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Key competencies in sustainability – Application in sustainable entrepreneurship

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Vision without action is merely a dream.

Action without vision just passes the time.

Vision with action can change the world.

Joel A. Barker

Abstract

Purpose – This thesis aims to elaborate on key competencies for sustainability applied by change agents and their specific relevance for sustainable entrepreneurs in practice. For this purpose, the existing set of key competencies for sustainability by Wiek et al. is combined with entrepreneurial competencies. The specific form of required competencies to act as change agent should inform future design of curricula.

Design/methodology/approach – Ass literature review regarding key competencies for sustainability, change agent concepts and sustainable entrepreneurs builds up the basis. Several semi-structured, qualitative expert interviewers with sustainable entrepreneurs inform about the awareness and relevance that the practitioners assign to each of the different competencies.

Findings – Applying this framework of different competencies to change agent behaviour of the entrepreneurs identifies some competencies of high relevance, but it also identifies some of lower application.

Research limitations – The analysis of the interview results depends on the representativeness of the sampling. This work limits its findings to sustainable entrepreneurs. Beyond this, a larger number of interviews and an expansion to other expert groups can strengthen the results.

Practical implications – Through this thesis the author contributes to the debate on key competencies for sustainability in higher education as well as the discussion about their practical relevance.

Keywords

Key competencies for sustainability, change agents, sustainable entrepreneurship, entrepreneurial competencies, specific competence sets

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1. Introduction

The future of humankind depends on the welfare of the globalised society as well as well-functioning ecosystems (Heinrichs *et al.*, 2016, p. 2). So far, we face today quite complex, urgent and persistent sustainability problems, which threaten the viability and integrity of societies worldwide (Heinrichs *et al.*, 2016, p. 312). Not only to understand but also to contribute solving these multidimensional problems students need to acquire a range of appropriate competencies. However, a broad range of different institutions and actors can influence the learning outcomes of students and higher education institutions might be of central relevance (Fadeeva *et al.*, 2010, p. 320).

Based on their opportunities and duties universities are able to equip learners with the required tools and strategies to foster sustainable development worldwide. Yet, higher education approaches struggle in facilitating to acquire these specific competencies. Their method of teaching students and their specific competencies are of major relevance and are one of the central challenges in sustainability research education (Barth, 2016, p. 107). A project aiming to provide evidence through further research is “Educating Future Change Agents – Higher Education as a Motor of the Sustainability Transformation”, a research cooperation between Leuphana University Lüneburg and Arizona State University. It has started in 2016 and addresses the core question of how competence acquisition can be fostered best on two levels – for novel teaching and learning approaches in individual sustainability courses as well as for entire sustainability curricula (Redman, 2017, pp. 1–2).

The goal of this work is to contribute to this objective by identifying which competencies in sustainability are crucial for future change agents. This seems to be possible by observing potential careers of learners as change agents either at an employment as sustainability expert in a given structure or at the formation of a new business or institution as entrepreneur. This work will focus on the required competencies for the employability of students to act as sustainable entrepreneurs in future (Barth, 2015, pp. 40–41).

To identify such specific competencies of relevance acting on the solutions for sustainability problems the corresponding solution process for sustainability problems provides guidance. A sustainability problem as a relevant problem for the society suggesting and activating scientific research interests (Lang *et al.*, 2012, p. 29) requires

specialised expertise to finally achieve long-term solutions. Change agents are needed to initiate, sponsor, direct, manage or implement such a change process, project or programme (Caldwell, 2003, pp. 139–140). In particular, change agents for sustainability performing sustainability as important part of their working environment (e.g. by including sustainability criteria into business processes and organisational structures or initiate sustainability-related projects) are central to solve these problems by applying key competencies for sustainability (Hesselbarth and Schaltegger, 2014, p. 26). If such change agents for sustainability are also capable of entrepreneurial competencies and their application, they can act as sustainable entrepreneurs to identify, transfer and implement long-term solutions for sustainability problems through utilisation of entrepreneurship. This complex approach how to solve a sustainability problem is needed as

> "Solutions to sustainability problems are generally *not* simple technical fixes or command-control procedures; they are often as complex as the problems themselves and require long-term processes that involve real-world experimentation, collective learning, and continuous adaptation" (Wiek and Lang, 2016, p. 32).

Key competencies are necessary for the transparent evaluation of students' learning and teaching outcomes and the analysis of their relevance to practical application (Wiek *et al.*, 2011b, p. 204). Therefore, it is essential to define a set of key competencies for sustainability that fulfils its function in the existing sustainability problem-solving framework. This was the starting point for the development of the competencies which will be described in more detail in the following chapter two (Wiek *et al.*, 2011b, p. 211). These competencies should be specified regarding different groups acting as change agents such as sustainable entrepreneurs.

Resulting this work will examine the research question which key competencies sustainable entrepreneurs need to find long-term solutions as change agents for sustainability. A more detailed description of it follows as part of the theoretical framework in chapter three.

This research will be conducted in two main steps. First, a literature review regarding the overall concept of key competencies for sustainability including their development and specific definitions for all six key competencies will be conducted (see chapter two). This classification will be used in the second step by an analysis of the specific target group of sustainable entrepreneurs based on qualitative interviews (see chapter four).

2. Literature review

Higher Education for Sustainable Development and synonymously used Higher Education for Sustainability emerged in the 1990s as a field of research and has become more and more established over the last 20 years (Barth, 2016, p. 109). Within the last years, the first academic programs in sustainability have been developed on the undergraduate and graduate level providing approaches on what to teach students to become change agents in future (Wiek *et al.*, 2011b, p. 203). This section provides the results of the literature review and aims to describe the current state of research. The sub-chapter 2.1 will provide background knowledge regarding sustainability challenges in general which are essential for this work. The second part follows with insights regarding key competencies for sustainability moving on with a detailed depiction of the change agent concept before closing with a section about sustainable entrepreneurs including their role as experts in sub-chapter 2.4.

2.1 Sustainability challenges

To act upon specific sustainability challenges a general description of sustainability problems is required. Such an approach is to define a sustainability problem as “a societally relevant problem that implies and triggers scientific research questions” (Lang *et al.*, 2012, p. 29). The main characteristics of sustainability are complex, urgent and persistent while “threaten[ing] the viability and integrity of societies across the world” (Heinrichs *et al.*, 2016, p. 312). The authors do also provide examples such as “the anthropogenic greenhouse effect, the destruction of the ozone level, the loss of biodiversity, population growth, and unemployment, are global problems and differ only in their regional characteristics” (Heinrichs *et al.*, 2016, p. 23).

The explanations how to approach sustainability problems should include the solutions for those problems described as being “generally *not* simple technical fixes or command-control procedures; they are often as complex as the problems themselves and require long-term processes that involve real-world experimentation, collective learning, and continuous adaptation” (Wiek and Lang, 2016, p. 32).

2.2 Research on key competencies for sustainability

Competencies are broadly, are currently quite popular and can be applied innumerous constructions as the word competence is often used as a synonym with ability, qualification or education, leading to numerous definitions which are not always clear (Gnahs, 2011, p. 11). Gnahs describes competence as a potential of knowledge and skills that enables to act appropriately (Gnahs, 2011, pp. 18–19). Over time, a mixture of several concepts arises which is also influenced by the English interpretation of skills similar to competencies leading to the interpretation that knowledge, skills, perspectives and values are parts within competencies (Adomssent *et al.*, 2007, p. 418) and (Barth, 2006, pp. 12–14). More precise, competencies are able to be applied to different contexts and situations (Barth, 2006, pp. 21–22). Interpreting competence as represented by different components Gnahs includes knowledge, skills, character, values and motivation (Gnahs 2010, p. 24-25).

In contrast to domain-specific competences being oriented towards a specific domain or subject area key competencies have a broad focus and are therefore applicable to broader living areas (Barth, 2006, p. 23). Following this, key competencies can be described as bundling different competence classes and cutting across these. They encompass various domain-specific competences and point to the most relevant fields of competence (Barth, 2006, p. 24). An underlying concept for the development of key competencies for sustainability competencies can be understood as functionally linked structures including skills, abilities, capabilities, capacities and qualifications that enable successful task performance (Wiek *et al.*, 2011b, p. 204).

A set of key competencies for sustainability has been defined out of the scientific discourse. These competencies of particular relevance to achieve the objective of sustainable development can be described as multifunctional and context independent while being important for all individuals (Hesselbarth and Schaltegger, 2014, p. 27).

Wiek et. al. identifies five competencies for sustainability based on a broad literature review: systems thinking competence, anticipatory competence or future thinking, normative competence or value thinking, strategic competence and interpersonal competence (Wiek *et al.*, 2011b, p. 205). They address specific steps and have several interrelations when exploring a complex sustainability problem (see figure one).

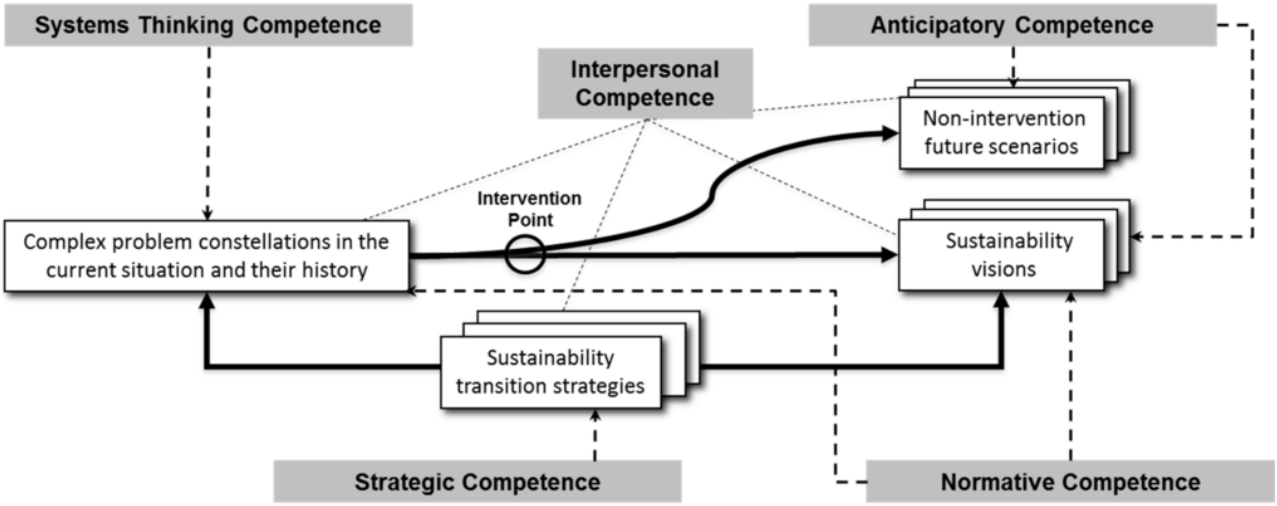

Figure 1: Key competencies in sustainability linked to a problem-solving framework (Wiek et al., 2011, p. 206)

The systems thinking competence supports the understanding of a complex problem constellation. The central ability is “to collectively analyze complex systems across different domains (society, environment, economy, etc.) and across different scales (local to global)” (Wiek *et al.*, 2011b, p. 207). Systems concepts to be applied include systems ontologies, cause-effect structures as well as “cascading effects, inertia, feedback loops and other systemic features related to sustainability issues” (Wiek *et al.*, 2011b, p. 207). From a systemic perspective systemic thinking is relevant for anticipating future pathways to identify possible intervention points, critical actors and to test distinguished transition strategies.

The anticipatory competence reinforces the anticipation of the effects of this problem and consideration of alternative future scenarios with or without intervention. It is the capability to “analyze, evaluate, and craft rich ‘pictures’ of the future related to sustainability issues and sustainability problem-solving frameworks” (Wiek *et al.*, 2011b, pp. 207–209). To explore different future trajectories and solution visions are utilised as scenario methodology and forecasting from statistical and simulation models as well as back casting and envisioning methods.

The normative competence guides selecting a more desirable sustainable future. It addresses the ability “to collectively map, specify, apply, reconcile, and negotiate sustainability values, principles, goals and targets” (Wiek *et al.*, 2011b, p. 209). Necessary skills are to specify, compare, apply, reconcile and negotiate sustainability values, principles, goals and targets. These are additionally informed by concepts of justice,

equity, responsibility, etc. in various processes including visioning, assessment and evaluation. This value thinking assesses the sustainability effects and impacts related to specific job activities and envisions a sustainable future for professions (Wiek *et al.*, 2011b, p. 209).

The strategic competence is used to develop a strategy working towards the chosen future. Hence, “the ability to collectively design and implement interventions, transitions, and transformative governance strategies” (Wiek *et al.*, 2011b, p. 210) is crucial to develop such strategic thinking. The development of intentional plans leveraging assets and alliances with stakeholders to overcome systemic inertia and path dependencies are goals supported by designing and realising plans, interventions and actions towards a transformational change (Wiek *et al.*, 2011b, p. 210).

All steps to study a complex sustainability problem e.g. the development of sustainability visions or sustainability transition strategies need interaction with various stakeholders. These interactions require an interpersonal competence to handle relations between people (Wiek *et al.*, 2011b, p. 206). This competence includes how to “motivate, enable, and facilitate” (Wiek *et al.*, 2011b, p. 211) participants in cooperative problem solving processes towards sustainability. Required abilities are expertise in project management, communication skills, collaboration, leadership, cultural understanding and empathy. These are utilised to build transition strategies in teams and with diverse groups of stakeholders of different socio-demographic backgrounds, knowledge and attitudes (Wiek *et al.*, 2011b, p. 211).

