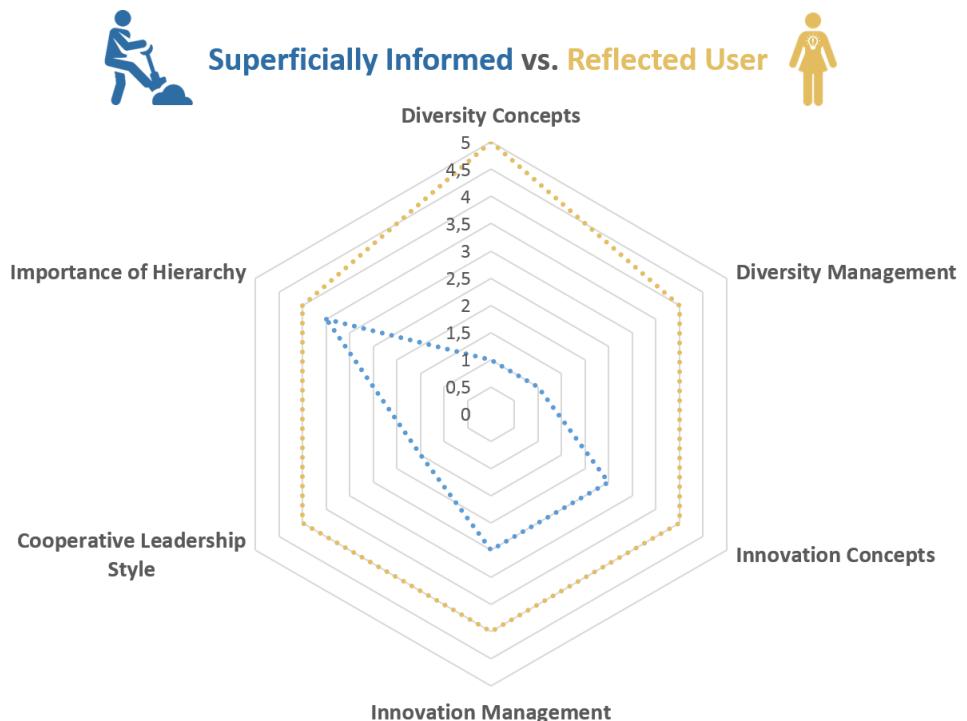


Figure II.10: Relation between superficially informed vs. reflected user

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Research Paper III

Diversity- and Innovation Management in Complex Engineering Organizations

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I Abstract

Diversity is increasingly being addressed as an innovation-promoting factor. For this reason, companies and institutions tackle the integration of a diversity management approach that enables a heterogenic perspective on innovation development. However, system-theoretical frameworks state that the implementation of diversity measures that are not tailored to the needs of the organization often lead to a rejection or reactivity with regard to the management approach. In this context, especially organizations, which are characterized by a specific hierarchical structure, a dominant habitus or specialist culture, must face the challenge of realizing a sustainable change of the corporate culture that sets the basis for implementing diversity management approaches. The presented research project focuses on analyzing the situation in a huge scientific collaborative project – so-called Cluster of Excellence (CoE) – with the aim to implement a diversity - and innovation management strategy. Considering the influencing determinants, the CoE is characterized by its embeddedness in the scientific system, a complex organizational structure, and a high fluctuation rate. The paper presents a systemic approach of reflecting these factors in order to develop a diversity- and innovation management strategy. In this frame, the results of a quantitative survey of CoE employees and derived mindset-types are presented. The results show a need for taking different mindset-types into account, to be able to develop a tailored management strategy. The aim of the project is to give recommendations for developing a sustainable management concept that promotes both diversity and innovation by drawing on the persisting mindsets of organization members while reflecting top-down as well as bottom up factors of implementation processes as well as the psychology of change. This paper addresses all who are concerned with the management of human resources in innovation processes and are striving for a cultural change within the framework of complex organizations.

Keywords: Change Management, Corporate Culture, Diversity Management, Engineering,

Innovation Management

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1 Introduction

Implementing a diverse workforce in organizations has become a popular topic across all major industries (Forbes 2012). Originally originating in the private sector, the approach of diversity management has been implemented in German companies since the turn of the millennium (Bissels *et al.* 2001). Therefore, the implementation of the approach is carried out with differing motivations. Often, the argumentation of motivation centers around the potential profits resulting from the successful implementation of diversity management. Especially in the frame of research and development processes different companies and industries “[...] take for granted the idea that diversity pays dividend in innovation problem solving.” (Smith-Doerr *et al.* 2017: 140). This assumption was followed by various research projects, which, with the help of different approaches, examined the innovation potential of different categories of diversity.

The paper will give an overview of studies that deal with the context between diversity and innovation. Building on that, the connection between diversity management and change management is described, setting the basis for a system-theoretical diversity management approach (chapter 2). Chapter three then describes the approach of investigating prevailing mindsets and attitudes linked to the diversity categories *gender* and *origin*. The study has been realized in a research organization in Germany that is strongly shaped by an engineering science habitus. In order to clarify the approach, the methodology will be explained afterwards (chapter 4). In this framework, the particularities and challenges of the CoE as research object will be a subject of discussion. After that, results are presented (chapter 5). Chapter 6 concludes with a discussion of the results, the reflection of limitations and an outlook on future research.

2 Theoretical Background

Lorenzo *et al.* (2017) investigated within the framework of a study with 171 companies from Germany, Switzerland and Austria, the positive correlation of country of origin, career path, background and gender in the context of innovation. In particular, they identified relationships between the size and complexity of the organization in the context of diversity management. The larger and/or more complex a company is, the more it benefits from diversity in management. For small or less complex companies, however, the influence tends to be smaller or even non-existent. Regarding specific diversity categories, Lorenzo *et al.* (2017) determine that the increase of gender diversity only has a positive effect if more than 20% of women work in management positions. Based on this result, they conclude that a high proportion of women among employees alone is not enough to increase innovation. Rather, an active diversity management is required, which makes it possible that “[...] gender diversity [...] go[es] beyond tokenism.” (Lorenzo *et al.* 2017: 4). Lungenanu and Contractor (2015) examined the influence of different types of diversity, both observable and not observable diversity categories (Milliken & Martins 1996; Loden & Rosener 1991; Watrinet 2008), on the creation process of innovation ideas. In the frame of their study, they focused on the influence of the diversity categories gender, cognitive and country diversity on the formation process of scientific collaborative innovation networks. The study with 1,354 researchers was mainly based on 469 publications, which were used to assess the degree of collaboration and networking. Their results show ambivalent results. Innovations, operationalized in the frame of publications, benefit from diversity but also from homophily. With regard to the advantages of homophily they argue, that homogeneous cultural backgrounds, operationalized through country of residence, as well as working with existing networks leads to a reduction of uncertainty. In contrast to this, diversity allows the inclusion of diverse perspectives as well as knowledge and thus, “[...] enables the recombinant knowledge required for innovation.” (Lungenanu & Contractor 2015: 548). Finally,

they conclude: “[...] that innovation, exemplified as publishing in a new scientific discipline, benefits from both homophily and diversity.” (Lungeanu & Contractor 2015: 560). Regarding the chances and challenges of diversity in research and development processes, Díaz-García *et al.* (2013) also come to an ambivalent conclusion in the frame of their analysis. From their point of view, employee diversity can lead to misunderstandings and conflicts based on the heterogeneous perspectives and mindsets. In this context, Voigt and Wagner (2006) define coordination and conflict losses through heterogeneity in the sense of the *process hypothesis*, which means fundamental process losses through diversity. Also Pelled *et al.* (1999) suggest that different forms of diversity can cause different forms of conflicts. According to that, Østergaard *et al.* (2011) notice a difference in the benefits of diversity in the frame of individual categories of diversity. While educational and gender diversity could lead to innovation, age diversity does not. Pesch *et al.* (2015) focus in the frame of their analysis on communication styles in context with innovation. The analysis, based on a survey study of 232 German small and medium-sized enterprises (SMEs), indicates ambivalent effects of diverse communication styles. Their results show, that on the one hand diversity in communication style enhances a creative team environment and thus contributes to innovation. In this context, innovation is considered in the frame of product innovativeness and market launch of new products. On the other hand, the different approaches of communicating also increases relationship conflicts within the team. However, Pesch *et al.* (2015) summarize: “Our results indicate that the beneficial effects of communication style diversity outweigh the dysfunctional effects on innovation performance in teams. Age diversity however has only a positive association with relationship conflicts.” (Pesch *et al.* 2015: 1). Söllner (2010) considers human capital diversity in context with innovations. The results of an empirical analysis indicate a positive relationship between the capacity to innovate and occupational diversity. Söllner (2010) sees the justification for this result in the fact that “[...] innovation is an interactive process, which requires the combination of diverse knowledge bases and different points of views [...].”

(Söllner 2010: 22). According to that, Söllner (2010) states comparable results in terms of diversity categories such as heterogeneity of work experience. Tortoriello *et al.* (2015) investigate the context between organizational innovation and knowledge diversity. In the frame of their analysis, knowledge diversity is defined as “[...] social structural conditions conducive to individuals supporting, facilitating, and promoting the innovativeness of their colleagues - a role we refer to as catalysts of innovation.” (Tortoriello *et al.* 2015: 423). This perspective assumes, that an individual’s network position as well as the type of knowledge that is made available through networking are key enabling factors for innovation processes (Tortoriello *et al.* 2015). In the frame of their study, knowledge diversity comprises external knowledge as a critical factor in innovation processes (Cohen & Levinthal 1990; Chesbrough 2003). Their results show, that direct benefits can be measured if employees have “[...] contacts that source diverse types of knowledge from outside the organization.” (Tortoriello *et al.* 2015: 432). Conversely, this means that in the context of the concept of diversity categories (Gardenswartz & Rowe 1991) various realities of life and backgrounds are advantageous to create a heterogenic information basis. Van Beers and Zand (2013) investigate in the frame of their study with 12811 innovating enterprises the impact of functional diversity and graphical diversity. In their approach, functional diversity is defined as “[...] cooperation with partners from multiple categories [...].” (Van Beers & Zand 2013: 308), and graphical diversity as “[...] collaboration with partners in different countries.” (Van Beers & Zand 2013: 308). Within the framework of their analysis, they differentiate between incremental and radical innovations. Their results show, that collaboration with external partners increases the performance of innovation activities. Differentiating radical and incremental innovations, there is a stronger effect in the context with radical innovations. Concerning the diversity of partners from diverse functional groups, Van Beers and Zand (2013) state, that there is a positive effect in the context with bringing radically new products to consumer market.

Looking at these results, different conclusions can be drawn. Science has tried to measure the relationship between diversity in the workforce and innovation by means of a wide variety of diversity categories (see figure III.1). To achieve this, different approaches have been used. Most frequently, a quantitative approach is chosen. This approach is used to measure a correlation between defined indicators of diversity and an innovation output. The approach must always be reflected when interpreting the results. Although a quantitative approach allows an overview of larger amounts of data, it makes it more difficult to analyze underlying or hidden structures and motives in more detail.

In summary, the analyzes suggest two key findings. Following Gardenswartz and Rowe's (2003) diversity category system (see figure III.1), different categories of diversity seem to have a positive effect on the development of innovations.

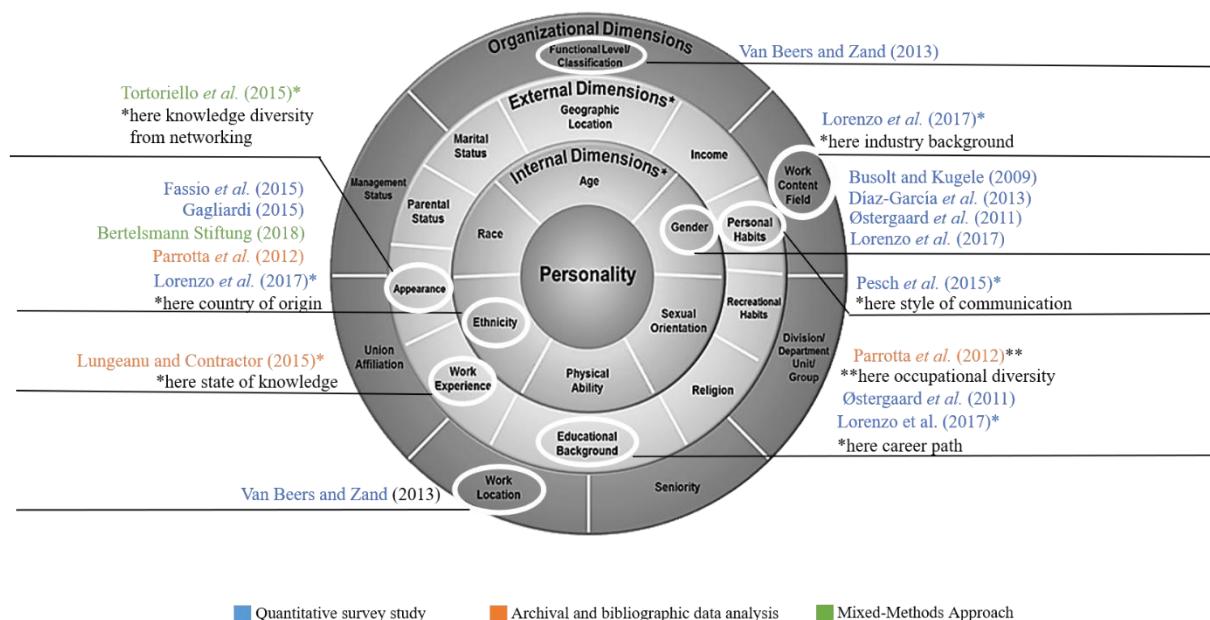


Figure III.1: Classification of the mentioned studies in the *Four Layers of Diversity* (Gardenswartz & Rowe 2003)

*Internal Dimensions and External Dimensions are Adapted from Marilyn Loden and Judy Rosener (1991)

However, the results also indicate that diversity creates challenges that need to be reflected. In particular, the complexity of interpersonal processes through the heterogeneity of perspectives and approaches must be considered. Thus, what on the one hand represents the potential of

diversity in the innovation process seems also to be the huge challenge. This challenging aspect of a diverse workforce leads to a resulting need for an active diversity management (Bartz *et al.* 1990; Aretz & Hansen 2003; Nooteboom *et al.* 2007; Hagenhoff 2008; Günther 2014; Lorenzo *et al.* 2017).

As a result, successful diversity management fulfills two functions. On the one hand, it serves to create structures that enable the establishment of a diverse workforce. In the context of a diversity management approach, Lorenzo *et al.* (2017) state that there is a need for a critical mass of diverse people for achieving positive effects. Reflecting the study results in connection with Kanter's *Tokenism*, it illustrates that a clearer representation of diverse groups in terms of diversity categories (see figure III.1) is required than previously assumed. While Kanter (1977) states in the context of assimilation strategies, that minorities up to a share of 15% are not perceived individually but as representatives of their group, a larger share seems to be required for the successful exploitation of various life realities, backgrounds and mindsets in the context of innovation and development processes. According to that, Lorenzo *et al.* (2017) conclude in the frame of their quantitative survey study “[o]nly when women occupy management positions does the innovation premium become evident. And it can't be a small number of women; innovation revenues only start to klick in when art least 20% of managers at a company are female, our survey shows.” (Lorenzo *et al.* 2017: 11). Zedlacher and Haar (2011) argue, that a higher share is necessary, to avoid group effects that hinder cooperation. From their point of view, dominant groups try to increase the difference to the minority. That often leads to social isolation of the tokens. On the other side, minorities try to develop coping strategies to compensate the difference to the majority. However, both group mechanisms lead to communication processes being blocked and cooperation being hampered (Zedlacher & Haar 2011).

Therefore, the aim of a diversity management approach must be to establish organizational processes that support the active recruitment of a diverse workforce. This also goes hand in hand with the establishment of an overarching management strategy and an associated corporate culture, which advocates the establishment of these processes.

On the other hand, successful diversity management continues this recruitment process by creating a corporate culture that enables the potential of diversity to be harnessed. Østergaard *et al.* (2011) point out that in the frame of their study “[...] the logistic regression reveals a positive relationship between an open culture towards diversity and innovative performance.” (Østergaard *et al.* 2011: 1). The corporate culture represents the value pattern of an organization (O'Reilly & Chatman 1996). Based on that framework, the range of possible individuality under the differentiated aspects of personality, professional competence, cultural, social, organizational and private environment etc. (see figure III.1), is appreciated and supported. In this context, diversity thus describes both a state and a process. As a result, diversity management needs to be applied across all departments and affects all management processes of a company that create the framework conditions for cooperation within the company. It must be considered as an ongoing cross-functional process that encompasses all departments within an organization. Cox (1993) defines under the managing diversity approach “[...] planning and implementing organizational systems and practices to manage people so that the potential advantages of diversity are maximized while its potential disadvantages are minimized. The goal of managing diversity as maximizing the ability of all employees to contribute to organizational goals and to achieve their full potential unhindered by group identities such as gender, race, nationality, age, and departmental affiliation.” (Cox 1993: 11). With regard to personnel management for example, this means to create an environment where employees can develop skills to achieve their maximum performance (Aretz & Hansen 2003).

The more complex the company in terms of organizational structure, authority to issue directives and hierarchies, the greater the need for structured diversity management seems to be. Lorenzo *et al.* (2017) state that the positive effects of a diversity management approach can be seen especially in complex and large organizations. In particular, organizations that are homogeneous, mono-cultural and in which a dominant group determines the values, norms and rules for all employees and fills the relevant decision-making positions, face a major challenge (Vedder 2001). This results in the need to deal in detail with the nature of the organization and to fathom the internal structures and processes. The active integration of employees into this analysis process is an important participative element, which enables a sustainable implementation of measures within the framework of diversity management. In this context, Aretz and Hansen (2003) proclaim a system-theoretical approach. Based on the *theory of general systems of action*, the system-theoretical approach serves as an analytical framework for capturing differentiated diversity dimensions, allowing the integration of previous diversity approaches (such as the Fairness & Discrimination Approach, Access & Legitimacy Approach and the Learning & Effectiveness Approach) and the development of multidimensional measures for diversity management (Aretz & Hansen 2003). Based on that, the active management of diversity becomes a strategic approach of corporate management that addresses many challenges and their consequences at the employee level. In the frame of their approach, Aretz and Hansen (2003) state several assumptions:

- Perception, thinking and evaluation of individuals are shaped by social collective standards.
- The definitions and attributions of meaning are not made actively by individuals but result from social interaction contexts. In this frame, they must acquire a certain social commitment in the sense of an institutionalization in order to be effective in society and/or organizations.

- Factual differences between people do not necessarily have to be socially perceived (in the sense of societal or organizational) and relevant. They can be perceived and defined differently.
- Differences between people can be socially constructed and thus become socially/organizational reality.
- It is important to consider that, in addition to communication-oriented aspect of acting, power-oriented action is also involved, in which the different benefit and power interests of the involved actors manifest themselves.

