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Teaching Portfolio

Introduction

What does it mean to be a teacher to young people coming of age in a climate and ecological emergency? I believe deeply in Lund University's mission to "understand, explain, and improve the world and the human condition." However, the demands on me as a teacher to live up to these ideals have grown enormously in parallel with the rapidly accelerating climate crisis.

When I was a student, I was inspired by the passion, curiosity, and enthusiasm of my professors. But producing and transmitting knowledge for knowledge's sake alone is not sufficient to meet the challenges of our moment in history, which the Intergovernmental Panel on Climate Change (2022) describes as a "brief and rapidly closing window to secure a liveable future." I therefore find my current development as a teacher focused on how to best serve students and an educational system living through the climate crisis, by harnessing both facts and feelings to empower wise and meaningful action.

Background: Teaching, Supervision, and Educational Leadership Experience

In this portfolio, I will reflect on my philosophy and experience as a teacher, which I see as an evolution from a teacher-centered to student-centered to pedagogical-centered approach. That is, in the early stages of my teaching career, I focused on myself: my own preparation, knowledge, and activities. Through practice, I improved my teaching skills, and thus increased my focus on student learning, resulting in my **selection as a Qualified Teaching Practitioner in 2017**. With my subsequent experience and increasing leadership roles at the department, University, and international levels, I have had the chance to develop my pedagogical competence through the cycle of practice, observations, theory, and planning (Olsson et al., 2010), as well as support the teaching and learning of others through developing and leading educational programs, initiatives, and collaborations, as described below.

I have experience in designing, developing, and delivering educational courses and programs at the bachelor's, master's, and PhD level, in Sweden, the US, and South Korea, including playing a leading role in program reform and evaluation. My teaching is informed by my own experience as a student, with four interdisciplinary degrees from three universities. I have always been interested in the connections and relationships between people, nature, and climate, an interest that has evolved from conducting ecological fieldwork as an undergraduate, to today leading research and teaching aimed at finding holistic and humane solutions to crises of people and nature.

My teaching experience includes: co-developing and teaching a **bachelor's** course on Global Climate and Environmental Change at Kyung Hee University in South Korea; responsibility for four courses at

the **Master's** level including redeveloping and teaching the foundational natural science course in the Lund University International Master's Programme for Environmental Studies and Sustainability Science (LUMES) for 8 years to over 300 students; designing and teaching the Rural Systems and Sustainability course for 4 years; and 3 years of teaching a two-week module, Quantitative Methods for Sustainability. Following a program reform to which I contributed, I am currently co-developing a new course, Methodology for Sustainability, which I will co-teach in November 2022.

I am honored that I have been chosen twice by the LUMES students as a Commencement Speaker at graduation, which I believe reflects positively on their assessment of my commitment to teaching.

At the **PhD level**, I have designed and delivered two courses: Write for Change, a PhD course on academic and popular science writing held at Lund University that attracted students from across the Nordic countries and the UK; and Storytelling for Science in the Climate and Ecological Emergencies, a PhD course held at Stockholm University to help early-career researchers share their expertise with a broader audience, which attracted students from across Sweden. I have also contributed to the design of the foundational Sustainability Science course for our PhD students while serving as Director of PhD Studies.

I have further been invited to give guest lectures at the bachelor's, master's, and PhD level across Lund University and at over 30 universities in Sweden and internationally, including my selection to deliver the 2022 Kritikos lecture at the Oregon Humanities Center at the University of Oregon.

In terms of **supervision**, I am currently main supervisor for one PhD and have just graduated four MSc students. In total I have mentored 4 PhD and 37 MSc students to successful degree completion, as well as several postdocs and other early-career researchers. I have mentored 11 masters' students to publish their theses in international peer-reviewed journals (underlined names on publication list in CV), with a dozen also communicated to the public and to research beneficiaries as blog posts, op-eds, and research posters. I take care to cultivate a collegial lab group, where we share fika at regular lab meetings, and celebrate the end of the school year with a barbeque at my allotment garden. I am especially proud that all of my students successfully submitted and defended their theses in June 2022, where our department had a record high number of incompletes due to pandemic struggles. My advisees reported very high satisfaction with their thesis experience, and wrote me a lovely note thanking me: "without you this process would have been significantly more painful and less enjoyable." For the last two years, I have served as a Masters' Thesis Examiner, responsible for the assessment of 8-10 theses per year in Sustainability Science. I have been the examiner for PhD dissertations in Sweden, Denmark, and Switzerland.