Later, these competencies have been complemented by the integrated problem-solving competence, a meta-competence to use and integrate the five key competencies for solving sustainability problems (Wiek and Kay, 2015, p. 30). This enables individuals applying different problem-solving frameworks to complex sustainability problems and developing practical solution options. Thus, it includes conducting integrated problem analysis, sustainability assessments and visioning as well as strategy building. (Wiek *et al.*, 2011b, p. 205) Furthermore, the German term of “Gestaltungskompetenz” (implementation competence) developed by de Haan is also part of the practical knowledge cluster contributing to integrated problem-solving approaches (Fadeeva *et al.*, 2010, p. 310). The integrated problem solving can be summarised by “having the skills,

competencies and knowledge to enact changes in economic, ecological and social behavior without such changes always being merely a reaction to pre-existing problems" (Wiek *et al.*, 2011b, p. 205).

All key competencies for sustainability build up on general skills and knowledge, like critical thinking and communication, as they are also required for successful interaction with partners. The interpersonal competence could be described as cross cutting key competences in sustainability whereas the integrated problem solving acts as meta-competence integrating the five key competencies to foster sustainable development (Wiek *et al.*, 2011b, p. 214).

2.3 Concept of change agents

The role of change agents in organisations has raised enormous interest over the last two decades (Caldwell, 2003, p. 131). Established out of the economical discipline of management, a change agent can be considered as an "internal and external individual […] responsible for initiating, sponsoring, directing, managing or implementing a specific change initiative, project or complete change programme" (Caldwell, 2003, pp. 139–140). Individuals acting as change agents are driving forces in a change process and do have a dominate opinion to convince and motivate others to leave established pathways and inspire their employees (Hesselbarth and Schaltegger, 2014, p. 26).

One specific form of change agents is "change agents for sustainability" (Hesselbarth and Schaltegger, 2014, p. 24). It describes people who work on social and ecological problems with entrepreneurial tools to contribute towards a sustainable transformation of the whole society via implementing sustainability management as common practice in organisations. These individuals can either be decision makers in a company or people who promote changes out of their position in a lower hierarchy level and without a specific role related to sustainable development (Hesselbarth and Schaltegger, 2014, p. 26).

Becoming a change agent depends on several factors. So far there is little knowledge how managers could be educated most effectively to become change agents (Hesselbarth and Schaltegger, 2014, p. 24). Specific change agent skills might be acquired via specific teaching formats. Some of these skills have been proven via case studies on their

application in education e.g. the ACPA project (College Students Educators International) which has created a list of central learning outcomes for such education formats. These learning outcomes enable students to encourage and understand the impacts caused by their personal choices outside as well as inside the classroom leading to a real-word oriented application of the learning targets as change agents (Svanström *et al.*, 2008, p. 346). Developments out of this project can be linked to the key competencies e.g. the explanation of how systems are interrelated have the same goal as the systems-thinking competence. It can be defined as the power to collectively analyse complex systems within different spheres like society, environment or economy from a local to global scale whereas taking cascading effects, passivity, feedback loops and other systemic features into account (Wiek *et al.*, 2011b, p. 207). These first teaching formats have successfully educated students in those competencies including their real-world application, but their use and relevance in professional careers has not been analysed so far. This is causing the need for deeper and more specific analysis of key competencies for sustainability depending on specific professional roles to prove their effectiveness (Wiek *et al.*, 2011b, p. 204).

2.4 Sustainable entrepreneurs as experts

The model of entrepreneurship as “the process of doing something new and something different for the purpose of creating wealth for the individual and adding value to society” (Kao, 1993, p. 69) can be defined by three parts where first of all entrepreneurship is the process of making changes. Further, an entrepreneurial process is doing more effective what others are doing while it identifies opportunities beyond the resources that are currently under control by the entrepreneurial individual (Kao, 1993, p. 69).

Someone “who undertakes a wealth-creating and value-adding process through incubating ideas, assembling resources and making things happen” (Kao, 1993, p. 70) is considered to act as an entrepreneur. This role includes to create wealth in a value adding process and being capable of activities involved in wealth-creating through “venture formation and/or the undertaking of entrepreneurial endeavours” (Kao, 1993, p. 70).

In terms of value creation, sustainable entrepreneurship can be described as form of creating economic and societal value by using innovative, market-oriented and personality

driven approaches to achieve a “break-through [for] environmentally or socially beneficial market[s]” (Schaltegger and Wagner, 2011, p. 226). In addition to these welfares, discovering and developing economic opportunities might also initiate and support the “transformation of a sector towards an environmentally and socially more sustainable state” (Hockerts and Wüstenhagen, 2010, p. 482).

To conduct the interviews, defining who is considered as an expert is important. The Latin language root of expert is “expertus”, meaning proven and tested. Experts are usually characterised as authority on a subject, specialists or connoisseurs. The expert is someone who has broad and also dedicated knowledge (Bogner *et al.*, 2014, p. 9). Being an expert is not a personal property or ability, but an attribution. This attribution takes place in practice if as a result of our specific research interest certain people are addressed through the interview request as experts (Bogner *et al.*, 2014, p. 11). The precise expertise is based on imposed relevance, described by Liebold and Trinczek, addressing the focus on a specific field of knowledge. There is a defined frame of reference which the expert assumes when making statements about a clearly defined reality. Outside this reality section the expert acts as a well-informed citizen (Liebold and Trinczek, 2009, pp. 33–34).

This work defines experts in sustainable entrepreneurship as individuals who act as chief executive officers and/or founders in their own sustainability oriented organisation. In addition, someone who fulfils the executive role while not being the owner of the business is also taken as a sustainable entrepreneur if he or she in engaged in entrepreneurial actions in the organisation.

3. Summary of the theoretical framework

This chapter will provide a short summary of an applied framework addressing the research question which key competencies sustainable entrepreneurs need to find long-term solutions as change agents for sustainability. This approach is the starting point for the more detailed development of specific methods in chapter four.

The goal is to identify the key competencies for sustainability with specific relevance for entrepreneurs. The expertise of practitioners out of the field of sustainable entrepreneurship will be used to analyse specific key competencies for sustainability based on their experience of realising long-term solutions for sustainability problems. In addition, entrepreneurial competencies might be relevant to the success of the person starting or running a business.

The process of sustainability problems being addressed by change agents for sustainability via the application of key entrepreneurial competencies is shown in figure two below. Change agents act as sustainable entrepreneurs whenever they also apply entrepreneurial competencies to identify solutions for sustainability problems. These are then characterised as long-term solutions via entrepreneurship and are also put into practice via the entrepreneurial activities.

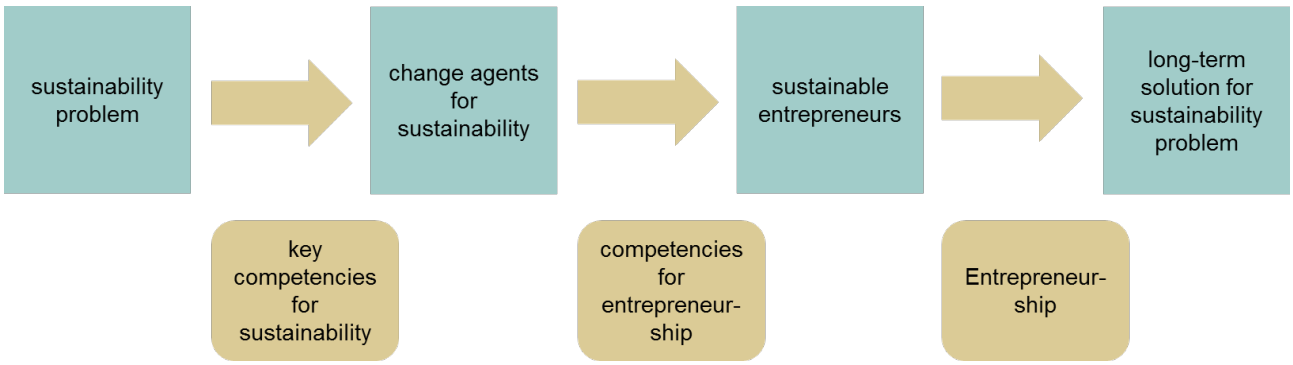

Figure 2: Approach to solve a sustainability problem

It seems realistic to suppose that specific competencies or specifications of the key competencies for sustainability exists which differ between entrepreneurs and other professional groups e.g. different opportunity identification potential compared to sustainability experts (Westhead *et al.*, 2005, p. 396). These competencies might then be valid for all kinds of sustainable entrepreneurs, varying in the level of importance

depending on the career-level and the industrial sector. Besides, additional entrepreneurial competencies are presumed to be relevant as accumulated skills and knowledge for sustainable entrepreneurs' daily practice (Westhead *et al.*, 2005, p. 397).

In a first step the different concepts of sustainability challenges, key competencies for sustainability, change agents and entrepreneurs as experts in this field are explained in the literature review in chapter two. This theoretical foundation is now used to elaborate on a qualitative research approach which is explained in much more detail in the following chapter four.

4. Methodology

The question regarding which key competencies sustainable entrepreneurs need is addressed using qualitative data collection and analysis. As the research field is partially unknown, existing sources are used to structure the field, concretise the research questions and identify the first experts (Wassermann, 2015, p. 55).

Data collection concerning the awareness and practical relevance of key competencies for sustainable entrepreneurs will be carried out via semi-structured qualitative interviews. Moreover, interviewees will be selected based on the theoretical sampling, that Glaser and Strauss developed while interviewing identified experts regarding their perceptions of competencies in sustainability as part of their professional role development, (including acting as sustainability change agents (Glaser *et al.*, 2010, p. 61). Keeping the key question that inspires this work in mind it is extremely important to note which competencies are relevant, the specific forms in which they are relevant and how these have been acquired.

This chapter will provide a detailed picture of the applied methods and their specific application in the study. First the general potentials of qualitative expert interviews are described. A section on how the questionnaire for the semi-structured interviews is developed follows while chapter 4.3 addresses the sampling of interviewees. The fourth part explains the individual proceeding and the interview situation. Following, the sub-chapter 4.5 provides information on the analysis of the interview data before the coding structure and its application is explained in chapter 4.6.

4.1 Application of qualitative expert interviews

A qualitative approach via expert interviews is conducted to proof the working hypothesis that specific key competencies for sustainability within the field of entrepreneurship exist. Such qualitative analysis is appropriate as qualitative interviews are often used for interdisciplinary projects (Wassermann, 2015, p. 65). The aim is to generate sufficient material to answer the outlined question. Based on the gathered material it is possible to check different hypotheses in the evaluation phase. Beyond, the material serves to

develop potential new hypotheses and provides general grounds for statements on connections and theories (Bogner *et al.*, 2014, p. 32).

The interviews are carried out as expert interviews and are used for the reconstruction of subjective interpretations as well as for the generation of information (Bogner *et al.*, 2014, p. 2). The expert interviews have the goal to test the hypothesis and validate first approaches by addressing operational or process knowledge regarding competencies in entrepreneurship. In addition, interpretative knowledge out of the perspective of entrepreneurs as central research subject regarding future perspectives is relevant (Bogner *et al.*, 2014, p. 23).

Interpretative knowledge contains the subjective relevance, views, interpretations, meaning drafts and explanatory patterns of the experts. It also includes the normative dispositions: objectives, evaluations, etc. that are not just factual knowledge. This knowledge form is not about the knowledge of the experts, it is more about the subjective perspective of the interviewees. Subjective does not mean only individually. In this case the interpretive perspectives that are collected in individual interviews can be shared collectively e.g. in specific expert groups. Interpretative knowledge is an explicit perspective and cannot be separated from the subjects. Interpretation is always certain to the subjective carrier (Bogner *et al.*, 2014, pp. 18–19).

Process knowledge or operational knowledge addresses expertise regarding action flows, interactions or organisational constellations in which experts are or have been involved. Respondents have a certain knowledge based on professional and personal experience. Process knowledge is a less specialised knowledge in the narrower sense as it is more experience knowledge. Such knowledge is more based on the individual and its environment: experiences can only be made by people and therefore this knowledge can only be gained by the people (Bogner *et al.*, 2014, p. 18).

These expert interviews are applied as reconstructing analysis (“rekonstruierende Untersuchungen”) to understand the phenomenon of key competencies and their acquisition by interviewing people who have gained their knowledge out of the participation in a certain field (Gläser and Laudel, 2010, p. 13). Beyond this comprehension of relations and contexts it is the goal to explore the unknown to broaden perspectives and foster the development of new approaches and theories (Liebold and Trinczek, 2009, p. 53).

4.2 Development of a questionnaire for semi-structured interviews

The target of semi-structured questionnaires is to test the hypothesis made in beforehand and explore the unknown as additional insight to the experts' perspective and knowledge (Wassermann, 2015, p. 57). The research questions are formulated with regard to theoretical assumptions and considerations, interview questions are formulated with regard to the knowledge and experience horizons of the interviewees to address their specific information at its best (Bogner *et al.*, 2014, pp. 33–34). To achieve this the questionnaire must address the topic in a respective manner by being open enough to allow narrative stories to explore new contents (Meuser and Nagel, 2009, p. 473).

The questionnaire for this work is adopted from an already carried out data collection with sustainability experts in January 2016 in Phoenix, Arizona as part of the project. This is adjusted towards the specific role of sustainable entrepreneurs, including simplifications of the raised questions to ensure a high comprehensiveness during all interviews. Sustainable entrepreneurs do not necessarily have any higher education on sustainability so questions should address competencies for sustainability in a commonly clear way. The questionnaire is developed in English to be comparable to results in Arizona for further research in the project "Educating Future Change Agents – Higher Education as a Motor of the Sustainability Transformation" (Redman, 2017). To achieve more comprehensive results from the interviewees it is translated into German. A pre-test of the interview questions is carried out to verify its functionality and to ensure it gains results in an appropriate manner (Bogner *et al.*, 2014, p. 34).