Reflecting the assumptions mentioned it becomes clear that diversity management does not have to be applied exclusively where visible diversity exists (Sepheri & Wagner 2000; Voigt & Wagner, 2006). Within the framework of diversity management, it is also important to determine why an organization may not be diverse (Aretz & Hansen 2003).

3 Diversity and Change Management

Considering the accelerated economic dynamics with their growing pressure for change and innovation on companies and the necessity of a more efficient and effective use of the resource *human capital*, Balser (1999) mentions that especially mono-cultural organizations appear to be too rigid and oriented towards the past, too little capable of learning and adapting, as well as too little creative and innovative. Since the implementation of diversity management is accompanied by constant change and companies are subject to change due to external factors, there is a need to reflect on possible influencing factors that hinder the sustainable implementation of diversity management (Leicht-Scholten *et al.* 2011). In Germany for example, the term *feminism* has a negative connotation (Nagl-Docekal 2012). Regarding diversity management, Studt (2016) states that barriers and resistance must be overcome, especially in qualitative management topics such as *diversity*. Studt (2016) justifies this with

the uncertainty with regard to the personal consequences of diversity management and the associated fear of loss of status, security, autonomy and recognition. Taking measurable indicators for the degree of diversity acceptance into account, the Workplace Gender Equality Agency (WGEA), an Australian Government statutory agency, measured and compared the gender pay gap across OECD countries (WGEA 2018). The gender pay gap gives an overview over the differences in pay between women and men. This measurable indicator is an expression for status of equality in a country, because of its long-term impact of an individual's life. The WGEA (2018) argues that “[o]ver a lifetime, the cumulative effect of the gender pay gap and other factors, such as time spent out of the workforce and unconscious bias, contribute to women retiring with far less superannuation savings and a higher risk of living in poverty in retirement than men. Addressing inequalities in the workplace is not only important in terms of justice, but because gender equality is central to a country's overall economic performance, and has been linked to improved national productivity, innovation and economic growth.“ (WGEA 2018). Following the report, Germany has still one of the highest average gross hourly gender pay gross in Europe. Although, there are laws and measures that strive for a change of structural factors, there seems to be a reactance with regard to a change.

When implementing diversity management, especially in Germany there seems to be the need for reflecting different influencing factors. In the context with diversity categories and the perception of minorities, in particular socio-cultural factors and in this connection structural factors, but also historical and medial factors must be considered, for understanding the prevailing mindsets but also requirements, possible barriers and anxieties (Steuer 2015; Leicht-Scholten *et al.* 2009). Considering Kotter's eight steps of change management (Kotter, 1995) the active engagement with the workforce in an organization is therefore essential. As far back as 1967 Greiner stated that up to a certain extent each company needs to overcome existing inertial forces and resistance during transformation (Greiner 1967). In this context, Aretz and

Hansen (2003) define, based on Hansen and Dolff (2000) as well as Thomas (1996), four options in dealing with diversity:

- a) Ignorance (e.g. denial, exclusion)
- b) Oppression (assimilation, oppression, isolation)
- c) Acceptance (Tolerance)
- d) Active promotion (building relationships, mutual adaptation)

While Aretz and Hansen (2003) consider separate options in the context with change through diversity management, Kotter (1996) regards these options as a coherent psychological reaction to change within a change process. From his point of view, the workforce can be divided in two groups. On the one hand, there are individuals that discover the need for change, on the other hand, other parts of the organization seem to prefer the existing situation and see no need for change. With regard to the second group, which is passive in the frame of a change context, the change results in the fear of destroying the existing state of satisfaction. Consequently, the passive group reacts by ignoring the need for change and aggression in respect of the change initiative. In this context, Kotter (1996) reports that “[...] 50% of the companies [...] fail in this first phase.” (Kotter 1996: 3). For this reason, it is necessary to demonstrate the need for change on all organizational levels. Even in the case of cognition, depression/suppression can initially occur, as old patterns and structures have to be abandoned and new standards have to be learned. The constant confrontation with the idea of change as well as the communication of necessity lead to an awareness being generated in the passive group. This is accompanied by the clear communication of a vision in order to be able to reflect on perspectives and the advantages of change. Only through this reflection process, it is possible for the passive group to accept the change process and to actively participate in measures. According to Kotter (1996), a sustainable implementation of change requires “[...] institutionalizing change in corporate culture.” (Kotter 1996: 8).

Bringing together these findings it is evident that there is a need for the active integration of the workforce and the management level for achieving a successful implementation of diversity management. Particularly against the background of the close linkage of the system-theoretical diversity management approach (Aretz & Hansen 2003), Kotters (1996) insights in the frame of change management processes and the need to transfer the approach into the corporate culture (Østergaard *et al.* 2011), it is necessary to actively involve organizations employees in the whole process.

According to Aretz and Hansen (2003), the trigger for diversity management can be seen in the social definitions and concepts of *diversity*, which then form the symbolic frame of reference for corresponding actions and strategies and create a social reality. As a result, it is necessary to examine whether and how diversity is socially constructed and defined in organizations. Following Köhler-Braun (1999), diversity can, for example, be regarded as a strategic success factor, as part of leadership behavior, as a management problem or as the result of legitimate action. In the frame of the investigation, the intentions and functions of diversity management then becomes clear (Aretz & Hansen 2003).

4 Research Approach: Discovering Prevailing Mindsets

Especially with regard to the reflection of the need for change, it is essential to uncover reactance and to discover existing thought patterns. Following this current state of prevailing mindsets, it is then possible to develop an approach that takes up the different thought patterns. In the frame of the following study, we focus on thought patterns and mindsets in the context with gender and cultural diversity. In particular, the perception of diversity in general as well as the perception of the context between diversity and innovation against the background of the measured actual state of diversity within the framework of the organization will be examined. The study represents the third step of the research design (Steuer *et al.* 2017). After analyzing

the demographic status quo, management level was surveyed for identifying prevailing mindsets regarding diversity and innovation. Within this second study, six management types could be defined (Steuer and Leicht-Scholten 2017). The quantitative survey of the organization's workforce is presented in this paper. The focus is on the results in the context of gender and origin diversity.

4.1 Gender Diversity

In the frame of their research, Díaz-García *et al.* (2013) come to the conclusion that gender diversity stands in a significant positive relationship with the development of radical innovations. Considering incremental innovations, there seems to be no significant effect (Díaz-García *et al.* 2013). Nevertheless, Busolt and Kugele (2009) state that against the background of “[...] the economic dimension of sustainable development relies on innovation, the under-representation of women in science and technology in the European Union is of special concern.” (Busolt & Kugele 2009: 109). Furthermore, they conclude that “[...] a productivity loss for the economy is to be expected.” (Busolt & Kugele 2009: 109).

Although factual reasons stand for the increase of gender diversity, inner personal attitudes such as prejudices or the anticipation of disadvantages through diversity can stand in the way of the change of a corporate culture and thus the implementation of a diversity management approach. Gender diversity has to be considered especially against the background of an engineering-scientific and therefore often male-dominated environment. For this reason, it is necessary to deal with employees' perception of gender diversity and to reflect the mindsets against the background of given organizational structures, influencing aspects and prevailing habitus' (Bourdieu 1982).

4.2 Cultural Diversity

In the frame of a meta-analysis the Bertelsmann Stiftung (2018) comes to the conclusion that there is a moderate positive link between cultural diversity and innovation. Bouncken *et al.* (2016) derive from their longitudinal qualitative study that cross-cultural teams have a high creative potential on the one hand but are also confronted with difficulties due to different work and communication styles on the other hand. Gagliardi (2015) as well as Fassio *et al.* (2015) focus in the frame of their analysis on the context between migrant workers and innovation. They conclude that there is a positive connection between immigration and innovation. According to that, Parrotta *et al.* (2012) state based on their empirical analysis: "We find that an increase in firm labor diversity in terms of ethnicity has a positive effect on the firm innovation process." (Parrotta *et al.* 2012: 26).

Different studies conclude that cultural diversity has a positive influence on different innovation contexts. However, with respect to the implementation of a diversity management approach, it is questionable to what extent there is awareness of the positive relationship between cultural diversity and innovation.

5 Methodology

In the frame of the analysis, descriptive as well as multivariate analyzes were conducted. The study was carried out in the frame of a so-called *Cluster of Excellence* (CoE) named *Integrative Production Technology for High-Wage Countries*. Connected to the university, the CoE represents organizations that bring scientists from different disciplines, departments and research groups together (see figure III.2). In order to be able to understand the development of opinions and the influence of external factors on perception, it is necessary to fathom the organizational structure as well as the structural integration of CoEs.

Steuer *et al.* (2017) capture the particularities of a CoE in the frame of a tripartite model. In the frame of this model, they differentiate between *Cluster-external patterns and frameworks*, *Organization-external patterns and frameworks* and *System-external patterns and frameworks* (see figure III.2). All three layers describe influencing factors, which have an impact on the personnel structure but also prevailing attitudes and mindsets of the Cluster workforce. In this context, *Cluster-external patterns and frameworks* refer to the employees working environment in the institutes. Within the framework of these research groups, employees are involved in institute-specific processes and work under a specific management style that may differ from that of other research groups. Furthermore, within this layer, factors like recruiting processes, dominant corporate culture, human resource management, as well as hierarchical factors are reflected. The layer *Organization-external patterns and frameworks* summarizes the influencing factors given through university framework and faculty/department structures. Under *System-external patterns and frameworks* Steuer *et al.* (2017) summarize factors affecting personnel law, contractual framework conditions, resulting fluctuation, expectations of the employer and loyalty to the organization.

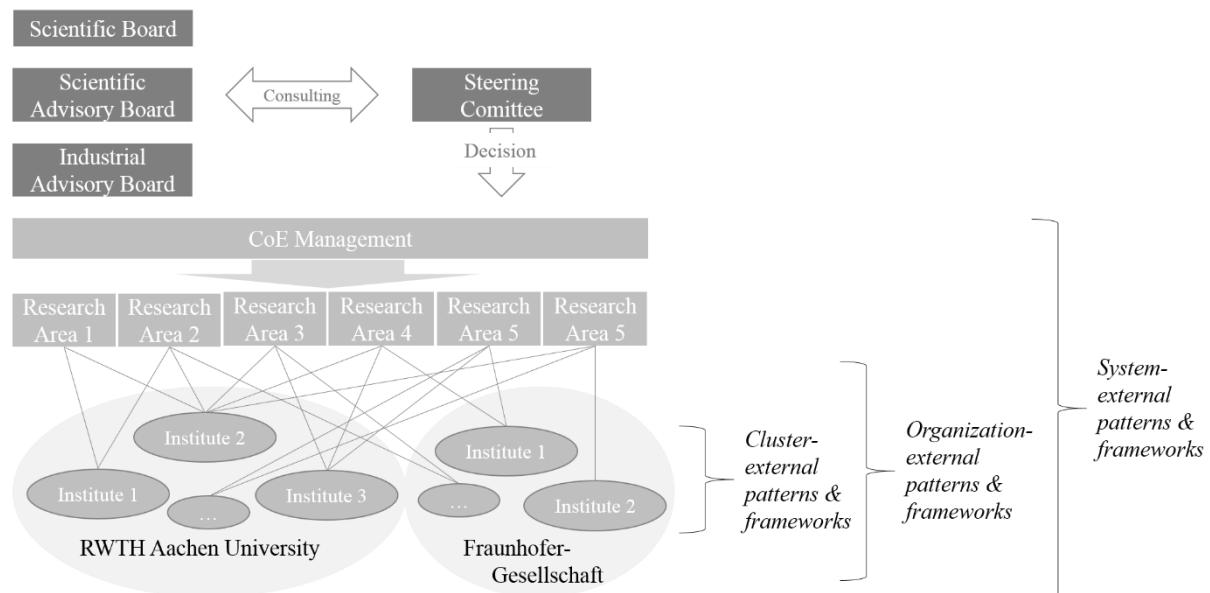


Figure III.2: Organizational structure of the CoE

The CoE staff consists of professors, junior professors, scientific staff and administrative personnel. Regarding the demographic data, 86.4% of all employees working in the Cluster are male. Due to the thematic focus of the CoE, 82.4% are related to institutes at the faculty of mechanical engineering, 11.8% are located at the faculty of natural sciences and mathematics, and whereas only 3.4% are affiliated within economics and 1.3% from linguistic and cultural sciences (1.1% gave no indication concerning the professional allocation). Considering the cultural background, 9.7% of Cluster employees have a non-German-background. Considering the demographic data and the top-down organized management structure, the object of research can be classified as a scientific organization that has the characteristics mentioned by Vedder (2001) earlier. With regard to the subject culture, a dominant habitus can be identified, which can be explained by the thematic location of the CoE in mechanical engineering topics.

In the context of the presented quantitative study, the scientific staff (doctoral candidates and post-docs) were interviewed. With a share of 81.9% they represent the largest status group in the frame of the CoE *Integrative Production Technology for High-Wage Countries*. A total of 149 persons from the status group were identified and invited to the survey by e-mail. 69 employees from the status group took part in the survey. Figure III.3 summarizes the demographic data of the participants. Regarding the diversity category *gender*, 8.7% claimed to be female and 91.3% to be male. The average age of the interviewees was 32.58 years, with a minimum age of 26 years and a maximum age of 64 years. Considering the origin of the participants, 13.24% indicated to come from a non-European non-German-speaking country, 1.47% to come from a European non-German-speaking country and 85.29% to come from a German speaking country. Multiple answers were possible with regard to the specialist background. Thus, 52 times the affiliation to the engineering sciences, 13 times the natural sciences/ mathematics/ informatics three times an affiliation to the humanities, one time the affiliation to the social sciences, two times the economic sciences and one-time others were

given. If one considers the educational background regarding the educational institution, 76.81% of the respondents completed their studies at the RWTH Aachen University and 23.19% at another university.

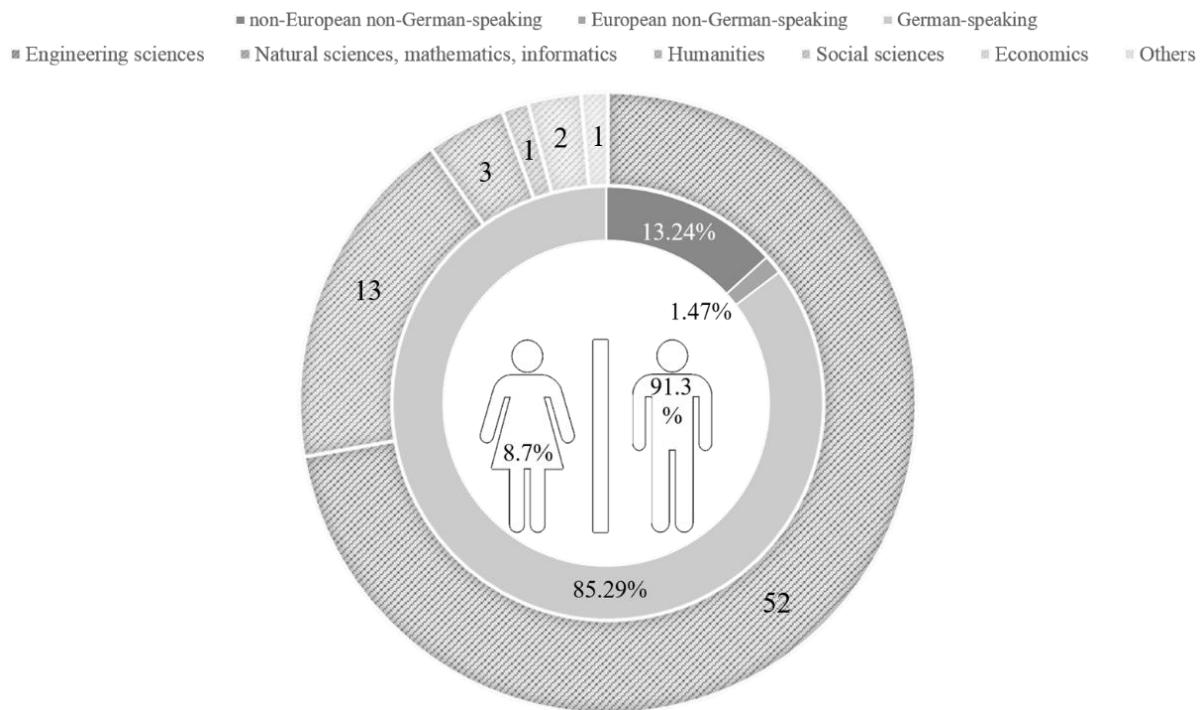


Figure III.3: Demographic data of the CoE

Summarizing the descriptive data of the CoE structure, one can assume that the CoE workforce is not diverse at the research assistant level.

The survey was conducted using a six-tiered Likert scale. The Likert scale was selected because it is suitable for measuring attitudes. In this context *attitude* is the emotional, mental and action disposition towards an environmental aspect (Albers *et al.* 2009). The setting is measured using several statements (items) which are evaluated by the test persons in a continuum from extremely positive to extremely negative (Stier 2013). As a result, the items refer to a theoretical construct. This allows to summarize tendencies in the statements. Considered under measurement theory, Likert scale is ordinally scaled, resulting from the assumption that interviewees consider the intervals between the answers as equal (Völkl & Korb 2017). In order to be able to use all statistical operations in data analysis, the Likert scale is often referred as

quasi-metric and treated like an interval scale. A prerequisite for an interpretation as quasi-metric is that the variables have at least five expressions and that the distances between the answers can be interpreted semantically and by numerical value assignment as equal (Urban & Mayerl 2011). Therefore, the response specifications are graded, but can be divided dichotomously by the six-step arrangement.

With regard to quantitative analysis, multiple response sets, Cramer's V and Kendall's Tau are used to examine perceptions of the diversity categories gender and culture in a context with innovation. Regarding the multiple answer set, dichotomies (consent and rejection) are formed for the questions of perception and attitude. These dichotomized variables can then be combined into a multiple answer set, whereby the agreement (= perceived diversity in a feature category) is recorded as a counted value. The advantage of this method is the direct comparison of the individual answer options with each other. The Cramer's V calculation is based on the chi-square statistic (David & Sutton 2004). Cramer's V can be applied to any table size (Warner 2013).

It provides information about the strength of a correlation, comparable to determining the correlation of variables. For the determination of these two measures, however, a nominal scaling of the variables is *sufficient*. Regarding measures of association for ordinally scaled data, linear and non-linear relationships can also occur, and statements can be made about the direction of the influence. Furthermore, a rank correlation coefficient analysis is conducted. The rank correlation can be used to describe the extent to which two rankings systematically vary with each other. Instead of the interval-scaled measured values, the respective rankings of the ordinal-scaled data are used. If there is a perfect correlation in the same sense, it is to be expected that the second data series will be arranged perfectly, i.e. (depending on the sorting selected) either from the smallest to the largest or from the largest to the smallest data set. In the case of a perfectly opposite relationship, on the other hand, it would be expected that the

second data series would be sorted exactly opposite to the first data series. All other cases deviate more or less strongly from these two special cases. In the frame of the presented study, Kendall's Tau is applied due to its insensitivity to associated ranks (Arndt *et al.* 1999).

