



UPPSALA
UNIVERSITET

Master thesis in Sustainable Development 247
Examensarbete i Hållbar utveckling

A Hitchhiker's Guide to Climate Change Leadership – an Educational Design Research Exploration of a Sustainability Course at Uppsala University

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DEPARTMENT OF
EARTH SCIENCES

INSTITUTIONEN FÖR
GEOVETENSKAPER

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May, F., 2015: A Hitchhiker's Guide to Climate Change Leadership – An Educational Design Research exploration of a sustainability course at Uppsala University. *Master thesis E in Sustainable Development at Uppsala University*, No. 247, 53 pp, 30 ECTS/hp

Abstract: Considering the ever-increasing impacts of climate change, the responsibility to take leadership lies with many actors; one of them being universities. The course in “Climate Change Leadership – Power, Politics and Culture” at CEMUS/Uppsala University explores the issue from a participatory perspective where students play a significant role in exploring what climate change leadership means throughout one semester. By using an educational design research approach this paper contributes to the further development of the course by giving a definition for climate change leadership as a theoretical outcome, and suggesting improvements for the course development as a practical outcome. To do so a theoretical analysis of leadership and change theories has been undertaken, as well as an analysis of data collected by current and former students, and course coordinators that have worked with the course before. The given definition and suggestions for the course will be subject to critical scrutiny in the upcoming spring semester and are subject to change depending on their efficacy in contributing to leadership capabilities in students.

Keywords: Sustainable Development, Education, Climate Change, Leadership, Educational Design Research, CEMUS

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Summary: The public opinion on climate change leadership, who should take it up, how it should be done and what it actually means, is heating up as the impacts of climate change become more and more visible. The Uppsala University course “Climate Change Leadership – Power, Politics and Culture” gives students the opportunity to explore those questions throughout one semester. The main aim of this paper was to improve the course by giving a definition for climate change leadership and some ideas on how to provide students with the practical and analytical tools they need to be leaders in this context. To do so climate change, leadership and change processes are examined and individuals invested in the course in different ways have been asked for their opinions. Thus, former students, current students and course coordinators that worked with the course contributed to the outcomes of this paper, which are a working definition and ideas for a course structure. The suggestions will be used during the course planning for next year, but are subject to change depending on how well they contribute to the intended outcomes and students' feedback.

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1 Introduction and Overview

1.1 Problem Exploration

Scientific research on climate change has come a long way since the Club of Rome published its “Limits to Growth” more than 40 years ago. The fact that human-induced climate change is affecting ecosystems all over the world is no longer the matter of scientific debate but a widely accepted fact and can be traced through continuous news reports covering the ever-increasing intensity of droughts, storms or other weather phenomena.

The Intergovernmental Panel on Climate Change (IPCC), the leading international body for the assessment of climate change, describes today’s global warming as “unequivocal” and the observed changes as “unprecedented over decades to millennia” (IPCC, 2014, p. 1). Science uses this very unambiguous language to describe the challenges humanity faces and offers clear suggestions on mitigation and adaptation (compare IPCC, 2014, SPM 3 and SPM 4). But international conferences hosted by the UN with the objective to assess progress on climate change and develop legally binding agreements on the reduction of greenhouse gases overall – but especially by developed countries – (UNFCCC, 2015) are increasingly regarded as failures by the general public, from the COP15 in Copenhagen to the latest instalment in Lima.

A lack of urgency can be observed which might best be explained by what Steffen et al. (2011) describe as the environmentalist’s paradox: human development and well-being in general is improving – but it does so at the cost of the environment. Given that humanity heavily relies on ecosystem services and natural resources, this trend can only continue for so long before the negative effects for humanity become disastrous. Unfortunately though, there appears to be a wide gap between what is known and certain in terms of climate change and solutions for it and what humanity as a whole actually does about it (Moser & Dilling, 2011; O’Brien, 2012). Nevertheless, apart from the UN, there are other institutions and organizations that can be, and in some cases already are, more effective actors for change, some of which are national parties, grassroots movements or universities.

In the context of climate change the term “Sustainable Development” – by some described as an oxymoron in itself (Lawrence, 2014, p. 499) – has become a catchphrase as a concept of solving the problem of global warming across all sectors since the Brundtland commission in 1987 initially defined it:

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987, p. 41).

The ambiguity of the concept especially in terms of what ‘needs’ are has led to a variety of different approaches, but the call to take “climate change leadership” (CCL)¹ in order to achieve sustainability is nowadays gaining popularity everywhere in political, social and economic arenas.

Universities have ever since their establishment been on the forefront of science and been drivers to societal change so it seems worthwhile to investigate how they approach this contemporary subject. Uppsala University is one of the oldest universities in Sweden, yet is

¹ Climate change leadership will be abbreviated throughout as CCL. The context will make it clear when it refers to the concept in general and when to the CEMUS course.

one of the pioneers in sustainability studies, having a student-founded and -led Centre for environment and development studies (CEMUS) that has its roots already in 1992.

The responsibility of Uppsala University to engage with these highly topical issues becomes even more apparent when taking a closer look at the university's self-imposed mission. It has recently been renewed and encompasses a wide range of objectives and strategies that aim to support it. The main mission is to

- “Gain and disseminate knowledge for the benefit of humankind and for a better world

[and in order to do so the university will strive to]

- Be a local, national and international meeting place for knowledge, culture and critical dialogue
- Develop new areas of knowledge through cross-disciplinary cooperation
- Be an integrated educational and research environment
- Be open to the outside world
- Contribute to achieving sustainable solutions to the challenges facing society
- Have a working environment and leadership characterised by openness, responsibility and trust.”

(Uppsala University, 2015a)

It could be interpreted from this mission that Uppsala University could be well suited as a leading institution in the CCL research field. Accordingly, an interdisciplinary course in “Climate Change Leadership – Power, Politics and Culture” has been offered at CEMUS since 2011.

While the course itself and the educational context at CEMUS provide a unique opportunity for students and researchers to engage in the field, the concept of CCL has been approached with a very broad scope in the preparatory and delivery phase of the course. This has meant shying away from explicitly defining what CCL is, and making a proposition on how to overcome the gap between science and action through CCL for the benefit of allowing students to explore CCL with an unbiased perspective.

Similar to the concept of Sustainable Development which has suffered from its ambiguity and vulnerability to misinterpretation (Sachs, 1999), the risk of the term CCL being too inclusively used with no concrete attached meaning to it can lead to a non-goal-oriented debate. Thus, there is a risk that no significant outcomes can be achieved, and perhaps even actors fail to be identified and addressed – or in this case rather: leaders. Therefore, it seems necessary to explore in more depth what CCL actually entails, so that various aspects studied in the course can be explored more deeply.

The next step then would be for students to be able to seize the opportunities in this field and become climate change leaders. A university course then needs to give them the tools and knowledge needed to do so. Given the interdisciplinary and student-led approach of CEMUS courses, different tools with the aim of improving leadership capabilities can – once identified – be implemented very fast to facilitate the optimal study experience for each student.

The problem seems apparent: there is a need for clarity and structure in a CCL course given its responsibility to contribute to education at a world-class university and society at large.

Working with an ambivalent definition has hurt the development of the sustainability concept and is not helping in the context of CCL either. The current debate needs to be advanced by bringing some more clarity to the question of what CCL entails, what skills and knowledge are needed to be a climate change leader and how those can be taught in a university course.

1.2 Background Information

This sub-chapter gives some necessary background information for this research paper. First off, CEMUS will be introduced and a brief account of its history given before taking a closer look at the educational model. Subsequently some information about the history of the CCL course and the recently introduced Zennström professorship is given. The aim is for the reader to gain a better understanding of the unique context of this paper.

1.2.1 CEMUS as an organization

The existence of CEMUS is the result of a student-led initiative. Niclas Hällström and Magnus Tuvendahl began their biology studies in 1988 with the expectation of the university being a place of “frenetic activity and enthusiasm; continuous debates and discussions; [...] idealism and the power to bring about change coupled with knowledge and thoughtfulness; [...] the courage to challenge and change the status quo” (Hällström, 2011, p. 15). But they soon became disappointed and frustrated when confronted with the dreary reality in which those high expectations were not met.

After long planning and deliberation they – in cooperation with senior faculty and in particular astrophysics professor Bengt Gustafsson – proposed a course to the then vice chancellor of Uppsala University Stig Strömholm called *Människan och Naturen* (Humanity and Nature). It revolved around a topic they were very interested in and that they found not offered anywhere else at the university, despite climate change and the concept of sustainable development being gradually more known and discussed by a wider audience throughout society. Hällström and Tuvendahl were inspired by a lecture held by Paul Ehrlich during which he was presenting the idea of a cross-disciplinary introductory course for all university students dealing with the challenges that humanity faces (ibid., p. 17).

Eventually the course was approved and was as requested not placed under any department, but directly subordinated to the vice chancellor, guaranteeing its interdisciplinarity. The first time the course was held in the autumn of 1992, 200 students with 500 applying took it; even though it had not been listed on the course catalogue in time. The growing support by students led to the extension into a student initiative with many activities surrounding the follow up course *Människan och Naturen II* (Man and Nature II) and eventually created the desire to establish a university centre.

CEMUS – the Centre for Environment and Development Studies – was officially instituted in 1996, jointly supported by both Uppsala University and the Swedish University of Agricultural Sciences (SLU) and has since grown considerably in size due to the increasing number of courses given both in Swedish and English (ibid, 2011).

1.2.2 Educational Model at CEMUS

From its initial stages on up until today, CEMUS promoted most of all student engagement, which goes as far as having the actual courses run by students. Indeed, students initiate, prepare, conduct, evaluate and improve every course. By limiting the amount of years students can work at CEMUS it is being secured that new input and ideas in particular but not limited to course development are continuously being included in the organization and course

development (Grandin, 2011). CEMUS is also closely associated with the active student participation project at Uppsala University that promotes the idea of student responsibility on a university-wide level.²

Both the student-run sub-organization CEMUS Roots which is open to join for all CEMUS students and the “Sustainable Development – Project Management and Communication” course give students the opportunity to engage in subjects that are of particular interest to them and get support in starting or joining local projects that they find meaningful and complement their academic, professional or personal interests. In this regard, the university’s aim of engaging with society at large as mentioned earlier is particularly fulfilled at CEMUS. It is also guaranteed that theory and practice are very closely connected. This is the case for all courses due to very ambitious course goals, creative and diverse examination tasks and a variety of different teaching methods that range from regular lectures to entirely student-facilitated classes.

Table 1 below shows a basic version of what the focus lies on in terms of content and form, thereby it needs to be considered that those two aspects are not separate entities but go hand in hand.

Table 1: CEMUS's courses content and form. Adapted from: Grandin (2011, p. 50)

Content	Form
<ul style="list-style-type: none"> • Interdisciplinary approach • Critical and creative thinking • Systems thinking • Ethics and values • Power relations • Problem-based learning 	<ul style="list-style-type: none"> • Students are seen as producers and not consumers of knowledge • Variety of participatory teaching methods • Reciprocity and flat hierarchy between students and coordinators • Broad range of lecturers from different academic fields and professions

Students working as course coordinators usually have a high motivation to engage the students that take the course and have a unique relation to them. Most coordinators perceive this role as a very different role compared to that of a teacher, since it focuses more on facilitation and creating an environment for learning that fosters cooperation and learning from each other instead of competition between each other. This idea is supported by there being no grades. Students are rated as either ‘pass’ or ‘fail’, a ‘fail’ never being definite. There always is the opportunity to resubmit an assignment or hand in a make-up task. This way failure is incorporated as an opportunity to improve.

1.2.3 History of the CCL course

The 15 ECTS credit course in CCL was first established in 2011 as a concrete response to the public and political debate around climate change, and has been held at CEMUS since 2011. Two students acting as course coordinators have since inception coordinated it jointly. So far, seven different people have worked with the course between one to three years. The content and structure has continuously evolved throughout those years, due to the prioritization of different individuals running the course and integrated student feedback for the most part. For

² More information available from <http://aktivstudentmedverkan.uadm.uu.se/about/> [accessed 26.03.2015]

a course coordinator the planning phase begins in October with the course officially commencing for students in mid-January and ending in late May or early June.

Upon completion of the course the students should according to the course goals be able to:

- “Critically relate to prerequisites, possibilities and limitations for a sustainable leadership within the climate field
- From an interdisciplinary, environmental historical perspective critically compare different explanatory models of how changes in the climate have influenced different historical and contemporary societies
- Interpret different theoretical models concerning the emergence of the industrial society as a cause for anthropogenic climate change
- Critically review and analyse global power relations and apply an equity perspective on the climate change challenge
- Analyse and interpret different theories of leadership, cooperation, organization and communication for a functioning CCL
- Explain the connections between climate changes, conflicts, cooperations and geopolitical power relations;
- Analyse and evaluate different proposed solutions and their opportunities, limitations and risks within the climate field;
- Apply skills within leadership, cooperation, organization and communication specifically connected to different contemporary and future scenarios within the climate field.”

(Uppsala University, 2015b, p. 1)

The course coordinators are supported by a course resource person from CEMUS, which customarily is one of the educational coordinators at CEMUS. Additional expert support comes from the work group, which the coordinators meet with at least twice in the preparatory phase to discuss course structure, examination and literature. The working group for CCL has for the most part consisted of the Acting Program Director at CEMUS, the Director of Studies at CEMUS, a doctor of theology and scholar in environmental ethics, a former minister of Foreign Affairs of Sweden and Senior Research Fellow at the Stockholm Environment Institute, a co-founder of CEMUS and founder of the What Next forum, a Stockholm Resilience Center associate and a student that has taken the course in the previous year.

CCL is one of only three 15-credit courses in English offered at CEMUS, the other two being “The Global Economy – Environment, Development and Globalisation” and “Sustainable Development – Project Management and Communication”. Having usually three in-class sessions per week gives the extraordinary opportunity to have an adequate amount of contact with the students.

1.2.4 Zennström professorship in Climate Change Leadership

Niklas Zennström, co-founder of Skype amongst other companies and graduate of Uppsala University has through his organisation Zennström Philanthropies made an earlier donation to Uppsala University that in the spring 2015 has manifested into the beginning of a professorship in CCL that is to run for 10 years and host a different professor every one or two years. Through its title this professorship is very closely linked to the CCL course giving it a new scope and opening up new possibilities both for CEMUS and for the Center for Sustainable Development (CSD), where the professorship is formally based (Uppsala

University, 2015c). How exactly this professorship is going to develop and what its concrete contributions to the course will be remains to be seen since the first CCL professor, Doreen Stabinsky from the College of the Atlantic in Maine, USA, only took her position at the beginning of February 2015. However, she has alongside the current course coordinators and Bo Kjéllen, former chairman of UN climate negotiations, organized and held a two-day negotiations workshop in the CCL course where the paragraphs 17-21 on mitigation proposed for COP21 in Paris have been negotiated by students. Many other possibilities to tie the professorship to the course, engage with university and society in different ways and further research in the field will most likely be explored in the future.

1.3 Research Questions and outline of the study

Having explored the problem and set the context, the aim and research question of this thesis can now be introduced.

The objective is ultimately to develop a working definition for CCL and suggest facilitation methods for the CCL course at CEMUS/Uppsala University that improve students' leadership capabilities.

In order to do so, some prerequisite questions need to be answered. The central research questions are:

- What does CCL entail and what skills and knowledge are required for it to be effective?
- How can a university course in CCL contribute to closing the knowledge-action gap with respect to the global issues of climate change? Which tools can be used?