The whole survey is structured in four thematic blocks with main questions where each block deals with a central question and leads over to the following one (Bogner *et al.*, 2014, p. 28). The guideline starts with an introduction block consisting out of two questions regarding the current business and the primary responsibilities. These questions are simple and supportive to get into conversation (Bogner *et al.*, 2014, pp. 59–60). The next section addresses activities and own contributions of each entrepreneur. Here a more detailed differentiation is made in main and sub questions. A main question faces a specific context or situation and sub-questions aim at more detailed aspects and open up the possibility to address different roles an entrepreneur might have (Bogner *et al.*, 2014, p. 34). The main questions here are 'Currently, how do you see your business contributing

to sustainability? What are the primary goals of your business activities?'. Accompanied by four sub-questions like 'What activities did (or do) implement in order to achieve the outcomes?' the aim is to receive an overview of different contexts and roles the interviewee acts in. The third block addresses skills and knowledge and thereby the awareness of competencies and has three main questions. The goal of this part is to understand which competencies are needed and for which application are these acquired. The last section addresses future projections regarding entrepreneurship and its potential in contributing towards transformational sustainability. The enquiry includes questioning skills and knowledge that a successful entrepreneur needs today as well as in future. Overall, the guideline covers different five types of questions. A combination of story-generating questions, targeting questions and factual questions are applied in a specific combination related to the target of each question and interview (Bogner *et al.*, 2014, p. 61).

4.3 Sampling for interviewees

The selection of the persons to be interviewed as experts is primarily based on the research question. According to the question it is necessary to identify persons who are able to provide information about the chosen research subject and the required perspectives (Bogner *et al.*, 2014, pp. 34–35). For the research interest of this work sustainable entrepreneurs as a heterogeneous group have a specific set of information regarding their activities as well as a self-interpretation of relevant competencies to perform the tasks.

To find appropriate experts representing the group of sustainable entrepreneurs the method of theoretical sampling developed by Glaser and Strauss will be applied. Theoretical sampling denotes the process of data collection aimed to generate theory (Glaser *et al.*, 2010, p. 61). The essential criterion for the selection of comparison groups is the theoretical relevance to come up with emergent categories. Therefore, different measures are selected to identify different characteristics of sustainable entrepreneurs for the sampling and relating them to each other (Glaser *et al.*, 2010, p. 65).

The experts described in chapter two are individuals who act as chief executive officer and/or founder of the organisations. This study focuses on business experience of the

interviewees and the field of their company activities to identify four sub groups of sustainable entrepreneurs. The measures are selected as business experience is a relevant criterion to differentiate entrepreneurs whereas the industrial sector might influence the activities of the entrepreneurs and thereby the specific required competencies (Westhead *et al.*, 2005, p. 396). The sub groups are represented in the matrix below (see figure three). The differentiation regarding business experience of sustainable entrepreneurs will be measured as existence of the company they have run in years. Firms existing less than five years are considered as start-ups and businesses running for more than five years are considered as established companies (Ucbasaran *et al.*, 2008, p. 164; Westhead *et al.*, 2005, p. 412). The field of activity is characterised by organisations aspiring for environmental benefits, called ecopreneurs whereas firms striving for social benefits are categorised as social entrepreneurs. The critical factor here is the core motivation of the business. Whereas ecopreneurship aims to solve environmental problems and create economic value, social entrepreneurship intends to solve societal problems and create value for the society (Schaltegger and Wagner, 2011, p. 224). In addition, sustainable entrepreneurs can also address environmental and social advantages at the same time.

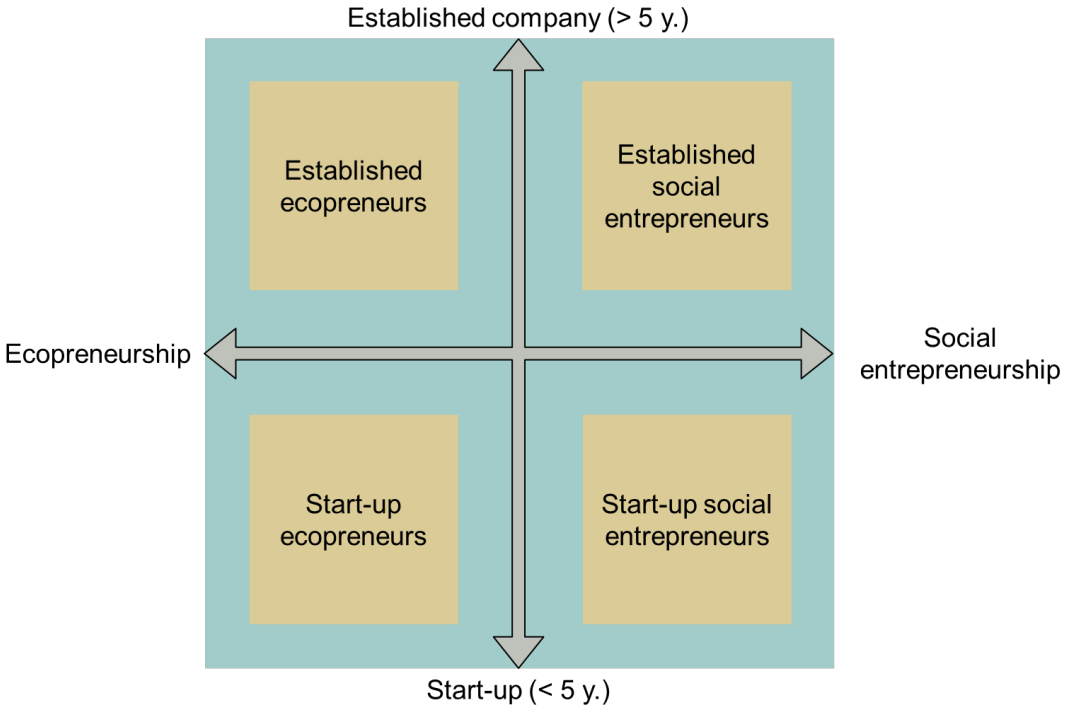

Figure 3: Matrix for theoretical sampling of sustainable entrepreneurs for interviews

This research interviews several experts to receive meaningful results out of the qualitative interviews (Wassermann, 2015, p. 55). The characterisation above is applied to identify ten professionals for the interviews covering all types staying within the available resources for this work. The final sampling included ten sustainable entrepreneurs out of various backgrounds. Figure four below provides information about the sampling size in each sub-section of sustainable entrepreneurship out of the theoretical sampling.

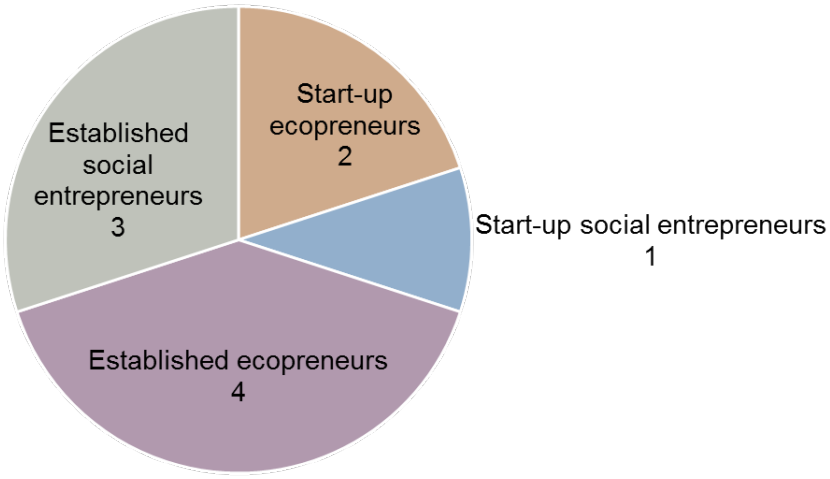

Figure 4: Sampling in sub-section of sustainable entrepreneurship

The distribution among age covered three different groups. There is one person between 21 to 30 years, three interviewees between 31 to 40 years and most of the entrepreneurs, six experts, are between 51 and 60 years old. The gender distribution covers 30% female and 70% male participants.

4.4 Proceeding and interview situation

Once potential sustainability entrepreneurs are identified requests regarding the participation and availability are send out. These include the research topic, the content of the interview as well as general information on the anticipated timeframe and format e.g. the language of the interview (Wassermann, 2015, p. 57). Each interview must be prepared especially for each interviewee regarding his or her background, main topics, specific fields of knowledge, current position and recent actions to allow detailed questions addressing the expertise of each professional (Wassermann, 2015, p. 59).

All interviewees are asked regarding the same content but not with the same wording so that questions might be adjusted before as well as during the interview (Bogner *et al.*, 2014, p. 28). How different interview questions are selected and formulated is distinguished in three forms. First, the position of the question in the temporal structure of the conversation especially during the introduction and the closing is relevant. Second, they are selected in proportion to the forms of content control depending on the answers and the response received. Third, formulations are relative to their consequences for the interaction situation and the possibilities to place particular knowledge forms in the foreground (Bogner *et al.*, 2014, p. 58).

All expert interviews are recorded to gather all information offered by the respondents for further analysis (Bogner *et al.*, 2014, p. 40). Most interviews during this work are conducted in a face-to-face conversation. Only if necessary due to the availability of interviewees a recorded phone-call interview is conducted.

For each interview, permission is enquired to record the conversation showing who has access to the data and how these will be handled (Wassermann, 2015, p. 59). The closing of each interview includes possible detailed request for clarification from the interviewer, the opportunity for possible additional point of the interviewee and a final appreciation for the answers and offered time (Wassermann, 2015, p. 61).

4.5 Approach to analyse the interview data

Following the recording a full text transcription of the interviews is made as this is necessary for a structured analysis of the interview data. This is of particular relevance as the operational or process knowledge of experts is required for this study (Wassermann, 2015, p. 61). The transcription is done verbatim and includes all questions (Bogner *et al.*, 2014, p. 42). The gained data are analysed by the qualitative content analysis developed by Mayring to test the hypothesis, generate new information out of the interview and uncover causal dependencies (Bogner *et al.*, 2014, p. 70). Focus of this work are units indicating the awareness of specific competencies and possible specific types of them. As this qualitative instrument is developed according to this specific study it has to be pilot tested (Mayring, 2014, p. 12). Further interpretation is done by contrasting the six key competencies out of the literature with the competencies mentioned by the interviewed

entrepreneurs. The goal is to identify which competencies for sustainability are of specific significant relevance for the professional role of sustainable entrepreneurs including their form. Furthermore, additional competencies not covered by the key competencies for sustainability might come up.

The method of qualitative content analysis is described as retaining “the strengths of quantitative content analysis and against this background to develop techniques of systematic, qualitatively oriented text analysis” (Mayring, 2014, p. 39). The instrument is individually designed for each research interest and is adjusted to the object or type of material in question. The specific steps of analysis have to be defined in advance in a procedural model (Mayring, 2014, p. 39). Despite this, it is important that all segments are theoretically well founded. This should be transparent enough that another interpreter could perform the same analysis and gains similar results based on the same data (Mayring, 2014, p. 40).

On a technical level, different units need to be defined for the further analysis of the transcript-data (Mayring, 2014, p. 32). This analysis will examine sentences, propositions and paragraphs in the full text.

Moreover, these units are analysed by the deductive category assignment that has the goal of extracting a certain structure from the material. This structure is produced by the application of a developed category system (Mayring, 2014, p. 95). The interpretation of interview data is done in a three-step process of defining categories first, then anchoring examples and finally formulating coding rules. The definition of the categories does determine which concrete parts belong to a specific category. Coding examples anchor the character of each of these categories. Then coding rules are particularised where problems of descriptions between categories might show up. These are then tested on text extracts if all categories and determinations are applicable (Mayring, 2014, p. 95). To assign those categories deductively seven steps are given by Mayring:

> “Step 1 Research question, theoretical background;
> Step 2 Definition of the category system (main categories and subcategories) from theory;
> Step 3 Definition of the coding guideline (definitions, anchor examples and coding rules);
> Step 4 Material run-through, preliminary coding, adding anchor examples and coding rules;

Step 5 Revision of the categories and coding guideline after 10 - 50% of the material;
Step 6 Final working through the material;
Step 7 Analysis, category frequencies and contingencies interpretation" (Mayring, 2014, p. 96)

Important in this work is that a nominal category system will assign the categories. Such qualitative category systems consist of a list of independent categories belonging to the structure of the analysis (Mayring, 2014, pp. 97–98).

4.6 Coding structure and application

The coding structure for this qualitative analysis is developed from the research question towards specific requirements of the conducted material. Out of the research question and the defined six key competencies for sustainability (Wiek *et al.*, 2011b, p. 204) a first category system is derived. The pre-test results lead to the introduction of the additional code 'learning environments' to capture different educational backgrounds and more specific distinctions between 'general competencies' and 'entrepreneurial competencies/business competencies'. The applied code system is represented in the figure below.

Figure 5: Developed code system of main- and sub-codes

The six sub-codes of ‘key competencies for sustainability’ address the six key competencies, defined by Wiek et al. The code ‘entrepreneurial competencies/business competencies’ refers to other competencies mentioned by the interviewees that are related to their role as entrepreneurs and managers in the business. In contrast the code ‘general competencies’ addresses other competencies of relevance such as critical thinking and basic communication skills (Wiek *et al.*, 2011b, p. 204).

This set of nine codes is used to work through all material again. The analysis highlights specific units, in most cases sentences which are connected to one of the codes. Overall, there are units identified for all codes. Following up an interpretation of these data is carried out. For the description of results see the next chapter and for their interpretation and discussion chapter six.

5. Descriptive analysis

The qualitative content analysis begins with a descriptive presentation of results structured by the developed code system. The following sub-chapters will present the results gained out of the expert interviews and is divided by the applied main- and sub-categories which have been developed in the previous chapter.