My **educational leadership** has included service as Director of PhD Studies for the Sustainability Science program, as well as 3 years of service on the LUCSUS Board and 5 years on the Board of Directors for the Centre for Environment and Climate Research, both of which included strategic directions for education (at the master's/PhD and bachelor's/master's level, respectively). I also served for 7 years on the Advisory Board of the ClimBEco Graduate Research School, Lund University (Climate, Biodiversity, and Ecosystem Services in a Changing World), to advise the development of

and interdisciplinary PhD education program encompassing both Lund and Gothenburg Universities. I recently accepted the invitation to join the Advisory Board of Faculty for a Future, a new €1m initiative to make academia fit for purpose in educating students in the climate and ecological crises, which has recently published a database of recommended open educational resources for teaching the social-ecological crises across disciplines.

1. An approach that promotes the students' learning process

I am obsessed with measuring and monitoring student learning, using the principles of constructive alignment (e.g., Biggs and Tang, 2011) to identify a handful of core skills and concepts I want my students to master, then working backwards to ensure that every course activity and assessment supports their learning in these domains. To make this clear to the students, I present my course on the first day of class in terms of the learning outcomes it is designed to achieve, and the activities that are designed to teach and assess these outcomes. Using this approach as a guiding philosophy has been extremely helpful in designing activities that directly support the skills I want the students to master (e.g., working in pairs to design and carry out an ecological field experiment, analyze the data using the R programming language taught in class, and write up the work in scientific paper format).

I have studied the framework for higher education in Sweden through my completion of the Docent course at LTH. For this course, I became familiar with the learning outcomes to achieve graduate degrees in Sweden. In this course, I led a research survey of over 100 PhD students and their supervisors to study how PhD students and their supervisors viewed student competencies in eighteen national learning outcomes. We found that supervisors rated PhD students more highly than they rate themselves, that men rated themselves more highly than women, and that the strongest skills overall were specialized methods and knowledge, while teaching, outreach to society, and professional ethics were rated lowest (Nicholas et al., 2013). I have used these findings in advising my PhD students, including to assess degree progress relative to those goals. This conveys the expectations for a PhD clearly and gives students the chance to be self-reflexive learners, and identify areas of strength as well as where they need support.

Diversity is a primary motivation for why students choose to study at LUMES, and a core value of teaching in the LUMES program. Our students are typically 90% international, representing up to 20 countries, with most studying in English for the first time. They range in disciplinary training from sociologists and anthropologists to engineers and a PhD in physics pursuing a career change. I strive to be aware of equality issues in the classroom, for example, in creating opportunities for more introverted students to contribute to discussion by submitting written comments or first discussing in pairs, rather than only calling on the more extroverted students who often are the first to raise their hands. I also follow best practices for gender equity, for example, by calling for the first question from a woman, which has been shown to increase gender balance in subsequent classroom participation, rather than going by hand-raising order, which tends to favor men (Carter et al., 2018).

Working with **diversity** is an opportunity to demonstrate fair practices that promote equality, which I aim to follow in my own practices as a teacher. For example, I grade blind in order to avoid the "halo

effect" where good students are given the benefit of the doubt across an exam, rather than being graded on what they have written. Therefore I assess exams across questions (grading all examples of question 1 together, then question 2) rather than across students (reading through an exam from start to finish) to maximize independence, reshuffling the order of exams graded between questions to prevent systematic order effects, and asking a colleague to comment on the exam wording before administering it to avoid ambiguity (Biggs and Tang, 2011, p. 232).

I have seen that many students struggle with writing, often with a large gap between impressive verbal articulation and what they are able to convey on paper. Reading countless student papers, as well as serving as a journal editor for *Climatic Change*, gave me insight into the patterns and structures of effective writing, which I have worked to make clear for students. This led me to develop tools to teach the principles behind clear writing, including a rubric for writing scientific papers that I use to both teach and assess writing (included in Appendix 1). This matrix, which spells out the standards expected for each key element of a paper, from "excellent" to "weak", makes both the structure and purpose of writing clearer to students, allowing them to **better assess themselves and their peers** and to know what they need to do to improve. As part of my commitment to disseminate best practices, I circulated this rubric for feedback from colleagues at universities in Sweden, Canada, the UK, and the US for pilot testing before I made it publicly accessible on my website. Demystifying the grading process and giving students the criteria to assess themselves empowers them to take charge of their own learning.