It is important to explore the theoretical and practical need for this study and give a basis to ground the suggested solutions on. Thus, educational design research (EDR) has been chosen as a main approach and tool for the study and will be presented in more detail in the following chapter. The subsequent chapter firstly introduces anthropogenic climate change as a super wicked problem, before secondly exemplifying leadership theory from a historic and comparative perspective, highlighting the relevance of selected theories to climate change. Then the knowledge-action gap in this context will be explored and some ideas on how change happens will be presented. With those insights in mind, the current CCL course and its approach to CCL will be introduced in order to make the implicit definition used so far explicit – thereby giving a working basis for a new CCL definition.

In the following part the form and content of the data collection will be explained (“why”) and described (“how”), with an in depth examination of the results. Former and current students and course coordinators have been asked to give their input to ensure that stakeholder opinions are included when giving suggestions for improvement of the current course. Certain challenges and opportunities posed by the data evaluation will be outlined and will be taken into consideration for the final chapter.

The discussion part is divided into two main parts, the first one trying to answer the first research question and giving a working definition for CCL. The second part will be a guideline for further course development on a more practical level, guided by the second research question.

2 Scientific Approach

2.1 Chapter Overview

When aiming to make recommendations for practical implementation for a course it is necessary to initially define and frame the subject of CCL in the specific educational context. This chapter gives an overview of how this study has been conducted using the EDR approach to obtain answers to the research questions. EDR is explained in general and in its more detailed stages in relation to the process of conduction and the outcomes of this thesis. Furthermore, ethical considerations in relation to the research are mentioned.

2.2 Educational Design Research

This study has been conducted using EDR. This decision has been carefully made keeping the research questions in mind that have the intention of resulting in contributions both on a theoretical level (working definition) and practical level (course development). EDR allows both aspects to be considered in an intertwined process, which is shown in the generic model by McKenney & Reeves (2012) depicted below in Figure 1.

Reeves (2006) argues that this approach is most useful when “aimed at developing an optimal solution for a problem in context”. The educational setting of the research also suggests using an approach designed to be used in that field, both of which are reasons supporting the use of EDR.

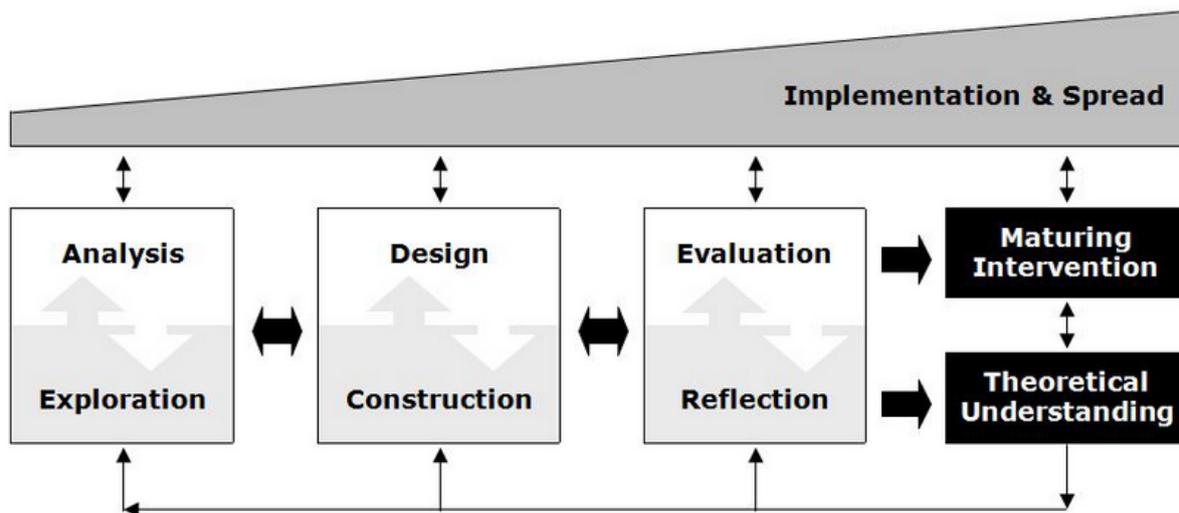


Fig. 1: Generic model for conducting design research in education (McKenney & Reeves, 2012, p.77)

2.2.1 Central Features of Educational Design Research

The model illustrates the five central features of the process according to McKenney & Reeves (2012, pp. 13-16): it is theoretically oriented, interventionist, collaborative, responsively grounded and iterative. All of those criteria are of inherent importance in this paper – even if to differing degrees.

Theoretically oriented

A thorough literature review has been conducted to frame the problem and gain insights on already existing research. While this is done generally in any kind of scientific research, in EDR the theoretic framework is also the basis to designing a solution to the problem. In

practice, this influences the paper in a way that while researching relevant climate change, change and leadership literature the outcomes of this are not only used to base a working definition on, but also supports the development of practical solutions.

Interventionist

In this relation, the aspect of interventionism becomes more reasonable. Alongside the creation of new theoretical insights, another goal is to suggest practical outcomes in the form of products, processes, programs and/or policies. Here, the outcomes will not encompass all four of them, but focus on processes and within this field especially on strategies. These will translate into certain products in terms of, for example, the idea for a workshop series.

Collaborative

Another distinctive feature of EDR is that it is conducted in collaboration with various stakeholders. In this case, this involves conversations with individuals affiliated with the CCL course or education for sustainable development in general. In terms of data collection, the current students of the course have been involved as well as former students through their course evaluations and course coordinators through questionnaires. The aim is to get more insights and perspectives on how the current course can be improved to all stakeholders' satisfaction.

Responsively grounded

The expertise of participants, quality of used literature and field-testing of proposed solutions are the pillars a responsively grounded EDR stands upon. The expertise of stakeholders is guaranteed by including stakeholders that have either taken, coordinated or worked very closely with the course and in the field. The literature reviewed also includes a variety of studies conducted in the field and theories related to the subject. Field testing however is a factor limiting the validity of the research results. Because even though the course will be running while problem solutions are being designed, they can only be included in the course planning for the next spring semester.

Iterative

Field-testing, and in connection to this, iterativeness and continuous improvement of design results are parts of EDR. Analysing the effectiveness of the outcomes however is out of the scope of this paper due to time limitations. Nonetheless, the results of this paper will be subject to extensive scrutiny by all stakeholders and future students.

On this note it is also worth mentioning that every year the course planning takes the form of an iterative process with coordinators reflecting on feedback from the previous year and using it in order to further improve the course. This includes adjusting the course to both expressed student needs and what is by them and their work group considered essential current knowledge in the field.

2.2.2 Process of Conduction

Apart from those five criteria, others are important depending on which literature is read, but most express the same ideas. One further aspect that is often considered important, and is mentioned by McKenney and Reeves (2012) is the adaptability and flexibility of EDR to different contexts and different levels ranging from local to global. The paper at hand is specific in a way that it is local and aims to analyse and improve one single course.

Nonetheless, the results are replicable in other similar courses and contexts as well and could, when it comes ideas for course development, be used even in very different leadership contexts.

In practice, as shown in the model above, the design and the theoretical research take place simultaneously and supplement each other. While the main steps are analysis/exploration, design/construction and evaluation/reflection they can overlap and are not strictly linear.

Analysis/Exploration

In this initial phase the problem and context is analysed, relevant literature reviewed and the conceptual and theoretical framework is decided upon (Plomp, 2010, p. 15). In the context of this paper the need for a working definition for CCL results from the abundant amount of leadership theories that focus on a variety of aspects, traits or situations for example, that fail to give one single definition for leadership that can be applied to all contexts. The analysis of concrete challenges posed by climate change and the following comparative literature review of the most commonly used leadership theories aims to highlight the strengths and weaknesses of selected approaches in light of their usefulness for the climate change problem. It also serves as a basis for a more concrete definition that aims to be a basis for the course.

Part of this phase is also the data collection. As mentioned before EDR is a collaborative process, and this study aims to include all stakeholders in the process, beginning in the analytical phase. The review of internal documents is part of this as well as is the inclusion of both current students and (former and current) course coordinators. Current students early on were handed a questionnaire investigating their own needs and expectations for course content and their own view on what CCL is. A more precise questionnaire has been given out to course coordinators that have worked with the course. Former students were included in terms of evaluating course reports that are being conducted at the end of each course and made available for coordinators of the following years. These reports contain both student evaluations, as well as basic information on the course and coordinator reflections, which makes them a valuable resource for this paper.³ Outputs in this phase are a better understanding and framing of the problem at hand and initial solution propositions (McKenney & Reeves, 2012, p. 86).

Design/Construction

This phase is described as the iterative phase where different prototypes are being tested, evaluated and improved (ibid., p. 109). Now, this process is slightly different in the current context. Since the course only runs once per year the suggested changes in this paper can only be implemented in the next semester in spring 2016. This is a limitation of the scope of this paper since there will not be the chance to test and improve the suggested implementations in practice as a part of this paper. However, since the course is being improved each year, each course can be seen as one cycle in the iterative process. It would then in conclusion mean that this paper is only one part within a larger process of continuous improvement. Moreover, due to the collaboration with other stakeholders in the creation of the solutions and beginning to think about concrete solutions early on in the process, initial ideas are being refined and changed already before they are presented as suggestions in the final discussion section later on.

³ More on the concrete process of data collection and results can be found in chapter 4.

Evaluation/Reflection

Whereas McKenney and Reeves (2012) admit that constant evaluation and reflection takes place throughout the design and construction phase, they describe this phase as a more systematic process with the aim of informing the external scientific community and driving further interventions. They suggest nine steps for the empirical analysis of findings, which occur in the following order:

- Establish the focus
 - Frame guiding questions
 - Select basic strategies
 - Determine specific methods
 - Draft and revise a planning document
 - Create or seek instruments
 - Collect the data
 - Analyse the data
 - Report the study
- (ibid., p. 133)

It becomes clear when looking at this evaluation process, that it is very similar the overall conduction process. This illustrates well that EDR is a repetition of mini-cycles, each of which employs the same process steps with the aim of improving the results of the previous cycle.

In terms of this paper, the process will only be repeated once, and can therefore not aim to reach the best solution possible. However, due to the repetition of some process steps and the triangulation of different types of data from different stakeholders, a certain improvement from initial design propositions can be expected.

2.2.3 Classification of design solutions

As a part of this paper, two different kinds of design solutions will be presented. These are based on Edelson's (2002) research on domain theories that he classifies as either a context or outcome theory. In this specific setting, the working definition for CCL represents a context theory. This means that the definition is not inherently bound by this particular setting but is applicable beyond the scope of this paper and thus can contribute to the larger scientific body of knowledge.

The suggestion of a workshop series on the other hand represents an outcome theory, which is associated with an interventionist aspect. This outcome is very specific for this case and is hopefully useful for individuals working with and planning the course in the future, but can – as it will be proposed here – not directly be applied in a different context. Classifying the design solutions in this way again clarifies the two-tracked approach of EDR where both theoretical and practical aspects are being explored parallel.

Figure 2 below shows how those different types of results will be incorporated when answering the research questions later on in chapter 5.

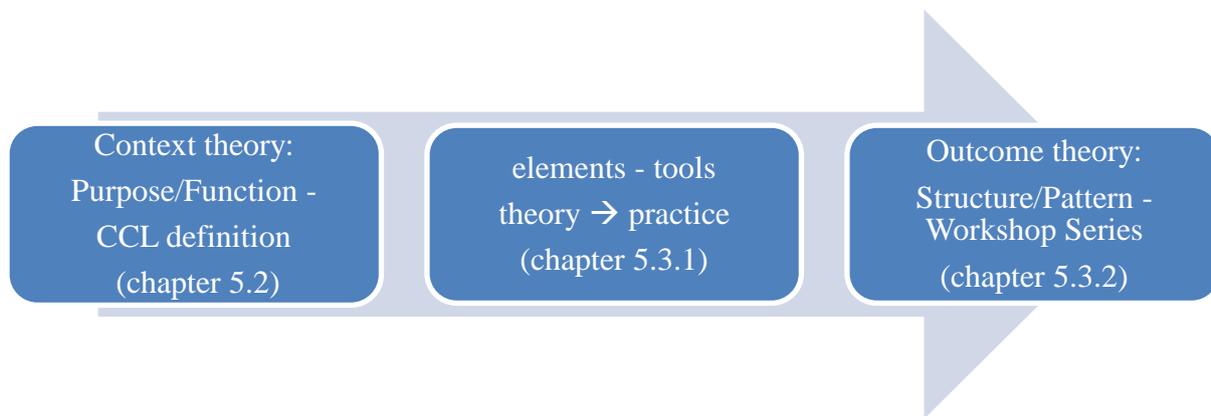


Fig. 2: Classification of research results. Own depiction.

2.4 Ethical Considerations

It is of importance to mention that the research part focussing on the CCL course at CEMUS/Uppsala University has been conducted while the course was running in the spring term of 2015 and the author of this thesis has been actively working with the course at the time as a course coordinator. This allowed the possibility to both gain greater insights into the methods employed in the course and obtain direct feedback from students and co-workers. However, there certainly is a personal bias and the risk of overlooking or setting preconceived priorities on certain factors, which can only be avoided to a certain extent.

While it would be out of the scope to go into detail about it, the issue of cultural bias in education needs to be at least mentioned, especially when taking into account the international audience of the CCL course. Helena Norberg-Hodge (n. d., p. 1) said that “There is an assumption that western education, western knowledge, is something that is superior... there is an idea that we have evolved to a higher level of being, and that these people, however lovely they are, they’re going to benefit from this superior knowledge.” Thus it needs to be taken into account that while all models presented here are inherent to Western culture and education by far not all students of the CCL course are from this culture nor feel necessarily comfortable in it.⁴ So when suggesting ideas for further course development it needs to be conceded that all ideas suggested derive from a Western perspective, including various assumptions, mindsets and worldviews. The author however does not intend to ignore or diminish the fact that several other ways of teaching and ideas about “what education should be like” exist in the world. Depending on the predominant culture, different kinds of guidelines might work in differently in varying context. Since this study is local and set in Sweden a Western attitude of most stakeholders is not controlled for.

In context of both the potential personal and cultural bias, some codes and policies for ethical research are attempted to be pursued throughout the research and evaluation. Shamo and Resnik (2009) have come up with a set that seems important, including honesty, objectivity, integrity, carefulness, openness, respect for intellectual property, confidentiality and respect for colleagues – all of which shall be the pillars this research is based on.

⁴ For more information on this see: Banks & McGee Banks (2010). *Multicultural Education – Issues and Perspectives*. John Wiley & Sons; 7th edition.

3 Towards a Definition for Climate Change Leadership

3.1 Chapter Overview

The following chapter looks at established research both in the fields of climate change and leadership. In order to give a working definition for CCL it seems necessary to shed light on both subjects, in particular in terms of identifying the challenges posed by climate change and investigating the capability of leadership theories concerning climate change. Furthermore, the status of research on the process of change is being explored. Ultimately, the current course in CCL will be introduced and analysed based on the theoretical insights of the foregoing sub-chapters with the main purpose of identifying the implicit CCL definition worked with in the course now so that there is a working basis for an explicit definition.

3.2 Categorizing the Problems of Anthropogenic Climate Change

The climate on earth has always been changing. This is due to so-called natural forcings, which can be both external and internal, and drive the overall climate towards warming or cooling. External forcings describe the changes in the earth's orbit around the sun, well described by the Milankovitch cycles, or changes in solar energy emissions. Internal forcings then describe all changes that occur within the earth system itself, which most prominently include volcanic activities and changes in ocean currents (Myhre et al., 2013, pp. 675-693).