6 Results

In order to get an impression of the perception of the prevailing diversity, participants were asked about the perception of individual categories of diversity. As figure III.2 shows, employees are influenced by their institutes as the institutes represent the daily working-environment. Furthermore, the institutes are the recruitment base for the research assistants that are part of the CoE workforce. Although the CoE represents an organizational framework, it can be seen as a functional construct under whose structure work is carried out decentrally in project groups. With regard to the reflection of diversity in the daily working environment, institutes and the CoE are therefore considered as separate organizations. Regarding the perception of diversity, it is assumed that the perception of diversity in everyday working life cannot be differentiated and reflected within the framework of the different organizational units (CoE and institutes). It is anticipated, that the influence of the daily working environment is stronger in terms of the perception of diversity.

6.1 Analysis Based on Multiple Response Sets

In order to standardize the answer to the question about the perception of diversity, a selection of diversity categories was made available within the framework of the survey. In the frame of the question: *Within my research institution the employees differ in terms of...*

- Age
- Professional background
- Marital status

- Gender
- Professional experience
- Physical abilities
- Origin
- Religion
- Way of working
- Native language
- Culture,

participants could choose between the diversity categories mentioned. The intention is that the participants reflect on diversity beyond naming frequently discussed categories such as *gender* or categories perceived through individual intersectionality. In the frame of the survey, several answers were possible.

Analysis shows that 86.4% perceive diversity in terms of *way of working*, 79.9% *marital status* and 69.5% *professional background* and 62.7% *gender* diversity. Considering the perception of individual diversity categories divided according to *gender*, it becomes clear that there is a similar perception with regard to the diversity categories *way of working* (83.3% females/ 86.8% males) and *professional background* (66.7% females/ 69.8% males). Major differences exist in the perception of the categories *professional experience* (33.33% females/ 69.8% males), *physical abilities* (16.7% females/ 52.8% males) and *marital status* (50% females/ 83% males). Differentiating the perception of individual categories with regard to *origin*, it becomes clear that, comparable with the results divided according to *gender*, *way of working* (86.3% German-speaking region/ 85.7% non-German-speaking region) and *professional background* (68.6% German-speaking region/ 71.4% non-German-speaking region) are the most frequently perceived diversity categories seen among employees from the German-speaking region as well as among employees from the non-German-speaking region. The largest difference in perception within this group can be found in the categories of *physical abilities* (41.2% German-

speaking region/ 100% non-German-speaking region), *age* (51% German-speaking region/ 85.7% non-German-speaking region) and *origin* (58.8% German-speaking region/ 85.7% non-German-speaking region).

6.2 Analysis Based on Cramer's V

Following the perception of specific diversity categories within the institutes, the respondents were asked about the perceived relationship between individual diversity categories and innovation. With regard to the relationship between *origin* and *different mother tongues increase innovative capacity*, a Cramer's V of .573, of a possible maximum value of 1, shows a medium association with a very significant value ($p < .01$). Considered separately, analysis shows while employees from non-German-speaking countries (100%) see a connection between the diversity of native languages and the ability to innovate, the absolute majority of employees from German-speaking countries reject (82%) a positive connection between diverse native languages and the ability to innovate. Considering the perception of the diverse gender, male (83%) as well as female (83.3%) test subjects dominantly agree that there is a perceived positive connection between gender-mixed team constellations and innovative ability. Regarding the relationship between the diversity category *gender* and the increase in innovation capacity through gender-mixed constellations, only a negligibly small relationship can be identified between *gender* and *gender-mixed constellations increase innovative capacity*. A Cramer's V of .003 and a corresponding error probability of almost 99% suggests that there is no correlation between the perception of a positive impact of gender-mixed teams of men and women.

Table III.1: Chi-square and Cramer's V for the diversity categories gender and origin

	“gender-mixed team constellations promote cooperation”	“gender-mixed team constellations increase innovative capacity”	“different mother tongues promote cooperation”	“different mother tongues increase innovative capacity”	Index
Gender	.000	.000			Chi-square
	-.003	-.003			Phi
	.003	.003			Cramer's V
Origin			16.382 .531** .531**	18.368 .573** .573**	Chi-square Phi Cramer's V

**p<.01

In addition, the participants were asked to what extent individual diversity categories promote cooperation. Analysis shows, that there is a moderate correlation between *origin* and *different mother tongues promote cooperation* (Cramer's V = .531) with a very significant value (p < .01). Looking at the individual groups, test persons from non-German-speaking countries tend to agree (71.4%), while those from German-speaking countries dominantly reject (90.2%) a positive context between different mother tongues and cooperation. Considering According to that, female (83.3%) as well as male (83%) employees dominantly state, that gender-mixed constellations promote cooperation. A Cramer's V of .003 and a corresponding error probability of almost 99% suggests that there is no correlation between the perception of a positive impact of gender-mixed teams regarding the promotion of cooperation and gender.

6.3 Analysis Based on Kendall's Tau

In the frame of the survey, participants are asked whether they consider the status of diversity as too high, *sufficient* or *too low*. Both the significance of diversity within the institutes as well as the significance within the CoE and thus the overarching organization are elicited separately. In a next step, the extent to which diversity characteristics perceived as particularly present (see 4.1 multiple response sets) provide information about the perception of the importance of diversity in the frame of the institute, was investigated. In a first step, the significance of the

institute as a daily working environment for the participants is examined. As table III.2 shows, there is no significant correlation between the perception of certain diversity characteristics and the perception of a *sufficient* status of diversity at the institute. On the contrary, several significant correlations with the perception of a *too high* value of diversity could be found (religion: .268, culture: .262 mother tongue: .247 and origin: .240). These correlations are all positive. This means that the more diverse the institute is perceived in terms of religion, culture, mother tongue and origin the more the value of diversity at the institute is perceived as *too high*. It is interesting to note that the topic of *gender*, communicated most strongly at RWTH Aachen University, does not show any significant correlation (.123) with regard to a *too high* importance. The values tend to be significant ($p < .05$). Regarding a perception of a *too low* value, only a significant negative correlation with the category of *professional background* (-.230) could be found. Conversely, this means the more diverse the institute is perceived about its professional background, the less likely it is that the importance of diversity will be perceived as *too low* at the institute.

Table III.2: Kendall's Tau-b perception of diversity and importance of diversity in the institution

Perception of Diversity Category	“in my institution the importance of diversity is sufficient”	“in my institution the importance of diversity is too high”	“in my institution the importance of diversity is too low”	Index
Gender	.114	.123	-.149	Kendalls tau-b
Origin	.140	.240*	-.085	Kendalls tau-b
Mother Tongue	.041	.247*	-.109	Kendalls tau-b
Culture	.009	.262*	-.030	Kendalls tau-b
Religion	.169	.268*	-.213	Kendalls tau-b

* $p < .05$

In order to investigate whether the organizations of the institutes are regarded by the employees separately from the CoE as a superordinate organization, it is necessary to analyze the value of diversity in the institutes as well as its significance in the frame of the CoE. Comparable to the results in the context of the perception of a *sufficient* importance of diversity in the institutes (table III.2), no significant correlation can be determined with regard to the perception of a *sufficient* importance of diversity in the CoE. However, as table III.3 shows, similar results can also be observed for a *too high* and *too low* status of diversity in the frame of the CoE.

Table III.3: Kendall's Tau-b perception of diversity and importance of diversity in the CoE

Perception of Diversity Category	"in the CoE the importance of diversity is sufficient"	"in the CoE the importance of diversity is too high"	"in the CoE the importance of diversity is too low"	Index
Gender	-.108	-.015	.197	Kendalls tau-b
Origin	-.001	.143	.060	Kendalls tau-b
Mother Tongue	-.066	-.016	-.060	Kendalls tau-b
Culture	-.021	.069	.033	Kendalls tau-b
Religion	-.030	.129	-.019	Kendalls tau-b

Table III.4 provides information on the extent to which the perception of the importance of diversity in one's own institute differs from the perception of the importance of diversity in the frame of the CoE. As figure III.2 shows, it is particularly important to compare perceptions within the framework of the two forms of organization in order to draw conclusions about suitable measures. The analysis makes it possible to link the functional structure of the CoE as a superordinate organization with the institutes as organizations representing the daily working environment.

Considering the perceived importance of diversity, the results indicate that the employees do not differentiate between the CoE and the respective institute. A Kendall's tau of .296 (*sufficient* importance of diversity) and .298 (*too low* importance of diversity) indicates a weakly positive correlation. Furthermore, if diversity is consciously perceived with regard to some categories, it cannot be assumed, however, that the significance of diversity is perceived as *sufficient*.

Table III.4: Diversities status in the CoE and the institutions

	“in the CoE the importance of diversity is sufficient”	“in the CoE the importance of diversity is too high”	“in the CoE the importance of diversity is too low”	Index
“in my institution the importance of diversity is sufficient”	.296**			Kendalls tau-b
“in my institution the importance of diversity is too high”		.130		Kendalls tau-b
“in my institution the importance of diversity is too low”			.298*	Kendalls tau-b

*p<.05; **p<.01

7 Discussion and Limitations

It can be stated that the perception of diversity is different for both, visible diversity and for less visible diversity (see chapter 5.1). The perception of certain diversity categories within the framework of the institutes is fundamentally different. Thus, the diversity categories *way of working* and *professional background* are perceived most often. Initially, this finding may also result from the fact that participants come from different institutes. In order to compare this result with the CoE, the connection between the statements made within the CoE and those

made by the institutes are examined within the framework of Kendall's Tau (see chapter 5.3). In this context, it is interesting to note that there is no differentiation in the perception of diversity in the CoE and the institutes. Considering the great differences within the institutes also coming from different scientific disciplines and led with diverse leadership styles, the findings have to be validated by further research. Two explanations could be either the employees do not differentiate the functional organization of the CoE from the daily working environment of the institute, or the investigated target group does not perceive any structural differences. In both cases, a qualitative approach is needed to further explore the extent to which perception is influenced by the environment.

Considering the results on the connection of individual diversity categories within the framework of innovations, different perceptions can be determined. While gender diversity is perceived as being related to innovation services, it is rejected in the context of origin (within the framework of different mother tongues). Different mother tongues thus seem to be perceived as a barrier. It is questionable whether this statement is based on experience or within the framework of an anticipated assumption based on stereotypes. Origin is in a close context with the cultural background. While the indication of origin represents an objective query, the questioning of the feeling of belonging or the location to a specific cultural background or environment represents a greater challenge. This becomes clear through the definition approaches of the concept of culture. Thomas (2005) defines culture as a man-made part of the environment, which, however, is manifested by creating a typical pattern of meaning or orientation for a nation, society, organization or group. National origin can, but does not have to, go hand in hand with a sense of cultural belonging. Thomas (2005) further defines that the orientation system is made up of specific symbols. As an example, he mentions *language*. Culture and language are often viewed in a symbiosis. Why is this relevant in this context? In order to further investigate the delimitability of the diversity categories in the context of

innovation, it is necessary to engage more closely with the employees with regard to their experiences with diversity and the individual definition of culture. In doing so, it is possible to draw conclusions about possible reactances in the implementation of diversity management. On the contrary, considering the category *gender*, it is not possible to draw conclusions about reactances, as both women and men see a relation between gender-mixed teams and innovation. Reasons for this attitude may lay in the normative commitment of the university as well as the faculties and the institutes referring to gender equality, so the answers could be driven by the intent being politically correct. It is questionable whether the reactions carried out by Kotter (1995) in the context of a change management process can be observed during the actual implementation of measures. In the context of further research, it is therefore necessary to examine the question of the extent to which normative response behavior is involved.

A further insight into the consideration of diversity issues is provided by the question of the significance of diversity. The significance of diversity in the CoE as a superordinate institution is of particular importance. Although a connection is seen between the diversity category *gender* and innovation (see Chapter 5.2), the significance of diversity is also rated as *too high* (see Chapter 5.3). However, if one considers the measured gender diversity within the framework of the distribution of women and men in the CoE (see Figure III.3), it becomes clear that the perception does not correspond to the current workforce structure. This may also be due to the fact that the survey was conducted in a strategic manner. In both cases, a strategic voting process that is intended to prevent the promotion of the topic as well as in case of true perception of a connection between gender and innovation and the simultaneous perception of a *too high* value, a top-down strategy must be pursued, that communicates the need against the background of an empirically proven potential of diversity in innovation contexts. At the same time, it is important to question when an organization is perceived as sufficiently diverse. With

regard to the correlation results, it should be considered that the correlation is an observation, but the observation does not allow any direct conclusion to be drawn about causality.

A limiting element is the high fluctuation within the CoE and the institutes. Although 149 target persons could be identified in this context, it is questionable which actual number of CoE member can be assumed. However, the study gives a valid overview over prevailing mindsets and attitudes and fluctuation is expected to have a minor influence.

In the frame of a next step, the different types of perception in the CoE workforce must be combined with the different types from the management level, in order to develop a strategy that reflects the different perceptions, needs and perspectives.

II Appendix

II 1 Questionnaire (in German)

1. SOZIOGRAFISCHE DATEN

Geschlecht

- weiblich
- männlich
- weitere

Alter

- $x < 25$
- $25 \leq x < 30$
- $30 \leq x < 35$
- $35 \leq x < 40$
- $40 \leq x < 45$
- $45 \leq x < 50$
- $x \geq 50$

Herkunft

- deutschsprachiger Raum
- europäischer, nicht-deutschsprachiger Raum
- außereuropäischer, nicht-deutschsprachiger Raum

Die Fakultät an der Sie ihr Studium absolviert haben, hatte einen Schwerpunkt in:
(*Mehrfachnennungen möglich*)

- Ingenieurwesen
- Naturwissenschaften/Mathematik/Informatik
- Architektur
- Medizin
- Geisteswissenschaften
- Sozialwissenschaften
- Wirtschaftswissenschaften
- Rechtswissenschaften
- Humanwissenschaften
- _____ (weitere)

Haben Sie ihr Studium an der RWTH Aachen absolviert?

- ja
- nein

Welche Fakultätszugehörigkeit hat das Institut an dem Sie zurzeit beschäftigt sind?
(*Mehrfachnennungen möglich*)

- Fak. 1: Naturwissenschaften/Mathematik/Informatik
- Fak. 2: Architektur
- Fak. 3: Bauingenieurwesen
- Fak. 4: Maschinenwesen
- Fak. 5: Georesourcen und Materialtechnik
- Fak. 6: Elektrotechnik und Informationstechnik
- Fak. 7: Philosophische Fakultät
- Fak. 8: Wirtschaftswissenschaften

Welche Position bekleiden Sie?
(*Mehrfachnennungen möglich*)

- Fak. 10: Medizin
- _____ (weitere)
- Oberingenieur*in
- ICD-Koordinator*in
- Team-/Gruppenleiter*in
- Projektleiter*in
- Wissenschaftliche Mitarbeiter*in

Wie lange bekleiden Sie Ihre derzeitige Position?

_____ Jahr(e)

Wie lange arbeiten Sie bereits an dem Institut an dem Sie derzeitig beschäftigt sind?

_____ Jahr(e)

2. INNOVATIONSAKTOREN

Der folgende Abschnitt behandelt die Strukturen in Ihrem Institut und dem Exzellenzcluster.

2.1: In meinem Institut sind die Menschen unterschiedlich im Hinblick auf:

Alter	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Fachl. Hintergrund	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Familienstand	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Geschlecht	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Berufserfahrung	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Körperl. Fähigkeiten	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Herkunft	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Religion	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Arbeitsstil	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Muttersprache	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kultur	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

2.2: Bitte kreuzen Sie an, wie Sie die folgenden Sachverhalte bei der Teamarbeit wahrnehmen:

Gemischt-geschlechtliche Konstellationen behindern die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Gemischt-geschlechtliche Konstellationen fordern die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Gemischt-geschlechtliche Konstellationen steigern die Innovationsfähigkeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kulturelle Unterschiede behindern die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kulturelle Unterschiede fördern die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kulturelle Unterschiede steigern die Innovationsfähigkeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Interdisziplinarität behindert die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Interdisziplinarität fördert die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Interdisziplinarität steigert die Innovationsfähigkeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Unterschiedliche Muttersprachen behindern die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Unterschiedliche Muttersprachen fördern die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Unterschiedliche Muttersprachen steigern die Innovationsfähigkeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

2.3: Bitte kreuzen Sie an:

Ich habe die Möglichkeit die Teamzusammensetzung meines Instituts aktiv mitzustalten.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Der vorherrschenden Teamzusammensetzung liegt eine Strategie zugrunde.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

3: MANAGEMENTSTRUKTUREN

Der folgende Abschnitt beschäftigt sich mit Managementstrukturen in Ihrem Institut und dem Exzellenzcluster.

3.1: In meinem Institut gibt es folgende Angebote:

Workshops zur Verbesserung der interkulturellen Zusammenarbeit	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Workshops zur Konfliktlösung/-vermeidung	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Flexible Arbeitszeitgestaltung	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Homeoffice	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Barrierefreie Räumlichkeiten	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kalender mit Feiertagen unterschiedlicher Kulturkreise	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Vertretungsmöglichkeiten	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

3.2: Folgende Maßnahmen nehme ich tatsächlich in Anspruch:

Workshops zur Verbesserung der interkulturellen Zusammenarbeit	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Workshops zur Konfliktlösung/-vermeidung	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Flexible Arbeitszeitmodelle	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Home Office	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Barrierefreiheit	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kalender mit Feiertagen aller Kulturkreise	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Vertretungsmöglichkeiten	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

3.3: In meinem Institut ...

... werden visionäre Ziele verfolgt.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... ist Kreativität wichtig	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... wird bereichsübergreifend zusammengearbeitet.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... gibt es Innovationsziele.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... werde ich zum Querdenken animiert.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... werden ausreichend Ressourcen zum Experimentieren zur Verfügung gestellt.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... arbeite ich mit gleichbleibenden Denkmustern.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... bleibt zum freien Experimentieren keine Zeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... spielen Innovationen eine untergeordnete Rolle.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... werden Innovationsvorhaben von Einzelpersonen umgesetzt.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

3.4: In Exzellenzcluster ...

... werden visionäre Ziele verfolgt.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... ist Kreativität wichtig	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... wird bereichsübergreifend zusammengearbeitet.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... gibt es Innovationsziele.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... werde ich zum Querdenken animiert.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... werden ausreichend Ressourcen zum Experimentieren zur Verfügung gestellt.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... arbeite ich mit gleichbleibenden Denkmustern.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... bleibt zum freien Experimentieren keine Zeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... spielen Innovationen eine untergeordnete Rolle.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... werden Innovationsvorhaben von Einzelpersonen umgesetzt.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

3.5: Zu meinen Aufgaben gehören:

Lehre	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Drittmittelakquise	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

4. FÜHRUNGSSTIL & HIERARCHIE

4.1: Bitte kreuzen Sie an:

Haben Sie Weisungsbefugnis gegenüber anderen Mitarbeitenden?

ja

nein

Wenn ja, gegenüber wem?

anderen WM

stud. MA

_____ (weitere)

Seit wie vielen Jahren tragen Sie Führungsverantwortung?