Feedback is essential for learning. One of the most effective characteristics promoting student learning in a large meta-analysis, which was more than twice as effective as the average, was when students provided formative evaluation to lecturers; that is, they gave feedback on the course and their learning, and are able to offer suggestions for improvement that can be incorporated in the course while it is running (Hattie, 2009). I have seen this in my own experience as a student, where I still clearly recall a young female professor I had in 2002, who gave us the chance to submit several anonymous rounds of feedback during the course on what was going well and what could be better. I was impressed that she shared the results in class the next day, and made changes as a result.

I have followed this practice in my own teaching, where I use formative feedback during the course to improve the course while it is offered. I can see that students appreciate a chance to be heard and share ideas. They appreciate seeing their comments taken seriously, and also to see their views in a larger context, recognizing that others may agree or disagree with them (for example, I often receive, and share, conflicting comments like "the course literature is too basic" and "the course literature is too difficult.") As a result of formative feedback, I have made changes to promote student learning, ranging from how I call on students to how much time is allocated to discussion.

Summative feedback takes place at the end of my courses through both formal course evaluations, and an informal lunch seminar open to all students to discuss the course and offer suggestions for improvement. (My dossier of course evaluations was already submitted and assessed in my previous application for Qualified Teaching Practitioner.) I have used varied assessment methods, including self-designed research projects and in-class examinations that were then both peer- and self-assessed to promote learning (in addition to assessment by the teacher for the final grade).

2. A basis in research and a scholarly approach that reflects subject breadth and depth

It is important for me that education informs and contributes to my scholarship, both in using evidence-based pedagogical approaches to support student-centered learning, and in contributing to educational research. I have therefore made sustainability education a core theme of my research, including developing a university climate curriculum based on IPCC synthesis science (Nicholas et al., 2014), which I have presented at international conferences in the US, France, and Belarus, with enthusiastic response by teachers who are adopting it internationally, and which I **presented at the Lund University Teaching and Learning Conference** (Nicholas, 2019; Appendix 2).

I am guided by evidence in aligning my teaching with real-world cases and skills to meet social demands, partly based on my research on current shortcomings of sustainability science education programs, finding little integration between natural and social sciences (O'Byrne, Dripps, and Nicholas, 2014), and shown that government recommendations and high school teaching curricula are poorly alignment with high-impact climate actions (Wynes and Nicholas, 2017; Wynes and Nicholas, 2019). I have also studied ways to enhance youth capacity outside of higher education, for example, through meaningful participation in science-policy fora (Dickson-Hoyle et al., 2018).

Teaching and research are linked in my classes in several ways, to show the current boundaries of the field as well as how these boundaries are drawn, contested, and evolving. First, I incorporate current research from my departmental colleagues and my own work in my teaching, which helps to demystify the process of research and to connect students with current research. Second, I actively create and promote opportunities for students to get involved in faculty research, including organizing the first Research Symposium between researchers and students in my department. Third, I draw course materials and activities from recent scientific articles, to link student learning with the current state of the field. In my courses, we spend time analyzing how papers are structured and how evidence is used to support arguments, to make the interrelated processes of research and writing more transparent.

Another example of linking teaching and research is my redesign of my Earth Systems Science class using the nine Planetary Boundaries (Rockström et al., 2009*;* Steffen et al., 2015), which introduces students to the natural science foundation for sustainability challenges in a context now widely used and debated in development and policy circles. In terms of the theoretical approach of Shulman (1986, 1987), I use the Planetary Boundaries framework to transform content knowledge, about the specific themes such as biodiversity loss and climate change, to pedagogical content knowledge, to make the approach and way of "thinking like a sustainability scientist" easier to teach and easier for the students to grasp. That is, I aim to structure the content for teaching to students, bearing in mind their common struggles and misconceptions, using teaching strategies with demonstrated effectiveness. For example, I use the Planetary Boundaries framework to teach general concepts in sustainability science, such as accepting the notion of limits vs. the often implicit assumption of perpetual growth as desirable or even possible. I also use the framework to consistently illustrate the research process itself, in going from unresearchable, abstract topics, concepts or "constructs" (such as climate change) through the process of operationalization to identify a variable that is clearly defined, observable, exhaustive and mutually exclusive, measurable, and based in valid theory, and

thus researchable.