Since the Industrial Revolution, humanity's influence on the earth's climate system has been rapidly increasing and scientists argue that it significantly contributes to accelerating climate change towards global warming. The consensus is that the planet has entered a new geological era called the Anthropocene, which quite literally means that humans now have a significant global impact on the earth's ecosystems (Steffen et al., 2011, pp. 741-746). Now, while it shall not be a focus of this paper, it seems necessary to mention that in public discourse the perception often is that there is no scientific consensus concerning the degree or even existence of anthropogenic climate change. A recent study however analysed almost 12.000 abstracts of peer-reviewed literature and found that out of those authors expressing a position on the topic, 97% endorsed the consensus position on anthropogenic climate change (Cook et al., 2013), as it is presented in the IPCC reports. While this is an overwhelming majority, climate change is often not recognised as an immediate threat and the issue lacks a responsive action due partly to the fact that greenhouse gases are colourless, odourless and invisible gases. The inert earth system also only slowly responds to changes so that effects of today's actions are only going to be visible sometime in the future (Moser & Dilling, 2011, p. 163).⁵

This 'human impact' mentioned above often refers to the increased emissions of CO₂ caused by the burning of fossil fuels that leads to an intensified greenhouse effect thus warming the earth. However there are further aspects associated with an increase in overall population, consumption habits and standards of living of humanity that have a strong – and in most cases negative – impact on ecosystems, marine habitats and also increase social vulnerability (O'Brien, 2012, p. 587).

Rockström et al. (2009) proposed nine planetary boundaries as a new approach to global sustainability in order to visualize and quantify a safe operating space for humanity. Those boundaries are climate change, change in biosphere integrity, stratospheric ozone depletion, ocean acidification, the closely linked phosphorus and nitrogen cycles, changes in land use,

⁵ Further reading on this topic: Hulme, M. (2009). *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*. Cambridge University Press.

freshwater use, atmospheric aerosol loading and chemical pollution. Their research has since been refined (Steffen et al., 2015), and it has become apparent that climate change and biosphere integrity are the two core boundaries that single-handedly – if transgressed significantly and unceasingly – can each drive the earth system into a new state that is most likely not particularly advantageous for humanity.

While climate change is one of the key planetary boundaries, the other mentioned criteria affect life on earth just as significantly and influence each other, which illustrates the systems aspect of anthropogenic climate change. According to Meadows (2008, p. 188) a system “is a set of elements or parts that is coherently organized and interconnected in a pattern or structure that produces a characteristic set of behaviours, often classified as its ‘function’ or ‘purpose’”. Moreover, it is impossible to know how a system is going to behave just by knowing how its elements are behaving, because systems are adaptive, resilient, goal seeking, self-preserving and self-organizing. When then thinking about climate change as a problem that needs to be solved, keeping the systems aspect in mind is one part of the necessary framing of the problem.⁶

Grint (2008) suggests that the problems of the 21st century are either tame, critical or wicked; depending on their characteristics. His assertion is that often change models fail to accomplish their goals due to inconsistent framing. In order not to suggest a CCL working definition and teaching approach that is likely to fail it seems reasonable to frame the problem before suggesting a solution later on.

Tame problems can be complicated, but they have a single-line solution and low uncertainty since they have occurred before, Grint (ibid, p. 12) for instance names puzzles as a good comparison. In order to solve tame problems a form of management is needed that describes the best processes to reach a solution in the most efficient and effective way. Critical problems, described as a ‘crisis’ (for example a heart attack, a leak of radioactivity in a nuclear plant, a plane crash, terrorist attacks etc.) require an immediate response, have virtually no uncertainty about what needs to be done and therefore do not offer much time for decision-making processes. To solve those kinds of problems command is needed in the form of decisive action (ibid, pp. 13-14). Wicked problems on the other hand are intractable, complex, have high uncertainty due to their uniqueness, offer no clear solutions and implemented solutions might even lead to more problems due to an unclear relationship between cause and effect. Grint (ibid) names obesity, drug abuse and violence as examples. He also states that initially attempts were made to solve climate change as a tame problem through the communication of scientific knowledge, which suggested biofuels as a solution. It emerged though that biofuels lead to decreased food resource availability, which in return created another problem: food insecurity. This example illustrates the wickedness of the climate change problem. Grint (ibid, p. 13) states that in order to solve wicked problems, leadership is needed, that “ask[s] the right questions rather than provide the right answers because the answers may not be self-evident and will require a collaborative process to make any kind of progress”.

⁶ More on Meadows’ system research in terms of change processes can be found in chapter 3.4.

Similarly Scharmer (2009, pp. 242-243) argues that the problem of human-induced climate change is not just messy and complex, but hyper-complex. This is characterized by three aspects:

- *Dynamic complexity*, meaning cause and effect are distant in time and space and sufficiently comprehending the problem from first-hand experience is hard
- *Social complexity*, that implies conflicting worldviews, cultures and interests among the key stakeholders
- *Emergent complexity*, meaning that the problems evolve in unpredictable and unfamiliar ways

Especially this last aspect of emerging complexity proposes an enormous challenge in terms of climate change. It implies that once the solution for one specific problem is found, the problem may have already changed into something else and pose a different challenge. Failure in such a scenario seems inevitable and is inherently part of the problem solving process. Unfortunately though, failure is in numerous societal aspects from education to politics not acceptable which makes it harder for any leader to approach the problem.

Rittel and Webber (1973, pp. 161-167) summarized ten traits for wicked problems in the area of social policy planning, which encompass the above mentioned characteristics by both Scharmer and Grint in a more specific way:

- “There is no definite formulation of a wicked problem
- Wicked problems have no stopping rules
- Solutions are not true or false, but better or worse
- There is no immediate or ultimate test of a solution
- Every solution is a ‘one-shot operation’, because there is no opportunity to learn by trial and error
- There is no exhaustively describable set of potential solutions
- Every wicked problem is essentially unique
- Every wicked problem can be considered to be a symptom of another wicked problem
- The causes can be explained in numerous ways
- With wicked problems, the planner has no right to be wrong”

Levin et al. (2012, p. 124) expand on those characteristics and introduce the term ‘super wicked’ to describe a new class of global environmental problems, for example climate change. The additional traits they put forward are:

- “Time is running out
- Those seeking to end the problem are also causing it
- The central authority needed to address them is weak or non-existent
- Irrational discounting occurs that pushes responses into the future”

While the aforementioned authors use different terms, they essentially describe complementary characteristics of climate change, which are all useful to frame the problem. For the sake of simplicity, in the course of this paper climate change shall be described as a super wicked problem

Solving super wicked problems requires leadership; in this case it is climate change leadership. However, the scientific literature surrounding leadership is widespread and focusses on a variety of different aspects concerning what a leader should be and what

leadership actually means. The following sub-chapter explores some of the major leadership theories with regard to their potential importance in solving the super wicked climate change problem. This will constitute another component towards the exploration of a CCL definition.

3.3 The Knowledge-Action Gap in Leadership Theory

3.3.1 Terminology

When talking about leadership some basic notes should be made on terminology. First, when using the term “leader” it refers to a person applying leadership. A leader is used here in a neutral context and doesn’t take into account any intersectional differences between individuals, for example gender, race, sexual orientation or place of birth. Parkin (2009, p. 94) defines a leader as a post-holder who is either chosen, elected or appointed to lead something, while that post-holder then may or may not be effective at executing leadership. I would like to add that in this reflection everyone is considered to have potential to be a leader in some context and should be able to take on this role, so it is not limited to the present, but also speaks to the future.

Leadership then is here analysed then in terms of different theories and not primarily styles, even though certain leadership styles are suggested as part of some theories. The definition of what leadership is then also differs from theory to theory; some refer to it as a process, some as an action. The selection of theories introduced in the following sub-chapter is by no means complete, but aims to give an overview of both the evolution of different theories over time and introduce aspects that are useful to include in a CCL definition. Strategic leadership for example is a well-known theory, but consciously left out here due to its limitation of leadership strictly within hierarchical organizations.

3.3.2 Comparative Analysis of Leadership Theory

The Great Man theory: To summarize the Great Man theory briefly, its main message is: leaders are born, not made. It emerged during the first half of the 20th century and reflected the notion that some individuals simply were superior to others when it comes to intelligence, energy and moral force. Thus, some people have by birth the power to lead others; examples often include Martin Luther King or Abraham Lincoln (Cawthon, 1996, p. 1). Though those basic assumptions on leadership have changed over time, the Great Man theory is still reflected widely in popular culture, for example in superhero movies such as Iron Man or Captain America. They strongly reflect that the ability to lead is subject to where one is born, with which status and privileges, and power provided through money or force (Parkin, 2010, p. 95). This is a male approach and focuses on innate attributes; therefore, it proposes many problems in relation to climate change, since it merely excludes at least half of humanity from taking up leadership positions.

Traits theory: Leadership research has along the lines of the Great Man theory also early on been tried to be classified through different traits that supposedly have an influence on the effectiveness of leadership. A literature analysis has led Zaccaro et al. (2004, p. 118) to summarize the main emerging key leader attribute categories from 1990-2003, which are cognitive capacities, personality, motives and needs, social capacities, problem-solving skills and tacit knowledge. While those are valuable categorisations that help understand what makes leaders effective, a common critique regarding this theory is the disregard of the situational context (Ng et al., 2008).

Path-Goal theory: In his theory, House (1971, revised in 1996) suggests that a leader's behaviour influences his followers' performance, motivation and satisfaction, which does not directly relate to creating change, but might be important to keep in mind for the relationship between course coordinators and students. The four different leader behaviours he identifies are: directive path-goal clarifying leader behaviour, supportive leader behaviour, achievement oriented behaviour and participative leader behaviour, the last being the one desired to be applied at CEMUS, taking into account its participatory approach to education.

Contextual Intelligence: Since no direct correlation could be verified between certain traits (and resulting behaviours) and effective leadership, research then started to focus more on the different conditions and situations a leader needs to adapt to. Nye (2010, pp. 85-101) argues that leaders in organizations need 'contextual intelligence', a lack of which explains why leaders thrive in some situations and fail in others. He argues that in order to be an effective leader in different contexts the culture of a situation needs to be understood, taking into account that even culture itself changes constantly; the distribution of power needs to be assessed and the followers changing needs and demands need to be understood.

Adaptive Leadership: Adaptive Leadership is a fairly new theory being introduced quite comprehensively by Heifetz, Grashow and Linsky in "The Practice of Adaptive Leadership: tools and tactics for changing your organization and the world" (2009). It is quite similar to the idea of contextual intelligence; however, it is not limited to an organizational focus, but aims to be applicable on all levels of society, taking into account an ever-changing world posing ever-changing challenges. What they call for in leadership practice are "new forms of improvisational expertise, a kind of process expertise that knows prudently how to experiment with never-been-tried-before relationships, means of communication, and ways of interacting that will help people develop solutions that build upon and surpass the wisdom of today's experts" (ibid, pp. 2-3). While this sounds challenging and in parts fairly abstract, they give practical information on how to implement those ideas throughout the book. Parkin raises the critique that adaptive leadership as a theory lacks a clear purpose – to work towards sustainability for example – for it to be used as more than a problem solving technique (2009, p.113-114).

Transformational theory: Another theory is that leadership is either transactional or transformational (Burns, 1978; Bass, 1985); I shall focus on the latter here. The assertion is that a transformational leader motivates his/her followers in a way that they can achieve more than originally expected (Bass, 1985, pp. 2-4) by appealing to higher level needs and thus changing the very nature of groups or even entire societies. Most importantly, they are driven by ethical and moral values. In studies, four factors of transformational leadership have been identified that can each be measured using the multifactor leadership questionnaire (Avolio et al., 1999):

- *Idealized influence:* leader becomes a role model for followers
 - *Inspirational motivation:* leader motivates by providing meaning and challenging followers
 - *Intellectual stimulation:* leader encourages followers to question assumptions, think out of the box etc.
 - *Individualized consideration:* leader fosters followers personal development
- (Johnson, 2015, p. 231)

Again though, this theory is related closely to the trait and great man theory in a way that it suggests certain criteria that lead to success in a leader-follower-relationship. It does take the

bigger picture and different contexts into account, but does not fully succeed in describing ways in which a leader can acquire certain skills and have a certain desirable influence over followers.

Emotional Intelligence: Daniel Goleman, who first introduced the term ‘emotional intelligence’, is of the opinion that leadership qualities can both be innate and nurtured. The soft skills that make up emotional intelligence are self-awareness, self-regulation, motivation, empathy and social skill all of which can be fostered through motivation, practice and feedback. Most leadership trainings though do not use those methods, and thus do not achieve the desired results (Goleman, 1998).

Sustainability-literate leadership: Parkin suggests a more concrete leadership approach that is striving for sustainability. The four ‘habits of thought’ she encourages to keep in mind when leading are resilience, relationships, reflection and reverence. Furthermore, she claims that a ‘good enough’ knowledge base in terms of ethics and values, people and community, science and technology and economics is essential. These points are quite concrete and more practically oriented than the aforementioned theories.

Environmental Leadership: Per se fairly close to CCL is environmental leadership, which is defined by Deborah R. Gallager (2012, p. 5) of Duke University as “a process by which Earth’s inhabitants apply interpersonal influence and engage in collective action to protect the planet’s natural resources and its inhabitants from further harm.” While this is a fairly universal definition in the broad sense of “save the humans and the world”, it leaves many open questions as to what exactly this type of leadership entails and how this preferred outcome should be achieved. So when defining CCL later on the aim is to be more precise on the “How”-part of a definition instead of ‘just’ the “What”-part.

One special criterion that is often attributed to good leaders is charisma. While this is not a specific theory in itself, charisma appears in many theories as a success factor or desirable trait. However, research has shown that in practice this is not the case, since it firstly lies in the eyes of the beholder and secondly is not directly related to effectiveness. Therefore charisma is not a prerequisite for a good leader, but it can nevertheless ensure a “profound and unusual effect on followers” (Yukl, 1994, p. 318).

What this brief leadership theory comparison has shown is that there is not one right leadership style that fits all contexts. Therefore leadership theories that suggest an adaptive or transformational approach seem more promising than other ones, so does the notion that leadership is a discipline that can be taught, given that the participant has a desire to lead to begin with, an opinion supported among others by Parks (2005).

Parks (2005) also suggest a concrete method on how to teach leadership skills, based on a Harvard course developed by Heifetz (who is amongst those that introduced adaptive leadership, as mentioned above). The case-in-point approach makes use of what is happening in the classroom itself and requires the teacher/coordinator to identify both explicit and implicit issues within the group and connect them to the course content. Thus, the theme, concept or skill to be learned becomes a very tangible experience. Students in those cases are both actors and analysers of their actions at the same time, while the teacher/coordinator supplies them with a framework and concepts that assist them in interpreting what is happening (Parks, 2005, pp. 7-8).

Now, two approaches of integrating the main leadership theories shall briefly be introduced. The first one (Fig. 3) is more of a visualization that shows how certain traits/characteristics

and behaviours affect leadership effectiveness (Derue et al., 2011). The researchers examined how the traits of ‘gender’, ‘intelligence’ and ‘personality’ and the behaviours of ‘transformational-transactional’ and ‘initiating structure-consideration’ influence the four leadership effectiveness criteria of ‘leader effectiveness’, ‘group performance’, ‘follower job satisfaction’ and ‘satisfaction with leader’. They concluded that the former two are responsible for a minimum of 31% of the latter, which suggests that there are even further dimensions to leadership effectiveness than traits and behaviours. Perhaps, they state, this is also due to them not being able to include further leadership theories into their model (ibid).