_____ Jahre

4.2: Ich würden den an meinem Institut vorgelebten Führungsstil als:

Beratend	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kooperativ	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Autoritär	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Partizipativ	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Patriarchalisch	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Demokratisch	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
_____ (weitere)	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

beschreiben.

4.3: Ich würde meinen eigenen Führungsstil als:

Beratend	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kooperativ	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Autoritär	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Partizipativ	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Patriarchalisch	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Demokratisch	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
_____ (weitere)	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

beschreiben.

4.4: Der vorgelebte Führungsstil ...

... beeinflusst meine Art zu Führen.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... dient mir als Orientierung.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... hindert mich daran meinen eigenen Führungsstil zu etablieren.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... begünstigt die Entwicklung von diversen Teams.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... begünstigt die Innovationsfähigkeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

4.5: Die Hierarchie in meinem Institut ...

... ist steil.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... ist flach.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... fördert die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... behindert die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... hat einen hohen Stellenwert.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... spielt eine untergeordnete Rolle.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... wirkt sich negativ auf die Innovationsfähigkeit aus.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... fördert die Innovationsfähigkeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... ist zu flach.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... ist zu steil.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... hat einen zu hohen Stellenwert.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... hat einen zu niedrigen Stellenwert.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

Figure III.4: Questionnaire (in German)

II 2 Case summary and statistical frequency (in German)

Fallzusammenfassung						
	Gültig		Fehlend		Gesamt	
	N	Prozent	N	Prozent	N	Prozent
\$wahrg_Div_Inst ^a	59	85,5%	10	14,5%	69	100,0%

a. Dichotomie-Gruppe tabellarisch dargestellt bei Wert 2.

Häufigkeiten von \$wahrg_Div_Inst

		Antworten		Prozent der Fälle
		N	Prozent	
Wahrnehmung Diversität im Institut ^a	Wahrnehmung Diversität Alter kategorisiert	33	8,0%	55,9%
	Wahrnehmung Diversität fachl. Hintergrund kategorisiert	41	10,0%	69,5%
	Wahrnehmung Diversität Familienstand kategorisiert	47	11,5%	79,7%
	Wahrnehmung Diversität Geschlecht kategorisiert	37	9,0%	62,7%
	Wahrnehmung Diversität Berufserfahrung kategorisiert	39	9,5%	66,1%
	Wahrnehmung Diversität körperl. Fähigkeiten kategorisiert	29	7,1%	49,2%
	Wahrnehmung Diversität Herkunft kategorisiert	37	9,0%	62,7%
	Wahrnehmung Diversität Religion kategorisiert	34	8,3%	57,6%
	Wahrnehmung Diversität Arbeitsstil kategorisiert	51	12,4%	86,4%
	Wahrnehmung Diversität Muttersprache kategorisiert	28	6,8%	47,5%
	Wahrnehmung Diversität Kultur kategorisiert	34	8,3%	57,6%
Gesamt		410	100,0%	694,9%

a. Dichotomie-Gruppe tabellarisch dargestellt bei Wert 2.

Table III-5 Multiple response set - Perception of diversity at the institute (total)

Fallzusammenfassung

	Fälle					
	Gültig		Fehlend		Gesamt	
	N	Prozent	N	Prozent	N	Prozent
\$wahrg_Div_Inst*A1.1	59	85,5%	10	14,5%	69	100,0%

Kreuztabelle \$wahrg_Div_Inst*A1.1

			Geschlecht		
			weiblich	männlich	Gesamt
Wahrnehmung Diversität im Institut ^a	Wahrnehmung Diversität Alter kategorisiert	Anzahl	2	31	33
		Innerhalb A1.1%	33,3%	58,5%	
	Wahrnehmung Diversität fachl. Hintergrund kategorisiert	Anzahl	4	37	41
		Innerhalb A1.1%	66,7%	69,8%	
	Wahrnehmung Diversität Familienstand kategorisiert	Anzahl	3	44	47
		Innerhalb A1.1%	50,0%	83,0%	
	Wahrnehmung Diversität Geschlecht kategorisiert	Anzahl	5	32	37
		Innerhalb A1.1%	83,3%	60,4%	
	Wahrnehmung Diversität Berufserfahrung kategorisiert	Anzahl	2	37	39
		Innerhalb A1.1%	33,3%	69,8%	
	Wahrnehmung Diversität körperl. Fähigkeiten kategorisiert	Anzahl	1	28	29
		Innerhalb A1.1%	16,7%	52,8%	
	Wahrnehmung Diversität Herkunft kategorisiert	Anzahl	5	32	37
		Innerhalb A1.1%	83,3%	60,4%	
	Wahrnehmung Diversität Religion kategorisiert	Anzahl	4	30	34
		Innerhalb A1.1%	66,7%	56,6%	
	Wahrnehmung Diversität Arbeitsstil kategorisiert	Anzahl	5	46	51
		Innerhalb A1.1%	83,3%	86,8%	
	Wahrnehmung Diversität Muttersprache kategorisiert	Anzahl	4	24	28
		Innerhalb A1.1%	66,7%	45,3%	
	Wahrnehmung Diversität Kultur kategorisiert	Anzahl	5	29	34
		Innerhalb A1.1%	83,3%	54,7%	
Gesamt		Anzahl	6	53	59

Prozentsätze und Gesamtwerte beruhen auf den Befragten.

a. Dichotomie-Gruppe tabellarisch dargestellt bei Wert 2.

Table III-6 Multiple response set - Perception of diversity at the institute (by gender)

Kreuztabelle \$wahrg_Div_Inst*A1.3kat

			Herkunft kategorisiert		Gesamt
			deutschsprachiger Raum	nicht-deutschsprachiger Raum	
Wahrnehmung Diversität im Institut ^a	Wahrnehmung Diversität Alter kategorisiert	Anzahl	26	6	32
		Innerhalb A1.3kat%	51,0%	85,7%	
	Wahrnehmung Diversität fachl. Hintergrund kategorisiert	Anzahl	35	5	40
		Innerhalb A1.3kat%	68,6%	71,4%	
	Wahrnehmung Diversität Familienstand kategorisiert	Anzahl	41	5	46
		Innerhalb A1.3kat%	80,4%	71,4%	
	Wahrnehmung Diversität Geschlecht kategorisiert	Anzahl	31	5	36
		Innerhalb A1.3kat%	60,8%	71,4%	
	Wahrnehmung Diversität Berufserfahrung kategorisiert	Anzahl	33	5	38
		Innerhalb A1.3kat%	64,7%	71,4%	
	Wahrnehmung Diversität körperl. Fähigkeiten kategorisiert	Anzahl	21	7	28
		Innerhalb A1.3kat%	41,2%	100,0%	
	Wahrnehmung Diversität Herkunft kategorisiert	Anzahl	30	6	36
		Innerhalb A1.3kat%	58,8%	85,7%	
	Wahrnehmung Diversität Religion kategorisiert	Anzahl	29	4	33
		Innerhalb A1.3kat%	56,9%	57,1%	
	Wahrnehmung Diversität Arbeitsstil kategorisiert	Anzahl	44	6	50
		Innerhalb A1.3kat%	86,3%	85,7%	
	Wahrnehmung Diversität Muttersprache kategorisiert	Anzahl	23	4	27
		Innerhalb A1.3kat%	45,1%	57,1%	
	Wahrnehmung Diversität Kultur kategorisiert	Anzahl	29	4	33
		Innerhalb A1.3kat%	56,9%	57,1%	
Gesamt	Anzahl	51	7	58	

Prazentsätze und Gesamtwerte beruhen auf den Befragten.

a. Dichotomie-Gruppe tabellarisch dargestellt bei Wert 2.

Table III-7 Multiple response set - Perception of diversity at the institute (by origin)

III References

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Research Paper IV

The Influence of Organizational Culture on Diversity Management in Complex Organizations

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I Abstract

Diversity is increasingly seen as a critical success factor. However, it is also discussed that apart from the potential resulting from a diverse team, there are also challenges to cope with. For this reason, the implementation of a continuous diversity management is required, which equally supports the acquisition of new employees on the one hand and the management of prevailing diversity on the other hand. In psychology, social and economic sciences literature there are different definitions of diversity resulting in various perspectives on the procedure to implement and design a diversity management approach. Specifically, against the background of the complexity of the corporate environment and the increasing requirements of internal corporate agility, there is a need to reflect on diversity more strongly in organizations and to manage it through system-specific approaches. Within the framework of this paper, an interdisciplinary approach is taken for investigating the context between organizational culture and prevailing mindsets towards diversity. Research object is a so-called Cluster of Excellence, a German, interdisciplinary, research organization. The results underline the importance of investigating the specific organizational culture when implementing a diversity management approach and show the necessity of combining change management and diversity management strategies. The results also emphasize the central role of managers as initiators, responsible persons and role models for the significance of diversity and the implementation of corresponding approaches. It is therefore necessary to involve leaders closely in strategy development processes and to raise awareness of their exemplary function, particularly in the context of diversity.

Keywords: Diversity, Change Management, Organizational Culture, Diversity Management, Organizational Structure

1 Introduction

The benefits of heterogeneous teams are discussed in multifaceted ways. For example, in relation to globalization, diverse perspectives in innovation processes are presumed as necessary elements to meet the challenges of a diverse society (Beacham & Shambaugh 2011; Grots & Creuznacher 2012; Gürler & Meyer 2013; López 2015; Sonntag 2014; Uebelnickel *et al.* 2015). This is based on the assumption of being able to develop demand-oriented products and services which are socially sustainable (Dubietzig 2009) due to the reflection of diverse perspectives and needs. As a result, organizations in a wide range of industries, e.g. Pixar (Solomon 2016) or NASA (Montagnon 2012), are implementing diversity management approaches for obtaining benefits through diversity. With the intention of making them an active and apparent part of the company, also enterprises like Pinterest (Daft 2016) or the Ford-Werke GmbH (Kasztan 2017) have taken measures to address different forms of diversity within the organization. In this context, it is questionable how the concept of diversity is to be understood and reflected within the framework of scientific studies that examine the context between diversity and the success of a company.

1.1 A Subject-Related View on Human Diversity

Diversity is not universally defined in literature. Particularly with regard to the specialist discipline, there are differences in the definitional differentiation and perspective focuses. Gardenswartz and Rowe (1998) define the *4 Layers of Diversity* (figure IV.1) from a human behavior perspective. The four layers *Personality*, *Internal Dimensions*, *External Dimensions* and *Organizational Dimensions* represent a proposal for the reflection of diversity in its different manifestations.

At the center of the 4 Layers of Diversity is the culturally shaped personality, which is influenced by the external circles (= dimensions). The core dimensions (primary dimensions,

internal dimensions) are biological or innate and unchangeable. This includes biological sex, sexual orientation, age, physical and mental abilities and limitations as well as social origin, national origin, skin color and ethnic affiliation. The secondary and external dimensions refer to the social identity and the social environment and are more easily changeable. Marital status, parenthood, educational attainment, level of competence, life and work experience, income, place of residence, current nationality, working methods, learning style, habitus, leisure time behavior, usually also religion or worldview are included in this dimension. The outer circle represents the Organizational Dimensions and refers to the professional and business culture or the work process. This involves criteria such as length of service, position in the organizational hierarchy, union membership and many more (Jungbluth 2015).



Figure IV.1: Four Layers of Diversity (Gardenswartz & Rowe 2003)

*Internal Dimensions and External Dimensions are Adapted from Loden and Rosener (1991)

On a closer analysis, the *4 Layers of Diversity* (figure IV.1) illuminate the concept of diversity from different disciplinary perspectives. While personality can be understood as an individual and psychological perspective on diversity, the external (observable) and internal (underlying)

(Milliken & Martins 1996) attributes/ diversity categories represent a social science perspective that deals with the effects of discrimination, labelling and stereotyping in social processes. The organizational perspective of diversity, on the other hand, reflects an economic perspective and the consideration of diversity in business structures and processes. The structure thus shows the necessity of different perspectives on the concept of diversity, but the characteristics of diversity are to be understood across disciplines.

Focusing on the personality dimension, Stuber (2004) gives a psychological perspective and states that diversity refers to the different states of mind. As a result, he derives a necessary openness in dealing with heterogeneity - i.e. the recognition and positive appreciation of differences (Stuber 2004). From an intercultural communication perspective, Larkey (1996) defines diversity in a culture-related, social science way “[...] as differences in worldviews or subjective culture, resulting in potential behaviors that may have oral differences among cultural groups [...], and [...] differences in identity among group members in relation to other groups” (Larkey 1996: 465). The central element of her definition is the delimitation of groups by certain characteristics. From an economic perspective, Milliken and Martins (1996) focus on the organizational frame. From their point of view, diversity is also expressed in the membership of a group or organization and is connected to similar identification and communication and thus, interaction patterns. Summarizing these different perspectives on human diversity, a broad definition seems to be expedient. For this reason, diversity should be defined in this work, following a broad approach, *as a variety of human qualities, including everything in how people differ or are similar to each other.*

1.2 Potentials and Challenges for Teams and/or Management Through Diversity

The extent to which workforce diversity has an influence on entrepreneurial success was investigated in different research projects from an economical perspective (e.g. Lorenzo *et al.*

2017; Lunguanu & Contractor 2015; Østergaard *et al.* 2011; Pesch *et al.* 2015; Söllner 2010; Tortoriello *et al.* 2015; van Beers & Zand 2013; van Dijk *et al.* 2012; Noland *et al.* 2016; Talke *et al.* 2011). Categories of diversity (Gardenswartz & Rowe 1998) – like gender, age, culture, but also communication style and occupation – were considered as well as how their impact correlated with business aspects like the impact on the size and complexity of an organization (Lorenzo *et al.* 2017), capital market performance (Talke *et al.* 2011), the creation process of innovations (Lunguanu & Contractor 2015; Østergaard *et al.* 2011), task complexity (van Dijk *et al.* 2012), leadership (Noland *et al.* 2016) or innovation performance in general (Pesch *et al.* 2015; Söllner 2010; Tortoriello *et al.* 2015; van Beers & Zand 2013; Dezsò & Ross 2012). In summary, all the studies suggest that various investigated forms of diversity like gender and educational background (Østergaard *et al.* 2011; Dezsò & Ross 2014; Noland *et al.* 2016; Talke *et al.* 2011), occupation (Söllner 2010), knowledge diversity (Tortoriello *et al.* 2015) and geographical diversity (van Beers & Zand 2013), have positive effects on corporate success. These results correspond to the so-called *Information-Decision-making Perspective* which focuses on the positive effects of diversity in work groups (van Knippenberg & Schippers, 2007). Reflecting on the spectrum of diversity categories (Gardenswartz & Rowe 1998), it should be noted that studies also came to the conclusion that not all diversity categories seem to have an impact (like age (Østergaard *et al.* 2011)) or actually have negative as well as positive effects like communication style (Pesch *et al.* 2015) and state of knowledge (Lunguanu & Contractor 2015).

At the same time, the investigation of the effects of diversity leads to the conclusion that a high degree of diversity also poses challenges, as a high degree of diversity implies different perspectives, experiences and backgrounds (Díaz-García *et al.* 2013; Voigt & Wagner 2006; Pelled *et al.* 1999; Ellemers & Rink 2016). This result is supported by the *Social Categorization Perspective* (on social group level) and the *Similarity-Attraction Paradigm* (on interpersonal

level with a focus on attitudes and values), which state that perceived similarities, especially with regard to values, attitudes but also characteristics like age and gender result in more sympathy (Byrne 1971; Brewer 1979; William Phillips & O'Reilly 1998; Jackson *et al.* 2003). Following this logic, conversely, differences seem to lead to less sympathy and more frictional points. According to Byrne (1971), Tziner (1985) defines the social psychology theories *Similarity Theory* and *Equity Theory*. While similarity theory postulates higher productivity based on homogeneity and shared values in teams, equity theory describes the tension and as a result disadvantages resulting from dissimilar team members (Tziner 1985). Supported by communication theory perspective, the principle of *Perspective Divergences* describes the effects of the differences between individual perspectives (Hartung 2002). Perspective divergences are regarded as the origin of disturbances in communication, even if the diversity dimension is not perceived as an individual attribute, but as an attribute of a certain group (Hartung 2002). This means, the more team diversity prevails, the more different perspectives and thus a greater potential for disruptions, especially in communication processes, are expected (Hartung 2002; Díaz-García *et al.* 2013).

According to the presented approaches, Milliken and Martins (1996) conclude: "Diversity thus appears to be a double-edged sword, increasing the opportunity for creativity as well as the likelihood that group members will be dissatisfied and fail to identify with the group." (Milliken & Martins 1996: 403). As a result, Cox (1993) points out that it cannot automatically be assumed that heterogeneity leads to better results. Therefore, even if the goal of a diverse workforce has been achieved, it is necessary to manage diversity and establish structures that enable cooperation in diverse teams (Bartz *et al.* 1990; Aretz & Hansen 2003b; Nooteboom *et al.* 2007; Hagenhoff 2008; Günther 2014; Lorenzo *et al.* 2017; Basset-Jones 2005).

1.3 Economical Perspective on Diversity Management

Following the OENORM S 2501:2008-01-01 (2008) diversity management is defined as a strategic management approach for the targeted perception and use of human diversity and relevant organizational environments or stakeholders in order to create structural and social conditions under which all employees can develop and unfold their capabilities and willingness to perform for the benefit of all parties involved and to increase organizational success (OENORM S 2501:2008-01-01 2008). Koall (2003), classifies the management of diversity as an approach with a human resource (HR) and organizational focus on management actions with the aim of developing and using human diversity in a way that is relevant to business (Koall 2003 cited in Bendl *et al.* 2004). Similarly, Sepehri and Wagner (2002) emphasize that diversity management is a concept of strategic corporate management and has a social and at the same time an economic-competitive component. In this context, diversity management aims to promote diversity within the organization and at the same time improve the organization's ability to use it effectively for the success of the organization.