5.1 Analysis of key competencies for sustainability

This section will introduce the findings in all six subcategories of the code ‘Key competencies for sustainability’. There are 82 codings in the main category and all statements during the interviews can be matched with one of the specific key competencies in the related sub-groups. The number of identified statements varies between the six key competencies for sustainability and is shown in figure six below.

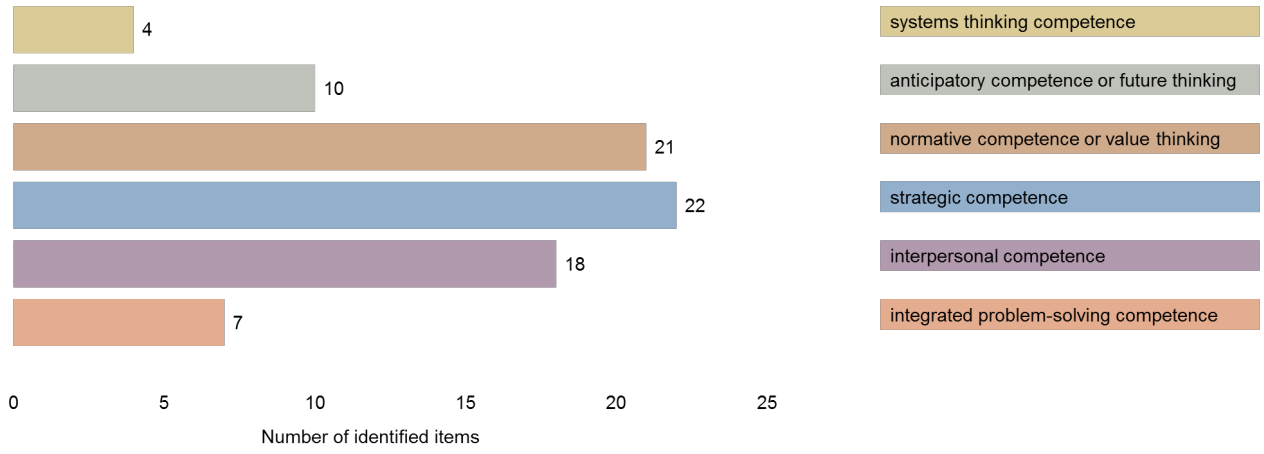

Figure 6: Number of identified items within key competencies for sustainability

5.1.1 Results on systems thinking competence

The sub-category ‘systems thinking competence’ addresses all kinds of systemic thinking activities and requirements mentioned by the interviewees. One entrepreneur mentions a “holistic and systemic thinking” (ger. “ganzheitliches und systemisches Denken” (ID #01, par. 44)) as central competence for sustainable entrepreneurs in future. The systematic understanding of change processes is something that goes on and on (ger. “Das ist ein

Prozess, der sich auch Stück für Stück immer weiter fortsetzt" (ID #04, par. 4)). Systems thinking is described as necessary for the full application of different abilities as they have to be put in a context (ger. "ich muss sie in einen Kontext stellen" (ID #10, par. 24)).

Furthermore, it also has a high relevance to some sustainable entrepreneurs leading and establishing their company in its complex structure (ger. "man muss einfach sich in viele Sachen, in sehr viele Details eines Unternehmens hineinversetzen können" (ID #08, par. 22)).

5.1.2 Results on anticipatory competence or future thinking

The interviewees mention their anticipatory competence several times. It addresses all kinds of exploring different future pathways and solution visions applying scenario methodology and forecasting and back casting methods (Wiek *et al.*, 2011b, pp. 207–209). There is a high awareness of anticipatory competence as it is directly mentioned as "adaptability" (ger. "Adaptionsvermögen" (ID #01, par. 44)) or "your also need flexibility" (ger. "Man braucht aber auch eine Flexibilität" (ID #04, par. 30)). One ecopreneur explains how he has taken already existing companies into account to develop his own sustainable business:

> "Yes, or [...] I looked at the companies a bit closer. Or even at their products and they are all ultimately, I say, companies, very sustainable companies, yes, which in some parts in some areas were a role model for me. But still something own has originated."
> (ger. "Ja, […] hab mir die Unternehmen ein bisschen näher angeschaut. Oder auch deren Produkte und das sind dann alles letztendlich, sag ich mal, Unternehmen, sehr nachhaltige Unternehmen, ja, die zum Teil in Teilbereichen sogar denn auch Vorbild waren für mich. Aber trotzdem ist dann etwas Eigenes daraus entstanden." (ID #02, par. 28)).

Future thinking is not only relevant to identify the companies' values in the beginning. It becomes more important in the "conception of projects to construct them in a way that they meet the requirements" (ger. "Konzeption von Projekten diese so zu konstruieren, dass sie den Anforderungen entsprechen" (ID #03, par. 10)). In this example conditions for potential sponsors as well as the obligations out of the societal discourse should be addressed (ID #03, par. 10). One expert who has founded a consulting firm describes how important future projections are to "be able to put oneself in the companies [perspective] and to look

at where through these measures, one realises a surplus value of the most diverse kind." (ger. "darum sich in die Unternehmen rein versetzen zu können und zu gucken wo durch diese Maßnahmen, die man umsetzt wirklich ein Mehrwert entsteht der unterschiedlichsten Art" (ID #09, par. 26)).

A clear future oriented application of the anticipatory competence is the preparation of following generations in the business. An interviewee describes it in her business as

> "the most important processes. On the one hand for the whole handover processes as we get older, then they are younger and on the other hand to find models that provides life which is fun and livable."
> (ger. "dass das so ganz wichtige Prozesse sind. Einmal auch für diese ganzen Übergabe-Prozesse, wenn also wir sind dann älter, die sind jünger, aber auch um Modelle zu finden, die das Leben und in denen das Leben Spaß macht und lebbar ist." (ID #04, par. 34)).

There is no content related focus on the business success mentioned except the goal of achieving individual satisfaction in the professional role for future generations of managers in the organisation.

5.1.3 Results on normative competence or value thinking

Items for value thinking are identified very often in most of the interviews. Contents related to the normative competence are mentioned 21 times in the whole study. In various constellations, it is related to the values, beliefs, goals and criteria for activities of the organisations.

One entrepreneur states "I think it's simply about other values" (ger. "Ich glaube, es geht einfach um andere Werte." (ID #09, par. 38)) when addressing important factors of successful sustainable entrepreneurship. These changes of values should target "to create a good community" (ger. "eine gute Gemeinschaft zu schaffen" (ID #09, par. 38)) for the overall society instead of limiting this value perception to the company itself. He summarises this attitude as doing rather something meaningful than just for profit ("Sinn vor Gewinn" (ID #09, par. 34)).

Addressing the system level via a normative approach another expert explains that "we need to rethink completely. Today, companies are no longer capital-oriented, but socially or publicly oriented" (ger. "Wir müssen komplett umdenken. Unternehmen heißt heute

nicht mehr kapitalorientiert, sondern sozial oder gemeinwohlorientiert" (ID #02, par. 40)). Following this, most sustainable entrepreneurs are probably aware of shifting goals in company orientation. To realise a change, "it requires a sound conviction of these issues, that means one has to adapt them by himself" ("es bedarf einer wirklichen Überzeugung der Themen, das heißt man muss es selber auch leben" (ID #03, par. 28)). Moreover the value and goal perspective is linked to the individual lifestyle of the interviewed expert. It is essential to "keep both feet firmly on the ground" (ger. "braucht allerdings auch noch die Bodenhaftung" (ID #03, par. 20)) when acting in the field of sustainability.

Sustainable actions are based on these findings closely related to the individual as one expresses "sustainability arises for me from a connection to my inner being" (ger. "Nachhaltigkeit entspringt für mich aus einer Verbindung zu meinem Inneren Sein" (ID #04, par. 22)). This is then justified by her goal of having "a life that is worth living" (ger. "ein Leben, das sich lohnt zu leben" (ID #04, par. 24)).

Taken as a whole, normative competence and its relevance for value creation and goal setting can be expressed as "the overall goal is actually to make the world a little better place in every little detail" (ger. "das übergeordnete Ziel ist eigentlich, die Welt in jeder Kleinigkeit zu einem etwas besseren Ort zu machen" (ID #07, par. 10)).

5.1.4 Results on strategic competence

The strategic competence described as "the ability to collectively design and implement interventions, transitions, and transformative governance strategies" (Wiek *et al.*, 2011b, p. 210) in the context of a sustainable organisation is mentioned by all ten interviewees in different contexts and application levels.

One expert describes that he "developed future strategies" (ger. "Zukunftsstrategien entwickelt" (ID #10, par. 6)) as part of his function as leader in the company. Later he adds that for creating such strategies a "change of perspective is the decisive" (ger. "Perspektivwechsel ist das Entscheidende" (ID #10, par. 24)). Another entrepreneur describes her duties as being responsible "for the development of the programs in the organisation; so how and where to is it going" (ger. "Ich bin zuständig für die Entwicklung

der Programme im Haus, also wie wo geht es hin" (ID #04, par. 6)) as she builds up new opportunities to introduce her customers to a more sustainable lifestyle.

When it comes to implementing such change processes decision-making has a high relevance for entrepreneurial actions. One expert states "I make the essential decisions" (ger. "Ich treffe die wesentlichen Entscheidungen" (ID #06, par. 8)) with regards to sustainability, but also for all general company related issues. Another position expands this power relation by a personal driven factor that "you can really implement a strategy" (ger. "man wirklich eine Strategie umsetzt" (ID #09, par. 12)) which is often the main step to "put projects into practice" (ger. "Projekte mit in die Praxis umsetzen" (ID #09, par. 16)).

Crucial action to perform well in decision making as an entrepreneur includes ongoing evaluation of actions (ID #03, par. 8), precise deliberation of her own perception (ID #08, par. 26) and critical reflection (ID #06, par. 28) to move from a niche to being a trendsetter and thereby increase the societal impact (ID #04, par. 14). This impact is described in several steps as "changes in his environment, changes in himself, changes in his own team, in his own company and finally changes in the market." (ger. "Veränderungen in seinem Umfeld, Veränderungen bei sich selber, Veränderungen im eigenen Team, in der eigenen Firma, Veränderungen auf dem Markt letztlich." (ID #06, par. 28)). Here achieving an impact on the market is mentioned as the highest level of contribution towards a transformation in civilisation.

The findings also describe the general application level of competencies as the "ability to structure things well, to organize processes as processes in project management are part of it" ("Fähigkeit habe, Dinge gut zu strukturieren, Prozesse zu gliedern, Prozesse im Projektmanagement gehören dazu" (ID #01, par. 32)) which is not only supportive in all sustainability related processes. Furthermore it is of great relevance for the general management of his organisation.

5.1.5 Results on interpersonal competence

Someone who is able to "motivate, enable, and facilitate collaborative and participatory sustainability research and problem solving" (Wiek *et al.*, 2011b, p. 211) is capable of interpersonal competencies. This is addressed by more than half of the experts during the

interviews expressed as “Interpersonal, communicative skills” (“zwischenmenschliche, kommunikative Fähigkeiten” (ID #01, par. 32)). Related to human resources, interpersonal competence as “enthusiasm among employees” (ger. “Begeisterung bei den Mitarbeitern” (ID #02, par. 10)) is mentioned as a central component within all competencies an entrepreneur should have. It is described as “the empathy in another person, in partners and to discover their interests” (ger. “das Einfühlungsvermögen in die andere Person, in Partner und das Raushören derer Interessen” (ID #03, par. 14)), which is an important personal skill to develop a competence regarding the interactions with others.

One central precondition is described as having an idea about “what you really want to do and with what enthusiasm for it, means the motivation” (ger. “was man eigentlich will und mit Begeisterung dafür, also die Motivation” (ID #03, par. 24)) pointing out that a clear position on the own targets as well as a high motivation are necessary. Following up, this enthusiasm can be utilised to inspire surrounding stakeholders, like the customers, “for sustainable thinking and action” (ger. “für nachhaltiges Denken und Handeln” (ID #05, par. 10)).

The relevance of successful exchange in networks and alliances is explained e.g. the “exchange with different stakeholders” (ger. “sich mit unterschiedlichen Interessengruppen austauschen” (ID #03, par. 20)) has a high impact on goal setting. To be successful in these relationships with other people being authentic is mentioned as key issue (ID #05, par. 20).

Overall it is described to act in the “role as a motivator” (ger. “Rolle als Motivator auftreten” (ID #10, par. 27)) and to actively “build-up networks” (ger. “Netzwerke aufzubauen” (ID #07, par. 28)) can lead to “emerge from society and act as a stimulus” (ger.”aus dieser Gesellschaft heraustreten und auch als Impulsgeber agieren” (ID #10, par. 27)) to facilitate sustainability problem solving.

5.1.6 Results on integrated problem-solving competence

Items addressing the integrated problem-solving competence as being able to apply problem-solving frameworks to complex sustainability problems developing practical solution options are identified in four of the interviews (Wiek *et al.*, 2011b, p. 205). An

interviewee addresses it directly by mentioning the “Gestaltungskompetenz” (ID #03, par. 22) as one of his competencies being relevant for his career. Complementary and in a process related form, another expert describes “self-evident initiatives, recognising problems, seeing solutions and applying and adapting them” (ger. “selbstständig initiatives Handeln, Probleme erkennen, Lösungen sehen und sie auch Anwenden und Adaptieren” (ID #01, par. 42)) as the main structure for him in sustainable entrepreneurship.

However, the meta-competence can be also identified in mentioned activities. As example, the founder of a consulting agency figured out “when we often come and bring the issue of sustainability, all others think we just cost money. This is true, but we are also showing how money can be saved through many measures” (ger. “wenn wir häufig kommen und das Thema Nachhaltigkeit bringen, denken alle, wir kosten Geld. Das stimmt auch, aber wir zeigen gleichzeitig auf, wie man durch viele Maßnahmen Geld einsparen kann” (ID #09, par. 8)). He presents how it is possible to develop practical solution options for acting against prejudices of his customers to implement sustainability in their business activities.