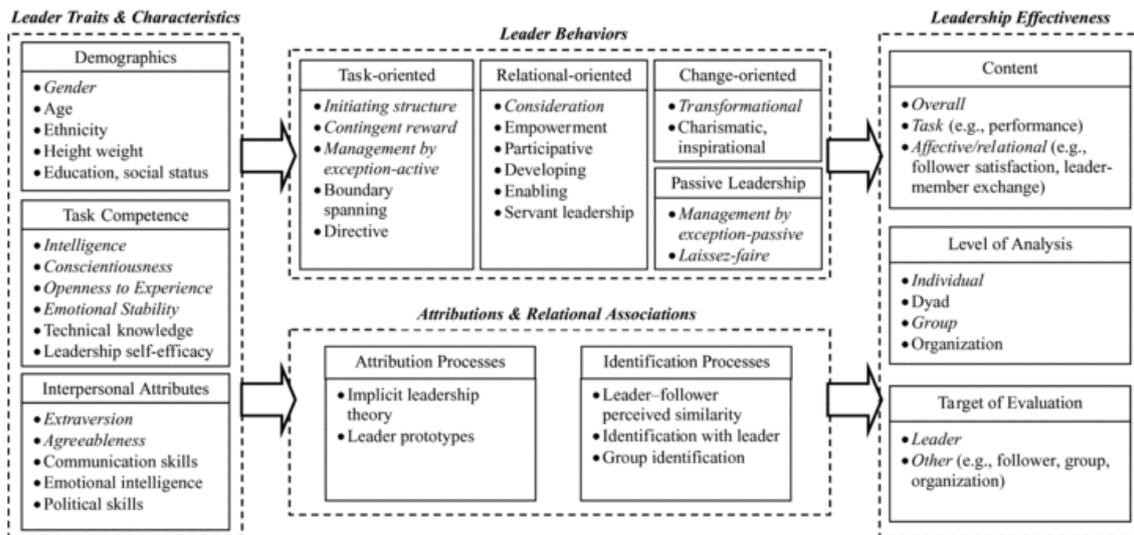


Fig. 3: An integrated model of leader traits, behaviours, and effectiveness (Derue et al., 2011, p. 8)

Another more practical model that aims to help in developing leadership capabilities and is therefore also very interesting within the scope of this paper is the ‘Three levels of leadership’ model (Fig. 4) introduced by James Scouller (2011).

The Three Levels of Leadership Model

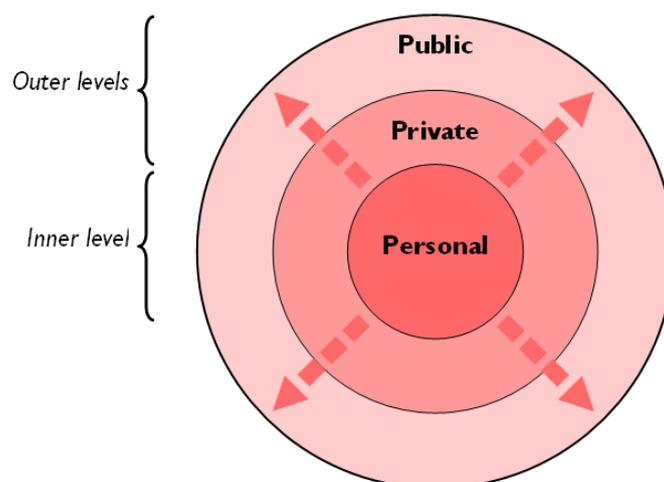


Fig. 4: The three levels of leadership model (Scouller, 2011)

He is proposing various specific behaviours for all contexts, but generally, for the outer levels ‘private’ (one-to-one leadership) and ‘public’ (one-to-many) they entail four main behavioural factors:

1. A shared, motivating group purpose or vision
2. Action, progress and results
3. Collective unity or team spirit
4. Individual selection and motivation

For the inner level ‘private’ (to grow one’s own leadership presence) he brings forward three aspects:

1. Developing one’s technical knowhow and skill
 2. Cultivating the right attitude toward other people
 3. Working on psychological self-mastery
- (Scouller, 2011)

This being a tangible model both suggesting the development of personal and interpersonal skills alongside with concrete behaviour suggestions makes it very valuable in an educational context. Furthermore, it is an integrated approach to leadership theory that aims to find commonalities, taking into account that there are discrepancies nonetheless. For example, it is being acknowledged that not all theories can be fully incorporated. Having seen that merely trait-based approaches (which are not well represented in this model) do not lead to effective leadership per se this shortcoming can be tolerated.

Having a clearer idea now about different leadership theories and their success criteria that might be relatable to CCL, the following sub-chapter – after ‘climate’ and ‘leadership’ have already been examined – takes a closer look on how change happens. This is done to get further insights towards answering the research questions.

3.4 How Does Change (not) Happen?

As stated earlier, one of the main problems with climate change is that despite all the accumulated knowledge about it there is so comparatively little action taken against it (O’Brien, 2012). So when we know the problem (anthropogenic climate change) and the solution (leadership), how does the change actually happen?

One stereotypical answer is that too many individuals need to change their behaviours to actually achieve any significant outcome; however, research has shown that only 10% of the population need to change to reach a tipping point that can trigger social change. This is based on the 10-80-10 rule where 10% each are collaborators/change agents and resistance and 80% are the broad majority that gravitates to either side, mostly depending on the leadership quality (Xie et al., 2011; Urry, 2011; Parkin, 2010, p. 97). Xie et al. (2011) argue that once the amount of change agents in the population has grown beyond 10% the required amount of time for the rest of the population to adapt to that committed opinion is rapidly decreasing. Subsequently in order for climate change action to be effective ‘only’ 10% of the world population need to be active change agents, which – at roughly 7.3 billion people at the moment – still requires 730 million, which is interestingly a little less than the combined populations of the EU and the US.

Krznaric (2007) explores numerous disciplinary approaches that attempt to explain how change happens and he concludes that there is no universal model as to how social change happens, but that change processes differ significantly due to contextual and situational specifications. In his conclusion, he additionally identifies five limitations that the disciplinary approaches share and urges for including them in future change processes: excessive reformism without politics or history, disregard of the environment, overlooking of personal relationships and mutual understanding, underestimation of contextual limitations and a lack of multidisciplinary agility (ibid, pp. 45-46).

Meadows (2008), who has already been mentioned earlier, approaches change processes in terms of systems thinking. She identifies twelve leverage points to intervene in a system so that it “produce[s] more of what we want and less of that which is undesirable” (Meadows, 2008, p. 145). In increasing order effectiveness, these are:

- Numbers – constants and parameters such as subsidies, taxes, standards
- Buffers – the sizes of stabilizing stocks relative to their flows
- Stock-and-flow structures – physical systems and their nodes of intersection
- Delays – the lengths of time relative to the rates of system changes
- Balancing feedback loops – the strength of the feedbacks relative to the impacts they are trying to correct
- Reinforcing feedback loops – the strength of the gain of driving loops
- Information flows – the structure of who does and does not have access to information
- Rules – Incentives, punishments, constraints
- Self-organization – the power to add, change, or evolve system structure
- Goals – the purpose or function of the system
- Paradigms – The mindset out of which the system – its goals, structure, rules, delays, parameters – arises
- Transcending paradigms

(Meadows, 2008, pp. 147-164)

Interestingly she argues that communication of sheer numbers is the least effective point of intervening, which might explain why the ever-increasing amount of information produced by scientists on climate change prognosis and effects might not have the influence on the public that it is aimed to have (O’Brien, 2012, p. 588, Moser & Dilling, p. 166). On the other hand, Meadows suggests that the most effective way of intervening in a system is the power to transcend paradigms, which is also the hardest to achieve. Essentially, it means that the most efficient way of intervening in the climate system requires a paradigm shift that perhaps involves a drastic change in the way we think about climate change and what it means to us.

This goes hand in hand with what O’Brien (2012) is asking for, which is further research into how change happens (as in: “How do we transcend boundaries?”) and why it often does not happen. In fact, in her opinion the knowledge-action gap is not the actual problem, but the fact that apparently the means are not matching the purpose and that thus perhaps a different approach should be considered.

In order to do so she proposes a ‘Challenging Big Assumptions’ (CBA) approach inspired by Kegan & Lahey (2009) in terms of global environmental change:

1. Identify the goal (‘Knowledge needs to be translated into action’)
2. Identify what is happening instead (‘decision makers are not effective enough, the public seems apathetic, businesses are not engaged’)

3. Identify hidden competing commitments ('commitment to other goals, commitment to economic growth paradigm, strong interests in maintaining wealth and power, short term focus favoured over long-term benefits')
 4. Identify the big assumptions that underlie these competing commitments ('problems are separate entities, the only growth that matters is economic, power relations and interests cannot be changed or would require drastic change in values, humans are short-sighted and reactive instead of anticipatory')
- (O'Brien, 2012, p. 592)

By thinking about these underlying assumptions, O'Brien hopes to call attention to "blind spots in current thinking" (ibid, p. 593) and encourage a new way of approaching change processes.

Moser and Dilling (2011) have identified four common misconceptions as the reason why climate change communication is not as effective as desired (as mentioned above), and given suggestions for improvements.

1. Inspiration comes through information (pro-environmental values and beliefs, incentives, perceived benefits, skill and sense of efficacy, social support, peer pressure, and practical assistance are underrepresented in climate change communication, but have been shown to foster behaviour change (Downing and Ballantyne, 2007; Gardner and Stern, 2002; Semenza et al 2008; Takahashi 2009 all cited in Moser & Dilling, 2011, p. 164))
2. Fear motivates (motivation by showing practical solutions would work better, because it is less manipulating and appeals to things people care about on a personal level)
3. One-fits-all (the audience needs to be better understood, as well as the culture, audience and context are important to frame messages which can differ significantly from context to context)
4. Mass media mobilizes (face-to-face communication is more persuasive than mass media communication (Lee et al., 2002 cited in Moser & Dilling, 2011, p. 168))

Thus, they assert that while communication is part of the picture in achieving change, it must be supported by policies and economic and infrastructural changes that support the well-intended messages (Moser & Dilling, 2011, p. 169). For example, if citizens are encouraged to use public transport instead of private cars, the infrastructure needs to be convenient enough to present a realistic alternative. In relation to this Swyngedouw (2010) notes that another problem with climate change communication is that at the moment it is very much centred around the abstract number of CO₂ emissions, instead of around the underlying issues of unevenly distributed power relations, control and influence networks and other types of injustice. This supports the assumption that the mere communication of science is not the solution to climate change.

Grint (2008, p. 11) as well attempts to identify core elements in change processes:

1. An accepted need to change
2. A viable vision/alternative state
3. Change agents in place
4. Sponsorship from above
5. Realistic scale & pace change
6. An integrated transition programme
7. A symbolic end to the status quo
8. A plan for likely resistance

9. Constant advocacy
10. A locally owned benefits plan

While this seems like another viable roadmap, he also discerns that following the steps on this list does not always lead to success, because – again – the specific problem varies in different situations and therefore requires a context-specific approach. Interestingly, one could argue that in climate change communication already the second point is lacking.

In conclusion, it can be said that research on how change happens is – as it is on leadership theories – not sufficiently complete enough to give any certain advice in terms of CCL. Whether extending the scientific body of knowledge might actually be the right tool in bringing about change can be, as indicated above, discussed. Either way any contribution to further the understanding of change processes is valuable.

3.5 Climate Change Leadership in the Layout of the Current Course (Spring 2015)

To complete the theoretical analysis of the topic a closer look will be taken in the following sub-chapter at the current layout of the CCL course and at which kind of implicit CCL definition is being used. This will then be the foundation for the analytical data analysis.

In 2015, 35 active⁷ students from 16 different countries (and all continents) are taking the CCL course at CEMUS. Currently the course is subdivided into six different sections, which are:

- Section 1: Changes in the Climate – Past, Present and Future
- Section 2: Leadership Toolbox
- Section 3: Mindsets and Justice
- Section 4: Confronting Political Paralysis
- Section 5: (Re)imagining Climate Change Leadership
- Section 6: Student Contributions

The course literature consists of articles that are distributed for corresponding lectures as preparatory material and three course books, which are:

- James Hansen: “Storms of my grandchildren: The truth about the coming climate catastrophe and our last chance to save humanity”, 2011 (Section 1)
- Mike Hulme: “Why we disagree about climate change: understanding, controversy, inaction and opportunity”, 2009 (Section 2 and 3)
- Naomi Klein: “This changes everything: Capitalism vs. the climate”, 2014 (Section 4)

Many articles are also taken from “What Next Vol. 3 – Climate, Development and Equity” compiled by Niclas Hällström.

The first section of the course lasts three weeks and aims at providing students with the current scientific knowledge about climate science. Additionally the students co-create a lecture called “An economic historical perspective on Sustainable Development”, have a Skype lecture with climate scientist James Hansen and watch the climate sceptic documentary “The Great Global Warming Swindle”. The latter includes a discussion on how to treat with individuals that have differing opinions from the mainstream. The section concludes with a

⁷ There are 41 students registered for the course in total, but as active students are only those counted that attend lectures and hand in assignments.

newly introduced climate science quiz, where students prior to taking the quiz contribute by submitting their own questions – a selection of which will ultimately constitute the quiz.

Section 2 is the most recently added part of the course and has been included as a response to students' continuous feedback asking for more practical leadership and communication tools⁸. The section lasts two weeks and includes in this year's course two dialogue labs, a lecture on rhetoric, one on bottom-up leadership and active student participation, a policy dating seminar and a workshop titled "The Wicked Leader". As part of the workshop, students discuss in groups the strengths and weaknesses of different leadership theories. They also explore and present reflections on their own strengths and weaknesses as leaders of their own lives.

Section 3 then looks at different "Mindsets and Justices" and consists of another six in-class activities. The aim is here is to add a global justice perspective to the problem of climate change. Moreover, the section contains the first out of four leadership labs in which students in groups of 4-5 individuals get to create their own course content for around one hour per group. Apart from the course goals there are almost no constraints to their choice of topic, activity or location (if reasonable).

Another three weeks are devoted to section 4 and political aspects and global power relations of CCL. The section concludes with a two-day negotiations role-play facilitated by Bo Kjéllen, former Swedish chief negotiator, and Doreen Stabinsky, current holder of the CCL Professorship at Uppsala University⁹.

The last section with regular in-class activities encourages students to "(re)imagine climate change leadership", and it is the longest section taking up four weeks. In seminars, lectures and workshops students familiarize themselves with alternative ways of CCL, while simultaneously taking in broader perspectives like agriculture and gender. During this time, groups are formed in an iterative process for case studies that students will be working on during the final section.

During this final section, students are expected to work independently in their groups, but are required to report to the course coordinators concerning their progress at least once and have the option to get ongoing feedback if they wish or need to. The final two days of the course then comprise the group presentations and the drafting of a CCL declaration facilitated by the students.

The group project is also the main part of the examination of the course. Apart from that the final days of each section have mandatory attendance; all other lectures and seminars require at least 75% overall. Throughout the course, students are required to hand in shorter assignments of varied nature as well. This year this includes:

- Taking a climate science quiz the students create their own questions for
- Writing a climate sceptic opinion piece
- Scientific review and reply to a peer's sceptic opinion piece
- Written reflection on leadership theories
- Participation in a Leadership Lab
- A choice assignment OR literature reflection on Klein's book
- Planning and carrying out a final month-long group project
- Presentation of the final group project

⁸ Compare chapter 4.3 and 4.4.

