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Key insights from climate communication – and how they can inspire sustainability in higher education

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Abstract

Purpose

In order to combat climate change and safeguard a liveable future we need fundamental and rapid social change. Climate communication can play an important role to nurture the public engagement needed for this change, and higher education for sustainability can learn from climate communication.

Approach

The scientific evidence base on climate communication for effective public engagement is summarised into ten key principles, including 'basing communication on people's values', 'conscious use of framing', and 'turning concern into action'. Based on the author's perspective and experience in the university context, implications are explored for sustainability in higher education.

Findings

The article provides suggestions for teaching (e.g. complement information with consistent behaviour by the lecturer, integrate local stories, and provide students with basic skills to communicate climate effectively), for research (e.g. make teaching for effective engagement the subject of applied research), for universities' third mission to contribute to sustainable development in the society (e.g. provide climate communication trainings to empower local stakeholders), and greening the campus (develop a proper engagement infrastructure, e.g. by a university storytelling exchange on climate action).

Originality

The article provides an up-to-date overview of climate communication research, which is in itself original. This evidence base holds interesting learnings for institutions of higher education, and the link between climate communication and universities has so far not been explored comprehensively.

Keywords

Climate change, energy transition, sustainable development, climate action, climate communication, public engagement, higher education, teaching, research, greening campus

Conceptual paper

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Introduction

The climate crisis is a dangerous threat to human well-being and the environment. In order to safeguard a liveable future we need fundamental and rapid social change. Rapid emissions cuts require significant lifestyle changes, greening of the economy, and supportive regulatory frameworks that put individual action into a context of collective action (WBGU, 2011). Such a transition needs the acceptance and contribution of people for years to come, and climate communication can help to generate this public engagement.

Universities play an important role as change agents for climate and for the sustainability transition (Ralph and Stubbs, 2014; Müller-Christ *et al.*, 2014; Leal Filho *et al.*, 2019). Their activities can be categorised into four fields: Teaching, research, third mission (which includes transfer of knowledge and direct contributions to sustainable development in society), and greening their operations (Velazquez *et al.,* 2006). Solutions in these fields are obviously highly dependent on people accepting, supporting and driving change. It seems promising to explore if and what can be learnt from climate communication for effective public engagement.

Some scholars have built bridges between climate communication and higher education for sustainable development, e.g. for specific activities like connecting arts and media production to learning about climate (Jacobson *et al.*, 2016; Rooney-Varga *et al.*, 2014), or by analysing curriculum gaps for climate communication as part of climate literacy (Cooper *et al.*, 2019). However, a more comprehensive and systematic overview does not exist yet. This article makes the current body of evidence on climate communication available to the community of sustainability in higher education, and explores how higher education may be inspired by this evidence.

Approach

Work for this article started with a review of handbooks on climate communication (Corner and Clarke, 2016; CRED and ecoAmerica, 2014; Hesebeck, 2018; Marshall, 2014; Schrader, 2021; Stoknes, 2015; Webster and Marshall, 2019; later complemented by Hayhoe 2021). The various aspects each author presents as being related to effective climate communication were extracted and clustered. A first draft of key principles was evolved. Then a broader review of scholarly literature was conducted, in order to refine the list of key principles (based on e.g. Moser, 2016; Kumpu, 2022), and substantiate the principles with concrete scientific evidence.

The first part of the article presents an overview of the ten evolving key principles (for more detail see (Sippel *et al*., 2022). Based on the author's perspective as a 'reflective practitioner' (Copeland *et al.*, 1993) in the field of higher education for sustainability, the second part of the article then explores what universities could learn from climate communication. This second part of the work is conceptual in nature and meant to be an invitation for discussion.

Findings – Key principles for effective climate communication

When we care for something, this can be a very powerful motivation to take action around this issue. Figure 1 shows that caring about climate is about cognition, *and* emotion and behaviour. This insight provides the foundation for the key principles presented later on.