5.2 Analysis of entrepreneurial competencies/business competencies

Entrepreneurial competencies related to the role of being an entrepreneur could be divergent thinking, active information search, business opportunity identification and innovativeness of product/service innovations (Frese and Gielnik, 2014, pp. 417–418). All kinds of business competencies complement the entrepreneurial competencies. In each of the ten interviews some entrepreneurial competencies can be identified as there is a broad range of different competencies addressed that are described in 49 items. This section should provide some insights about the different competencies mentioned from the experts.

In the interaction with employees, “human resources management” (ger. “Personalführung” (ID #04, par. 6 and ID #08, par. 18)) is described as crucial task for sustainable entrepreneurs. This role is also addressed by the required “leadership competence” (ger. “Führungskompetenz” (ID #03, par. 22)) which is supported by several statements in the interviews. One expert mentions that “to delegate work or to let people participate” (ger. “um Arbeit zu delegieren oder sie zu beteiligen” (ID #01, par. 32)) is

important for his success. Another entrepreneur supports this statement by declaring “responsibility to distribute so to speak further [tasks] into the team” (ger. “Verantwortung weitere zu verteilen ins Team sozusagen” (ID #10, par. 20)) is important for him in his daily routine. This distribution of tasks is described in more detail as feeling “as a driver and as an innovator” (ger. “als Treiber und als Innovator“ (ID #02, par. 10)) in the own company. Beyond this leadership orientation human resource management is also expressed as being in charge for “personnel accounting, personnel management, then the whole accounting department” (ger. “Personalabrechnung, Personalführung, dann das ganze Rechnungswesen” (ID #05, par. 6)).

Very important to the entrepreneurial process is the opportunity identification (Frese and Gielnik, 2014, pp. 417–418). This is described quite often as “recognising opportunities” (ger. “Chancen erkennen” (ID #06, par. 28)) or to “risk starting something new” (ger. “Wagen was Neues zu starten” (ID #04, par. 23)). This “entrepreneurial perspective to identify opportunities” (ger. “unternehmerische Perspektive Chancen zu erkennen” (ID #06, par. 22)) is described as important characteristic of entrepreneurs. One sustainable entrepreneur sees the core of being successful in the differentiation in opportunity identification, “If one wants to be entrepreneurially successful, then one shall behave different than the majority of the population” (ger. “wenn man unternehmerisch erfolgreich sein will, dann muss man sich schon anders verhalten, als der große Durchschnitt der Bevölkerung” (ID #06, par. 28)). Other experts support this approach by some specific methods to be applied. One example is to understand “design thinking is a part of our methods” (ger. “Design Thinking ist ein Teil von unseren Methoden” (ID #10, par. 16)) with the goal to “develop creative solutions” (ger. “kreative Lösungen entwickeln” (ID #09, par. 16)).

Moving from individual perspectives on mentioned competencies towards more economically oriented ones understanding the market situation is quite prominent in many interviews. The “analysis of the market and then the link to the company goal” (ger. “Analyse des Marktes und dann in Verknüpfung immer wieder mit dem Firmenziel” (ID #02, par. 16)) is mentioned as a fundamental success factor. In this context it is important to have “on the one hand consciousness for the needs of the market, on the other hand the flair for the brand and not to weaken the content of the brand “(ger. “Gewissen Gespür auf der einen Seite für die Bedürfnisse des Marktes, auf der anderen

Seite das Gespür [für] die Marke und die Inhalte der Marke nicht zu verwässern" (ID #02, par. 26)). Thus, to keep the balance between marked orientation and core values of the brand an expert mentions that one central activity in her business is to "look where our customers are exactly" (ger. "gucken, wo […] unsere Kundschaft genau [steht]" (ID #04, par. 16)). Overall, the role of taking entrepreneurial action includes to give "impulses and ideas on how we present ourselves on the market" (ger. "Impulse und Ideen wie wir am Markt auftreten" (ID #06, par. 8)).

Another recognised business area of relevance is marketing and sales. One expert describes this as she has to have "a bit of marketing expertise" (ger. "ein Stück weit Vermarktungsfachwissen" (ID #07, par. 28)). In addition another entrepreneur sees to draw "process visualisation and user stories" (ger. "Prozessvisualisierung und User Stories" (ID #10, par. 16)) as important part in creating the image of his firm. To achieve a credible image, it is

> "The most important thing for an entrepreneur being successful in the sustainable area is, I believe, that he is reliable and trusted. Whether this is Siemens or whether it is Kenners Landlust, it is always the credibility that is the crucial factor. "
> (ger. "Das wichtigste für einen Unternehmer, wenn er im nachhaltigen Bereich erfolgreich ist, ist glaube ich, dass man es ihm abnimmt und glaubt. Ob das jetzt Siemens ist, oder ob das Kenners Landlust ist, es ist immer die Glaubwürdigkeit, die das Entscheidende ist" (ID #05, par. 20)).

Activities in finance are mentioned as important in some of the interviews as the goal of these is to realise "financial profit" (ger. "finanziellem Gewinn" (ID #04, par. 6)). This is intercepted in various ways of execution, for example as "potential financing, foundation, fundraising" (ger. "potentielle Finanzierung, Stiftung, Fundraising" (ID #01, par. 12)). Thus, a sustainable entrepreneur also interprets his role as he "have to ensure that we can finance these projects" (ger. "muss dafür sorgen, dass wir diese Projekte finanzieren können" (ID #03, par. 8)).

To build up networks for long-lasting business relations is described as "to look for contacts and then to develop the appropriate concepts for talking, establishing relationships and staying in touch" (ger. "Kontakte zu suchen und dann entsprechende Konzepte zu entwickeln, mit denen ins Gespräch zu kommen, Beziehungen aufzubauen und im Kontakt zu bleiben" (ID #03, par. 14)). The next section focusing more on general competencies will provide some more insights on the relevance of communication skills.

5.3 Analysis of regular competencies

Beyond key competencies for sustainability and specific entrepreneurial competencies, regular competencies addressing general skills and knowledge like critical thinking and communication are also relevant (Wiek *et al.*, 2011b, p. 204). In total there are 31 items identified in the code of 'regular competencies'. This sub-chapter will give an impression what the mentioned competencies are and how the participants express them.

The most prominent content in all items is communication related competencies. Such a „communication competence" (ger. „Kommunikationskompetenz" (ID #03, par. 22)) is directly mentioned and addressed by many entrepreneurs. On behalf of this interaction with other people it is important to have a "flair for people and situations, for needs" (ger. "Gespür für Menschen und Situationen, für Bedürfnisse" (ID #07, par. 28)). Furthermore it is necessary to "deal with people very consciously and be able to walk-up to people by self-initiative" (ger. "sehr bewussten Umgang mit Menschen hat und man in der Lage ist aus Eigeninitiative auf Leute zuzugehen" (ID #01, par. 32)) to initiate interactions and use potentials of such relations. This is described as also highly relevant when it comes to "teamwork" ("Teamarbeit, die Teamzusammenarbeit" (ID #01, par. 12)).

Experts also address rhetorical expertise as important to their success. These are key skills when it comes "to hold their own workshops or lectures as an expert also to be perceived professionally" (ger. „eigene Workshops oder Vorträge zu halten eben als Experte auch professionell wahrgenommen zu werden" (ID #01, par. 32)). How the company is presented and what is communicated to the public has an impact an entrepreneur describes out of her experience that "complete disclosure" (ger. "komplette Offenlegung" (ID #08, par. 26)) is the appreciate solution in her business. Reinforcing this point of view another expert states that whenever errors occur "this should be handled without keeping it quiet even if there are problems, also in-house and explain why there are problems and not trying to hide it" (ger. "Dieses auch nicht hinter den Berg halten, auch wenn es mal Probleme gibt, auch in dem Haus und das erklären warum es Probleme gibt und nicht versuchen es zu vertuschen" (ID #05, par. 28)).

Also very important is "self-discipline in any case" (ger. "Selbstdisziplin auf jeden Fall" (ID #01, par. 32). This is described as a "high level of self-responsibility" (ger. "hohes Niveau an Eigenverantwortung" (ID #10, par. 20)) which is necessary to achieve a high

performance. In this context one describes “you have to be relatively honest to yourself” (“muss man natürlich relativ ehrlich zu sich selbst sein” (ID #07, par. 36)).

“Willingness to learn” (ger. “Lernbereitschaft zu haben” (ID #06, par. 28)) adapting from experiences and the development of tacit knowledge are also described in the regular competency items. This is expressed as “the principle of trial and error, learning from the results, reflecting if this is tested quasi-playfully” (ger. “das Prinzip Ausprobieren und Scheitern, Lernen aus den Ergebnissen, Reflektieren, wenn das quasi spielerisch erprobt wird” (ID #10, par. 30)). This approach of trial and error and learn from it is mentioned by another entrepreneur as success factor, “whoever wants to be successful must make mistakes and must be ready to make mistakes” ger. “Also wer erfolgreich sein will, der muss Fehler machen, der muss bereit sein Fehler zu machen” (ID #06, par. 28)). One expert describes how he has learned of his experience as “manager in the age of twenty-one years. He has, so to speak, grown into the task” (ger. “bin mit dem einundzwanzigsten Lebensjahr zum Geschäftsführer sozusagen in die Aufgabe hineingewachsen” (ID #02, par. 7)). This can be summarised as “we need a culture of communication” (ger. “da brauchen wir bei uns eine Kultur der Kommunikation” (ID #10, par. 20)) enabling individuals to build up “a certain fault tolerance, ability of learning and also a certain form of democracy” (ger. “eine gewisse Fehlertoleranz, Lernfähigkeit und auch eine gewisse Form der Demokratie” (ID #10, par. 20)).

Closing this descriptive analysis there are many more topics addressed in the regular competencies section. Some just address methods as “simplification” (ID #09, par. 21) others speak about specific skills as “creativity” (ID #01, par. 44) or concentrate on “general knowledge” (ID #05, par. 18). These will not be further elaborated as the findings only appear once and thereby are not sufficient for further interpretations in the given context.

6. Discussion

The results show a relevance of all analysed key competencies for sustainability as well as of the entrepreneurial competencies and business competencies and the regular competencies for sustainable entrepreneurs. However, there are different levels of importance identified and the competencies are sometimes interpreted and applied in diverse characteristics. This chapter will discuss the competencies for sustainability as well as the other recognised competencies and identifies potential links in-between based on the interview outcomes whereas the overall conclusions are drawn in the next chapter.

6.1 Discussion of key competencies for sustainability

This first section in the discussion is evaluating the presented results of chapter 5.1 in connection to current research findings and related constructs out of the literature review. Capturing an overall interpretation, looking at the numbers of identified items presented in figure six (see chapter 5.1), all six competencies developed by Wiek et al. are mentioned during the interviews and thereby verify their application for sustainable entrepreneurs on a general level. This matches the outcome of the broad literature review which was conducted to initially identify a set of key competencies (Wiek *et al.*, 2011a, p. 5). The differences in frequency of occurrence show that the six competencies might have different levels of relevance and can be interpreted based on the number of items in an either broad or narrow perspective. As it is not a quantitative study the interpretations based on numbers are not representative.

In the beginning, the definition of competencies as “specified and broadened to include skills, motivations and affective dispositions” (Hesselbarth and Schaltegger, 2014, p. 27) is confirmed by the results. These address not only the competency constructs but even more often mention related skills as well as motivations regarding their activities as change agents for sustainability. Thus, the presented results can also be described by “complexes of knowledge, skills, and attitudes that enable successful task performance and problem solving” (Wiek *et al.*, 2011b, p. 204). The specific competencies are mentioned in different manners during the data collection. Some of them are directly addressed, others are only partially covered and some are not mentioned at all by some of the participants.

The results on systems thinking competence show that there is an urgent need for a holistic and systemic thinking to understand change processes. It also addresses the complexity in companies as well as the requirement of interpreting systems thinking approaches in a given context. A similar theoretical construct is the strategic knowledge cluster which aims to integrate different competencies including systemic components to achieve an overall contribution for complex transition strategies (Fadeeva *et al.*, 2010, p. 310). In spite of this some interviewees pointed out the relevance also to act within the complex structure of their own companies (ID #08, par. 22). But most interview results do not show a relation to systems thinking competence leading to the assumption that it might not be relevant for all sustainable entrepreneurs.

Diving into the interpretations of anticipatory competence the needs for flexibility and adaptability are essential to the entrepreneurs and name the competence construct indirectly (ID #01, par. 44 and ID #04, par. 30). This is also expressed as “employers will need a clearer idea of the skills that are now available to them and how they can be applied to solve problems” (Wiek *et al.*, 2011a, p. 11), whereas here the employers are also in the function of problem solvers and it is about utilizing available capacities.

The attributes of adaptability and flexibility are also crucial for the concept of change agents being addressed in the analysis regarding the set of 44 abilities and traits of change defined for ACPA by Svanström and her colleagues (Svanström *et al.*, 2008, p. 346). In addition, future thinking is contextualised in companies as adaptation based on other competitors and with regards to changing conditions in the environment of a company (ID #02, par. 28 and ID #03, par. 10). Supplementary, the obligations out of the societal discourse lead to a certain pressure on change processes in creating and deciding on future scenarios (Abson *et al.*, 2016, p. 34; Barth, 2016, p. 61). A higher number of items addressing this construct support this relevance for some change agents. Not all interviewees have stated their individual relation towards the anticipatory competence enabling the idea that it might be of higher relevance than systems thinking approaches, but not generally required for acting as sustainable entrepreneur.