⁹ Compare chapter 1.2.5.

The in-class sessions can take four different forms:

Guest lecturers: Both academic and non-academic experts from different fields and universities are invited to come and speak to students. The lecturers are encouraged to engage the students throughout the lecture and send preparatory reading as well in order to guarantee a qualitatively high discussion. Usually they leave at least 15 minutes at the end of the lecture to discuss the topic with students and take questions.

Seminars: While seminars and workshops may have a different meaning for different course coordinators, in CCL the term seminar is used when doing in-class activities that are more content focussed, for example in 2015 two literature seminars have been held for “Why we disagree about climate change” by Mike Hulme and “This changes everything” by Naomi Klein respectively. In those sessions, students are expected to come prepared and discuss different questions based on their preparatory work with each other and the course coordinators.

Workshops: Workshops on the other hand are very interactive and practical throughout and are often made up of group discussions that are very valuable in this context due to the interdisciplinarity and international course composition. There are mandatory workshops at the end of each section that allow students to reflect back on what they have learnt during the foregone section and/or discuss questions that have not been answered yet.

Leadership Labs: Leadership Labs have been a part of the course for the second year now and have been very well received by students. Here students are randomly split into groups of 4-5 individuals and are responsible in this group to create around 1,5 hours of course content. This year there are eight different groups which results in twelve hours in total entirely organized by students. They are free in the type of content they want to create and are only limited by the course goals. The overall aim is to both give them the opportunity to apply leadership skills (both in the preparatory group work as in the in-class situation) and to give them the chance to include course content that has not been prioritized by the course coordinators but that they deem useful for their peers in the CCL context.

What makes working with the course problematic in terms of choosing focus areas and topics is the lack of a clear definition of what CCL is. Students are given the opportunity to explore different leadership theories and their applicability in the context of climate change. However, evaluations and oral feedback from students shows that this rather confuses them as they would prefer and expect to have more clarity on the subject and concrete solutions upon completion of the course. To avoid repetitive sessions on what CCL is and what it means for different individuals and in different contexts a working definition might be helpful in order to approach the problem in a more structured way.

3.6 Outcome of theoretical problem analysis

The theoretical exploration of climate, leadership and change in this chapter has brought some key insights to the issue of CCL and given a basic understanding that makes it possible to discern the working definition currently used in the course. The idea of how CCL can be defined begins to take shape, but before further exploring this and analysing the stakeholders' input it seems reasonable to take a look at the current status quo of the course in a more abstract way.

As stated above, there currently is no definition for CCL used in the course and students are invited to explore what it means to them throughout the course. Intentionally by the end of the

course, through writing a CCL declaration, they are supposed to show that individually they have grasped the topic and can work together on defining this and putting their ideas and values into a shared vision to take with them in the future. In short, the CCL course relies on a participatory and co-creative approach which gives a lot of space to the students and their own ideas.

Throughout the course they are provided with knowledge in terms of climate change science and lectures on some core issues that support growing their knowledge of the topic, and various seminars and workshops are held to explore aspects of communication and tying open ends together.

A definition for CCL if made explicit could look like this: “CCL is a process that explores different causes and effects of human-induced climate change with the aim of encouraging fair and equal participation of all stakeholders throughout all levels of society in finding appropriate tools to mitigate and adapt to climate change from a personal-local to a political-global perspective.”

A lot of value is placed on aspects of justice, encouraging engagement and the discord between a greater need for adaptation or mitigation. It also gives a lot of room to include different specific issues that embody the ‘tools’ mentioned and identify different stakeholders in the process. While this is a good starting point and has worked very well in the course so far, the upgraded definition later will aim to give the course more structure by including concrete aspects relating to change and leadership processes that will hopefully take the course to the next level.

In terms of framing of the problem this chapter clarified the current situation. To create an even better understanding of what CCL can entail and how it can be taught better the next chapter is devoted to the input of other former and current stakeholders of the CEMUS course to gain a better understanding of the desired situation.

4 Data Collection and Analysis

4.1 Chapter Overview

As a part of the EDR approach described earlier in the paper it is essential to include stakeholders in the process as much as possible. Therefore, I have asked current students and current and former course coordinators for their input and have evaluated course reports from 2011 on which include a summary of students’ course evaluations and their ideas on improving the course. This chapter discusses in detail how the data has been collected and why which questions have been asked. At the same time, the answers are being presented, before ultimately formulating different challenges and opportunities that are incorporated in the results.

4.2 Data Gathering

As it is inherent to the process of conducting EDR the data collection has, as a basis for the design process, been carried out parallel to the literature research and review. Initially students of the current course have been given a questionnaire early on in the course to get a general feeling of both their perception of leadership and which tools and skills they feel are needed in order to become climate change leaders. The study of old course reports has been conducted occasionally over a period of two months to itemize further ideas expressed by former students. Finally, the questions put forward to (former) course coordinators have been

conducted halfway through the process to get their very concrete input. This form of data triangulation allows for a more valid and reliable overall picture of stakeholder opinions and meets the research criteria of being responsively grounded and collaborative. All questions fulfil a certain purpose towards answering the research questions, described in more detail below.

4.2.1 Current Student Questionnaire

A valuable resource to get information on student perceptions on CCL are current students, since they are a key stakeholder and very much involved with the topic of this paper at this moment in time. For the purpose of this study, the questionnaire has been handed out to the students two weeks into the course to get their opinions on what CCL is and what they feel they need from the university to foster their own leadership capabilities. The main aim in this regard is to get as unbiased opinions as possible, since there is a chance that later on in the course they would just list many things done in the course as either beneficial or not beneficial, but would not think of other things that maybe did not come up as part of the course.

Students answered the questions at the end of the final workshop for section 1, where they took a climate science quiz and had a workshop on critical thinking. This is important to keep in mind when evaluating the results since oftentimes ‘climate science knowledge’ and ‘critical thinking’ are mentioned in terms of important knowledge or skills. This is presumably at least partly due to them dealing with those two aspects intensively during that day.

The first two questions asked were related to their gender and age. While all questionnaires were filled out anonymously, due to a relatively small data sample it is still considered important to keep some main criteria like group size, gender distribution and age average in mind. In total the questionnaire has been filled out by 35 participants, 16 of which were female and 18 of which were male (one person did not check a gender). The average age is 22 years, with the youngest being 20 and the oldest being 32. Again, one person did not state their age here. This does not influence the result of the study especially considering that not every student answered every question to begin with.

Subsequently the students were asked to list skills, characteristics and knowledge they deem are necessary for leaders in a political, economic, environmental and everyday context. The purpose of this question was to find out what students think is needed from a climate change leader (before asking later how that could be taught at university) in the most prevalent leadership contexts to be effective. The division has been done to give the opportunity to think in a more realistic way and not suggest an idealized leader. The results of this question are summarized in Table 2 below, the number in brackets giving the amount of times an answer has been given by different participants if the same answer was stated more than once.

Sometimes differentiating between skills and characteristics has been difficult. Ultimately, skills are here being seen as things that can be taught and characteristics are more related to inherent character traits or behaviours. ‘Confidence’ is here considered a skill that can be learned, even though this might be disputable.

Table 2: Required skills, knowledge and characteristics in different fields according to current students. Own depiction.

	Political	Economic	Environmental	Everyday
Know-ledge	Climate science knowledge (6)	Fair distribution of costs (3), climate science knowledge (2)	Climate science knowledge (12), keep economics in mind (2)	Climate science knowledge (5)
Skills	Motivating, listening, confidence, persuasiveness (5), progressive outside of the box thinking (3), diplomatic (11)	Good speaker (2), good with money (2)	Simply/communicate science (6), offer solutions (3), holistic view (2), create positive narrative (2), good in tough negotiations	Use education, leading by example (6), critical thinking, listening (4), persuasiveness (2), speaking skills, confidence (5)
Characteristics	Impartial (2), interact with society, convincing, taking actions not only decisions, integrity/ethical (6), have greater good in mind (2), transparency (3), passion, needs good team as support (3), humility, hardworking, long term focus	Consider SD in business – innovation (6), tying everything together, listening to others (3), anticipation, reliability, empathy, commitment, long-term focus (2), ethical values (6), environmental importance (5), creativity (5), global not local, charismatic, honesty	Courage to make good decisions, passion, ethical values (2), realistic, hope, cooperation with politics and economy (4), walk the talk, honesty (2), open mind, persuasiveness, modesty, think big, passion	Take responsibility (3), passion (3), realise potential power, impartial, trustworthy (3), empathy (2), humour, consistency, patience, integrity, vision (3), creativity, charisma (6), open mind (3), honest, supportive

It can be seen from this table already that the list of characteristics encompasses a wide range of traits, which would imply that the trait approach to leadership is still widely used, whether that is done consciously or not. Even during classes when students were asked to describe a climate change leader, often they focussed on certain static characteristics and traits more than on the need to adapt to different challenges and contexts. In terms of required knowledge they name climate science across all sectors, least mentioned though in the economic sector, even though many think that an economic leader should be able to incorporate sustainability ideas.

Afterwards they were asked to decide whether they believe leaders are born or nurtured. This is an interesting question just to be able to figure out the main tendency in class to one of the most highly debated issues about leadership, which then also has an impact on how they think leadership skills can be taught. Interestingly, while the majority (27) said they believe leaders are nurtured, a significant minority (6 students, which translates into 18%) also believed that leaders are born. While momentarily the course is structured in a way that aims to foster leadership skills it is interesting to take into account that quite a few students are also taking the class that do not think this is possible. While this is an interesting issue and could easily be explored in more depth, in terms of this paper it just needs to be taken into account for the course development. Some students might need some more support to see themselves as change agents.

Next, they were asked to decide upon a number representing how many leaders are roughly needed to effectively combat climate change. As options were ‘one’, ‘hundreds’, ‘thousands’, ‘millions’ and ‘every single human being’ given. The results are presented below in Table 3.

Table 3: Amount of leaders required to bring about change according to current students. Own depiction.

Amount of leaders	Times selected	Relative distribution
One	3	9%
Hundreds	4	12%
Thousands	6	18%
Millions	6	18%
Everyone	14	43%

As the table indicates almost half of the students are of the opinion that every human being needs to be a leader in order to effectively combat climate change. With the course and CEMUS encouraging participation and student engagement, this seems like a natural result. However, almost 10% think that a dictatorship of some kind with one leader seizing the reins is necessary. Again, this highlights the diversity of opinions within the class.

The follow up questions then asked in which field(s) this leader/these leaders should be active, relating back to the question asked earlier where students were asked to list characteristics, skills and knowledge a climate change leader needs in certain fields: political, economic, environmental, everyday. Everyday leadership has been taken out for this question, since it is related more to professional leadership activities, but could have been left in in hindsight. On the other hand students were allowed to tick as many alternatives here as they wished, the results listed below in Table 4.

Table 4: Leaders in different fields according to current students. Own depiction.

Fields	Times selected	Relative distribution
Political	1	3%
Economic	1	3%
Environmental	-	-
Political and economic	6	19%
Political and environmental	3	9%
All (political, economic, environmental)	21	66%

This shows that the vast majority of students also perceives leadership as an interdisciplinary process and highlights the importance of interdisciplinary teaching in return. Intriguingly, those students that choose only one option completely disregarded environmental leadership, seeing the path to a solution rather in politics or economy or a mix of those.

Through the final two questions the purpose was to get some more general ideas on the specific composition of individuals within the class and their attitude towards CCL in an educational setting. The first one was whether they see themselves as a leader and why so. There is an almost equal distributions between ‘yes’ (17) and ‘no’ (18) answers. The reasons – when given – for ‘yes’ were:

- ‘I’m leading by example’ (9),
- ‘I’m an activist’,
- ‘I’m learning about climate change’ (3),
- ‘I’m working in the field’ (3),
- ‘Everything is connected’,

‘I’m open’ and
‘I have sound knowledge in the field’.

The explanations for ‘no’ were:

‘I don’t feel prepared enough, I lack knowledge and/or confidence’ (9),
‘I don’t have enough influence over people’ (2) and
‘I’m not that interested in the topic/I don’t feel passionate about it’ (6)

Overall the reasons why students feel like leaders seem related to them being in some way involved with leadership already and having a sense of confidence, while the students that do not see themselves as leaders show a lack of confidence in themselves and in their knowledge, whereas some also lack passion or interest.

The concluding question then was what they would need to learn at university to become a climate change leader in terms of skills, knowledge or other personal development, with respect to the research questions. The results are listed below in Table 5, again with the numbers in brackets being the number of times an answer was given by different students if it was more than once.

Table 5: Skills, knowledge and other personal development asked for in their leadership education according to current students. Own depiction.

Skills	Knowledge	Other personal development
Leadership skills (3); Communication/rhetoric/ public speaking/debating (24); Critical thinking (6); Group work (3); Negotiation (3); Creativity (2); Listening; Writing (2); interaction with different stakeholders (4); skills can’t be learnt	How to use education on a day-to-day basis; Climate science knowledge (20); Understanding of uncertainties/scepticism (2); Understanding multiple perspectives (5); Problem solving; Social psychology/behavioural science (3) Politics (3); Cultures/humanities (2); Biodiversity/landscape variability (2); Economics (2); Systems thinking (5); Practical solutions to climate change (3)	Use capabilities and perfect to one’s capacity; Open-mindedness (4); Confidence (6); Support; Discussions; Teach how to make clear messages; Charisma (3); Empathy; Positivity

The answers here could have been expected from the former results, with the majority asking for more communication-based training, climate science related knowledge and in terms of personal development for methods to improve their confidence and interpersonal capabilities. The large amount of other aspects mentioned only a few times illustrates well that different individuals have different needs and demands regarding their education. For example, while some would prefer learning more about economic aspects others would prefer learning more about psychology.

This survey managed to advance an understanding of students’ ideas of CCL and what they expect from the course. The following sub-chapter discusses how students that previously

took the course rated it, how content they were with the fulfilment of course goals and which ideas they had on improving the course.

4.2.2 Former Student Evaluations

Every year at the end (and usually already throughout the course) students fill out evaluations of the course. In these they are asked to rate every lecture, seminar, workshop and the reading and examination tasks according to the components' meaning to their learning. In the end, they are also invited to give some general feedback on the course, CEMUS, the fulfilment of the learning outcomes (course goals) and give ideas on how the course can be improved for the next year. These evaluations are anonymous, and a summary is included in the final course report written by the course coordinators. Course reports are a major resource for the coordinators of the upcoming year in planning the course, since they give a good understanding of which particular components worked well and which might need improvement.

The tables 6 and 7 below show the progression of the average ratings for general feedback and the fulfilment of learning outcomes respectively.¹⁰ The lowest score is one (meaningless) and the highest is five (very meaningful).

Table 6: Evaluation of course elements 2011-2014. Own depiction.

	2011	2012	2013	2014
General impression of the course	4,4	4,6	4,2	4,2
Lectures	4,2	4,1	3,8-4,1 (3,9)	3,8-4,0 (3,9)
Seminars	4,2	4,6	3,5-4,0 (3,8)	3,5-4,0 (3,8)
Literature	4,0	3,8	3,4-4,1 (3,8)	3,4-4,1 (3,8)
Examination tasks	4,1	4,2	3,1-4,3 (3,8)	3,1-4,3 (3,8)

The range of ratings in 2013 and 2014 is due to students rating the lecturers, seminars, literature, and examination tasks for each section separately. The mean rating is given in brackets.