3. Teaching skills and commitment

Several years ago, I used constructive alignment at a higher level to help **redesign the entire two-year curriculum in our masters' program** with a small team of colleagues. We followed the five core competencies in sustainability science promoted by Wiek et al. (2011) to redesign a more active, coherent, and integrated curriculum, implemented in 2016. To stay relevant in a changing society with evolving student needs, we have again reformed the master's curriculum, for example in re-introducing a Methods course which I will now teach, with the new design starting in 2022. It is important to me that my colleagues and I see the education we create and deliver is not static, but rather is part of an evolving process in conversation with each other, with students, and society.

Creating a **positive learning environment** where students feel valued, engaged, and respected is a key aspect of my teaching philosophy. Such an environment is not only a more fun and rewarding one to work in, but also promotes student learning through enhanced peer collaboration. During the eight years I taught the first course in the LUMES program (Environmental Problem Awareness, later reformed to Earth Systems Science, ESS), I had the opportunity to create this environment from the first day of the program, where we blend social activities (name games, icebreakers) with communication about program and course goals and function. I make it a point to learn all of my student's names by the first week of class, and ensure that they know each other's as well, to create a collaborative environment. (This is facilitated by creating a photo list of all new students in the first week, which we share with all staff and students.)

In the second week of ESS, I led a 3-day, 2-night field trip. Here I designed and led field experiments where students collect, analyze, and present observations on water, biodiversity, and land use change. This retreat also includes cultural trainings (for example, the card game Branga, where students simulate the frustrations of coming to a new environment where expectations are different by playing a card game where they all have been given different rules, but cannot speak to communicate this.) I have also included trainings on personality types (e.g., introvert/extrovert) and tips for effectively including everyone in a group, including having students write groupwork contracts to clarify expectations for group projects and collaborations at the start. This compliments one of the core intended learning outcomes of the LUMES program, the "interpersonal competences" including leadership, communication, and self-reflection (Wiek et al., 2011), which are critical for successful work in sustainability.

4. Holistic view and interaction

I am a champion for constructive alignment across courses and programs, and have been invited by our Head of Department to present my framework for constructive alignment at our teachers' collegium, showing how learning outcomes are integrated throughout a course across the design and delivery, and form the backbone of assessing student learning (Appendix 3). Since research shows that students are highly motivated by understanding what they are supposed to learn, and why it's

relevant for their learning and future professional lives, this emphasis is important to motivate students.

One of my favorite parts of being a professor is **mentoring students**. My philosophy of student supervision is to provide a graduated level of intellectual independence, while retaining focused input into research design, analysis, and writing as appropriate. I aim to demonstrate the element of discovery in the research process, to help students move away from a mindset of trying to get the one "right" answer, as if on a multiple choice test, and towards a mindset of figuring out the criteria by which they can weigh competing options or hypotheses for themselves. My goal is to balance the opportunity for students to learn from their own choices, while helping them avoid common pitfalls and steering them in directions that will contribute to the field. I encourage my students to write early and often, and to revise constantly, so that they see the ways in which writing is a way to develop their thinking, rather than the common misconception that writing simply records the finished products of thinking. I train my students to focus on telling a story visually, starting with making conceptual figures at the beginning of a paper and adding more empirical results over time, to encourage them to see the big picture of their research contribution as well as be able to explain its key findings to a wide audience. I also focus on professional skill development, including giving lunchtime seminars on academic writing, publishing, and time management, and writing guides on topics such as advice on academic publishing (Appendix 4) and authorship (Appendix 5).

In terms of **supervision**, I am currently main supervisor for one PhD and have just graduated four MSc students. In total I have mentored 4 PhD and 37 MSc students to successful degree completion, as well as several postdocs and other early-career researchers. I have mentored 11 masters' students to publish their theses in international peer-reviewed journals (underlined names on publication list in CV), with a dozen also communicated to the public and to research beneficiaries as blog posts, op-eds, and research posters.