To further discuss the normative competence it is important to recognise the high amount of 21 items as all entrepreneurs described some content related to value thinking. Even in this high relevance, expressed by the high number of relations it is only indirectly

addressed e.g. when the experts provide statements regarding specific norms and values (ID #09, par. 38 and ID # 04, par. 22). Overall value related statements address four different issues in the current discourse. Firstly, the changing societal perceptions impact the discourse and thereby shape potential future visions (Abson *et al.*, 2016, p. 34). Secondly, the need for values keeping both feet on the ground is essential to understand current problems within the actual context and their historical development (ID #03, par. 20). Thirdly, issues regarding the purpose and value of live address the question of individual responsibility regarding a transformation towards sustainable development (Adomssent *et al.*, 2007, p. 427; ID #04, par. 10). Finally, the provided norms can be summarised as a positive future vision defined in the overall goal to bring improvements in various parts of life is a key factor to achieve a sustainable development for individuals as well as for the whole society (ID #07, par. 10).

The most prominent competence out of the interviews is the strategic competence, 22 items out of all participant's responses address it. Overall, it has a high relevance as each change process carried out as action of change agents can be described as forming strategies for transitions. These new future strategies require a change of perspectives to transfer the new visions into action (Hesselbarth and Schaltegger, 2014, p. 26). An important role plays the decision making function in the described responsibilities of the sustainable entrepreneurs because understanding as decision maker "what must be done, why, when, how, and by whom" (Ford and Ford, 1995, p. 557) is crucial to the success of a change process. Entrepreneurs as most influential individuals in a firm act in general as decision makers (Westhead *et al.*, 2005, p. 395). This is also mentioned in the interviews as power to implement strategies (ID #09, par. 12) and the duty to decide on essential issues (ID #06, par. 8). To increase a created impact a continuing process of improvement is necessary which is described as critical reflection and ongoing evaluation out of the data set. Such evaluation approaches are also applied by Brundiers and Wiek to identify the main characteristics of challenges in sustainability education including to facilitate further collaboration among different stakeholders (Brundiers and Wiek, 2011, p. 122). More detailed descriptions of the strategic changes to be achieved refer to the potential that entrepreneurship has. Here the huge market impact by the formation of new companies is an already widespread concept (McMullen and Shepherd, 2006, p. 132; Shane and Venkataraman, 2000, p. 223). The described forms of strategic competencies required by

the change agents are named often together with regular skills such as organising and project management (ID #01, par. 32) and match the state of the art that regular competencies are of high importance (Wiek *et al.*, 2011b, p. 204).

Results on the interpersonal competence by 18 identified items show that it is quite relevant for change agents in this work to interact and convince others (Hesselbarth and Schaltegger, 2014, p. 30). Moreover, this is especially relevant for sustainable entrepreneurs as they have to deal with various personalities such as employees, customers and other important stakeholders. Out of this, Ford and Ford do consider “change as a communication-based and communication-driven phenomenon” (Ford and Ford, 1995, p. 541; McMullen and Shepherd, 2006, p. 133), where motivation is a crucial factor of success. Also, the provided data supports this position as entrepreneurs describe the enthusiasm and motivation as key factors of their actions (ID #03, par. 24). The crucial relevance of motivation and communication and thereby also the relevance of interpersonal competencies is a well-known phenomenon in entrepreneurship research (Frese and Gielnik, 2014, p. 424) and (McMullen and Shepherd, 2006, p. 138). The actual research also identifies networks as important factors as social networks may lead to a higher business success (Frese and Gielnik, 2014, p. 426) and describe acting as a stimulus promoting change as part of the entrepreneurial role (McMullen and Shepherd, 2006, p. 133). Concluding the variety of mentioned skills related to interpersonal competency implies a high relevance with individual characteristics. These might depend on the personalities of change agents as well as on their valuable previous experiences (Westhead *et al.*, 2005, p. 394).

Skills and knowledge related to the integrated problem-solving competence as meta-competence are mentioned infrequent compared to the three last mentioned ones. Seven identified items address the construct in direct as well as in indirect manners. One interviewee directly states that it is necessary to have a certain “Gestaltungskompetenz” (ID #03, par. 22) which is explained as implementation competence being of key relevance to successfully implement sustainability initiatives (Fadeeva *et al.*, 2010, p. 310). Another construct mentioned in the interviews is the crucial factor of opportunity identification which is illustrated as recognising problems and seeing solutions. This is an advanced framework out of the entrepreneurship research and therefore includes two categories that influence if opportunities are discovered or not. Firstly, the individual needs to possess

required prior information to identify an opportunity successfully. Secondly, cognitive properties on how to value a potential opportunity are necessary (Shane and Venkataraman, 2000, pp. 221–222). Within this structure, the cognitive properties and prior information are addressed in the data set and support the relevance of integrated problem-solving competence. The competence is also indirectly addressed in specific activities expressed as pointing out solution potential rather than supporting potential prejudice against sustainability related goals. Overcoming such a prejudices is an important step towards sustainable development and requires participatory approaches (Barth, 2016, p. 341). An example related to the results here is the influence of entrepreneurs on existing business via their firms actions. Overall, the integrated problem-solving competency enables some of the entrepreneurs to develop practical solutions to implement sustainability in their actions (ID #09, par. 8).

6.2 Discussion on further competencies

After discussing the pre-defined key competencies for sustainability this sub-chapter aims to provide a summary of main findings related to the identified entrepreneurial competencies including business competencies as well as for the regular competencies.

In total numbers, the code of entrepreneurial competencies has 49 related items while the regular competencies are characterised by 31 items where interviewees addressed the specific coding. Furthermore, both fields can be discussed as conglomeration of several different parts of the competencies expressed as skills, knowledge and expertise in the specific applications to each entrepreneur who has contributed to the results.

The field of business competencies addresses six different perspectives which are use of human capital, opportunity identification, market analysis, marketing & sales and finance and networking & relationships. Some of them have already been addressed above related to the key competencies for sustainability, as for example networking is also essential for the interpersonal competence. Thus, the following paragraphs should give some guidance to which extend the findings reflect the current research. The relevance of using human capital of the entrepreneur him- or herself as well as initiating this potential in others is one precondition for successful entrepreneurship (Westhead *et al.*, 2005, p. 397). The importance of business opportunity identification for entrepreneurial action is a key

factor as each change affecting the world has to identify the opportunity beforehand (Frese and Gielnik, 2014, pp. 417–418). Further details among the opportunity identification process are explained in chapter 6.1 regarding its relevance for the integrated problem solving competence. The three classical subjects in an academic economic education are market analysis, marketing & sales and finance and represent the importance of general business skills for enabling entrepreneurial action. Here Morris et al. raise in their questionnaire the related areas of “information management “, “selling/marketing” and “financial transactions” as potential sources of competence for entrepreurs (Morris *et al.*, 2005, p. 730). According to Svanström et al. a successful sustainability change agent has to have knowledge about economic issues (Svanström *et al.*, 2008, p. 347). Following up, she also describes to collaborate and network as essential activities of entrepreneurs (Svanström *et al.*, 2008, p. 348). In addressing the question of this work the mentioned areas of entrepreneurial competencies are all of relevance for a successful entrepreneurial performance. They are also relevant to act as sustainable change agent if this is done as sustainable entrepreneur.

Regular competencies being present in the interview data can be structured by five areas that are addressed. These fields are communication related competencies, rhetorical skills, realistic sense of self, willingness to learn including trial and error and complementary methods. Even if Wiek et al. distinct between the regular competencies and more specific competencies for sustainability, they state very clear how relevant these standard competencies are (Wiek *et al.*, 2011b, p. 204). The development of advanced communication skills is important to act as a change agent (Hesselbarth and Schaltegger, 2014, p. 27) in combination with rhetorical skills. Both are represented in the discussion of interpersonal competencies (see chapter 5.1 and 6.1). A certain level of realistic sense of self is required as it is necessary to have a value system as well as a self-concept supporting change agent activities (Svanström *et al.*, 2008, p. 347). To learn from trials which lead to success or failure is important as it offers via real-life learning settings the opportunity to achieve required competencies and foster personal development (Barth, 2015, p. 125). Finally, the ability to apply specific methods refers to methodological knowledge being one of different competency-sets for sustainability and is therefore required (Brundiers and Wiek, 2011, p. 110). Overall, the relevance of general competencies is reflected by the interview results as also discussed above.

6.3 Limitation of this work

The discussion offers to partially distinct between competencies of higher importance and competencies of lower importance and also provides some specifications regarding the format being applied by the sustainable entrepreneurs. However, it is important to see the limits of this work. The small sampling size (n=10) and individual interviews can only provide a first impression of a possibly relevant set of key competencies. The sampling only addresses the factors of business experience and general field of action be dividing into ecopreneurs and social entrepreneurs. Additional factors such as industry, company size, age and regional context might also have an impact on the results. Here, more research effort is needed to verify the findings and also concretise the definitions of each of the competencies with regards to the application by entrepreneurs solving sustainability problems as change agents.

7. Conclusion

The aim of this work is to answer the question which key competencies do sustainable entrepreneurs need to find long-term solutions as change agents for sustainability. Therefore, the six key competencies for sustainability developed by Wiek et al. formed the general framework which was tested via qualitative expert interviews. These are conducted with sustainable entrepreneurs to figure out which key competencies are applicable for sustainable entrepreneurs and their change actions. During the process the findings suggest also a varying relevance of the key competencies for sustainability whereas entrepreneurial competencies and regular competencies are also of relevance for entrepreneurs to act as sustainable change agents.

More in depth, the three competencies of a high relevance to sustainable entrepreneurs are anticipatory competence, normative competence and strategic competence while on the other hand the systems thinking competence, interpersonal competence and integrated problem solving competence cannot be described as equally important. This is based on the lower relevance across all collected data which might be influenced by the specific company background and level of education of the individuals to be aware of specific competencies. However, nearly all competencies and their mentioned sub-parts are interpreted in specific forms by the entrepreneurs. In the normative competence a need for values to keep both feet on the ground understanding current problems as well as norms to bring improvements in various parts of life are key factors. This targets achieving a sustainable development for individuals as well as for the whole society. The specific interpretation of the strategic competence is characterised by the high importance for decision-making processes, relevance to implement and act including an ongoing evaluation of own actions. An entrepreneurial form of interpersonal competence is indicated by the need to deal with various personalities in business understanding change driven by communication, key influence via motivation and abilities to network. Competencies regarding systems thinking, personal interaction and integrated problem solving are also quite important as each of them is addressed by some responses.

Besides these important competencies related to sustainability the skills required to act as a successful entrepreneur are equally important as they have been addressed throughout

the data set. Essential entrepreneurial competencies, such as opportunity identification, should be included in key competencies for sustainable entrepreneurs. Furthermore, regular competencies as critical thinking and communication skills are also of major relevance to the overall success of implementing change as they are in a relation to the already addressed key competencies (Wiek *et al.*, 2011b, p. 204).

Even if a distinction between competencies of high importance and competencies of lower importance can be made, more research effort is needed to understand how key competencies for sustainability are applied by different expert groups, what they have in common and which parts distinct between the groups.

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Bastian Hagmaier

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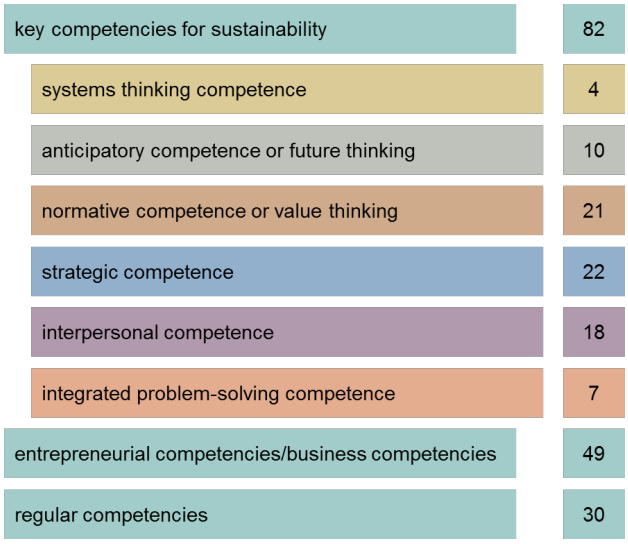
Annex

1. Code system and statistics

Coding system with total numbers



Statistics of codes for each participant and in total

Code / particpant	ID #01	ID #02	ID #03	ID #04	ID #05	ID #06	ID #07	ID #08	ID #09	ID #10
key competencies for sustainability	10	8	16	13	5	4	6	3	10	7
systems thinking competence	1	0	0	1	0	0	0	1	0	1
anticipatory competence or future thinking	1	2	2	3	0	0	0	1	1	0
normative competence or value thinking	0	2	3	7	0	0	4	0	4	1
strategic competence	4	2	2	2	2	3	1	1	2	3
interpersonal competence	3	2	5	0	3	0	1	0	2	2
integrated problem-solving competence	1	0	4	0	0	1	0	0	1	0
entrepreneurial competencies/business competencies	3	6	6	6	5	8	3	1	5	6
regular competencies	7	2	4	4	2	2	2	1	2	4

2. Code rules and codings

2.1 Key competencies for sustainability — systems thinking competence

2.1.1 Code comment

- Systems-thinking competence is the ability to collectively analyze complex systems across different domains (society, environment, economy, etc.) and across different scales (local to global), thereby considering cascading effects, inertia, feedback loops and other systemic features related to sustainability issues and sustainability problem-solving frameworks. (Wiek et al. 2011, p. 207)
- analyse sustainability problems cutting across different domains (or sectors) and scales (i.e., from local to global)
- applying systems concepts including systems ontologies, cause-effect structures, cascading effects, inertia, feedback loops, structuration
- systemic thinking for anticipating future trajectories (from a systemic perspective), for identifying intervention points and critical actors, and for testing transition strategies

2.1.2 Codings (4)

"ganzheitliches und systemisches Denken" (ID #01, Paragraph 44)