The opinions on what the best things about the course are vary to an extent. Some students especially favoured a specific lecture or a book, but a core ingredient that is constantly mentioned is the learning from peers and group discussions. In 2011 the rating for this category was 4,7. While no equivalent number has been accounted for in the other years, it appears to be an essential and highly valued part of the course.

Both tables show that the ratings over the years have generally been quite high, across all categories never being lower than 3,1. Considering a three stands for 'meaningful' or 'fulfilled', this is quite impressive. That the overall rating of the course has never been lower than 4,2 shows as well that while some components are scored lower the contentment with the course taken as a whole is high.

¹⁰ Since the course for 2015 is not finished at the time of writing, the evaluations for the current year cannot be included here.

Table 7: Fulfilment of course goals 2011-2014. Own depiction.

	2011	2012	2013	2014
Critically relate to prerequisites, possibilities and limitations for a sustainable leadership within the climate field	4,2	4,1	3,9	3,7
From an interdisciplinary, environmental historical perspective critically compare different explanatory models of how changes in the climate have influenced different historical and contemporary societies	4,1	4,0	3,8	3,5
Interpret different theoretical models concerning the emergence of the industrial society as a cause for anthropogenic climate change	4,0	4,1	3,8	3,5
Critically review and analyse global power relations and apply an equity perspective on the climate change challenge	3,8	4,2	4,0	3,9
Analyse and interpret different theories of leadership, cooperation, organization and communication for a functioning CCL	3,9	3,8	4,0	3,5
Explain the connections between climate changes, conflicts, cooperations and geopolitical power relations	4,2	4,0	4,0	3,8
Analyse and evaluate different proposed solutions and their opportunities, limitations and risks within the climate field	4,3	3,9	3,9	3,6
Apply skills within leadership, cooperation, organization and communication specifically connected to different contemporary and future scenarios within the climate field	3,9	3,4	3,8	3,4

Even though it is less helpful for a comprehensive chart, having different ratings in 2013 and 2014 for the lectures, seminars, literature, and examination tasks makes it very helpful to understand which of these components worked well and which did not. For example the James Hansen book ‘Storms of my grandchildren’ is in both years rated 3,4 while ‘The Politics of climate change’ by Anthony Giddins received a rating of 3,8 in 2013 and Patrick Bond’s ‘Politics of Climate Justice’ a 4,1 in 2014. Based on these ratings it might seem surprising that Hansen’s book is still part of the required reading in 2015 and both Bond and Giddins are not. However, other aspects have been taken into account when making decisions on literature. Hansen’s book still gives a good overview of climate science and an equivalent substitute has not been found yet. Both Giddins’ and Bond’s book were used for the political sections for which we felt this year it was important to include Naomi Klein’s new book ‘This changes everything’ leading us to waive the former two.

In terms of examination the final project case study received a rating of 4,3 in both years and has in the previous two years been very appreciated by the students. The first assignment on the other hand, which used to be an oral presentation of climate science knowledge to policy makers, has only been rated 3,1 and has this year been replaced by a climate science quiz. The quiz was suggested both by former students and course coordinators and even though only about a third of the students passed it, it seems to have been appreciated by them nevertheless. While a quiz is a very traditional mode of examination it ensures that everyone in the course has a common basic understanding of climate science. The make-up task for those that failed

the quiz was to hand in the correct answers afterwards. These are just two quite concrete examples of how student evaluations can influence the decision making for the following year(s) – or not.

As a part of the evaluation and course report students also are given space to give specific suggestions on how the course can be improved for the upcoming year.

In 2011, the course was still structured slightly different than it is today. Suggestions then were to decrease the number of course goals, to better clarify what CCL can be, to include more practical leadership skills and more challenging perspectives on what CCL can/should be in the future.

In 2012, the course coordinators stated that it was hard to find lecturers for some topics they would have liked to add, which included theoretical leadership, media and climate change, business perspectives and perspectives from the developing world. They furthermore suggest making the final project less of a case study and more of a project involving practical leadership skills, which in their eyes could improve the ratings for the last course goal. Concrete input from students was not included in this report, but it can be assumed that those recommendations are closely related to feedback they have gotten from students.

In 2013, again it was declared that for the aforementioned aspects no lecturers could be found. Additionally, course coordinators still felt that the gender aspect was underrepresented despite having a lecture on it. Moreover, reading quizzes were suggested in order to get students to actually read the literature. 73% of the students felt no important aspects or topics were missing from the course, other suggested including more global politics and international relations, climate migration, local examples and economics.

In 2014 it was only 47% of the students that felt no aspects or topics were missing from the course. Suggestions for the following year included: theoretical leadership models, individual leadership, practical solutions and effective communication. In terms of concrete solutions, again perspectives from developing countries and more conflicting views were mentioned, as well as environmental economics and a need for tools that are more practical and leadership skills.

While course evaluations and reports are a good way for students to influence education and valuable source of information respectively, some challenges became apparent from studying the former reports. One is that finding lecturers for some very interesting topics that students are asking for can be challenging. Another is that students in general have a very good impression of the course. However, some course goals score consistently lower than others, which will have to be taken into account in the future.

4.2.3 Course Coordinator Questionnaire

Lastly, after getting different kinds of information and input from current and former students, the last stakeholder group questioned were former course coordinators.¹¹ Out of six total individuals that have worked with the course since its start in 2011 (apart from myself), I managed to get feedback from four, which appears to be a good result. In order to be as objective as possible they will not be referred to with their names, but are numbered through CC1-CC4.

CC1 is a Swedish male and has been working with the course in its first instalment in 2011.

¹¹ The complete filled out anonymized questionnaires can be found in the Appendix 9.2.

CC2 is a New Zealand male and has been working with the course for two years in 2012 and 2013 (preparation phase).

CC3 is a Swedish male and has been working with the course for two years in 2013 (conduction and evaluation phase) and 2014.

CC4 is an American-Finnish female and has been working with the course for three years between 2013 and 2015 (currently working on the course as well).

As course coordinators, we discuss our own version of what CCL means in the preparatory phase, thus it is a perspective that changes with new coordinators working for the course. As a result, some aspects change continuously. Since all coordinators have intensively worked with the course and are therefore very familiar with the complexity of the CCL topic they were asked more specific questions that more directly relate to the research questions of this paper than the previous ones to students. In order to keep the amount of time required to fill out the survey low and thus increase the chance of getting a variety of feedback only three questions were asked and distributed via email. In some cases, a kind reminder was necessary, but all four coordinators were excited about taking part and voicing their opinions. With two coordinators, I was unfortunately unable to have communication with despite several attempts.

The first task was: *Please give your definition of climate change leadership.*

CC1 states that during the course they did not use a specific definition for CCL. But when asked to give one now he said: “The process where relevant and adequate actions/steps are taken (by an individual, a group, nation(s) etc.) on local, regional, national or international level, that contributes to significantly brake and ultimately stop the ongoing human-induced climate change, but also to adapt to a changing climate, which is inevitable”.

CC2 had previously written a blog post with his take on CCL, which came in handy. He stresses that CCL does not require power, but is defined by a net positive impact on others. He argues that influencing others to make positive changes in their lives is what CCL is about. Also being able to formulate arguments very well – which requires solid scientific knowledge but also rhetorical skills – helps to do so as does a focus on the ‘why’ instead of the ‘how’. In his mind, CCL is a transformational leadership process that is done by example.

CC3 had trouble finding a concise definition, but said that it is a leadership, that adds an additional dimension to all decision-making processes in self, society, business and state. He acknowledges that the challenges presented by climate change will differ in both place and time, which is why he deems a broad definition to be more suitable.

CC4 characterizes CCL as influx, caring and relational. She says, “it takes uncertainty and builds relationships, creates space for creativity, maintains transparency, and builds bridges to create connections.”

All of them in their definitions somehow relate to the aspect of uncertainty that seems inherent to working with CCL. They also include that it affects and should be present on a levels of human life, from a personal-local to a political-global level and everywhere in between. Additionally the interpersonal aspect is being stressed.

The second question was: *What knowledge and skills do students in your opinion need to become climate change leaders? Try to be as specific as possible.*

CC1 says that basic knowledge and understanding of the complexity of climate change science is important, but even more so is an understanding of the underlying assumptions, values and worldviews. He says analytical tools are important in order to be able to challenge current norms, understand different perspectives and solutions and cooperate with different stakeholders from all parts of society. In terms of personal skills, he stresses the importance of leaving one's comfort zone, engagement and self-confidence with the aim of inspiring others.

CC2 argues that only a basic understanding of the science is necessary, but that essentially a climate change leader should have a good intuition for what is right and wrong, be responsible for their actions, change their lifestyle and inspire others to do the same. Concrete topics he suggests are food – since it is the best way to connect with the local environment – and economic links to climate. As a core problem with the current situation, he sees the elemental need for economic growth that is trumping all environmental efforts.

CC3 is of the opinion that courage is the key to challenging values, behaviour, theories and culture. Therewith grows a desire for knowledge about the processes in nature and society and for tools used to model and understand these processes. He thinks a climate change leader should be literal in natural as well as social sciences and in the humanities in order to be able to treat with problems interdisciplinary.

CC4 gives a concise answer by listing some important points: Awareness, appreciation, and acceptance of diversity; a strong ability and willingness to listen genuinely; critical thinking.

Many of the ideas brought up by students earlier come up here again, for example climate science knowledge, critical thinking, confidence, courage, interdisciplinarity, interaction between individuals and stakeholder groups and leading by example.

The last question then was: *Which learning and teaching methods do you think are most effective in improving those skills and knowledge from your experience with the course? Are there any other methods you would have liked to use but never got the chance to or experienced in a different context and found helpful?*

CC1 thinks that the CEMUS educational model is well suited to improve all the skills he has mentioned above, being able to host lectures from different both academic and non-academic fields. Student responsibility in this regard plays an important role, also due to the high degree of participation of students both in class and in society. During his time with the course, they increased the amount of responsibility students took for their own learning which resulted in them being in charge of the final declaration session entirely themselves.

CC2 supports this idea and suggests including current real life cases (for example the upcoming COP21 in Paris) whenever possible. As well, he thinks the final project is a valuable task for students to explore a topic of their interest in depth. In general, he suggests diversity in topics and formats.

CC3 stresses the importance of a learning environment where CCL does not imply restrictions, but possibilities for engagement and enactment with social, political, cultural, technological and economical systems and models. Also he proposes to not only reflect on external issues but also explore personal matters, in order to find one's own identity, values, wants and needs, which he admits can be scary process, but also an exciting and important

one. Overall, he urges for a more positive narrative concerning climate change and believes that excitement can carry students far in their studies.

CC4 is as well trying to create a space where students take responsibility for their own and each other's learning and sees herself more as a facilitator to that process. A variety of exercises, small group discussions and giving students the opportunity to facilitate the course themselves are all valuable parts, so are traditional lectures.

4.3 Main Insights

Student Questionnaire

In terms of knowledge required to effectively execute CCL across all sectors climate science knowledge is regarded as most essential, as are to some extent basics of economics. Indispensable skills include the ability to motivate and communicate, leading by example and confidence, while for characteristics ethical behavior, sustainability in business, creativity, communication with stakeholders and charisma are mentioned most frequently.

Approximately half of the students are of the opinion that everyone is and should be a climate change leader and also that a leader should be active across all sectors. While this is the mainstream opinion, many students think differently.

Figure 5 below depicts an overview of the knowledge, skills and other personal development aspects students require from university to become leaders.

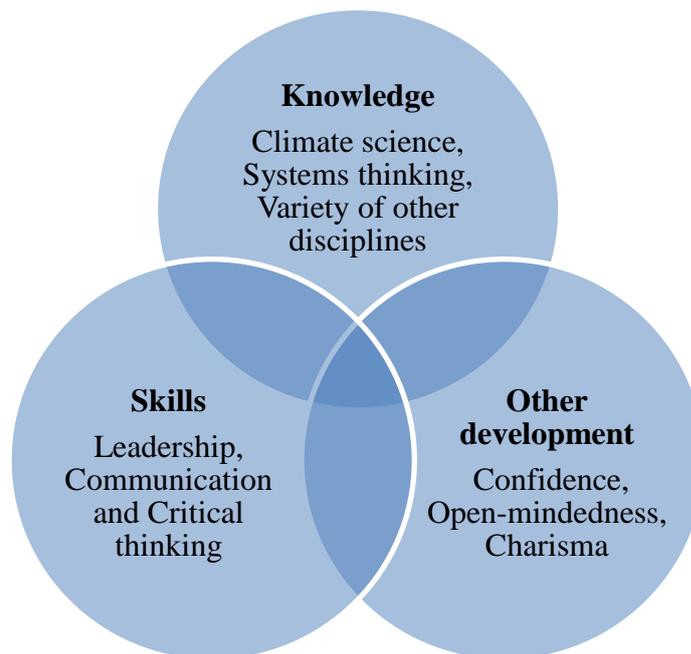


Fig. 5: Overview of knowledge, skills and other development required from university. Own depiction.

Former Students

The general impression of the course has ever since been very high, although literature and examination tasks have consistently been rated lower than lectures and seminars. The fulfilment of course goals has overall been dropping slightly since the beginning, with the lowest rated course goals being:

- Analyse and interpret different theories of leadership, cooperation, organization and communication for a functioning CCL
- Analyse and evaluate different proposed solutions and their opportunities, limitations and risks within the climate field
- Apply skills within leadership, cooperation, organization and communication specifically connected to different contemporary and future scenarios within the climate field

What has also become apparent from studying the course reports is that it has always been challenging to fulfil all course goals equally and that practical and theoretical leadership expertise and third world perspectives should be improved.

Course Coordinators

Regarding a definition for CCL leading by example and on all levels with the aim of stopping climate change is the common denominator. This requires accepting uncertainty, being creative and building relationships.

Figure 6 below shows an overview of the knowledge and skills that students need from a course coordinator perspective, as well as learning and teaching methods that are helpful with facilitating them.

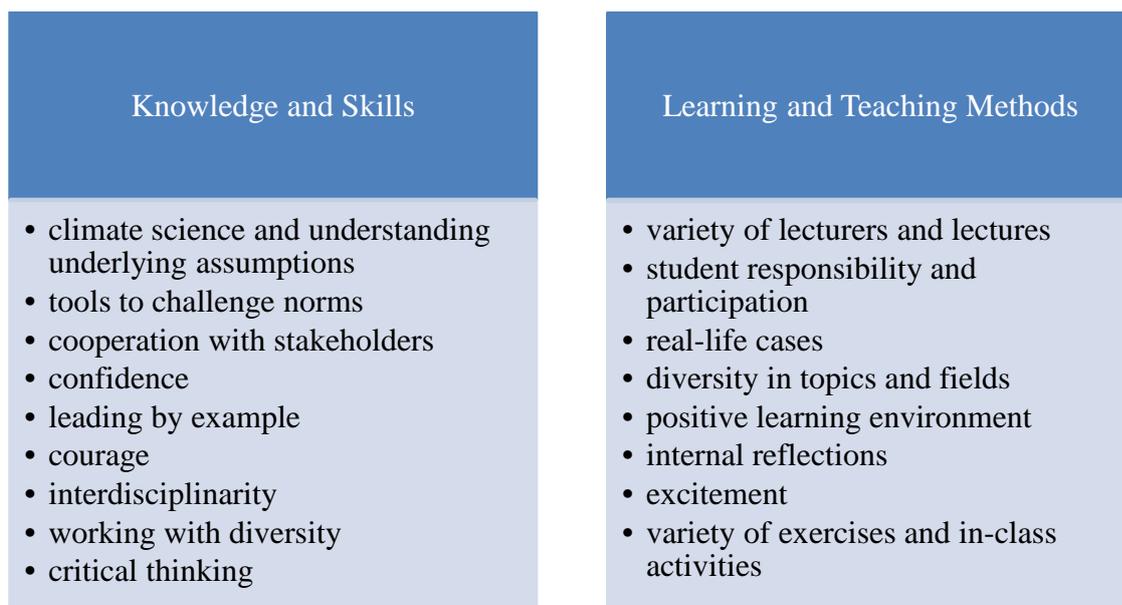


Fig. 6: Overview of needed knowledge, skills and helpful learning, teaching methods. Own depiction.