Vedder (2006) regards diversity management as a strategic instrument for increasing efficiency in its core business. Based on different approaches that tackle the economically relevant impact of diversity (Cox 1993; Cox JR. & Blake 1991; Bateman & Zeithaml 1993; Krell & Sieben 2011; Sepehri & Wagner 2002; Plummer 2003; Krell 1999), Krell and Sieben (2011), Krell (2007a; Krell 2007b), as well as Vedder (2006) deduce nine functional economic (Bendl 2004) arguments for diversity management:

1. Workforce structure
2. Cost argument
3. Personnel marketing argument
4. Marketing argument

5. Flexibility and innovation argument

6. Creativity argument

7. Problem-solving argument

8. Financing argument

9. Internationalization argument

From their point of view, the measures taken to increase diversity mean that diversity management has a direct influence on the *workforce structure*. Against the background of demographic change, this form of personnel policy opens new possibilities for counteracting the ageing of the workforce. Furthermore, the reflection on diversity and the opening of equal opportunities should also contribute to greater employee satisfaction and an improved innovative potential (Hunt *et al.* 2015: 11). In this context, Krell and Sieben (2011) as well as Vedder (2006) define the *cost argument* as a benefit, resulting from satisfied employees. The underlying thesis concludes that employees perform better through the perceived acceptance of their individual diversity. This assumption refers to Maslow's hierarchy of needs, a five-tier model that categorizes human needs from motivational theory perspective (Davey 2018). In the frame of Maslow's approach, self-esteem and appreciation by others represent an important need for people (Maslow 1943: 381). Based on the cost argument, the advantage of *personnel marketing* can be seen in the acquisition of different talents by a diverse workforce and a positive employer image. In this context, the concept of *employee branding* can also be mentioned as a process of “[...] ensuring that employees act in accordance with the organization's brand values” (Edwards 2005: 266). The *marketing argument* stands for the idea that a diverse workforce is better able to respond to the diversity of customer needs. Cox (1993) also sees a significant competitive advantage here. He refers to several American studies that confirm the positive influence of heterogeneous management level on sales, resulting from insider knowledge of the potential target group. The *flexibility and innovation argument*

summarizes the ability of heterogeneous organizations to adapt to a dynamic environment. Vedder (2006), recognizes that the reason for this is the increased acceptance of alternative views, as well as an individual tolerance of ambiguity and cognitive flexibility, which is supported by an active diversity management. From the perspective of the *creativity argument*, it is assumed that a value spectrum broadened by diversity management leads to the dismantling of conformity barriers. Following this, the integration of new approaches and ideas is facilitated. Psychological studies also indicate that more diverse viewpoints lead to more innovative group decisions (Thomas 2003; Rastetter 2006). Nemeth and O'Connor (2019) conclude “[d]issent both liberates and stimulates our thinking” (Nemeth & O'Connor 2019: 81). Krell (1999) mentions that homogeneous groups can solve problems faster than heterogeneous groups, but that diverse groups can come up with more viable solutions. The *problem-solving argument* includes the aspect that diverse groups can refer to a broader knowledge base and thus obtain qualitatively higher-quality solution approaches. The reason for this is the stronger reflective behavior in these groups. With regard to the *financing argument*, Krell (2007a) sums up that in the context of investment decisions, the focus is increasingly not only on economic but also on social aspects. For example, investment fund companies in the USA have already committed themselves to investing in companies that have diversity programs. The potential offered by active diversity management is included as a factor in profit analyzes. If diversity management is successfully implemented, a company will be able to adapt more easily to cultural circumstances. Following on from the flexibility and innovation argument, the *internationalization argument* emphasizes the potential to act better in a globalized market.

The argumentation outlined above points out that the economic benefits of diversity management are particularly emphasized. From a system-theoretical perspective, this means that different diversity dimensions are seen as functional for the economic benefit within the framework of diversity management. Which of these diversity dimensions are considered as

functional depends on the organizational context and its power relations (Bendl & Hofmann 2004 in Bendl 2004).

In this paper, an approach is developed that integrates the interdisciplinary perspective on diversity management, by combining concepts and approaches from psychology, economic and social sciences. The project is conducted in public science sector and strives for implementing a diversity management approach in a complex organization by including elements derived from change management theory, while reflecting the psychological aspects of change processes on individual level. The presented study focuses on the relationship between individual employee mindsets regarding diversity and the mutual influence of the organizational culture and employees. The aim of this paper is to shed light on the organization internal dynamics in the context of implementing a diversity management strategy.

The underlying theory is based on the investigation of the relation between diversity and organizational culture with elements of acceptance research, reflecting the psychological demands of a change management approach. Sociological literature refers to a political perspective of diversity management at universities as higher education institutions, but not to scientific research organizations in this environment (Güttner 2011). From an economical perspective, Özbilgin and Tatli (2008), indicate an interrelation between diversity management and the necessity for an organizational change, whereas Cao *et al.* (2003), primarily consider the opposite perspective of the impact of process, structural, cultural and political diversity on the implementation of the management of change (MoC). The psychological literature has not addressed these interrelations yet. For this reason, the study fills a research gap because it takes up and reflects the structural complexity of the interplay between the management approaches diversity management, change management and organization management.

The object of research is a so-called Cluster of Excellence (CoE) (<https://www.iop.rwth-aachen.de/cms/~gpfz/Produktionstechnik/>). The CoE is a large research alliance with an

engineering focus in Germany that is strongly connected to university systems (for further information readers are referred to chapter 3a). The results represent an abstraction of the findings gained in the frame of the research of the CoE. The research object is characterized by special framework conditions of the public higher education system in Germany on the one hand and the resulting complexity of personnel management on the other hand.

The paper is organized as follows: In the second chapter, a theoretical approach that combines the management concepts change management, organization management, and diversity management is discussed and the particularities of complex organizations are illustrated as mentioned above. In the third chapter, the research design and the methodology are explained, and the research object is described in a more detailed fashion before the central results of the quantitative employee survey are presented. In the course of the discussion, the core findings are then examined and put into context with a first draft of an implementation concept.

2 Reflecting Diversity Management in Complex Organizations

Regarding the factors that require the implementation of diverse perspectives, Hanappi-Egger (2004) states that diversity approaches will increasingly gain importance. The reason for this is seen in the fact that traditional organizational concepts are too short-sighted with regard to challenges such as globalization, migration, demographic changes and increasing competitive pressure (Hanappi-Egger 2004). Furthermore, Hanappi-Egger (2004) points out that especially rapidly changing environmental factors that raise new questions of competence place high demands on the learning ability of organizations. Consequently, a triangulation between diversity management, complex organizations and a necessary agility in organizational structures seem to be essential for being able to cope with those external requirements.

2.1 Complexity in Organizational Structures

To be able to explain the connections more precisely, it is necessary to take a closer look at the underlying concepts. Considering the complexity of organizations, in the first instance the term *organization* needs to be analyzed in a differentiated way. When defining the concept of organization, a distinction can be made between the *organizational structure* and the *operational structure* (Nordsieck 1934; Kosiol 1968). The *operational structure* comprises the formation and distribution of tasks as well as the relations between the task responsible and can be summarized under processes (Hub 1994; Oelsnitz 2009). The *organizational structure*, also described as structures, summarizes the logical framework within information flows and authority to issue directives applies (Oelsnitz 2009). It should be discussed whether the described dichotomy is still appropriate or the static perspective on organizational structures is still adequate. In the context of this paper, the dichotomy between organizational structure and operational structure is used for the reflection of the different aspects that need to be considered in the organizational context. A critical discourse on the concept will therefore not be conducted at this point. Despite the separate consideration, operational and organizational structures are interwoven and interdependent. Within this paper, the focus lies on the organizational structure as framework for interaction. Nevertheless, especially when analyzing the development of an organizational culture and diversity management, operational structures and the development of working processes need to be reflected (see figure IV.2).

The characteristics that define a complex organization are interpreted in different ways. In literature, two different perspectives that influence the degree of complexity of a company are discussed. Analyzing the described indicators, there are external influencing factors on the one hand and internal aspects on the other hand. Potgieter *et al.* (2005), Scheinpflug and Stolzenberg (2017) as well as Hartung (2014), define a company's complexity in the frame of external factors. From their point of view, the network of markets and people (Hartung 2014), an

increasingly volatile, dynamic, interconnected and ambiguous entrepreneurial environment (Scheinpflug & Stolzenberg 2017), uncertainties and changing customer profiles (Potgieter *et al.* 2005), and the resulting structures that reflect these external circumstances define the complexity of a company. Considering the internal perspective, influencing factors like the increase of complex transformations in companies (e.g. mergers, splits, sharing) (Op't Land and Dietz, 2012), complex forms of cooperation (e.g. company networks) (Seiter 2006), volatile organizational units and decision-making authorities (Rieble 2014) as well as processes of internal decentralization (Hirsch-Kreisen 1995) are cited. From an internal perspective, Canitz (2013) states that a complex organizational structure manifests itself on the macro and the micro level. Regarding the macro level, the complexity is determined by the organizational structure, the degree of decentralization, and the number of company locations maintained. Whereas, the complexity of individual business processes is defined as the so-called micro level. Canitz' (2013) perspective of macro and micro level seems to be related to the concept of operational and organizational structures (Nordsieck 1934; Kosiol 1968) mentioned earlier. Putting the different perspectives together, organizational complexity is characterized by the need to make continuous adjustments that reflect both internal and external circumstances. This need is accompanied by a necessary entrepreneurial agility, which is mirrored in the frame of the organizational structure.

2.2 Influence of Agile Methods on Complexity

Coming from the software development sector, agile methods are characterized by combining already existing philosophies and techniques (like participatory design and ideas from soft system methodology) into new approaches (Strode *et al.* 2009). Based on practical experiences, the approach was developed to quickly deliver quality (software) products (Strode *et al.* 2009). To shed theoretical light on the practical approach, Abrahamsson *et al.* (2003) define four main influencing aspects – object-orientation, evolutionary development, internet technologies and

methodology engineering – as indicators of agile development. Based on that, the approach has been further developed and adapted to different application scenarios (Strode *et al.* 2009; Nerur *et al.* 2005; Reifer *et al.* 2003). However, the necessary agility in complex companies went hand in hand with the need for an appropriate organizational culture. From Strode *et al.* (2009) ‘s point of view, “[o]rganizational culture is a shared belief system that permeates an organization or subunit and ultimately influences the actions of people and work groups.” (Strode *et al.* 2009: 2). Bringing agile methods in a context with the organizational culture, Strode *et al.* (2009) summarized that there seems to be a mutual interdependence that has an impact on the success of an agile approach in an organization. In their study, Strode *et al.* (2009) found out that there is a statistically significant correlation with regard to context between the organizational cultural factors and agile method use. Based on the *Competing Values Framework* (CVF) (Cameron & Quinn 1999), Strode *et al.* (2009) identified especially aspects that affect the consideration of collaboration in the frame of the organization (“the organization values feedback and learning”, “social interaction in the organization is trustful, collaborative, and competent”, “the organization values teamwork is flexible and participative and encourages social interaction”, “the organization enables empowerment of people”, “the organization is results oriented” (Strode *et al.* 2009: 7) but also the implementation of a certain leadership style in an organization (“the project manager acts as a facilitator”, “the management style is that of leadership and collaboration”, “leadership in the organization is entrepreneurial”, “innovative, and risk taking”, “the organization is based on loyalty and mutual trust and commitment” (Strode *et al.* 2009: 7). Based on this, they come to the conclusion that “[...] agile methods [may be] more acceptable in low formality organizations.” (Strode *et al.* 2009: 7). Considering complex organizations and the associated necessary agility it seems that the organizational culture needs to be reflected, especially when implementing diversity management.

2.3 The Interdependencies Between Organizational Culture and Diversity

Management

With regard to the term organizational culture, there are different definitions (Tharp 2009). In the context of diversity management in complex organizations, Schein's (2004; 1990) definition of the term organizational culture illustrates the importance and the dependency of the concepts, as “[c]ulture can [...] be defined as (a) a pattern of basic assumptions, (b) invented, discovered, or developed by a given group, (c) as it learns to cope with its problems of external adaptation and internal integration, (d) that has worked well enough to be considered valid and, therefore (e) is to be taught to new members as the (f) correct way to perceive, think, and feel in relation to those problems.” (Schein 1990: 111). As a human-made concept, the organizational culture influences the daily work and work process but has also an impact on human interaction and the perception of individuals and thus on the appreciation of diversity (figure IV.2).

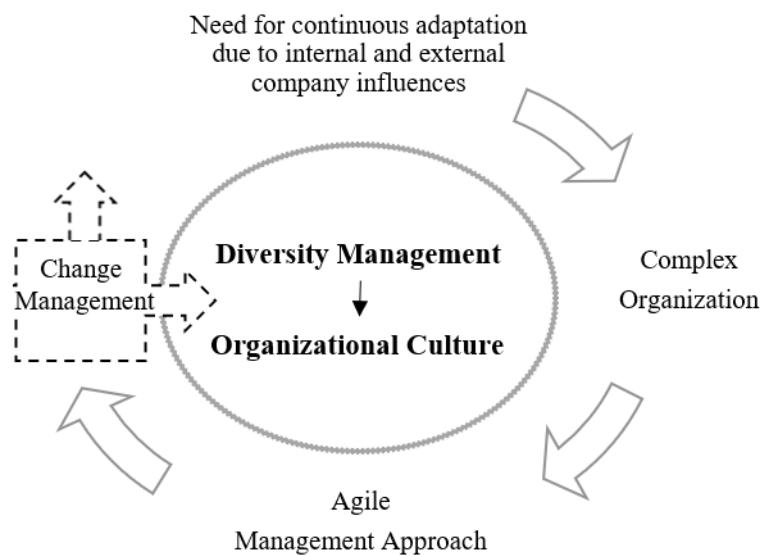


Figure IV.2: Theoretical embedding of diversity management in the organizational context

Organizational culture is a central element since it supports or hinders the agility of a company and is thus, the basis for a functioning complex organization (Strode *et al.* 2009). A similar importance is attributed to the organizational culture in the context of diversity management.

In this context, Tomervik (1995) concludes that “[...] (2) the meaningful aspects of diversity are how it affects the individual and the organization; (3) the broadened definition of diversity requires a culture change within organizations such as management styles, human resource systems, philosophies, and approaches; and (4) there is an emphasis in communicating a concept of diversity as more than race, gender, Affirmative Action and equal employment opportunity.” (Tomervik 1995 in Bendl *et al.* 2004: 58). As a consequence, it is not only necessary to implement a diversity management concept, but also to reflect the existing organizational culture. Thereby, the aspects mentioned by Tomervik (1995) are mutually dependent. To create an appropriate culture, it is necessary to reflect the communication of the meaning of diversity, to create transparency on all company levels, to show how diversity is valued and what influence it has on the organization and the individuals. As a result, the aim of diversity management is to change the organizational culture in a way that managers and employees take diversity for granted and appreciate its value for the working climate and economic success (Charta der Vielfalt e. V. 2017). Considered the other way around, Überacker (2004) states that diversity management must be understood as a corporate goal and characteristic of organizational culture for being implemented successfully. To achieve this, it is necessary to first create and in a further process, to consolidate diversity within a company. However, prevailing mindsets and structural barriers pose potential obstacles to integrating the value of diversity into an organization.

Stuber (2002; 2004) states that diversity management is often implemented in already existing processes, structures and contents of an organization. Thus, individuals but also organizations may have very different ideas about diversity (see chapter 1), which are reflected in their corporate strategy (Hanappi-Egger 2004). For example, Hanappi-Egger (2004) concludes that if diversity is seen as a source of conflict (resistance perspective) and should be avoided, the organization’s self-image is based on dominant, norm-setting groups and resulting perspectives.

In accordance with this, Dass and Parker (1999) summarize different diversity perspectives that result in a certain organizational culture and strategic response (see table IV.1).

Table IV.1: Managing diversity approaches (Dass and Parker 1999, according to Hanappi-Egger 2004)

Diversity perspectives	Problem Statement	Internal Definition	Organizational Culture	Objective	Strategic Response
Resistance perspective	Diversity as non- issue or threat, danger	Dominant ideal	Monoculture, sustain homogeneity	Defending the status quo – Reactive	Reactive
Discrimination and fairness perspective	Diversity causes problems	Classical differences (disadvantaged groups), protected groups	Assimilation of individuals and equal opportunities	Level the playing field for members of protected groups	Defensive
Access and legitimacy perspective	Diversity leads to advantages, opportunities	All differences	Differentiation and positive appreciation of differences	Access to customers and markets	Accommodative
Learning, Effect Viability Perspective	Diversity and similarities offer opportunities and bear costs	Important differences and similarities	Acculturated, multicultural and pluralism	Individual and organizational learning for long term effect	Proactive

For example, Dass and Parker (1999) define the discrimination and fairness perspective as an organizational reality where “[...] prejudice [keeps] members of certain groups out of organizations.” (Dass & Parker 1999: 70). If this perspective is prevailing, they recommend a defensive strategy, including to bring the different interest groups together. The categorial, linear scheme suggests, that there is one (dominating) perspective in each organization and as a result, one stringent strategy that must be applied. This also becomes clear in their definition of implementation strategies on a case-by-case basis (Dass & Parker 1999). However, it is questionable whether this linear perspective corresponds to reality why the approach needs to be discussed critically. For this reason, the resulting central theses for the presented research approach are:

‘In an organization there are different attitudes and perceptions of diversity that lead to the specific organizational culture.’

and

‘The diversity management approach is influenced by the organizational culture.’

The perception of diversity on organizational and individual levels is a central element in the implementation of a diversity management concept. Ellemers and Rink (2016) conclude that the recognition and explicit positive appreciation of diversity in an organization is key factor for success as it “[...] is an important source of work motivation and belongingness for minority group members [...]. Thus, it is not the numerical representation of different groups of workers, but the social acceptance of different people with different perspectives that is decisive [...].” (Ellemers & Rink 2016: 51). In accordance with this, different approaches summarize under diversity beliefs (van Knippenberg *et al.* 2004), diversity perspectives (Ely & Thomas 2001) or diversity attitudes (Sawyerr *et al.* 2005) the extent to which the value of diversity is reflected by individuals. Van Dick *et al.* (2008) define the perceptual process as social categorization, according to the *Social Categorization Perspective* (van Knippenberg & Schippers 2007), which “[...] refers to the group members’ cognitive differentiation between themselves and other members due to perceived differences on a certain attribute (such as ethnic background, age, gender, functional background, etc.).” (van Dick *et al.* 2008: 1465). From their point of view those “[d]iversity beliefs are of particular interest, because they may be associated with positive responses rather than the negative effect of social categorization processes when workgroup diversity is subjectively salient [...]” (van Dick *et al.* 2008: 1465). In conclusion, the perception of diversity in business context seems to be a critical element, when aiming at implementing diverse perspective in entrepreneurial processes.

Attitudes towards a diverse workforce or team constellation can vary due to influencing factors such as the management style of the person directly superior, personal references to the topic

or other influencing factors. To be able to develop a concept that takes the different perspectives and needs of all employees into account and thus achieves broad acceptance, it is necessary to involve all employees of an organization in the development process. Consequently, it is particularly important to examine the different mindsets on all employee levels and, in a further step, to reflect on them in the context of the organizational culture. This approach contradicts other approaches that pursue “[...] a normative pattern of organizational approaches to diversity [...]” (Bowens *et al.*, op. cit.)” (Dass & Parker 1999: 77), that result from the fact that “[o]rganizations often tend to focus on symptoms without seeing the bigger picture.” (Dass & Parker 1999: 75).