"Das ist ein Prozess, der sich auch Stück für Stück immer weiter fortsetzt" (ID #04, Paragraph 4)

"man muss einfach sich in viele Sachen, in sehr viele Details eines Unternehmens hineinversetzen können" (ID #08, Paragraph 22)

"ich muss sie in einen Kontext stellen" (ID #10, Paragraph 24)

2.2 Key competencies for sustainability — anticipatory competence or future thinking

2.2.1 Code comment

- Anticipatory competence is the ability to collectively analyze, evaluate, and craft rich ‘‘pictures’’ of the future related to sustainability issues and sustainability problem-solving frameworks. (Wiek et al. 2011, pp. 207–209)
- exploring different future pathways and solution visions
- applying scenario methodology and forecasting from statistical and simulation models
- back casting and envisioning methods
- anticipatory multi-methodologies as well as participatory anticipatory approaches

2.2.2 Codings (10)

“Adaptionsvermögen” (ID #01, Paragraph 44)

“erfolgreiche Unternehmen, die Entwicklung angeschaut, Hipp, das Unternehmen kennen Sie. Und andere, die einfach Vorbilder waren.” (ID #02, Paragraph 26)

“sehr nachhaltige Unternehmen, ja, die zum Teil in Teilbereichen sogar denn auch Vorbild waren für mich. Aber trotzdem ist dann etwas Eigenes daraus entstanden.” (ID #02, Paragraph 28)

“Konzeption von Projekten diese so zu konstruieren, dass sie den Anforderungen entsprechen sowohl im Hinblick auf mögliche Förderer, als auch im Hinblick auf die derzeitige Diskussion auf Bundesebene” (ID #03, Paragraph 10)

“über dies Zusammenarbeit mit KiTas eigentlich von den KiTas auch Lernen, das heißt man braucht eine große Offenheit und muss sich einfach da rein arbeiten in diese” (ID #03, Paragraph 16)

“zuständig so auf der Geschäftsführungsebene für Zukunftsszenarien, also sowas wie Berechnungen, was würde welche Entwicklung an finanziellem Gewinn nach sich ziehen.” (ID #04, Paragraph 6)

“Man braucht aber auch eine Flexibilität” (ID #04, Paragraph 30)

“Und ich glaube, dass das so ganz wichtige Prozesse sind. Einmal auch für diese ganzen Übergabe-Prozesse, wenn also wir sind dann älter, die sind jünger, aber auch um Modelle zu finden, die das Leben und in denen das Leben Spaß macht und lebbar ist.” (ID #04, Paragraph 34)

“Und man dann mit denen idealerweise überlegen kann wie man in welchem Bereich so fort fährt.” (ID #08, Paragraph 22)

“darum sich in die Unternehmen rein versetzen zu können und zu gucken wo durch diese Maßnahmen, die man umsetzt wirklich ein Mehrwert entsteht der unterschiedlichsten Art.” (ID #09, Paragraph 26)

2.3 Key competencies for sustainability — normative competence or value thinking

2.3.1 Code comment

- Normative competence is the ability to collectively map, specify, apply, reconcile, and negotiate sustainability values, principles, goals, and targets. (Wiek et al. 2011, p. 209)
- specify, compare, apply, reconcile, and negotiate sustainability values, principles, goals, and targets, informed by concepts of justice, equity, responsibility, etc., in various processes, including visioning, assessment, and evaluation
- values thinking in sustainability problem-solving, for example, for providing normative orientations to problem analysis, futures thinking activities, and strategy building
- assess the sustainability effects/impact of one’s job activities and envision a sustainable future for one’s profession

2.3.2 Codings (21)

“viele Anfragen auch aus konventionellem Bereich bekommen, ob wir nicht konventinelle Säfte herstellen. Das haben wir alles immer abgelehnt und sind wirklich immer bei dem Kern sozusagen der Kernaufgabe geblieben” (ID #02, Paragraph 14)

“Wir müssen komplett umdenken. Unternehmen heißt heute nicht mehr kapitalorientiert, sondern sozial oder gemeinwohlorientiert” (ID #02, Paragraph 40)

“nicht nur als Wissen zu haben, sondern auch in gewisser Weise als Überzeugung.” (ID #03, Paragraph 20)

“Man braucht allerdings auch noch die Bodenhaftung, gerade wenn man sich mit dem Thema Nachhaltigkeit beschäftigt” (ID #03, Paragraph 20)

“es bedarf einer wirklichen Überzeugung der Themen, das heißt man muss es selber auch leben.” (ID #03, Paragraph 28)

“Und Nachhaltigkeit ist ja sowas was sich irgendwie ins Leben rein wurmt, also, wenn man erstmal mit anfängt, dann taucht an allen Ecken und Enden was auf, womit man gar nicht gerechnet hat.” (ID #04, Paragraph 4)

“wir kommen ja aus der Gorleben-Bewegung und Nachhaltigkeit ist für uns ein ganz ganz starker Motivator” (ID #04, Paragraph 10)

“Und wenn wir etwas beruflich machen, dann muss es nachhaltig sein, aber es wäre auch schön, wenn es als Beispiel dienen würde.” (ID #04, Paragraph 10)

“Da haben wir gemerkt so, da sind wir einfach toleranter geworden. Also die Gesellschaft als Ganzes, glaube ich, wenn man größere Mengen von Menschen bewegen will, dann muss man aufpassen, dass man nicht zu hart ist, wobei ich schon glaube, es ist eine Abwägungssache.” (ID #04, Paragraph 16)

“Nachhaltigkeit entspringt für mich aus einer Verbindung zu meinem Inneren Sein.” (ID #04, Paragraph 22)

“Ich will ein Leben, das sich lohnt zu leben.” (ID #04, Paragraph 24)

“Und ich glaube, dass das so ganz wichtige Prozesse sind. Einmal auch für diese ganzen Übergabe-Prozesse, wenn also wir sind dann älter, die sind jünger, aber auch um Modelle zu finden, die das Leben und in denen das Leben Spaß macht und lebbar ist.” (ID #04, Paragraph 34)

“Ja so das übergeordnete Ziel ist eigentlich, die Welt in jeder Kleinigkeit zu einem etwas besseren Ort zu machen” (ID #07, Paragraph 10)

“Und man eben bemüht ist genau in dieser Umwelt eben eine positive Resonanz für dieses eigene Handeln hervorzuheben.” (ID #07, Paragraph 34)

“Dass man da eben seinen Idealen treu bleibt und eben sich nicht hinreißen lässt dann die grüne Verpackung zu wählen und wirklich eben bei sich auch bleibt.” (ID #07, Paragraph 36)

“Das eben der Sinn und Zweck von Unternehmen nicht nur wirtschaftliches Wachstum um jeden Preis ist, sondern eben auch einen gesamtgesellschaftlicher Beitrag zu leisten.” (ID #07, Paragraph 38)

“Wichtig ist, alle Maßnahmen müssen eins machen, sie müssen den Umweltabdruck des Unternehmens verbessern. Nur dann führen wir eine Kostenersparnis durch.” (ID #09, Paragraph 8)

“Gibt es für mich so ein paar Thesen. Wie 'Sinn vor Gewinn'” (ID #09, Paragraph 34)

“dass es eben darum geht eine gute Gemeinschaft zu schaffen” (ID #09, Paragraph 38)

“Ich glaube, es geht einfach um andere Werte.” (ID #09, Paragraph 38)

“greife ich eher sozusagen philosophisch drauf ein und sage einfach wie ich mir vorstelle, dass wir Projekte auswählen, was die Kriterien sind.” (ID #10, Paragraph 14)

2.4 Key competencies for sustainability — strategic competence

2.4.1 Code comment

- Strategic competence is the ability to collectively design and implement interventions, transitions, and transformative governance strategies toward sustainability. (Wiek et al. 2011, p. 210)
- competent in strategic thinking, design and implement systemic interventions, transformational actions, and transition strategies, accounting for unintended consequences and cascading effects
- develop intentional plans that leverage assets (carriers) and stakeholder coordination (alliances) to overcome systemic inertia and path dependencies
- designing and carrying out plans, interventions, and actions towards transformational change
- position one’s job activities in a way that it contributes to sustainability transitions

2.4.2 Codings (22)

“Und ein so ein Modellprojekt war ein Konzept, eine Methode, die sehr projektorientiert, handlungsorientiert arbeitet, fast schon unternehmerisch” (ID #01, Paragraph 8)

“Projektstrukturierung, strategische Geschichten.” (ID #01, Paragraph 12)

“relevante Partner zu finden, also für jedes Marktsegment was wir bedienen, also Schule, Kommune, Ausbildungsbetriebe gibt es verschiedene Key-Partner quasi” (ID #01, Paragraph 26)

“dass ich diese Fähigkeit habe Dinge gut zu strukturieren, Prozesse zu gliedern, Prozesse im Projektmanagement gehören dazu” (ID #01, Paragraph 32)

“Aber mit Unternehmern, die gleichgesinnt und gleichgestrickt sind, wo man einfach dann im Bundesverband Naturkost bin ich mit drin und bei BAUM in Hamburg, bei dem Umweltverein bin ich mit drin. Bei Demeter sind wir Mitglied bei Bioland sind wir, machen wir mit.” (ID #02, Paragraph 32)

“Transformation der Ziele, das erfordert natürlich schon eine gewisse Intelligenz” (ID #02, Paragraph 40)

“wir evaluieren das ja auch inwieweit KiTas dann zum einen Nachhaltigkeitsstrategien umsetzen” (ID #03, Paragraph 8)

“Man braucht allerdings auch noch die Bodenhaftung, gerade wenn man sich mit dem Thema Nachhaltigkeit beschäftigt” (ID #03, Paragraph 20)

“Ich bin zuständig für die Entwicklung der Programme im Haus, also wie wo geht es hin” (ID #04, Paragraph 6)

“Also wir haben ja angefangen als die Ökospinner, jetzt mittlerweile sind wir die Trendsetter.” (ID #04, Paragraph 14)

“Und dann haben wir zusammen mit acht Häusern, glaube ich waren wir, versucht Kriterien da zu entwickeln, haben die zusammen entworfen, entwickelt, geprüft. Das war ein Prozess von fast drei Jahren bis wir so weit waren, das wir gesagt haben, so jetzt können wir auf den Markt gehen und sagen, es gibt in Deutschland klimaneutrale Hotels.” (ID #05, Paragraph 14)

“wenn Kollegen etwas machen wollen, sind wir auch gerne bereit, die Erfahrung einfach weiter zu geben.” (ID #05, Paragraph 18)

“Ich treffe die wesentlichen Entscheidungen” (ID #06, Paragraph 8)

“Das dritte ist natürlich auch sich selber mit seinen eigenen Entscheidungen und seinen Projekten immer wieder kritisch auf den Prüfstand zu stellen und sich selber zu fragen, stimmt das eigentlich was ich dort angenommen habe? Ist das wirklich die Chance schlechthin?” (ID #06, Paragraph 28)

“Veränderungen herbei zu führen, Veränderungen in seinem Umfeld, Veränderungen bei sich selber, Veränderungen im eigenen Team, in der eigenen Firma, Veränderungen auf dem Markt letztlich.” (ID #06, Paragraph 28)

“Ich glaube, ganz wichtig ist, dass man eben immer auch eine Perspektive für das Umfeld und die Umwelt hat, aber nicht nur egoistisch motiviert ist in allem was man tut, sondern immer auch weiß, das was ich tue hat Auswirkungen für alle um mich herum.” (ID #07, Paragraph 34)

“Und dann muss man da immer bei jedem material nochmal genau gucken und nochmal genau abwägen.” (ID #08, Paragraph 26)

“natürlich auch in der Form, dass man wirklich eine Strategie umsetzt” (ID #09, Paragraph 12)

“Projekte mit in die Praxis umsetzen” (ID #09, Paragraph 16)

“Management mache und die Zukunftsstrategien entwickelt” (ID #10, Paragraph 6)

“der Perspektivwechsel ist das Entscheidende” (ID #10, Paragraph 24)

“rauskommen aus seiner Fachwelt und in der Gesellschaft den Blick auf diese Fachwelt richten” (ID #10, Paragraph 24)

2.5 Key competencies for sustainability — interpersonal competence

2.5.1 Code comment

- Interpersonal competence is the ability to motivate, enable, and facilitate collaborative and participatory sustainability research and problem solving. (Wiek et al. 2011, p. 211)
- can motivate, enable, and facilitate collaboration towards sustainability
- project (group) management, communication, deliberation, negotiation, collaboration, leadership, pluralist (trans-cultural) understanding, and empathy empathetic listening and engagement
- problem analysis, conduct sustainability assessments and develop visions
- build transition strategies in teams and with diverse groups of stakeholders.