When I supervise masters' students, I ask at the first session what success with their thesis would look like for them. Their answers can range from "I want to pass the thesis course with my mental health intact" to "I want to produce new knowledge that can be immediately applied by decisionmakers" to "I want to do research that will prepare me for applying for further PhD study." Understanding the diverse goals of students helps me to support them in **preparing for the professional career** that best aligns with their interests. Many of my students have returned to university study after a decade or more of professional experience, out of a desire to make a career change that better aligns with their values. Working to design a thesis experience that both makes use of their existing skills, and can challenge them in new directions, is a fun part of the job. I also encourage students to pursue professional development opportunities (for example, linking their studies with internships or research assistantships), and have frequently helped students design projects and thesis studies that build on partnerships with non-academic organisations, such as the grocery chain Coop or transport experts within Lunds Kommun.

Importantly, my MSc supervision has included a strong focus on educational topics, including a thesis on environmental education in Icelandic primary schools (Hallfreðsdóttir 2011), youth engagement in

informal education in the United Nations climate negotiation process (Darrach 2011) and the Global Landscapes Forum (Nasir 2016), an evaluation of the climate actions recommended in high school textbooks compared with those that reduce emissions most, which has been downloaded over 800,000 times (Wynes and Nicholas, 2017), as well as an assessment of the climate change curricula in Canada compared with research-based recommendations for maximum impact (Wynes & Nicholas, 2019).

In addition to my work across the department as Director of PhD Studies, discussed below, I am an active supervisor to my own PhDs. I meet and give feedback every other week with my current PhD student, and have spent time in the field with PhDs, including a week doing fieldwork in Ecuador, administering household surveys to look at benefit distributions from a payment for ecosystem services program in the Amazon with my first PhD student (Krause, Collen, and Nicholas, 2013). During this fieldwork, I began mentoring a master's student I met in the field, eventually resulting in a second publication (Collen et al., 2016). I enjoy being inspired by students to question my fundamental assumptions and investigate new topics.

I strongly believe in transparent and fair criteria for both recruiting and assessing students. In a recent recruitment for Agenda 2030 PhD students across Lund University, I developed an assessment process for our department that ended up being adopted by the Social Sciences faculty.

Because I place specific knowledge in a **broader context**, I have been asked to give numerous kickoff or inspirational talks to frame courses and workshops, both within and outside of academia, for example at leadership courses for artists, the annual conference for Swedish Museums, and courses at LTH, S-fac, and N-fac at Lund University.

5. Continual improvement and in-depth reflection on the basis of knowledge of teaching and learning

Similar to the reflective texts my students write to monitor their own learning, I also write about my teaching experiences to better learn from them. Since 2014, I have kept a website where I share teaching resources I have developed, such as rubrics, the peer writing tutor materials, and the We Can Fix It World Café. I also maintain a blog where I share my thoughts for students, ranging from research design to applying to PhD programs, as well as reflect on my own experiences (selected posts included Appendix 4; all available from http://www.kimnicholas.com/blog).

Blog posts have included my reactions to articles I read in education journals and the popular press (for example, this post on "Why I posted last year's final exam on the first day of class"), insights from conversations with colleagues (e.g., simple tips on research proposal writing from a conversation with Harriet Bulkeley, professor of geography at Durham University), my own philosophy and teaching perspective as exemplified by materials I've created (a widely cited post on "Cheat sheets for writing scientific papers" where I share rubrics, a paper outline, a guide to common problems I see in student writing, a template for a master's thesis proposal, and slides on research design), a guide to new teaching tools such as the realtime survey tools for classroom use that I learned about at a Lund

University USV teaching retreat, and a response to an article on how to follow open data principles (Wolkovich et al., 2012) that I've implemented with my lab group. I share these posts via Twitter with my colleagues and students, as well as other instructors around the world, and have received positive feedback from students as well as other instructors who are using my materials in teaching.

I have eagerly pursued professional development opportunities within teaching throughout my career. I came to Lund with extensive pedagogical training from the US during graduate school, including a one-year teaching fellowship at the University of Wisconsin funded by the National Science Foundation to teach the theory of inquiry-based learning and pair graduate students with elementary school teachers to design and carry out age-appropriate science learning activities. I also participated in a graduate-level course on Science Course Design at Stanford University. Since coming to Lund, I have taken advantage of all the pedagogical opportunities available to me instructed in English, including completing both levels of the Learning and Teaching in Higher Education (LATHE) course, as well as the docent course at LTH. This training has given me a deep appreciation for focusing on student learning as the core of my teaching, and opportunities for my own learning in aiming to continuously improve my teaching.