4.4 Challenges and Opportunities

The analysis of the different data sets above proposes some interesting challenges and opportunities for the upcoming tasks of defining CCL and giving recommendations on how to teach it at CEMUS. Naturally, every challenge is also an opportunity and vice versa, depending on one's point of view.

The main challenge in terms of this paper would be to encompass all suggestions by current and former students and course coordinators in the recommendations. A major point why this will be hardly possible is diversity. The course comprises a diverse group of students that all bring their distinct backgrounds and interests to class. Then, there is a variety of aspects that

theoretically are related to CCL, but that cannot all be included in the course due to time-restrictions or unavailability of appropriate lecturers.

Then especially course coordinators stress the diversity of instruction methods and topics, which seems relevant also for students considering they think a leader should be active in all fields and their wish for more global perspectives. They also wish for a variety of different disciplines to be included, implying the need for interdisciplinarity. While a dissatisfaction of some will be the implication of using this diversity, it is important to acknowledge that creating a perfect course for everyone is realistically seen as virtually impossible.

Students and coordinators both have stated the importance of confidence and courage, and personal development as essential in their leadership education. While the focus with the course has so far been on exploring issues and aspects surrounding climate change, the fulfilment of course goals suggests that there is a need for more practical exercises to help expand students' capabilities. This appears to be just as important as being knowledgeable.

Leading by example is another component mentioned by all stakeholders, both as a skill and as part of a CCL definition. This corresponds to notion of including more real life cases and examples of practical leadership solutions. Moreover this aspect also corresponds to the last course goal of applying leadership that is rated lowest almost consistently throughout all four years.

A discrepancy can be identified when it comes to student responsibility. While it is listed extensively by coordinators, it is not by students. This might be due to them not being familiar with an educational model as participative as CEMUS', but certainly requires creating a mutual understanding between both parties. Thus, it is inherently important to convey to students that they are to an extent responsible for their own learning, and encourage them to use the space that is given to them in class to learn from each other and explore some of their own distinct interests as much as possible.

5 Discussion and Recommendations

5.1 Chapter Overview

This chapter focuses on making suggestions for the course based on the preceding theoretical and analytical problem analyses. While the previous chapters gave an insight into the current situation and the desired situation, this final section will give recommendations on how to overcome the discrepancies.

The division into two sub-chapters corresponds to the EDR approach, beginning with a theoretical exploration into a working definition, followed by more practical and context-specific proposition in terms of course form and content¹². Meadows' (2008) definition of systems shall be followed with the course seen as a system in itself. The CCL definition then represents the function/purpose of the course and the second part outlines different elements and a coherently organized structure to fulfil the former.

5.2 A Working Definition of Climate Change Leadership

The CCL definition as identified currently used in the course was¹³: "CCL is a process that explores different causes and effects of human-induced climate change with the aim of

¹² Compare chapter 2.2.3.

¹³ Compare chapter 3.6.

encouraging fair and equal participation of all stakeholders throughout all levels of society in finding appropriate tools to mitigate and adapt to climate change from a personal-local to a political-global perspective.” The theoretical exploration of relevant literature on climate change, leadership and change processes has delivered new insights that shall be incorporated in the new definition. Figure 7 below illustrates and summarizes the main points.

Firstly, in the presented context anthropogenic climate change has been identified as the problem, the super wicked problem to be more precise. According to Grint (2008) the solution to that type of problem is leadership. Rittel and Webber (1973) however stated that there are no definite solutions to wicked problems due to non-static problems. Thus, CCL becomes a vicious circle where tools and solutions constantly need to be adapted to the imminent problem.

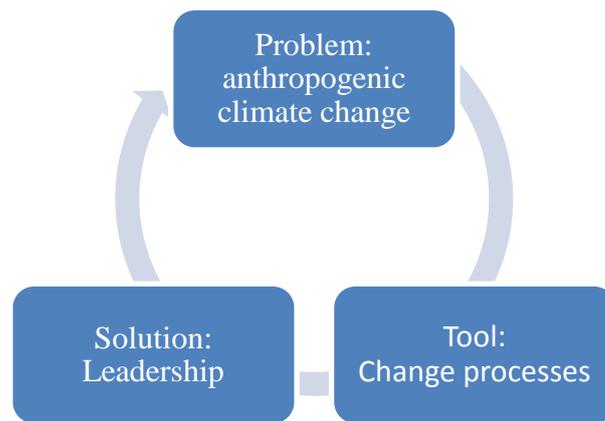


Fig. 7: The vicious circle of the CCL challenge. Own depiction.

Erratically emerging and dispersing climate challenges are the drivers of this circle and an adaptive capacity is needed to adjust the decision-making process. What can be deduced from this is that CCL is not a one-way street, but a continuous and repetitive process. This key finding needs to be encompassed in a definition as well. Moreover, it appears useful to summarize the core theoretic insights corresponding to each part of the vicious circle that will be incorporated in the CCL definition.

In terms of the problem, it has become apparent that human-induced climate change is a super wicked problem, characterised by dynamic, social and emergent complexities and an overall uncertainty on solutions and their effects in the future. Rockström (2009) proposed twelve planetary boundaries as a tool to measure the extent of damages done and provide a visual mean to illustrate the destructive consequences of current actions and their potential to pose serious threats for humanity.

The solution to (super) wicked problems according to Grint (2008) is leadership. The comparative analysis on leadership theories has firstly shown that context is a significant factor that can by no means be disregarded by any tool or agent for change. Secondly, the relationship aspect between leader and follower and stakeholders is inherently vital in both communication and leadership effectiveness. And thirdly, leadership can be learnt by anyone that has an interest in becoming a leader. Motivation, practice and feedback are some important aspects of leadership education (Goleman, 1998).

The analysis of relevant literature on change processes has shown that the knowledge-action gap can partly be explained by a mismatch between means and purpose. Climate change has been, and often still is, approached as a tame problem. Thus, it has been argued by O’Brien

(2012) and others, that the strategies put in place logically lead to an undesired response. Meanwhile aspect of interdisciplinarity and diversity in problem solving appear to increasingly gain importance in current decision-making. Given the complexity of the issue and the multitude of perspectives and ideas on it, embracing also intergenerational and intersectional points of view, for example, seems sensible. This holds true especially when keeping in mind that a minority of students believe that one leader is sufficient to solve the climate change problem and do not identify as (potential) leaders themselves. In practice, all relevant perspectives in a given context can and should be heeded in decision-making processes throughout all spheres of sustainability: environmental, social and economic.

Having taken into account the core elements of CCL, the working definition for CCL as one outcome of this paper is:

CCL is a continuous, collaborative and transformational process with the purpose of overcoming the knowledge-action gap in adaptation and mitigation to the super wicked problems of climate change in order to sustain humanity within the planetary boundaries.

A climate change leader then is everyone that works towards that goal despite an uncertainty in terms of methods and outcomes on a personal-local to a political-global level by applying interdisciplinarity and interpersonal skills in contextual change processes.

The clear distinction between leadership and leader is done to encourage engagement on all levels and reduce abstractness. The implication is as well that everyone has the potential to be a leader and thus that leadership skills can be learned. The definition still allows sufficient space for course coordinators to include topics relating to “adaptation and mitigation”, “personal-local” and “political-global” level. Specific questions regarding aspects of social justice and responsibility can still be drawn from that definition as well, but a core aim is to depict CCL as an opportunity for positive change instead of an allocation of blame.

5.3 Course Development

5.3.1 From theory to practice – The elements for change

Context

It is imperative to take into account the specific context of CEMUS when making a recommendation for further course development. The key points in this regard include stakeholders, target group, viability and the physical, organizational and educational context.

Stakeholders that have appeared as contributors to this paper are both current and former students and course coordinators. Apart from that, the central stakeholders include the working group for the course and educational coordinators at CEMUS. Coordinators for other courses, future CCL coordinators and Uppsala University and its affiliates have a secondary interest as well. Each of those stakeholders fulfils a certain role in the preparatory, delivery and/or post-delivery phase of the course. Main suggestions that can be drawn as conclusions of this paper however concern CCL course coordinators and CCL students.

Given the educational model at CEMUS the student responsibility is high. To a large extent students of the course are themselves in charge of fulfilling the course goals by engaging and actively participating in a variety of activities. The main challenge that can be deduced from this for coordinators is apt facilitation. The awareness of the educational model needs to be apparent throughout the course to optimize students’ abilities to work and learn in this quite

unique environment that offers a high degree of freedom; to clarify and exemplify that with freedom also comes responsibility.

The target group is a key success criterion. Predominately the students of the course are ultimately the target group, since they are supposed to be climate change leaders. If the working definition and suggestion for course development do not translate satisfactorily into their view on CCL, the rate of acceptance and thus success will be low. The recommendations of this chapter however will also be under scrutiny of the aforementioned stakeholders and therefore be subject to future modifications.

In terms of physical, organizational and educational context a positive learning environment, a variety of perspectives and academic and non-academic lectures alongside a positive narrative around climate change and diverse instructional methods have been identified as fundamental contributions to an effective leadership education. For teaching methods, this suggests utilizing an extensive range of options from lectures and discussions to collaborative learning, role-play, games, presentations, debates, field trips and videos. Important is, as O'Brien (2008) states, that the methods match the purpose.

Elements of CCL

Keeping the CCL working definition and the specific context in mind some, the tools for analysing and successfully executing change processes in various context can also be summarized along the three parts of the vicious circle of CCL (Figure 7 above) – problem, tools and solution.

In terms of 'problem' it is vital for students to understand the basics of human-induced climate change and the super wickedness of the problem to further comprehend on a more abstract level why those type of problems are complicated to solve. This includes in particular introducing the remarks of Scharmer (2009) on dynamic, social and emergent complexities and Meadows' (2008) systems approach.

'Leadership' as a solution to the super wicked problem requires a critical reflection of the most prevalent theories in order to relate the working definition of CCL to the bigger picture. Identifying principles and limitations of effective leadership on a personal and political level in different contexts is a prerequisite for using change tools appropriately. In addition, while CCL is complex, encouraging students to ask the right questions is, according to Grint (2008) of higher importance than giving them the right answers.

Bridging the gap between 'problem' and 'solution' can be done by using 'tools' to comprehend, evaluate and/or improve change processes. Those tools encompass the 10%-rule (Xie et al., 2011, Urry, 2011) and confronting underlying assumptions on how change happens. Krznaric's (2007) summary of common aspects that are disregarded in change processes in disciplinary sectors, Meadows' (2008) points for leverage in systems and the CBA approach by Kegan & Lahey (2009) as applied by O'Brien (2008) are further tools that can give students analytical assets.

Knowledge and Skills

In order to be able to use those tools efficiently certain skills and knowledge have been identified as most helpful in Figures 4 and 5 above. Now, it can be debated whether one person needs to possess all those skills while also being literate in natural and social sciences and humanities in order to be an effective climate change leader. I would argue not. It very much depends upon the situation, which has been shown in the data analysis. As an everyday

leader on a small scale, enthusiasm and leading by example are sufficient skills, while communication skills appear to be more indispensable with an increasing amount of stakeholders. Thus, having a ‘CCL skill checklist’ seems misguided.

The set of potential solutions for wicked problems is not exhaustively describable; therefore, it seems more relevant in an interdisciplinary context to facilitate a broad range of skills and knowledges depending on the students’ interest. Certainly, communication skills are relevant for every climate change leader, but even here, a student wanting to become a community worker might require a different training than a student more interested in research. So in the context of climate change the listed skills can be seen as modules, each of which varies in importance for different students. What should continuously be seized is the opportunity to learn from each other and in that relation (small) group discussions. Throughout every year this has often been stated by students as being one of the best things about the course, and while exchanging pre-existent knowledge it also fosters (intercultural) communication skills.

5.3.2 A Workshop Series

Having identified the purpose/function and the elements of the ‘CCL system’ practical recommendations on its structure are in order. Thereto the logic of the vicious circle of CCL above (Fig. 7) shall be followed. Figure 8 below shows the outline of a workshop series that encompasses the vicious circle and its elements, as well as the working definition.

The suggested structure follows the ‘problem – solution – tool’ elements, with the final workshops of each section of the course connected to a coherent series. This can be seen as an underlying process to the students’ learning throughout the rest of the course and is depicted below in Figure 8.

The first workshop after section one “Changes in the Climate – Past, Present and Future” is devoted to exploring the ‘problem’ part and framing climate change as a super wicked problem, once the tame, wicked and critical typology of problems has been clarified. Section two, the “Leadership toolbox” concludes with a workshop on different leadership theories, as it is partly done already today. The purpose is to introduce the aforementioned CCL definition and discussing it against the backdrop of other leadership theories that students have read about and familiarized with during the toolbox section.

The third workshop on introducing different tools for analysing leadership cases takes place at the end of the third section “Mindsets and Justice”, for example by using the case-in-point method (Parks, 2005), briefly introduced earlier. While this layout is for simplification reasons oriented on the current layout of the course, it would be just as meaningful with a different overall course structure. Also the second and third workshop could easily be switched.

The fourth and all following workshop(s) at the end of each section have the purpose of giving motivation, practice and feedback – key elements in practising leadership according to Goleman (1998). Examining current cases of leadership and practising communication skills are elements that should be represented in the course more expansively and this seems a fitting opportunity. It can entail a critical evaluation of different cases from all over the world that students present and be continued throughout and as well in the final project.