For ensuring a sustainable implementation of diversity management especially into complex organizations, an approach that considers organizations from a holistic perspective is required. Based on the assumption that diversity management is implemented in existing structures, Aretz and Hansen (2002; 2003a; 2003b) follow a system-theoretical approach that follows the *theory of general systems of action* as an analytical framework for gathering a more differentiated perspective on prevailing diversity dimensions. From their point of view, managing diversity implies a continuous process of reflection, which allows to scrutinize hegemonic (Bates 1975; Clayton, 2006) constructions and to counteract the processes that constantly recreate those structures (Aretz & Hansen 2003b). In this context, hegemony is seen as a social reality which affects how perception, thinking and evaluation of individuals are shaped by social collective standards (Aretz & Hansen 2003b). The standards result from social interaction contexts, which lead to an institutionalization of meanings (e.g. stereotypes) and thus to an action effectiveness in society (Aretz & Hansen 2003b). From this perspective, the subjective perception seems to be more relevant than factual existing diversity. Consequently, to initiate diversity management, factual existing diversity seems to be not required (Sepehri & Wagner 2000). The trigger for diversity management is rather necessary if social definitions and concepts of

diversity, which then form the symbolic frame of reference for corresponding actions and strategies and create a social reality, are prevailing and reproduced in the frame of communication processes and social interaction (Aretz & Hansen 2003b). Organizations can be considered as micro societies in which own definitions and reference frameworks as well as norms and values are defined that shape the organizational culture. Consequently, it is necessary to question whether and how diversity is socially constructed and defined in organizations (e.g. as a strategic success factor, as part of leadership) (Aretz & Hansen 2003b). It is requisite to consider the motivation for implementing diversity management, what kind of positive effect is expected, which actors are involved, which actors are not involved and many other aspects. When reflecting the intentions for diversity management, the lack of diversity also needs to be investigated (Aretz & Hansen 2003b). In this context, Aretz and Hansen (2003b) link to findings from Total Quality Management (TQM) and Business Process Re-engineering (BPR). Studies dealing with both management approaches point to the necessity of a holistic and systemic approach that reflects the business as a whole, for achieving a sustainable change (Cao *et al.* 2003).

The need for investigating diversity in organizations gives rise to several challenges. Eybl and Kaltenecker (2009) state that not only the diversity of organizations, but also the complexity of their change is neglected. They also point out that the connectivity of diversity management at the various company levels is as unproblematised as the concrete handling of the resistances, which are given side effects of any change project (Eybl & Kaltenecker 2009). With regard to change processes, Kotter and Cohen (2002) as well as Schein (1999) state that failure of organizational change is not primarily attributable to conceptual issues. Kim *et al.* (2011) as well as Rafferty *et al.* (2013) supplement that failure in change projects results from the behavior of the employees in the frame of the process. According to that, Choi and Ruona (2013) conclude in reference to George and Jones (2001) and Porras and Robertson (1992):

“Organizations only change and act through their members, and successful change will persist over the long term, only when individuals alter their on-the-job behavior in appropriate ways.” (Choi & Ruona 2013: 339). Accordingly, Ellemers and Rink (2016) come to the conclusion that the negligence of employee needs results in a change resistance. The integration of diversity management into an existing enterprise goes hand in hand with a change (Keil 2009) on the structural level and thus, also with a change in organizational culture. The analysis of existing concepts and studies shows that the development of a diversity management approach has to be accompanied by the development of a change management (Graetz *et al.* 2012) approach in order to achieve a sustainable implementation.

Despite the need of dealing with the triangle of diversity management, change management and organization management, existing theories do not adequately address processes especially in the context of complex organizations. Thus, there is currently a lack of an approach that reflects the influencing factors described above. The in-depth examination of mindsets is, however, of great importance in order to develop a demand-oriented diversity management approach and to initiate an organization-specific change process. The goal is to minimize psychological effects such as reactance by reflecting the prevailing mindsets for ensuring a sustainable change process. Therefore, by reflecting the development of an organizational culture in investigating workforce mindsets, the presented study addresses an important but under-researched dimension of implementing diversity management in complex organizations.

3 Method

To develop a concept for implementing diversity management in a complex organization, a methodological approach is required which deals with the different levels of an organization and makes them and their members object of research. To capture the different levels of reflection of the employees, the presented research study followed a mixed-method approach

(see figure IV.3). In the first step, a quantitative analysis was carried out to examine the state of diversity and, on the basis of this analysis, to develop a demand-oriented research approach (Steuer *et al.* 2017a). Based on this numerical capture, a qualitative survey with the management level was conducted. As a result, six management types (Steuer-Dankert & Leicht-Scholten, 2019) were derived, which allowed for derivation of the prevailing organizational culture whilst also representing the basis for implementing a top-down strategy (Steuer & Leicht-Scholten 2017). In the final step, a quantitative questionnaire survey was carried out with the employees of the organization. In the frame of this study types and prevailing mindsets were detected.

3.1 Research Context

The research approach was designed on the basis of the 6-step analysis method (Bargen & Blickhäuser 2004; Bendl *et al.* 2004; Bendl 2004) which is based on the *Business Design Principles*. The method's core is the examination of the organization in the form of an analysis of the problems of affected persons. Within the framework of the approach, particular attention is paid to the analysis of obstacles to develop options based on these. This paper presents the results of the employee survey as third study of the developed research design (figure IV.3) and the identified clusters.

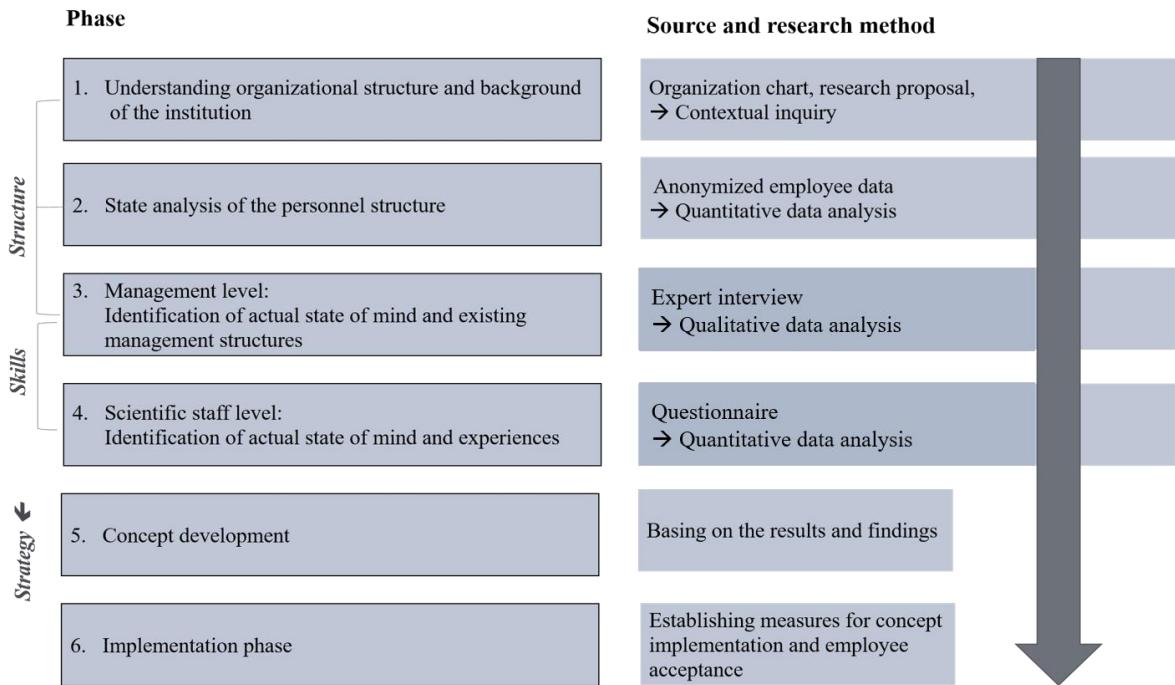


Figure IV.3: Research design (Adapted in Accordance to Steuer *et al.* 2017a)

Stuber's (2004) study illustrates that previous approaches to diversity management have so far been considered predominantly in companies that are characterized by management with direct authority to issue directives. In addition, the emphasis on the economic advantages of diversity management shows that it seems to be initially a strong private law effort and that economic advantages are expected from the implementation of diversity management. Therefore, it is not surprising that most studies consider diversity management in an entrepreneurial frame. However, it is questionable, whether the positive effects of diversity management can also be realized in scientific organizations in the public sector or whether and to what extent the formats need to be adapted.

To study the dynamics described above a so-called Cluster of Excellence (CoE) in Germany was selected as research object and complex organization. For further information please see Steuer *et al.* (2017b; 2017a) and Deutsche Forschungsgemeinschaft (2014; 2019a). The chosen research object is a complex organization from the science sector. Due to the high demand for corresponding research approaches in the context of the university environment, a CoE was

chosen as the target organization. Research organizations like the CoEs are of increasing importance for the scientific world, as more and more inter and transdisciplinary collaboration are needed to cope complex challenges. In Germany, such clusters collaborate on central scientific issues (Deutsche Forschungsgemeinschaft 2019b). Conceptualized as large research alliances, the CoEs are “internationally visible, competitive research and training facilities, thereby enhancing scientific networking and cooperation among the participating institutions” (Deutsche Forschungsgemeinschaft 2019a). In addition to their scientific interdisciplinary orientation, the CoEs also fulfill other functions. Large research alliances like the CoEs are directly linked to the strategic orientation of the university and also serve as a training environment for future scientists (Deutsche Forschungsgemeinschaft 2019a).

The CoE is located at RWTH Aachen University and was called “Integrative Production Technology for High-Wage Countries” (Brecher 2012) until 2019. In the process of the excellence initiative in 2018, the CoE was realigned and is now called “Internet of Production” (RWTH Aachen University n.d.). The surveys were conducted at the CoE “Integrative Production Technology for High-Wage Countries”. At this time, 381 members were registered at the organization. The research alliance was characterized by a strong connection to engineering issues and a high number of employees that are related to the engineering faculty (82.4%). The remaining 17.6% were distributed among the faculty for natural sciences and mathematics (11.8%), the faculty for economics (3.4%), the faculty for linguistic and cultural sciences (1.3%). 1.1% gave no indication with regard to the professional allocation. Based on the annual demographic report, 86.4% of all employees classified themselves as male and 9.7% indicated a non-German-background (Steuer *et al.* 2017a). Summarizing the results from the descriptive analysis of the organization, the CoE is characterized by a male-dominated, German engineering habitus (Steuer *et al.* 2017a).

The level of complexity of the CoE as an organization can be characterized by internal and external factors. CoEs are integrated in an academic environment. This is accompanied by different influencing factors and framework conditions. For example, these include the time limitation of employment contracts and the requirements to be met by the scientific activities employed by the university. In addition to research activities, this usually includes teaching duties, too. Regarding the legal basis between CoE and research staff, employment contracts are usually concluded with the respective university (RWTH Aachen) or research organizations like the Fraunhofer-Gesellschaft. Regarding the application processes at RWTH Aachen University, job interviews and decisions are decentralized and carried out in the research institutions (Steuer *et al.* 2017b; Steuer-Dankert & Leicht-Scholten 2019). Conversely, this means that the members of the CoE are not directly employed by the organization and that the management of the CoE has no explicit authority to issue directives. This is also reflected in the frame of the internal structure (figure IV.4).

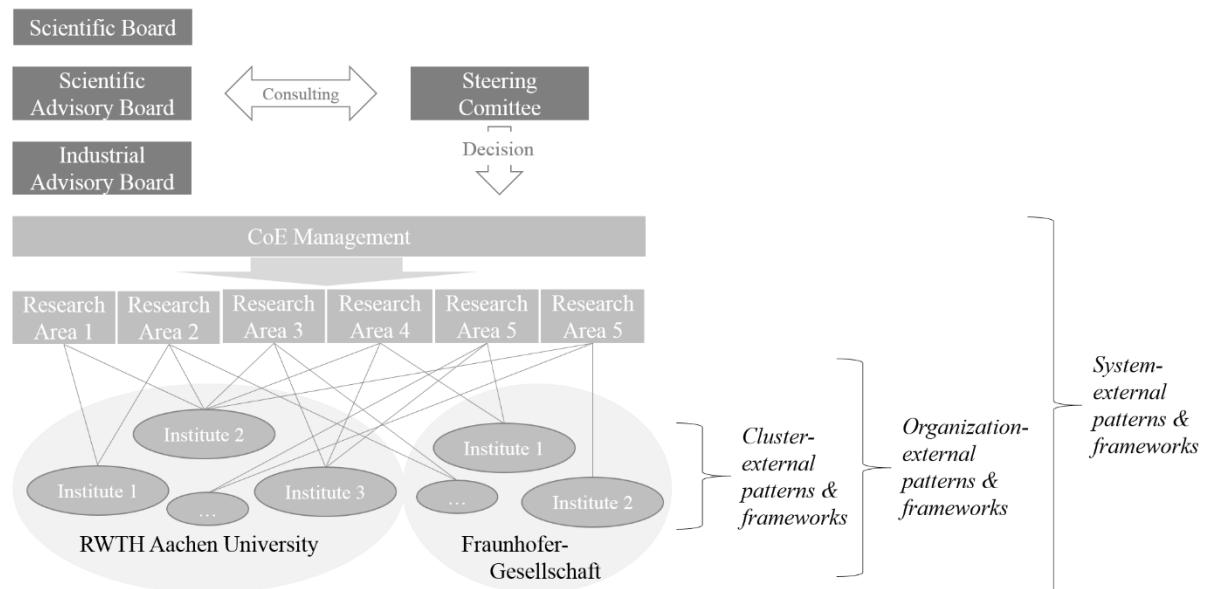


Figure IV.4: Organizational structure of the CoE ‘Integrative Production Technology for High-Wage Countries’
(Steuer-Dankert & Leicht-Scholten 2019)

The CoE is organized in so-called research areas. In those work streams, employees coming from different research institutions work in sub-projects under a joint research question. The projects are subordinated to management in the respective research area and this management is subordinate to the CoE Management. However, generally, the professorial level in the respective research institutes is entitled to issue instructions. Consequently, employees are being subjected to different management structures and leadership styles specific to the institute, which then meet each other within the framework of the research projects. The resulting different influencing factors, as well as the linkage of the research areas as a claim of an agile organizational structure, lead to a complex organization.

To capture the organizational culture in the frame of the described research association, Schein's (2004) *Three Levels Conceptualization of Organizational Culture* forms the basis for the research approach. Schein (2004) defines three interrelated aspects of organizational culture: artifacts, values, and assumptions. Assumptions represent beliefs and are taken for granted, whereas values represent principles, standards and aims shared in an organization. In contrast to this, artifacts stand for aspects that are visible and tangible (such as "open door" policies, public areas for exchange etc.). Following this logic of three layers of organizational culture, the survey aims at investigating mindsets and perceptions, which are influenced by artifacts, values and assumptions prevailing in the organizational work environment. The focus on mindsets and perception is based on Haun's (2016) *Cognitive Model*, that differs between the *perceptive system* and the *effective system*. Considering the perceptive system, thinking, emotion and motivation are brought in a context. This is of particular importance when investigating the development of an organizational culture in diversity context as studies (e.g. Cunningham 2007) on the one hand indicate a reliable correlation between the objectively prevailing diversity and the perceived diversity. The perceived diversity influences the Social Categorization Perspective (see 1. Introduction) and thus, the perceived similarities and

sympathy on social group level (Jaffé *et al.* 2019). On the other hand, the interface to the effective system, consisting of behavior and real acting, is seen on the reflection of experiences that can influence the way people deal with diversity. As a result, Haun's (2016) approach allows the implementation of cognition in an artificial and thus inorganic system, like an organization, because it enables to capture both humans with their cognition and organizational systems with their artificial cognition (Haun 2016). For this reason, Haun's model represents the basis for investigating organizational structures as well as individual human perceptions at the same time and to contextualize the results.

Resulting from CoE's organizational structure (see figure IV.4), the perception within the research institute as well as the perception within the CoE as an organization were surveyed. The intention for this approach is the derivation of the extent to which the CoE as organization is differentiated from the individual research affiliation. With the focus on the CoE as research object, the perception of diversity can be reflected with the results of the first (descriptive) analysis of the given (numerical) employee structure (see 3c sample) (Steuer *et al.* 2017b). On the institute level, perceptions can be reflected with the statements made by the management level in the second (qualitative) analysis (Steuer & Leicht-Scholten 2017) (see figure IV.3). This approach enables a critical reflection of the statements made within the framework of the quantitative survey by drawing on other perspectives in the form of studies.

3.2 Data Collection

In order to capture the organizational culture as a central factor in the implementation of a diversity management approach in a complex company, employees were asked about their perception of diversity categories, hierarchies, leadership style and prevailing diversity as well as innovation management approaches. The survey topics are based on the *Organizational Culture Assessment Inventory* (OCAI) (Cameron & Quinn 1999), which is linked to the

Competing Values Framework (CVF) (Cameron & Quinn 1999). The OCAI questionnaire is a tool to determine the prevailing but also the desired corporate culture (Wiener 2018; Cameron & Quinn 1999). This tool allows the recording of four replicable culture types in organizations and groups (clan culture, adhocracy culture, hierarchy culture and market culture). Following the idea of type formation, a cluster-specific questionnaire was developed in line with the OCAI, which reflects the scientific focus on the topics of diversity and innovation.

The survey was conducted using a six-tiered Likert scale (1 = completely disagree, 6 = completely agree), asking for example for “I am of the opinion that in my institute the importance of diversity is too high/ sufficient/ too low” or “I would describe the leadership style at my institute as consultative/ cooperative/ authoritarian/ participative/ patriarchal/ democratic”. The Likert scale was selected as a suitable instrument for the measurement of attitudes. In this context, the term ‘attitude’ is understood as the emotional, mental and action disposition towards an environmental factor (Albers *et al.* 2009). The Likert scale is ordinally scaled under the assumption that study participants consider the intervals between the answers as equal (Völkl & Korb 2017).

3.3 Sample

Regarding the basic population, a total of 149 target persons were identified. The survey was distributed via e-mail. The response rate was 46.31% among the employees from the status group. With regard to the demographic data of the participants, 8.7% identified themselves as female and 91.3% as male. The average age of participants was 32.6 years (min. of 26, max. of 64 years). 13.24% stated to come from a non-European non-German-speaking country, 1.47% from a European non-German-speaking country and 85.29% to come from a German speaking country. In terms of the specialist background, 52 participants mentioned the affiliation to the engineering sciences, 13 persons the affiliation to the natural sciences/ mathematics/

informatics, three persons to the humanities, 2 persons to the economic sciences and one person to the social sciences. One person mentioned an affiliation to “others” (multiple answers were possible). 76.81% of the participants completed their studies at the RWTH Aachen University and 23.19% at a different university.

3.4 Data Analysis

In order to identify the influencing factors on the organizational culture as well as hidden structures and mechanisms that influence the implementation of a diversity management approach, the analysis aims at revealing clusters and correlations, that allow conclusions to be drawn about the organizational culture at cluster and institute level. To achieve this, the focus of the study was placed on the identification of mindset-types on the employee level.