6. Educational Leadership and Development

I have recently concluded a three-year term as Director of PhD Studies, where I led the quality assurance work for the academic program, served as a mentor and advocate for Sustainability Science PhDs, and worked with leadership at the departmental, faculty, and university levels to establish and put into practice fair and clear practices to ensure PhD progress.

When I started this position, I was frequently asked questions I did not know how to answer, both practically (in terms of where to look for guidance) and philosophically (in terms of explaining or justifying how decisions had been made, or what the relevant principles were for interpreting a PhD's request for conference funding or what was expected at their first-year seminar.) I relied on generous colleagues and administrators within LUCSUS and across the faculty to "show me the ropes" of the practical side, in familiarizing myself with the structure and organization of the faculty leadership. I also decided to "leave the position better than I found it," in terms of developing clear guidance both for how to be PhD Director of Studies, and in providing guidance to the PhDs and their supervisors, to increase equity across students. I felt this work was especially important as currently hosts about a dozen PhDs, many of whom come from the Global South and are supervised by early-career faculty, thus clear and fair guidance is essential to ensure all have an equal opportunity to succeed in their graduate careers and beyond.

Thus, I wrote the first job description for the position of Director of PhD Studies at LUCSUS, a handbook for How to Be PhD Director at LUCSUS, and a Handbook for PhD Students at LUCSUS, which compiles key information in one place and guides students where to find what they need (Appendix 6). I also developed guidance documents for how to do everything from request departmental service hours, compiling the advice from the faculty, university, and internal departmental documents for the first time; to developing the expectations for the first-year and midterm seminars, based on student

requests due to lack of clarity and certainty around the structure and purpose of the seminars. My goal with all of these documents has been to reduce the friction for others to navigate the system, and to increase fairness and transparency across students.

While previously the Individual Study Plan (ISP) was seen as a bureaucratic formality, as Director of PhD Studies, I worked to make better use of the document as a living research plan to help students sharpen the coherence of their research design. Through iterative rounds of feedback on the content, particularly of the research plan and demonstration of the learning outcomes for a PhD, I aimed to produce a research plan that could be used as a basis for fieldwork and incorporated into documents that were valued by the students, including their milestone seminar papers and dissertation *kappas*. I also had responsibility for holding the development talks for PhDs, where I aimed to help students clarify and articulate their own goals and metrics of success. After many PhDs expressed concern over lack of networking opportunities during the pandemic, I wrote a widely shared guide to building new academic relationships without relying on in-person conferences (Nicholas, 2021b).

Another important development under my leadership as Director of PhD Studies was to initiate regular collegium meetings of PhD supervisors at LUCSUS, which had never before been formally arranged. By having these twice-quarterly meetings to share updates from the faculty and university, share best practices amongst each other, and raise and address any concerns about PhD supervision, I have strengthened the participation and interaction in the culture of PhD supervision. Overall, my reflection is that positive relationships with colleagues is one of the most critical factors for success in managing education. Academics are intrinsically motivated and strongly value our independence; anyone who has tried to lead academic teams is familiar with the feeling of herding cats. An area I prioritise for my continued leadership development is to take the time to understand the motivations and priorities of my colleagues, so that we can design processes that work smoothly and engage all. Having documents and procedures exist is not sufficient for them to be put to use; people have to see and believe for themselves their benefit and importance in order for such contributions to be successfully woven into the institution and carry on beyond individual initiatives, a goal I feel I am still working towards.

As I have become one of the most senior teachers in LUCSUS, I see that I have an important role to play in supporting others' teaching development. I have therefore mentored PhD students in course design and supervision, based on the needs they expressed in their Individual Study Plans as well as in needs identified in conversations from teaching meetings; given feedback on junior colleagues' teaching plans; and mentored the colleague who has followed me as Director of PhD Studies, to make the transition and the start of her work as smooth as possible. I have also nurtured the development of PhD students as researchers, by holding workshops every semester based on needs they expressed, such as developing visual figures for presenting their research, and how to write the kappa (introduction) of their dissertation. These workshops received positive feedback and resulted in stronger written and oral presentations from our graduates.

I am increasingly called upon to provide teacher training, for example, in the Collegial Project Course: Teaching Sustainability with a dozen teachers (engineers from PhD to professor level) from across LTH in fall 2022.