2.5.2 Codings (18)

"Grundsätzlich war oder bin ich der Impulsgeber gewesen, der die Leute zusammengezogen hat" (ID #01, Paragraph 12)

"aktiv an Diskussionen zu beteiligen, sich entsprechend als Akteur sichtbar zu machen und dann aktiv auf Leute zugehen" (ID #01, Paragraph 30)

"zwischenmenschliche, kommunikative Fähigkeiten" (ID #01, Paragraph 32)

"Begeisterung bei den Mitarbeitern" (ID #02, Paragraph 10)

"Beobachtung des Marktes findet natürlich in ganz vielen Gesprächen mit Naturkostladen statt, mit Verbrauchern aber eben auch auf den ganz vielen Naturkostmessen auf denen wir sind und daraus die richtigen Ergebnisse ziehen" (ID #02, Paragraph 20)

"das Einfühlungsvermögen in die andere Person, in Partner und das Raushören derer Interessen" (ID #03, Paragraph 14)

"Man muss sich mit unterschiedlichen Interessengruppen austauschen können und auch ein Stück weit in sie einfühlen können, in deren ja Antriebe in deren Beweggründe" (ID #03, Paragraph 20)

"man braucht eine gewisse Motivationsfähigkeit" (ID #03, Paragraph 20)

"eine Idee von dem was man eigentlich will und mit Begeisterung dafür, also die Motivation" (ID #03, Paragraph 24)

"begeisterungsfähig sein, aber auch Begeisterung entwickeln können bei anderen oder Motivation, motivieren können." (ID #03, Paragraph 28)

"dass wir unsere Gäste begeistern für nachhaltiges Denken und Handeln" (ID #05, Paragraph 10)

"Authentizität" (ID #05, Paragraph 20)

"Erfahrungsaustausch unter Kollegen ist uns das wertvollste gewesen" (ID #05, Paragraph 22)

“die Fähigkeit Menschen relativ schnell für sich zu gewinnen. Und eben auch darauf aufbauend Beziehungen, Netzwerke aufzubauen.” (ID #07, Paragraph 28)

“dafür muss man erstmal auch viele Menschen bewegen, diese ganzen Themen miteinander zu verbinden.” (ID #09, Paragraph 22)

“an einer nachhaltigen Beziehung, also das heißt wir sind an einer langfristigen Beziehung interessiert, wo es nicht darum geht, ich sag mal, seine Leistungen zu teuerst möglich zu verkaufen, sondern es darum geht, dass beide Seiten merken, wenn man gemeinschaftlich handelt man mehr erreichen wird.” (ID #09, Paragraph 22)

“aus dieser Gesellschaft heraustreten und auch als Impulsgeber agieren” (ID #10, Paragraph 27)

“in dieser Rolle als Motivator auftreten” (ID #10, Paragraph 27)

2.6 Key competencies for sustainability — integrated problem-solving competence

2.6.1 Code comment

- Integrated problem sovling competence includes "Gestaltungskompetenz" (de Haan)
  This over-arching competence is generally conceptualized as ‘having the skills, competencies and knowledge to enact changes in economic, ecological and social behavior without such changes always being merely a reaction to pre-existing problems. (Wiek et al. 2011, p. 205)
- meta-competence to use and integrate the five key competencies for solving sustainability problems
- able to apply different problem-solving frameworks to complex sustainability problems and develop practical solution options
- meaningfully integrate problem analysis, sustainability assessment, visioning, and strategy building
- describe the need for integrated problem-solving activities and how the different competencies enable this effort to foster sustainability

2.6.2 Codings (8)

“Für mich Unternehmertum ja quasi selbstständig initiatives Handeln, Probleme erkennen, Lösungen sehen und sie auch Anwenden und Adaptieren” (ID #01, Paragraph 42)

“dass ich eine sehr freie Hand habe und sehr viel Gestaltungsspielraum.” (ID #03, Paragraph 6)

“Dazu also was ja Gestaltung solcher Prozesse, ich finde auch das ist ein Entwicklungsprozess.” (ID #03, Paragraph 12)

“man braucht gestalterische Fähigkeiten” (ID #03, Paragraph 20)

“Gestaltungskompetenz” (ID #03, Paragraph 22)

“diese Vertriebsgesellschaft stand nun vor der spannenden Frage, ja wer übernimmt denn dann die Versorgung? Und daraufhin habe ich dann gesagt, ja gut, dann gründe ich ein Versorgungsunternehmen.

Und das war der Anstoß um die Firstcon zu gründen. Also durch diese Nachfrage, die dann plötzlich auf uns zukam." (ID #06, Paragraph 18)

"Dann haben wir einen dritten Bereich aufzuzeigen Unternehmen, wenn wir häufig kommen und das Thema Nachhaltigkeit bringen, denken alle wir kosten Geld. Das stimmt auch, aber wir zeigen gleichzeitig auf, wie man durch viele Maßnahmen Geld einsparen kann." (ID #09, Paragraph 8)

2.7 Entrepreneurial competencies/business competencies

2.7.1 Code comment

- Divergent thinking, active information search, business opportunity identification and innovativness of produc/service innovations (Gielnik et al., 2014)
- Other business and entrepreneurship related competencies

2.7.2 Codings (49)

"potentielle Finanzierung, Stiftung, Fundraising" (ID #01, Paragraph 12)

"deutschlandweite Netzwerktätigkeit, d.h. damit verbunden alle möglichen Fachkongresse und Tagungen" (ID #01, Paragraph 26)

"entsprechend Leute zu, um Arbeit zu delegieren oder sie zu beteiligen." (ID #01, Paragraph 32)

"ich fühle mich immer auch als Treiber und als Innovator und so eine Organisation" (ID #02, Paragraph 10)

"neue Ideen reinzubringen, neue Produktideen reinzubringen, neue Verfahren anzuwenden" (ID #02, Paragraph 10)

"Analyse des Marktes und dann in Verknüpfung immer wieder mit dem Firmenziel" (ID #02, Paragraph 16)

"Konsumentenrecherche, Befragungen, den Markt beobachten auf Messen etc." (ID #02, Paragraph 16)

"Beobachtung des Marktes" (ID #02, Paragraph 20)

"Gewissen Gespür auf der einen Seite für die Bedürfnisse des Marktes, auf der anderen Seite das Gespür die Marke, die Marke und die Inhalte der Marke nicht zu verwässern" (ID #02, Paragraph 26)

"ich muss dafür sorgen, dass wir diese Projekte finanzieren können" (ID #03, Paragraph 8)

"Rechnung, Förderanträge, Abrechnung von Fördermitteln, Öffentlichkeitsarbeit bis hin zu Mitgestaltung von Fortbildungen" (ID #03, Paragraph 8)

"wo kann man diese Themen positionieren in der Fachdiskussion, wo kann man Netzwerke nutzen und auch Netzwerke aufbauen um Unterstützer für die Ideen zu finden." (ID #03, Paragraph 12)

"Kontakte zu suchen und dann entsprechende Konzepte zu entwickeln, mit denen ins Gespräch zu kommen, Beziehungen aufzubauen und im Kontakt zu bleiben" (ID #03, Paragraph 14)

“betriebswirtschaftliche Grundlage” (ID #03, Paragraph 20)

“Führungskompetenz” (ID #03, Paragraph 22)

“finanziellem Gewinn” (ID #04, Paragraph 6)

“Personalführung” (ID #04, Paragraph 6)

“gucken, wo ist unsere Kundschaft genau” (ID #04, Paragraph 16)

“Kreativität, Hartnäckigkeit und Resilienz” (ID #04, Paragraph 22)

“Wagen was Neues zu starten” (ID #04, Paragraph 23)

“norddeutschen Kreativitäts- und Freiheitsdrang” (ID #04, Paragraph 24)

“die normalen Verwaltungstätigkeiten, die anfallen in so einem Betrieb” (ID #05, Paragraph 6)

“Personalabrechnung, Personalführung, dann das ganze Rechnungswesen” (ID #05, Paragraph 6)

“Krankenkassen und Verwaltungen und Anmeldungen und überhaupt die ganze Kontoführung” (ID #05, Paragraph 6)

“Das wichtigste für einen Unternehmer, wenn er im nachhaltigen Bereich erfolgreich ist, ist glaube ich, dass man es ihm abnimmt und glaubt. Ob das jetzt Siemens ist, oder ob das Kenners Landlust ist, es ist immer die Glaubwürdigkeit, die das Entscheidende ist.” (ID #05, Paragraph 20)

“auch als Unternehmer aufklärend tätig zu sein” (ID #05, Paragraph 24)

“Kopf und Seele des Unternehmens” (ID #06, Paragraph 8)

“ich gebe die Hauptsächlichen Impulse und Ideen wie wir am Markt auftreten” (ID #06, Paragraph 8)

“Um das Ganze erstmal als Chance zu erkennen, da braucht man einfach den vertrieblichen Blick.” (ID #06, Paragraph 22)

“die unternehmerische Perspektive Chancen zu erkennen” (ID #06, Paragraph 22)

“betriebswirtschaftliche Grundkenntnisse” (ID #06, Paragraph 22)

“Chancen erkennen” (ID #06, Paragraph 28)

“wenn man unternehmerisch erfolgreich sein will, dann muss man sich schon anders verhalten, als der große Durchschnitt der Bevölkerung” (ID #06, Paragraph 28)

“Durchstehvermögen” (ID #06, Paragraph 28)

“Finanzen, Businessplanung angeht, steuere das Marketing, steuere den Vertrieb” (ID #07, Paragraph 6)

“ein Stück weit Vermarktungsfachwissen” (ID #07, Paragraph 28)

“gewisses betriebswirtschaftliches Knowhow” (ID #07, Paragraph 28)

“auch in dem Bereich eine Produktionsführung. Also Unternehmensführung, Personalführung” (ID #08, Paragraph 18)

“kreative Lösungen entwickeln” (ID #09, Paragraph 16)

“wir können sehr sehr gut mit Zahlen umgehen” (ID #09, Paragraph 18)

“durch die Kreativität sind immer wieder Ideen entstanden” (ID #09, Paragraph 20)

“eine gute kaufmännische Ausbildung” (ID #09, Paragraph 28)

“verkäuferische Talente oder Ausbildungen” (ID #09, Paragraph 28)

“bin ich quasi in allen Produktrealisierungen oder Kreationsprozessen involviert” (ID #10, Paragraph 14)

“Design Thinking ist ein Teil von unseren Methoden” (ID #10, Paragraph 16)

“Prozessvisualisierung und User Stories” (ID #10, Paragraph 16)

“Verantwortung weitere zu verteilen ins Team sozusagen” (ID #10, Paragraph 20)

“Zusammenarbeit mit Kunden und durch die Entwicklung des Projektes” (ID #10, Paragraph 22)

“Größte Schwäche es eigentlich bisher ist, dass die Gründer die rausgehen wenig Feedback sich einsammeln von anderen und wenig damit arbeiten” (ID #10, Paragraph 30)

2.8 Regular competencies

2.8.1 Code comment

- ‘‘regular’’ competencies, such as critical thinking and basic communication skills (Wiek et al. 2011, p. 204)
- ability to learn new things, cooperation, communication, conflict management, independency, teamwork, transparency, tolerance, rhetorical competencies
- general knowledge

2.8.2 Codings (30)

“Ich kümmere mich hauptsächlich schon um die Kontakte nach außen.” (ID #01, Paragraph 12)

“Teamarbeit, die Teamzusammenarbeit,” (ID #01, Paragraph 12)

“sehr bewussten Umgang mit Menschen hat und man in der Lage ist aus Eigeninitiative auf Leute zuzugehen, Kontaktpunkte zu finden, Punkte der möglichen Zusammenarbeit, also kommunikative Fähigkeiten.” (ID #01, Paragraph 32)

“Fähigkeiten sich zu präsentieren, also kann man auch unter rhetorischen Fähigkeiten zusammenfassen eigentlich, aber wenn man so speziell eigene Workshops oder Vorträge zu halten eben als Experte auch professionell wahrgenommen zu werden.” (ID #01, Paragraph 32)

“Dann ist es Selbstdisziplin auf jeden Fall.” (ID #01, Paragraph 32)

“selbstständig mit Menschen Projekte durchgeführt habe” (ID #01, Paragraph 34)

“Kreativität” (ID #01, Paragraph 44)

“bin mit dem einundzwanzigsten Lebensjahr zum Geschäftsführer sozusagen in die Aufgabe hineingewachsen” (ID #02, Paragraph 7)

“Gesunden Menschenverstand.” (ID #02, Paragraph 26)

“Platzierung dieser Projekte in Fachgremien, Fachmedien aber auch in der Öffentlichkeit” (ID #03, Paragraph 10)

“man braucht eine Kommunikationsfähigkeit, die ist, glaube ich, sehr wichtig.” (ID #03, Paragraph 20)

“Kommunikationskompetenz” (ID #03, Paragraph 22)

“Kommunikationsfähigkeit und auch ein Einfühlungsvermögen in notwendige Netzwerke” (ID #03, Paragraph 24)

“man braucht aber auch eine Toleranz” (ID #04, Paragraph 16)

“unsere sehr stark nachhaltige Ausrichtung, die wir auch von Anfang an sehr gut publiziert haben” (ID #04, Paragraph 20)

“Aber mit einem pragmatischeren Ansatz” (ID #04, Paragraph 34)

“Konventionen brechen” (ID #04, Paragraph 39)

“viel Allgemeinwissen” (ID #05, Paragraph 18)

“Dieses auch nicht hinter den Berg halten, auch wenn es mal Probleme gibt, auch in dem Haus und das erklären warum es Probleme gibt und nicht versuchen es zu vertuschen.” (ID #05, Paragraph 28)

“Also wer erfolgreich sein will, der muss Fehler machen, der muss bereit sein Fehler zu machen.” (ID #06, Paragraph 28)

“Lernbereitschaft zu haben” (ID #06, Paragraph 28)

“Gespür für Menschen und Situationen, für Bedürfnisse” (ID #07, Paragraph 28)

“Ja, da muss man natürlich relativ ehrlich zu sich selbst sein.” (ID #07, Paragraph 36)

“komplette Offenlegung zum Beispiel” (ID #08, Paragraph 26)

“Simplifikation” (ID #09, Paragraph 21)

“man braucht auch eine dicke Haut” (ID #09, Paragraph 34)

“das wichtigste ist methodisch zu arbeiten” (ID #10, Paragraph 16)

“da brauchen wir bei uns eine Kultur der Kommunikation auf der einen Seite, eine gewisse Fehlertoleranz, Lernfähigkeit und auch eine gewisse Form der Demokratie” (ID #10, Paragraph 20)

“hohes Niveau an Eigenverantwortung” (ID #10, Paragraph 20)

“das Prinzip Ausprobieren und Scheitern, Lernen aus den Ergebnissen, Reflektieren, wenn das quasi spielerisch erprobt wird” (ID #10, Paragraph 30)