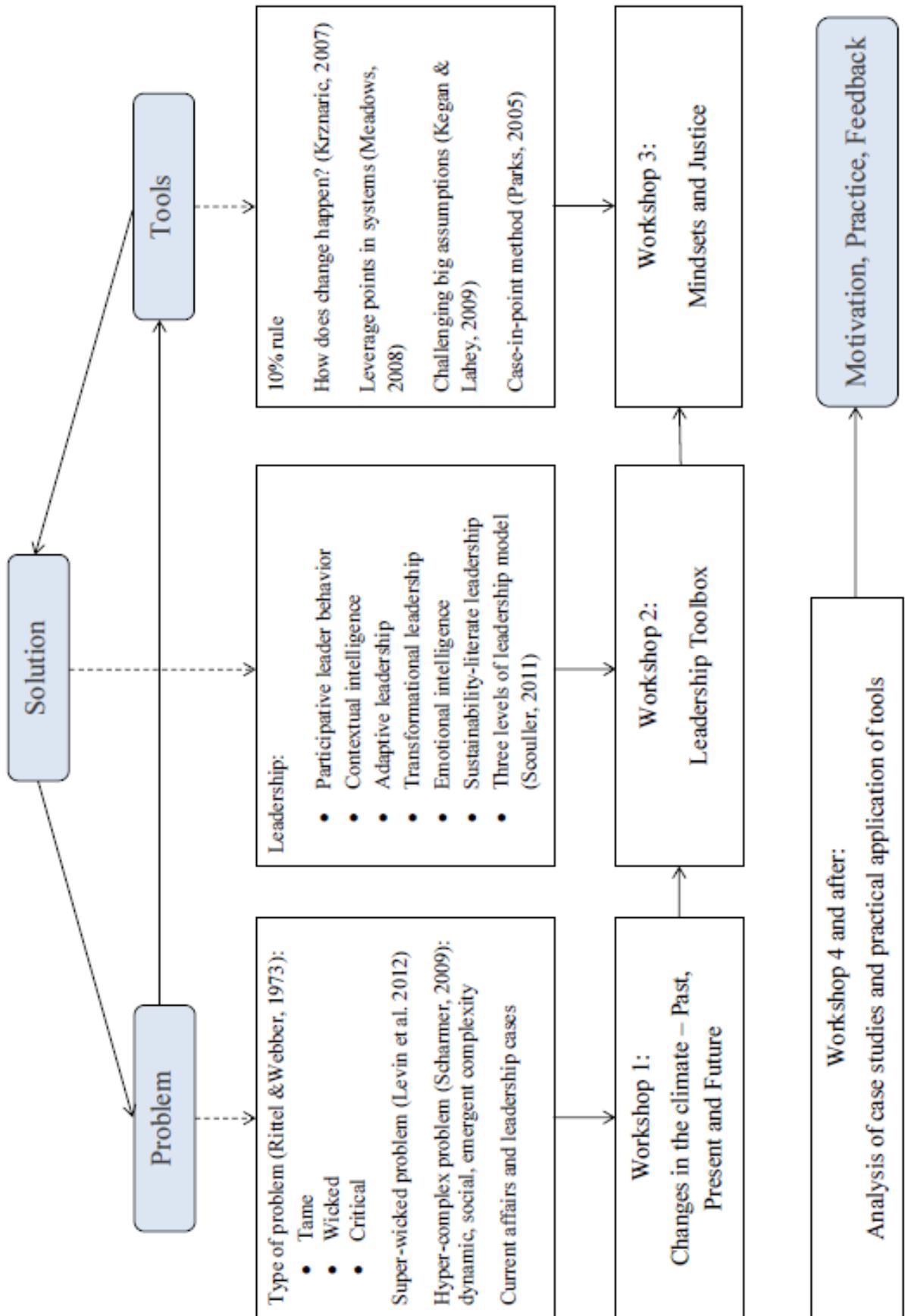


Fig. 8: Proposed Model for a Workshop Series. Own depiction.

The suggested approach for what could be called a CCL workshop series does not aim to replace the final section workshops as they are constructed today – a possibility to tie together different issues that came up in every section. It rather gives the workshops an improved purpose in relation to what students are asking for and offers the opportunity to approach CCL on a very graspable and hands-on level.

Now, all the above-mentioned tools and methods can contribute to closing the knowledge action gap in leadership. What seems to be lacking in current change processes has been outlined in the foregoing chapters. Mostly this is related to non-context-specific approaches, the demand for one-fits-all solutions and an uncertainty as to which methods and tools leaders should use in order to be effective. While the CCL course cannot easily overcome all those problems, it can give students the tools to evaluate different situations properly and the skills to find solutions for them. In practice this is mostly restricted to a personal and local level, but if students decide to work in politics or business in their careers, the tools and skills learned in the course will remain to be helpful.

Changing behavioural patterns, interacting and positively influencing others, and living with and acknowledging uncertainty are some key characteristics of CCL. While many students ask for concrete tools and skills to be a climate change leader, what this workshop series should clarify is that CCL is not a one-way road with easy and concrete solutions. More often than not “outside of the box” decision making might be what is needed, as well as overcoming assumptions on how we define effective leadership and in this context also how we perceive and judge failure. Thus, deconstructing the common understanding and misconceptions of leadership should also be an inherent part of this workshop series. Having a working definition for CCL to scrutinise, critique and reconstruct offers the opportunity of a more structured facilitation approach, which might improve students’ leadership capabilities in the upcoming spring term and beyond.

The evaluation of this upcoming implementation is, as mentioned above, out of the scope of this paper. It is however recommended that a follow-up evaluation will be done in the next year to further improve both the course and the CCL working definition.

6 Conclusion

Anthropogenic climate change is probably one of the most complex challenges humanity has ever faced and the consequences will be felt by everyone unless we take up leadership to stop it – fast. This thesis can hopefully contribute to the CCL debate in an educational context so that it will not end up to be a term as ambiguous as sustainable development is. While the CEMUS course in CCL currently builds upon a co-created understanding of what CCL could and should be, the aim of this paper was to give a working definition for CCL and suggest improvements for the course development. Thus, the intention was to contribute on both a theoretical (definition) and practical (course improvement) level, including a problem analysis in both spheres whilst involving current and former key stakeholders.

Exploring a pathway into how CCL can be taught at a university to optimally equip students with the leadership capabilities to lead society towards an overcoming of the gap between the extensive knowledge on climate change and the inconsequential action against it is ambitious. However it is essential to continuously improve the course and adjust to current challenges. Thus, the contribution of this thesis should only stand as transitional to the improvements after the next semester of the course. When arguing for adaptive leadership capacities and the

ability to adjust to changing contexts, this needs to hold true as well for courses given at the university, especially in a field as fast-evolving as sustainability.

While the scope of this paper in terms of practical suggestions for course development was somewhat specific the influence in the future could still be considerable. Compared to a ripple effect each student taking the course and continuing to be a climate change leader in his or her specific context, could eventually induce the positive change needed to combat and stop anthropogenic climate change.

Nonetheless, a better understanding of how change happens and how leadership can be an effective solution for super wicked problems and how these processes can be implemented successfully in varying contexts needs to be the subject to further research in order to spread the importance of CCL throughout society and create practical and tangible solutions. This goes hand in hand with a need for a better communication between science and the public.

The suggested tools are useful points of departure for initiating and improving change processes, but others need to be integrated in the course as research in the area progresses. In conclusion, the part of the equation not deciphered well enough yet is the matter of how to translate the solutions to problems into context-specific change processes.

Ultimately, CEMUS and the CCL course need to continue to live up to the university mission and contribute to a better world. This means to continuously strive to improve education and the students capabilities as current and future change agents.

“Education is the most powerful weapon which you can use to change the world.”

Nelson Mandela (UNESCO, 2015)

7 Acknowledgement

Although at times I wish it would have, this thesis did not write itself. And without the help of quite a few people the process would have been much more complicated and stressful than it actually has been.

Thank you first and foremost to Veli-Matti Vesterinen who has been the best supervisor a girl can ask for (apart from this one time when he didn't check his emails for three weeks), giving valuable advice when needed but gave me the space needed to develop and pursue my own ideas.

Thank you also to David Kronlid for his evaluation and his valuable role in the working group for the CCL course and Tom "the English teacher" for pointing out not only the flaws but also the strength of my second-to-last draft.

Thank you to all the students that ever filled out an evaluation for CCL for unknowingly contributing to this work, as well as to the current students of the spring 2015 for voicing their opinions. I will always remember them as my first group and wish them the best on their upcoming journeys.

Thank you also to the former CCL coordinators for shaping such a great course, to Christian and Johan for giving me an insight into their work, to Sanna for being a fantastic co-coordinator and BAFFFL and to Rickard for so much more.

Thank you Daniel and Isak for giving me the opportunity to work in this great environment and giving me all the support I needed and thank you as well to all the other course coordinators at CEMUS and the CCL work group.

To my fellow Master friends only one thing: Much love, very MSD. The memories will last a lifetime.

Finally, because I'll probably never be able to say it in my Oscar acceptance speech: thank you to my parents who are the most wonderful, caring and supportive people that I know in the entire world. Without you I would be neither where nor who I am. Danke!

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9 Appendix

9.1 Student Questionnaire

About yourself:

Gender:

Age:

- 1. When you think of leadership in different contexts, what characteristics, skills and knowledge are particularly important to bring about climate change effectively and efficiently?**

Political Leader	Economic Leaders	Environmental Leaders	'Everyday Leader'

- 2. Which statement do you agree with (choose one)?**

- Leaders are born (not everyone can be a leader)
- Leaders are nurtured (everyone can become a leader)

- 3. How many leaders are necessary to bring about climate change (choose one)?**

- One
- A couple hundred
- A couple thousand
- A couple million
- Every single human being

- 4. In which field should a climate change leader be active (choose as many as you wish)?**

- Political
- Economical
- Environmental

- 5. Do you see yourself as a climate change leader?**

- Yes
- No

Why so?

- 6. What would you need university to teach you in order for you to become a climate change leader in terms of...**

Skills	Knowledge	Other personal development

9.2 Course Coordinator Questionnaire

Questions:

1. *Please give your definition of climate change leadership.*
2. *What knowledge and skills do students in your opinion need to become climate change leaders? Try to be as specific as possible.*
3. *Which learning and teaching methods do you think are most effective in improving those skills and knowledge from your experience with the course? Are there any other methods you would have liked to use but never got the chance to or experienced in a different context and found helpful?*

Answer CC1:

1.

When we worked with the course we didn't spend much time or effort (as I remember) to agree upon a definition. Instead, we let the many examples brought up throughout the course give the students a picture or a map of what climate change leadership can/should be. But if I now should try and define the concept I guess it should be something like: "The process where relevant and adequate actions/steps are taken (by an individual, a group, nation(s) etc.) on local, regional, national or international level, that contributes to significantly brake and ultimately stop the ongoing human induced climate change, but also to adapt to a changing climate, which is inevitable."

2.

Some basic knowledge of the climate change science and the impacts of burning fossil fuels is essential. But even more crucial, I would say, is an understanding of the underlying assumptions, values, world views etc. that drive the unsustainable trend. Analytical tools to do so are important. To be able to challenge current norms, challenge what is taken for granted and leave one's comfort zone, engagement and self confidence is also of great importance. Engagement and enthusiasm is also important in order to inspire others to act (lead by example). Another important skill is understanding the complexity of the climate change challenge, to be able to see it from many different perspectives and as something much more than a technical problem with a technical solution. Skills in cooperating with stakeholders from different parts of society is also important and in this comes a perception of the fact that people understand the phenomenon of climate change in different ways depending of different interests or social/cultural backgrounds.

3.

Cemus' educational model is, in the way it is organized, well suited to improve those skills mentioned. To bring in many different lecturers from different fields, both academic and non-academic helps to understand the complexity of the challenge and cooperation between different stakeholders. The fact that students are responsible for giving the courses is perhaps the best example of student participation and my impression is that this also affects the students taking the courses - giving them more confidence in participate in the learning. The engagement from the coordinators is often quite high which (hopefully) inspire the students to actually have a great influence on the course. I think that the high degree of participation from students (both coordinators and students taking the course) in the classroom helps creating participation in society and engaged citizens - a prerequisite for good climate change leadership. Me and Dermot tried to activate the students more and more throughout the course and handed over more and more responsibility along the way in our seminars. In the very last

seminar we coordinators sat at the back while the students led a negotiation and together formulated a CCL declaration - this was a good example of student participation.

Answer CC2:

1. As it happens, I wrote a blog on that topic –

<https://smacademia.wordpress.com/2011/12/23/what-makes-a-climate-leader/>

I guess the shortest answer to that would be that it is leadership at any level that inspires positive change in others, where positive change means change to lower impact behaviors.

2. They certainly need an elementary understanding of the science, and the sources, causes, potential solutions etc, but only really enough to get by. Ultimately, a climate leader could have a strong intuition for what is right or wrong, or what is needed, and lead by example, without a lot of technical knowledge in the subject. Above all, I think students need to be able to accept responsibility for their own actions, to make changes to their own lifestyle, to be able to convince others to do the same, to inspire hope for a positive future (shy away from too much focus on the problems) and enjoy life while they are at it.

A few specific examples – I think food is always a central place to start. To know about good methods of food production, and to be able to eat seasonally and locally wherever possible. Food is the best way to connect us with our local environment. Above all, food waste is one of the things that annoys me the most. All waste is harmful to the planet, but food waste is the most unethical, when one billion people are malnourished. Therefore, a good understanding of sustainable food is a good education towards wider issues with sustainability. Foraging, resilience, preserving, health are all highly relevant.

The other personal favorite of mine is about economy and its links to the climate. I'm a strong believer that economic growth is the root cause of basically all environmental problems, and recognizing that we need to pursue other economic goals is important. This is more at the national/political level though. The sooner we can stop putting economic growth above all other goals, the better.

3. I think Cemus is way ahead of the game here, and many of the seminar types where students participate are really valuable. Using real-life current examples helps where possible (like the Paris negotiations/plans for example). The project is good to let students follow their own interest.

Having a range of guest lecturers is also good – people will respond to different styles, so like with everything, diversity is the key.

Answer CC3:

1. First and foremost I see CCL as leadership performed within the framework of climate change, as such it adds an extra dimension to decisions made at all levels in society; business, state and not the least individuals and other kinds of organizations.

I also think it might be hard to make a very strict or rigid definition as climate change, and the challenges that come with climate change will differ both in time and space.

I think there are plenty of reasons to argue that it is of utmost importance that climate change is something to be considered in almost all decision making.

This might be a too broad definition but the causes for climate change are many and diverse.

2. I think courage is key. The courage to challenge the values, behavior, theories and culture that still do not take climate change to be much more than a footnote. With courage the need and want for knowledge about the processes in society and nature that fuels climatic change

and the consequences will come, and also the tools used to model and understand these changes.

I know it might be a lot to ask of any single person, but in order to become climate change leaders, students will have to be literate in both the natural sciences (of course to a certain degree), the social sciences and the humanities. The nature of climate change is such that it will demand leaders to be able to view issues from multiple perspectives.

To evaluate problems and decisions from different perspectives will be very important, which brings us back to the courage to also make the best decisions possible.

3. I think one of the most important things is to create a learning environment where climate change does not only mean restrictions but also possibilities for engagement and enactment with the social, political, cultural, technological and economical systems and models that is so formative of who we are and the society we live in.

Climate change calls for engagement not solely on strict climate related issues, but also introspectively, who we are, where do we want to go, what is the price for going this-way rather than that-way. This is both scary and exciting but I really think one should encourage students to take the questions as far as they dare.

Students will need support tackling these issues, I have seen many students and researchers get disillusioned when dealing with the wicked nature of climate change, the many causes and the diverging effects. But climate change does not only come with horror, it comes with change, and there is excitement and a lot of possibilities in change. To make dysfunctional systems more functional, to reform and create a more humane and just world.

It is on this excitement that I think students get a long way to understand the complicated and complex systems that govern our climate and also to bring that understanding with them outside the doors of the university.

Answer CC4:

1. A leadership that is influx, caring, and relational. The future is uncertain. It always is and always has been. What CCL is, is a leadership that takes uncertainty and builds relationships, creates space for creativity, maintains transparency, and builds bridges to create connections.

2. Awareness, appreciation, and acceptance of diversity. Strong ability and willingness to listen genuinely. Critical thinking.

3. It's super difficult. There is no way of knowing. My teaching philosophy is trying to create a space where students take responsibility for their own and each other's learning. This entails facilitation, allowing them to do a variety of exercises revolving around small group discussion, and giving them the opportunity to facilitate the course themselves. However, using a diversity of methods is good, and as such, we also have traditional lectures. Some students do not like the space and are uncomfortable in it. Perhaps this is because they have not experienced a learning space like it before, but it can take several weeks for students to become accustomed to it. I would like to have more opportunity to have dialogue—proper dialogue ala Bohm. I would also like to have had the opportunity to really dig deeply into different ideas around leadership so that students could really test them. Like, for example, in a dialogue session.