I find a major barrier to educational equality is the informal knowledge required to successfully navigate higher education, and thus I place a high value on **demystifying and sharing the usually unwritten rules of academic success** to enable more to succeed, such as through regular posts on my academic blog and social media to share advice and teaching and learning materials on applying for faculty jobs, defending a thesis, giving a research talk, navigating the peer-review and publication process, or rubrics for assessing research papers. I also make time to contribute to professional development for early-career researchers, such as through giving a Sunday workshop on "10 things I wish I'd known 10 years ago" aimed at PhD students, and participating in a webinar on Academic Failure for the international Postdoc Training. I receive feedback that these resources combining academic advice with personal stories, including reflecting on my own shortcomings, failures, and learnings, are deeply valued by students to overcome the cultural pressures in academia to constantly perform and achieve. Recognising failure as an inherent part of life, and perhaps a sign that you are taking sufficient risks to continue to grow, is a helpful framing for me, and early-career researchers tell me it has been extremely encouraging for them to see modeled and encourage them to persist.

Since 2021, I have served as a **Masters' Thesis Examiner**, responsible for the assessment of 8-10 theses per year in Sustainability Science, on topics ranging from rewilding to climate communication on TikTok. I have learned a great deal from conversations with senior colleagues regarding assessment. Students came up to me at graduation to thank me for the detailed feedback I provided on their theses (see Appendix 7), where I focused on identifying both what was successful and specific areas where they could improve.

I have developed a wide range of **teaching materials**, ranging from resources for primary and secondary school students to take climate action, to a World Café on climate solutions, which are available on my website for others to use. My research findings have been included in high school science textbooks in the US and Sweden. My recent popular science book, *Under the Sky We Make: How to be Human in a Warming World* (Nicholas, 2021a), received a starred recommendation for educators from Booklist, and has been adopted as a course textbook in science, sustainability, and humanities classes at the high school, bachelor's, master's, and PhD level. I see this book as a tangible contribution to enhancing "educational imagination"—a tool to help students, and our wider society, consider and begin to bring about social transformations that are not locked into a continuation of the unsustainable past, but rather offer and help create a range of brighter futures.

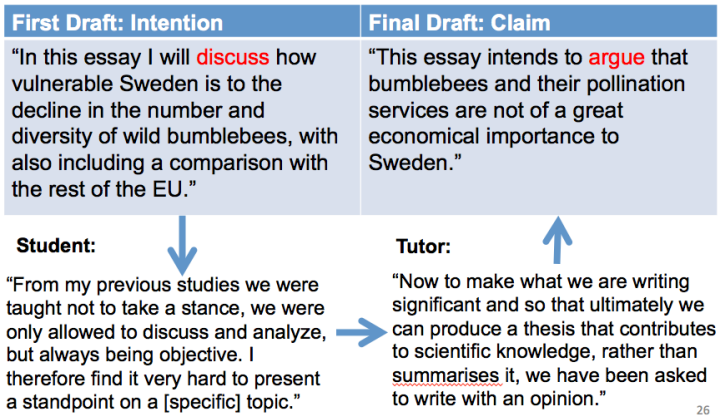
Finally, in terms of **teamwork,** I enjoy bringing out the best in others by taking the time to understand and support their motivations, and creating a positive work environment where diversity is valued and equality is practiced. I began an interdisciplinary bachelor's degree in 1996, and have worked at the intersection of natural and social sciences ever since. The pandemic created challenges in maintaining social cohesion and support at work. Recognizing this difficulty, and how essential

positive relationships are for a happy and productive workplace, I initiated and co-organized two highly appreciated staff activities adapted to provide quality time while mindful of the health recommendations in effect at the time: an evening gathering around bonfires with warm soup and fresh bread last fall, and a two-day countryside retreat with canoeing, hiking, tai chi, and games this spring. I organized a "fun fact bingo" which got colleagues talking and laughing with each other as they learned who traveled with kilograms of cheese in their luggage or had hosted the artist Björk at an afterparty at their apartment. These teambuilding foundations are essential to good communication, creativity, and productivity at work, to being able to listen deeply and collaborate successfully, and to enjoy doing so.