The quantitative data were analyzed in a SPSS-supported cluster analysis (Two-Step), rank correlation and contingency correlation. Depending on the scale, rank correlation (ordinal scaled data) and contingency correlation (nominal scaled data) were used for the preliminary analysis of highly correlating variables whose influence would affect the significance of the cluster analysis. For this reason, the results from highly correlating variables are expressed with Kendall’s tau-b or Cramer’s V and the results from the analysis of less correlating variables with the Two-Step cluster analysis.

The aim of the cluster analysis is to group objects or persons for which several characteristics are present within groups (clusters) in such a way that a cluster contains objects (cases) that are as similar as possible with regard to the variables (Janssen & Laatz 2017). Each cluster should be homogeneous as possible, which implies that the clusters should be heterogeneous as possible among each other. Since the requirements for the analysis were the simultaneous use of different categories, the need for an automatically determination of an optimal number of clusters as well as the separation of outliers, the Two-Step Cluster Analysis was chosen as

analysis instrument. The procedure consists of two steps, the pre-cluster step and the cluster step. In the pre-cluster step, a sequential formation of sub-clusters with very similar cases is carried out. Over several iterations a Cluster Feature Tree with three levels is then created. In this phase, outliers can be transferred into their own sub-clusters. Within the second phase, the cluster step, sub clusters (without outliers) are then merged into the final clusters using agglomerative hierarchical cluster analysis. The merging of the clusters is done on the basis of a distance measure like the Euclidean distance or a measure based on Log-Likelihood, with the goal of the smallest increase in distance (Janssen & Laatz 2017). For the current analysis we use the Log-Likelihood distance measure.

Following Gutfleisch (2008) different preliminary considerations for conducting the Two-Step Cluster Analysis are necessary. Regarding the dataset, variables that provide insight into the research question were selected. A standardization using the z-transformation was not necessary because only categorial variables were used. Furthermore, no strong outliers were found in the data set. Highly correlating variables were excluded or included for content-related reasons. Variables with constant characteristics (such as gender) lead to a levelling of the differences but were included in the analysis for being able to conduct gender-related investigations.

4 Findings

As described in chapter 1, different studies see a close connection between the diversity of employees and the innovative ability of a company. Against the background of the research project, it is necessary to investigate to what extent this connection is consciously present in employee's minds. The underlying assumption is that a conscious awareness of the connection between a diverse team and better results outweigh the challenges caused by heterogeneity and, as a result, is accompanied by an appreciation of diversity.

To identify the perception of diversity as a management task, the perceived importance of diversity was compared with the perceived importance of innovation management, for being able to classify the perception of two approaches that are located at the management level. For this reason, participants were asked whether they consider the status of diversity and the status of innovation management as ‘too high’, ‘sufficient’ or ‘too low’. Both the significance of diversity within the institutes as well as the significance within the CoE as overarching organization (see figure IV.4) were elicited separately. A first descriptive analysis gave an overview over the perception, given in absolute terms (table IV.2).

Table IV.2: Perception of diversity and innovation management in the institute/CoE in absolute terms

<i>Perception of</i>	Too high	Sufficient	Too low
Diversity	7/7	31/35	9/14
Innovation Management	3/5	27/30	15/16

As table IV.2 shows, the results allow two conclusions to be drawn. Diversity and innovation management tend to be perceived similarly in terms of their significance. Considering the significance of diversity, a slight deviation can be seen at the institute level where the significance of diversity seems to be less important compared to innovation management. On the other hand, the perception of the importance of the approaches in both organizations is at a comparable level. There may be different reasons for this effect. For example, participants may not differentiate the concepts and may not differentiate between the two different organizations.

In order to enable a more detailed consideration of the perceived importance of diversity and innovation management and due to correlating variables, an analysis based on Kendall’s tau-b was carried out (Arndt *et al.* 1999). Table IV.3 gives an overview over the perceived importance of diversity in the research institute compared to the perception of the importance of diversity in the CoE. The results confirm the descriptive analysis and indicate that there seems to be no

differentiation in perception between the CoE and the respective institute. A weakly positive, highly significant correlation is indicated by a Kendall's tau-b of .296 ('sufficient' importance of diversity) and .298 ('too low' importance of diversity).

Table IV.3: Kendall's Tau-b perception of diversity and importance of diversity in the institute/CoE (Steuer-Dankert & Leicht-Scholten, 2019)

	'in the CoE the importance of diversity is sufficient'	'in the CoE the importance of diversity is too high'	'in the CoE the importance of diversity is too low'	Index
'in my institution the importance of diversity is sufficient'	.296**			Kendalls tau-b
'in my institution the importance of diversity is too high'		.130		Kendalls tau-b
'in my institution the importance of diversity is too low'			.298*	Kendalls tau-b

Similar results can be observed regarding the comparison of the perception of the importance of innovation management between CoE and institute (table IV.4). The weakly positive correlations indicate that innovation management is, for example, also perceived as 'sufficient' in the CoE if the position is perceived as 'sufficient' in the institute (.191). On the other hand, the correlation is highly significant, with one value classified as 'too high' being shown both in the CoE and in the research institutions (.460). Thus, the more detailed analysis confirms that,

when viewed quantitatively, employees do not differentiate between the CoE and the research institute as organizations.

Table IV.4: Kendall's Tau-b perception of innovation management and importance of innovation management in the institute/CoE

	'in the CoE the importance of innovation management is sufficient'	'in the CoE the importance of innovation management is too high'	'in the CoE the importance of innovation management is too low'	Index
'in my institution the importance of innovation management is sufficient'		.191		Kendalls tau-b
'in my institution the importance of innovation management is too high'			.460**	Kendalls tau-b
'in my institution the importance of innovation management is too low'			.190	Kendalls tau-b

To classify the perception of diversity, it is necessary to reflect the importance of diversity measured by the perception of prevailing diversity categories. Initial analyzes have shown that diversity categories *origin* (Predictor Importance: 1.00), *mother tongue* (Predictor Importance: 0.72), *religion* (Predictor Importance: 0.67), *culture* (Predictor Importance: 0.52) and *gender* (Predictor Importance: 0.29) are the most appropriate items for clustering, as they have the strongest predictor importance when compared with each other. Combining the mentioned

diversity categories with the item *perception of the importance of diversity in the frame of the research institute*, the Two-Step Algorithm identifies two clusters (silhouette dimension for cohesion and separation: 0.6, cluster quality: good), including 44 persons. Although the groups are not completely homogeneous, two clusters can be clearly distinguished: those who perceive their institute as diverse in terms of the diversity categories mentioned above (59.1% - 26 persons) and those who tend not to perceive diversity (40.9% - 18 persons). Despite the difference in perception, both groups nevertheless predominantly classify the value of diversity as 'sufficient' (figure IV.5).

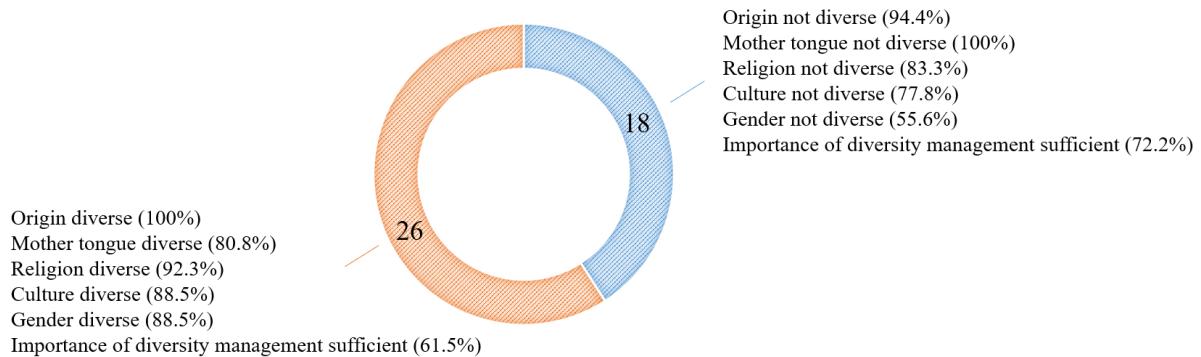


Figure IV.5: Clusters perceived diversity and perceived importance of diversity

If the demographic data of the respondents (gender, age, origin) is considered in the context of the perception of diversity, two clusters can be identified (silhouette dimension for cohesion and separation: 0.5, cluster quality: middle, 43 persons included). A closer look reveals that the perception of diversity seems to be independent of variables such as age, gender and origin, since all characteristics are found in both the group of perceived diversity and the group that does not perceive diversity. Concluded, the perception of diversity cannot be determined by specific diversity characteristics. Conversely, factors other than gender, origin, and age appear to influence perceptions of diversity. It is therefore questionable whether the reflection on diversity is influenced by aspects such as the perception of diversity in daily teamwork and/or the exemplified leadership style.

Considering the influence of the perceived impact of diversity on collaboration, five clusters can be identified (silhouette dimension for cohesion and separation: 0.7, cluster quality: good, 47 persons included). The analysis shows a differing perception of the benefits of the diversity categories of mother tongue, culture and gender in the context of cooperation. Only eight people (17 %) indicate that all three diversity categories are beneficial to cooperation. At the same time, this group perceives the importance of diversity as 'sufficient'. A second cluster is characterized by a general rejection of the benefits of diversity, with a simultaneous perception of diversity as 'sufficient' (10.6 %). Considering a further cluster, only the benefits of gender diversity are agreed to (28.8 %). Cluster four and five reject the benefits of diversity in mother tongue but differ in their perception of the importance of diversity. While in cluster four the importance is classified as 'too low' (21.3 %), in cluster five it is classified as 'sufficient' (21.3 %). The perception of the analysis focuses on the research institute as a daily workplace. It is questionable to what extent the leadership style at the institute has an influence on the perception of the benefits of diversity.

Looking at the perceived leadership style, the items with the highest predictive influence were selected. This pre-analysis led to the leadership styles of participatory, democratic and consultative leadership being taken out and resulted in a focus on the authoritarian (Predictor Importance: 0.93), patriarchal (Predictor Importance: 0.37), and cooperative leadership (Predictor Importance: 0.18), styles. This first analysis already shows the leadership styles perceived and/or prevailing within the framework of the research institutes and gives an indication of the institute cultures. Exemplified in the research institute in connection with the perception of diversity, the analysis reveals three clusters (silhouette dimension for cohesion and separation: 0.6, cluster quality: good, including 47 persons). The analysis shows that no clearly differentiable groups can be formed on the basis of perceived leadership style combined with the importance of diversity. Cluster one (42.6 % - 20 persons) and three (25.5 % - 12

persons) tend to have the same perception of leadership style, but they take the value of diversity as ‘sufficient’ and as ‘too low’ (figure IV.6).

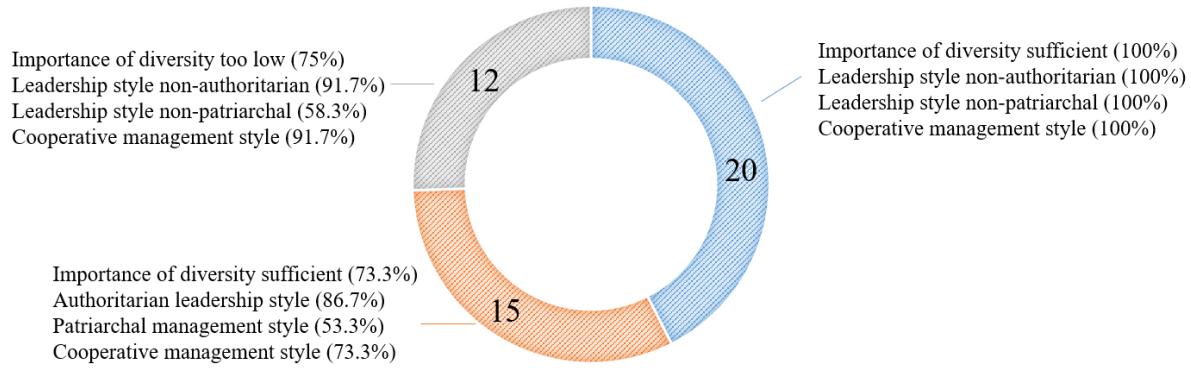


Figure IV.6: Clusters perceived importance of diversity and leadership style at the research institute

For this reason, no conclusions can be drawn from the leadership style regarding the value of diversity. Nevertheless, the role of leadership must be scrutinized, especially in the context of the organizational culture. Different researchers mention the need for top-down initiative, especially in the context of diversity management (Köppel 2013; Stuber 2004; Gessler & Stübe 2008; Kühmayers 2017). For this reason, it is necessary to scrutinize the extent to which the leader serves as a role model and can thus be a central element in a process of change. In accordance, the perceived context between one's own leadership style and the leadership style exemplified at the institute were investigated.

The leadership styles considered were consultative, cooperative, authoritarian, participatory, patriarchal and democratic. The investigation focused on the leadership style prevailing at the institute and the perception of the own leadership style. The analysis was carried out in the form of a rank correlation (Kendall's tau-b), since the equivalent variables correlate too high and were therefore not suitable for a cluster analysis. The analysis consistently shows medium to strong, positive correlations between the perception of the leadership style exemplified and the individual leadership style (consultative tau = .401, p<1%; cooperative tau = .466, p<1%);

authoritarian tau = .285, p<5%; participatory tau = .390, p<1%; patriarchal tau = .481, p<1%; democratic tau = .500, p<1%). Persons who state that the leadership style they have experienced is advisory also state this for their own leadership style. The correlation can indicate a role model function of the leadership on the employees.

5 Discussion

“[...] [P]ro-diversity beliefs seem to prevent negative effects of subjectively perceived diversity and thus might be able to facilitate positive consequences of diversity.” (van Dick *et al.* 2008: 1483).

According to van Dick *et al.* (2008), the aim of the presented quantitative study was to include the employee perspective in the concept development process for implementing the prevailing mindsets into the concept development process on the one hand and initiating the change process on the other hand. The results reveal mechanisms and structures that need to be considered when developing a diversity management strategy. Thus, the results also show the need for a system-theoretical approach and contradict the concept of implementing generally valid measures in organizations.

Like most prior work, the study found that top-down implementation strategies are an important aspect when implementing diversity management into an organization. However, we also find that a system-theoretical analysis of the organization is crucial to understand structural barriers, prevailing mindsets and hidden mechanisms. Furthermore, we found out that in the context of the research object there seems to be a direct role model function of the superior, in this case the professorial level. This results in action implications for further strategies and approaches.

Reflecting the organization's complexity, it is evident that employees hardly differentiate between the research institutes and the CoE as a superordinate organization. Considering the authority to issue directives and the implementation level of a diversity management approach,

this is of central importance, since both the CoE management and, even more so, the management level of the research institutes plays a central role. In the analysis, the similarity between the self-perceived individual and the exemplified leadership style indicates that the management level has a special exemplary function. The reason for this can be either the adaptation of the exemplified leadership style or the preference of the employee to work with a person with similar attitude. This thesis is linked to Kanter's (1977) theory of so-called *Homosocial Reproduction* (Guttig 2015; Volpone 2013; Kanter 1977), which describes a principle of promotion, especially among men, and expresses that male leaders in many organizations promote a relatively homogeneous group that is similar to them in norms, values, interests and abilities (Müller & Sander 2005). As a consequence, leadership positions tend to be passed on to people with similar characteristics. Regarding especially the perception of the benefits of diversity and a corresponding appreciation of these benefits in everyday professional life, a reflection of leaderships and their impact on the organizational culture is required in interaction with the management level at the respective research institutions.

Based on the findings of this quantitative employee survey, it is possible to reflect on the results of the previous qualitative survey of managers (Steuer & Leicht-Scholten 2017). As a result of this survey with its focus on diversity management, innovation management, and leadership, six different types (the superficial informed, the active follower, the passive follower, the intentional refuser, the sceptics and the reflected user) were identified. Comparing the results of the qualitative and quantitative (figure IV.3) study, it becomes clear that the assessments of managers are based on self-assessment, as the perception of diversity activities differs from the amount of existing diversity but is comparable with the perceived importance of diversity on employee level. On the other hand, however, the tendencies of intentional refusers and sceptics at management level are also reflected at employee level. This parallel supports the theory of the influence of managers and, in the scientific field, professors on scientific staff. This results

in the necessity of a concept that focuses on these key-roles and makes management tasks, which also include diversity management, a major field of activity in the scientific community.

In order to address the complexity of the CoE's organization, an approach is needed that could be effective at both the management level of the institute and at the central CoE level. As a result, a cross-organizational culture should be established with shared values, goals and standards that are stringently lived by management levels in both organizations. This is accompanied by a change, which, according to the change management approach of Kotter (2011), is triggered by the recognition of a need. According to that, it is important to avoid reactance as a psychological effect of change and, due to the role model function, to make the management level aware of their impact on the employee level.

Therefore, a central element for a strategy is to sensitize the management levels. This requires a continuous improvement process that provides space for reflection and thus enables a sustainable change. The influence of the scientific system, however, it also requires restrictive changes in structures. The indication of a necessity can also be inspired from outside. In this context, the DFG represents a possible control instrument. However, especially in the case of motivation by an extern, the application of controlling instruments is required that provide a more sustainable performance review than the collection of demographic data of the CoE staff, as the presented study reveals. In the controlling context, it should be noted that the effects of measures tend to be of qualitative and long-term nature (Vedder 2006) and thus quickly elude quantitatively structured controlling instruments.

In the further process, the participation of employees is needed to establish an organizational culture appropriate to diversity. Especially against the background of the complex organization, it is necessary to link the daily work processes with the values and standards of the adapted organizational culture. In this context, agility and diversity mean change on different levels. Göhler (2017) states that only in a situation of trust, employees can learn from mistakes and

only then can common evaluation patterns be changed. Therefore, the management sets an example in dealing with mistakes and the sustainability of the learning effect is thus influenced by the management. The goals of agile work are innovation and rapid adaptability, and both can only be achieved if multi-perspectivity is enabled and managed (Göhler 2017). In an agile organization, flexible and cross-functional teams, i.e. heterogeneous constellations, should be normal.

However, the study also has some limitations. Surveys provide a snapshot of a given situation. As a result, the constant evolvement of organizations as micro societies needs to be reflected. The quantitative study allows the investigation of correlations but does not reveal causal connections. The hidden motives, for example the perception of the importance of diversity, can therefore only be formulated as theses. This results in the need for additional qualitative studies that allow a closer examination of the background. A further limitation is the fluctuation of employees and the tracking of statements, which is not permitted for reasons of data protection. The limitation of the duration of activities at university research institutes by the law on science time contracts leads to a fluctuation of employees and thus to differing pre-post datasets. However, since the existing organizational culture cannot be traced back to individuals, but rather to attitudes that can be identified in a group, it is possible to counteract this effect through the pre-analyses for Two-Step cluster analysis and the sorting out of outliers. Consequently, this approach was conducted in the frame of the presented study.