7. Community Dialogue

Connecting to the world at large is an important part of my teaching: in linking my activities in the classroom to society, in bringing students in contact with society to inspire the design of their work to address pressing problems, and to share their results with those who can benefit from them. This approach to impact, as scholarly work that can benefit specific actors in society (Reed, 2016), guides my belief that some of the most meaningful use of my time is to share scholarly findings with those who can put them to use in their own work and lives. I have increasingly focused on taking my own and others' research findings from peer-reviewed journals into formats that can meet people where they are to inform, empower, and inspire them to make change. It is a long and uncertain journey to go from generating or synthesizing knowledge, to identifying and reaching a target audience to provide that knowledge in an actionable and empathetic way that answers their question or solves their problem, to creating enough emotional engagement that the knowledge has a chance to change hearts and minds, and finally, that these internal changes can lead to external changes in practices and policy. While I try to find meaning in the process and not only focus on outcomes which I cannot control, I also can see evidence my work is making a difference.

A generic skill I help my students develop is their **ability to make compelling arguments**, that is, to make a claim and support it with logical reasoning and robust evidence, sharpening their critical thinking. Making well-supported arguments is the essence of academic scholarship, and essential to meaningfully engage with, and contribute to, civic discussion and debates. I have honed this focus through a collaboration with Ladaea Rylander, a writing specialist at the Lund University Academic Support Centre. Together, we developed a flagship peer writing tutor program, which is the subject of a book chapter we have co-authored (Nicholas et al., 2017) and has been expanded to other departments. Ladaea provides a one-day training to a group of tutors selected from the second-year masters' students, who then read incoming student's essays and provide several rounds of feedback using forms I developed and facilitate two in-person writing sessions where students get feedback from the tutors and their peers. Teaching the **craft of writing** has proven to be a powerful way to improve students' critical thinking and communication skills, as seen in the strong improvement in this student's central claim below:



Source: Nicholas et al., 2017

From the peer writing tutor program overall, we have found benefits both for students and peer tutors. Students have benefitted from motivation from their tutors to understand why and how to make claims in academic writing and were empowered to make bolder claims that they were more excited to write and are more exciting to read. The tutors have benefited from both improving their own writing, and honing their teaching skills (Nicholas et al., 2017). Overall, it has been tremendously satisfying to see the improvement in student writing, and to hear students ask each other "What's your evidence?" as they discuss ideas in class and beyond.

I am grateful that my popular science book, *Under the Sky We Make: How to Be Human in a Warming World* (Nicholas, 2021) has touched readers including as a *Los Angeles Times* bestseller, a textbook for high school, bachelors', and graduate courses, and through selection by Stanford University President Marc Tessier-Lavigne as the 2022 book for the Founders' Circle, the 1,200 supporters who have donated $1 million or more to Stanford University. I have long been involved in science communication on social media, most actively on Twitter as @KA_Nicholas, where I have close to 15,000 followers from journalism, academia, local and national government, and civil society. After learning that email is 10-50 times more effective for engagement than social media, I launched a monthly newsletter on facing the climate crisis with facts, feelings, and action in January 2021; We Can Fix It has grown to a lively community of nearly 5,000 subscribers. To further bring research to the public, I regularly write essays and evidence-based advice for magazines and newspapers, including *The Guardian, New Scientist, Elle*, *The Conversation,* and *Decanter*, and deliver over 75 public lectures and moderations and give over 100 media interviews per year.

I work to develop relationships with partners in society, both to inform my own research and to create educational opportunities for students. For example, in 2021 I mentored Paula Kuss in a masters's thesis designed within the context of my Formas project to help Lund Municipality become climate-neutral by 2030. The most urgent priority for Lund is to reduce emissions from transport, which primarily come from private cars. Therefore, Paula conducted a study of studies, examining nearly 800 published studies and case studies to identify which measures have already worked in European cities to reduce cars, and using transition management theory (Loorbach et al., 2015) with interviews with local experts to suggest which measures would be most effective in Lund. Paula

presented her work to Lund policymakers at graduation, and it has since been published in a peer-reviewed journal (Kuss and Nicholas, 2022), adapted into a long-form article in The Conversation that has been read over 60,000 times (Nicholas, 2022), and appeared in *The Guardian* (Nicholas and Kuss, 2022). Because it is based on real-world data, especially in the context of the EU Mission to deliver 100 climate-neutral cities by 2030, practitioners have found the work extremely useful. Paula and I have been invited to present it to transport, planning, regional, political, and international networks in the US, Canada, Sweden, and Brussels, including as a part of New York Climate Week.

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