6 Conclusion

Implementing a sustainable diversity management strategy in organizations by redesigning organizational culture is a lengthy process that requires the participation of all stakeholders and starts at the management level. Reflecting on the posed thesis of different attitudes and perceptions with regard to diversity in an organization that lead to a specific organizational

culture, it can be summarized that different mindsets (manifested in clusters) can be identified in the analyzed organization, which in their totality and their interplay result in an organization-specific culture. This unique culture has to be given consideration in the development of a management concept that aims at promoting diversity in a sustainable way. Reflecting accompanying change, it is particularly important to consider the effects on employees like the cognitive processes (input, processing, output), which are to be reflected in connection with grasping thinking, perception and behavior and have an influence on the motivational system. The system-theoretical approach provides the basis for understanding the thinking of the people in the organization and the individual cognitive processes. This is necessary to develop a sustainable and demand-oriented strategy.

II Appendix

II 1 Questionnaire (in German)

1. SOZIOGRAFISCHE DATEN

Geschlecht

- weiblich
- männlich
- weitere

Alter

- $x < 25$
- $25 \leq x < 30$
- $30 \leq x < 35$
- $35 \leq x < 40$
- $40 \leq x < 45$
- $45 \leq x < 50$
- $x \geq 50$

Herkunft

- deutschsprachiger Raum
- europäischer, nicht-deutschsprachiger Raum
- außereuropäischer, nicht-deutschsprachiger Raum

Die Fakultät an der Sie ihr Studium absolviert haben, hatte einen Schwerpunkt in:
(*Mehrfachnennungen möglich*)

- Ingenieurwesen
- Naturwissenschaften/Mathematik/Informatik
- Architektur
- Medizin
- Geisteswissenschaften
- Sozialwissenschaften
- Wirtschaftswissenschaften
- Rechtswissenschaften
- Humanwissenschaften
- _____ (weitere)

Haben Sie ihr Studium an der RWTH Aachen absolviert?

- ja
- nein

Welche Fakultätszugehörigkeit hat das Institut an dem Sie zurzeit beschäftigt sind?
(*Mehrfachnennungen möglich*)

- Fak. 1: Naturwissenschaften/Mathematik/Informatik
- Fak. 2: Architektur
- Fak. 3: Bauingenieurwesen
- Fak. 4: Maschinenwesen
- Fak. 5: Georesourcen und Materialtechnik
- Fak. 6: Elektrotechnik und Informationstechnik
- Fak. 7: Philosophische Fakultät
- Fak. 8: Wirtschaftswissenschaften

Welche Position bekleiden Sie?
(*Mehrfachnennungen möglich*)

- Fak. 10: Medizin
- _____ (weitere)

- Oberingenieur*in
- ICD-Koordinator*in
- Team-/Gruppenleiter*in
- Projektleiter*in
- Wissenschaftliche Mitarbeiter*in

Wie lange bekleiden Sie Ihre derzeitige Position?

_____ Jahr(e)

Wie lange arbeiten Sie bereits an dem Institut an dem Sie derzeitig beschäftigt sind?

_____ Jahr(e)

2. INNOVATIONSFÄKTOREN

Der folgende Abschnitt behandelt die Strukturen in Ihrem Institut und dem Exzellenzcluster.

2.1: In meinem Institut sind die Menschen unterschiedlich im Hinblick auf:

Alter	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Fachl. Hintergrund	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Familienstand	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Geschlecht	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Berufserfahrung	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Körperl. Fähigkeiten	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Herkunft	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Religion	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Arbeitsstil	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Muttersprache	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kultur	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

2.2: Bitte kreuzen Sie an, wie Sie die folgenden Sachverhalte bei der Teamarbeit wahrnehmen:

Gemischt-geschlechtliche Konstellationen behindern die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Gemischt-geschlechtliche Konstellationen fordern die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Gemischt-geschlechtliche Konstellationen steigern die Innovationsfähigkeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kulturelle Unterschiede behindern die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kulturelle Unterschiede fördern die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kulturelle Unterschiede steigern die Innovationsfähigkeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Interdisziplinarität behindert die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Interdisziplinarität fördert die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Interdisziplinarität steigert die Innovationsfähigkeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Unterschiedliche Muttersprachen behindern die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Unterschiedliche Muttersprachen fördern die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Unterschiedliche Muttersprachen steigern die Innovationsfähigkeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

2.3: Bitte kreuzen Sie an:

Ich habe die Möglichkeit die Teamzusammensetzung meines Instituts aktiv mitzugesten.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Der vorherrschenden Teamzusammensetzung liegt eine Strategie zugrunde.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

3: MANAGEMENTSTRUKTUREN

Der folgende Abschnitt beschäftigt sich mit Managementstrukturen in Ihrem Institut und dem Exzellenzcluster.

3.1: In meinem Institut gibt es folgende Angebote:

Workshops zur Verbesserung der interkulturellen Zusammenarbeit	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Workshops zur Konfliktlösung/-vermeidung	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Flexible Arbeitszeitgestaltung	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Homeoffice	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Barrierefreie Räumlichkeiten	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kalender mit Feiertagen unterschiedlicher Kulturkreise	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Vertretungsmöglichkeiten	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

3.2: Folgende Maßnahmen nehme ich tatsächlich in Anspruch:

Workshops zur Verbesserung der interkulturellen Zusammenarbeit	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Workshops zur Konfliktlösung/-vermeidung	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Flexible Arbeitszeitmodelle	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Home Office	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Barrierefreiheit	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kalender mit Feiertagen aller Kulturkreise	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Vertretungsmöglichkeiten	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

3.3: In meinem Institut ...

... werden visionäre Ziele verfolgt.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... ist Kreativität wichtig	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... wird bereichsübergreifend zusammengearbeitet.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... gibt es Innovationsziele.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... werde ich zum Querdenken animiert.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... werden ausreichend Ressourcen zum Experimentieren zur Verfügung gestellt.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... arbeite ich mit gleichbleibenden Denkmustern.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... bleibt zum freien Experimentieren keine Zeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... spielen Innovationen eine untergeordnete Rolle.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... werden Innovationsvorhaben von Einzelpersonen umgesetzt.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

3.4: In Exzellenzcluster ...

... werden visionäre Ziele verfolgt.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... ist Kreativität wichtig	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... wird bereichsübergreifend zusammengearbeitet.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... gibt es Innovationsziele.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... werde ich zum Querdenken animiert.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... werden ausreichend Ressourcen zum Experimentieren zur Verfügung gestellt.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... arbeite ich mit gleichbleibenden Denkmustern.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... bleibt zum freien Experimentieren keine Zeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... spielen Innovationen eine untergeordnete Rolle.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... werden Innovationsvorhaben von Einzelpersonen umgesetzt.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

3.5: Zu meinen Aufgaben gehören:

Lehre	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Drittmittelakquise	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

4. FÜHRUNGSSTIL & HIERARCHIE

4.1: Bitte kreuzen Sie an:

Haben Sie Weisungsbefugnis gegenüber anderen Mitarbeitenden?

ja

nein

Wenn ja, gegenüber wem?

anderen WM

stud. MA

_____ (weitere)

Seit wie vielen Jahren tragen Sie Führungsverantwortung?

_____ Jahre

4.2: Ich würden den an meinem Institut vorgelebten Führungsstil als:

Beratend	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kooperativ	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Autoritär	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Partizipativ	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Patriarchalisch	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Demokratisch	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
_____ (weitere)	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

beschreiben.

4.3: Ich würde meinen eigenen Führungsstil als:

Beratend	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Kooperativ	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Autoritär	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Partizipativ	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Patriarchalisch	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
Demokratisch	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
_____ (weitere)	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

beschreiben.

4.4: Der vorgelebte Führungsstil ...

... beeinflusst meine Art zu Führen.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... dient mir als Orientierung.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... hindert mich daran meinen eigenen Führungsstil zu etablieren.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... begünstigt die Entwicklung von diversen Teams.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... begünstigt die Innovationsfähigkeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

4.5: Die Hierarchie in meinem Institut ...

... ist steil.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... ist flach.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... fördert die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... behindert die Zusammenarbeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... hat einen hohen Stellenwert.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... spielt eine untergeordnete Rolle.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... wirkt sich negativ auf die Innovationsfähigkeit aus.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... fördert die Innovationsfähigkeit.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... ist zu flach.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... ist zu steil.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... hat einen zu hohen Stellenwert.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu
... hat einen zu niedrigen Stellenwert.	<input type="checkbox"/> stimme gar nicht zu	<input type="checkbox"/> stimme nicht zu	<input type="checkbox"/> stimme eher nicht zu	<input type="checkbox"/> stimme eher zu	<input type="checkbox"/> stimme zu	<input type="checkbox"/> stimme absolut zu

Figure IV.7: Questionnaire (in German)

II 2 Two-Step Clusters (in German)

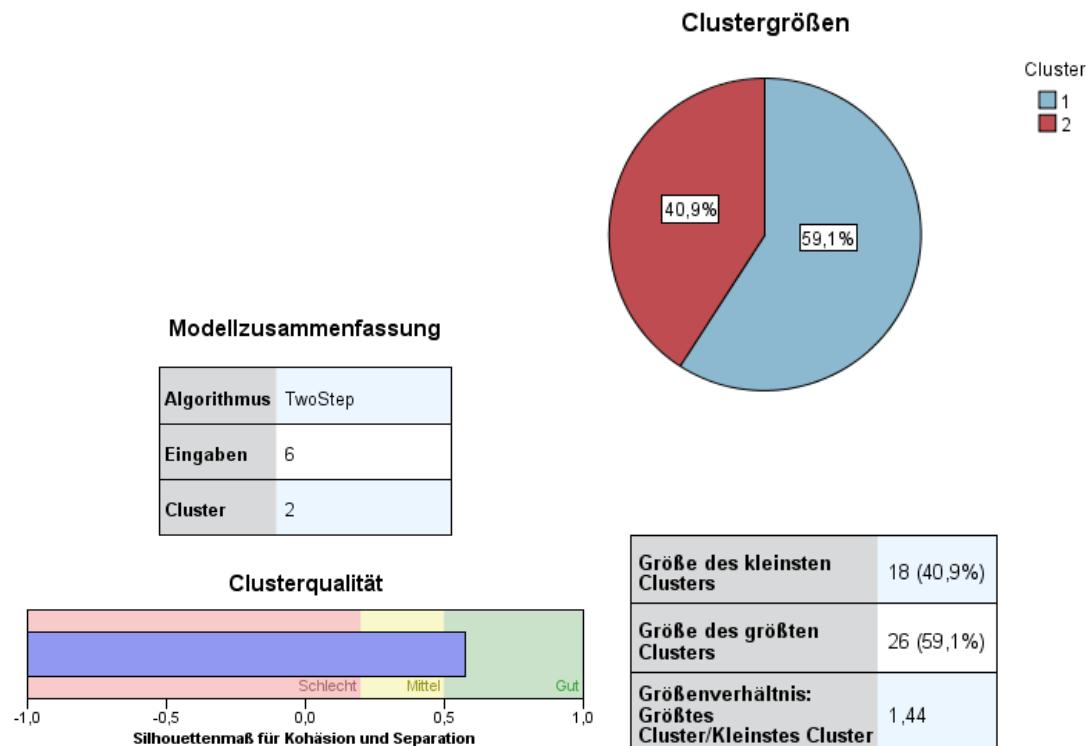


Figure IV.8: Diversity categories and the significance of diversity

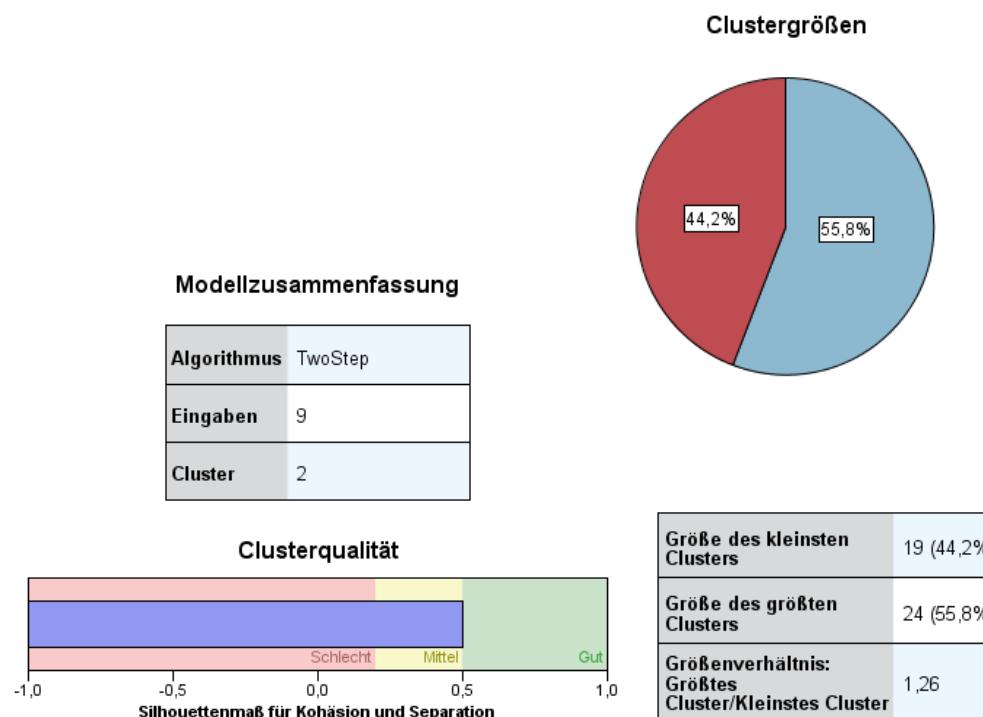


Figure IV.9: Diversity categories and significance Diversity, consideration of demographic data

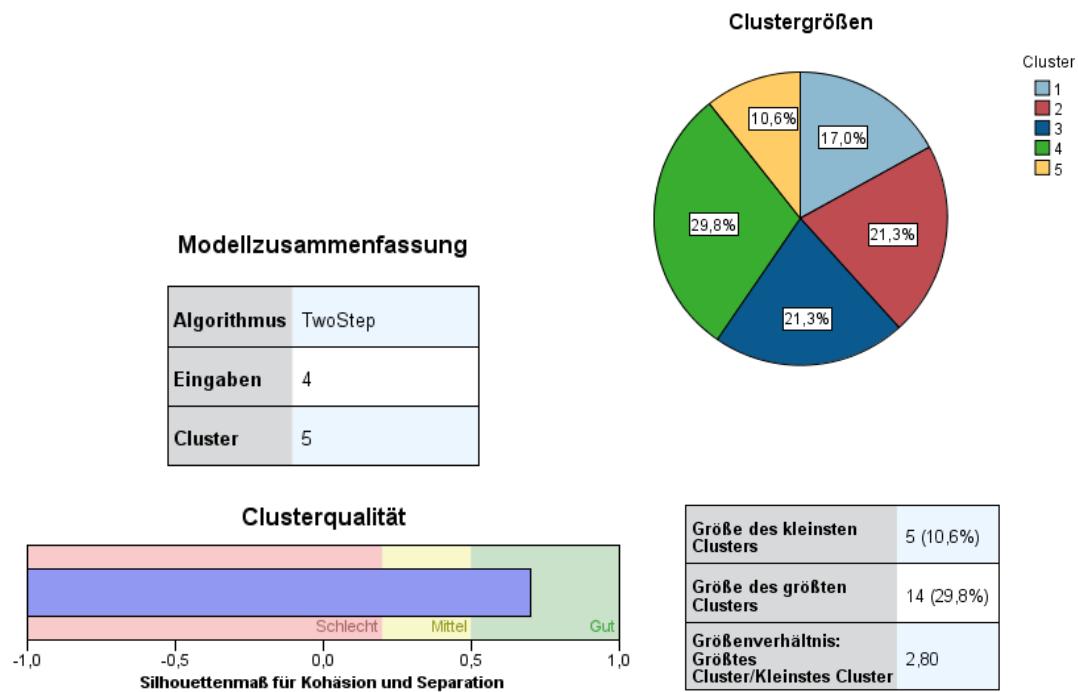


Figure IV.10: Cluster analysis: Promoting cooperation through gender, culture, mother tongues and the value of diversity

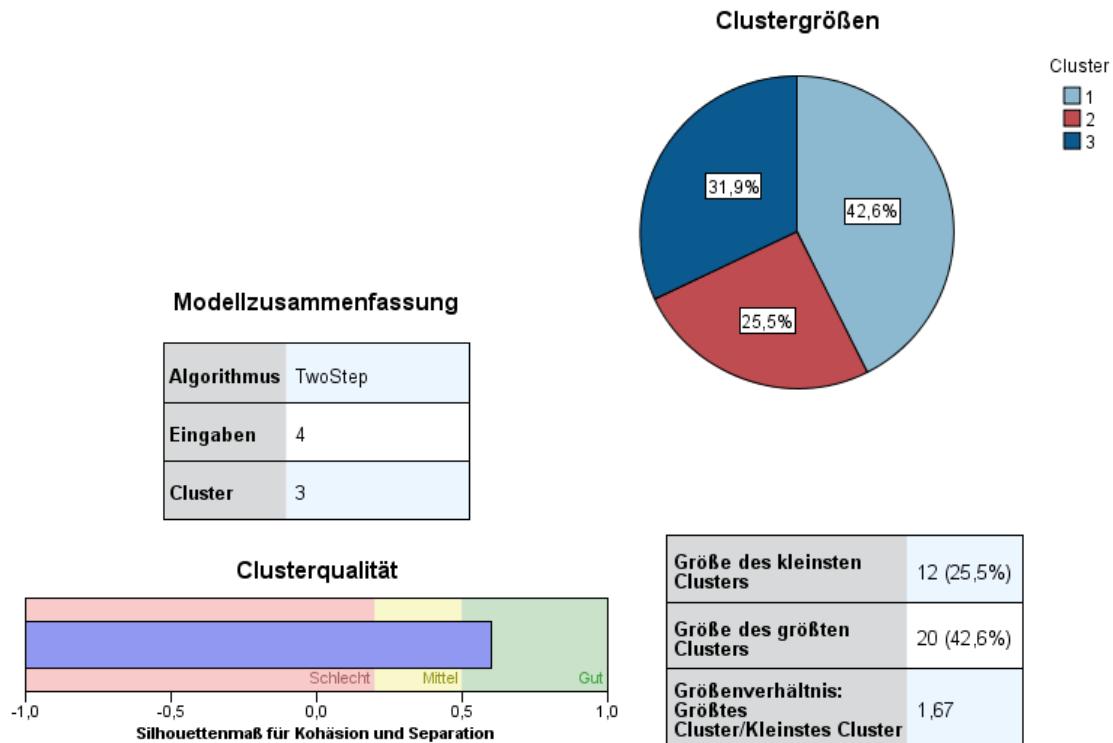


Figure IV.11: Cluster analysis: Management style and the importance of diversity

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