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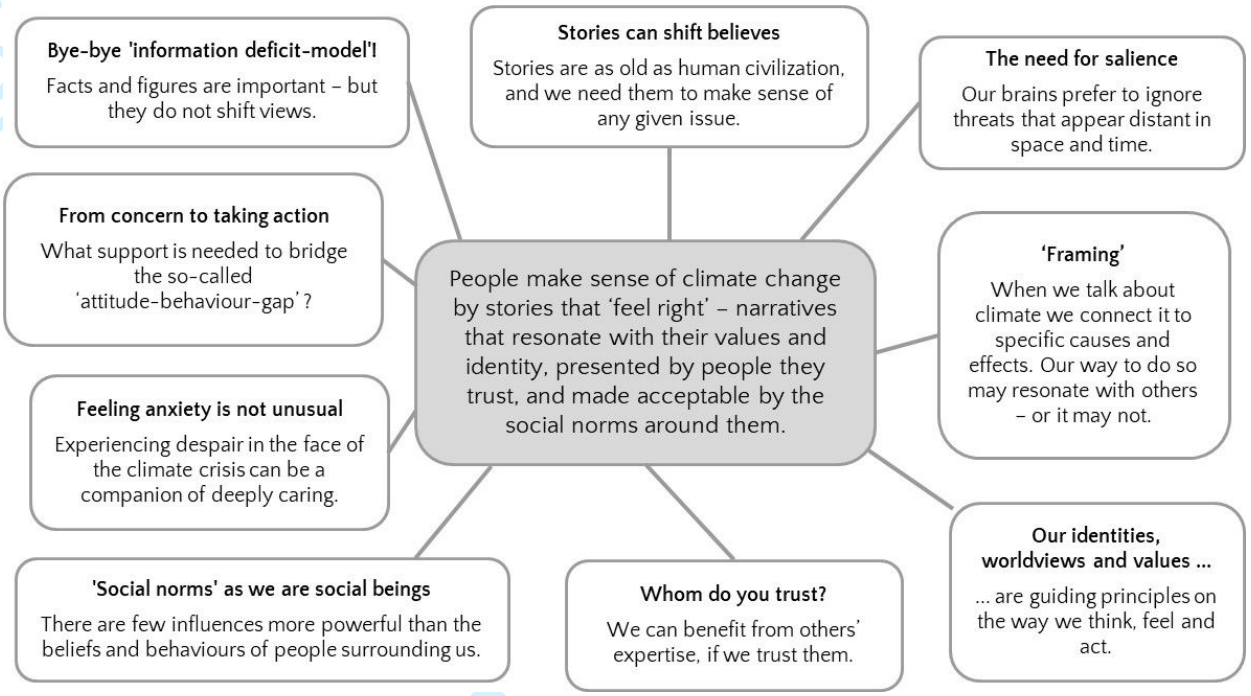

Figure 1: How people come to care about climate

Source: Based on Seethaler et al., 2019; Leiserowitz, 2006; Hayhoe 2018 (for 'information deficit-model'); Gustafson et al., 2020 (for 'stories'); Gifford, 2011; Lorenzoni and Pidgeon, 2006 (for 'salience'); Badullovich et al., 2020; Nabi et al., 2018 (for 'framing'); Corner et al., 2014; Leiserowitz, 2006 (for 'values'); Goodwin and Dahlstrom, 2014 (for 'trust'); Hawkins et al., 2019; Sparkman et al., 2021 (for 'social norms'); Gunasiri et al., 2022; Baudon and Jachens, 2021 (for 'eco-anxiety'); Kollmuss and Agyeman, 2002; Bouman et al., 2021 (for 'action'); Brick et al., 2021 (in general)

The following presents ten key principles for effective climate communication. The principles are structured into three clusters: First, what has proved successful to open the door; second, what is needed to reach minds and hearts; and third, what has been found to help turn concern into action. There is some logical order in this categorisation, the first category of principles probably being a basis for the other categories, the second category providing well researched insights on how to communicate more effectively, and the third category focussing on the less researched field of how climate communication can trigger public engagement and climate action. However, all three are probably needed to effectively engage people.

To start with, three principles seem to be especially relevant to open the door and prepare the ground for having climate conversations:

1. Start with people's values and search common ground

Though this is not a general rule (see e.g. Kollmuss and Ageyman (2002) for the so-called 'attitude-behaviour-gap'), values are generally a good guide to the way people think, feel, and act on a whole range of different topics – including energy and climate change (Corner *et al.*, 2014; Corner *et al.*, 2016; Hornsey *et al.*, 2016). One focus of climate communication research has been on better understanding how climate communication can connect to the values and worldviews of target groups (Moser, 2016). The values of a person communicating climate may often not be the same as the values of their audience. As many climate communicators used to have an environmental background, the way they intuitively communicated climate probably resonated best with

environmental audiences (Whitmarsh and Corner, 2017). However, a key challenge may now be to reach groups from all over societies.

As the climate crisis is a threat to every element and all aspects of our lives, a connection can be drawn to climate from all kinds of different values of a specific target group (e.g. Hayhoe, 2021). There is research on values held by different segments of societies and how they connect to climate for different national contexts such as the United Kingdom (Wang *et al.*, 2020, 2021), the United States (Leiserowitz *et al.*, 2022), Australia (Morrison *et al.*, 2018), or Germany (Melloh *et al.*, 2022). Amongst others, this research lines out shared values connected to climate that provide a common ground for climate communication likely to resonate with most people. These shared values seem to include: health; restoring balance between humans and nature; autonomy, energy security and safety; passing over a good world to our children (IPCC WGIII, 2022; Melloh *et al.*, 2022; Wang *et al.*, 2020, 2021).

2. Nurture trust in messengers

Trust is a precious commodity in communication. People will usually connect more easily with the message of a messenger whom they perceive as credible and who speaks to their world views, or who even belongs to their community (Fielding *et al.*, 2020). Trust in climate communication can be nurtured by identifying and supporting new climate communicators that are already trusted persons for a specific target group – for example a study in the US showed that the impact of the same climate messages increased, when they were attributed to members of the Republican party or the military (Bolsen *et al.*, 2019). Climate communication can support such 'new voices'.

Concerning specific 'types' of communicators, global surveys on trust find a low level of public trust in politicians and the media, and high levels of trust in scientists (Edelman, 2021). Scientist's credibility can be further enhanced by perceived competence and good intentions (National Academies of Sciences, Engineering, and Medicine, 2017; Hendriks *et al.*, 2015), as well as by their authenticity, that is whether people are able to experience the expert as a person, with unique and individual qualities, beyond a role as researcher or member of a certain institution (Saffran *et al.*, 2020; Dudman and de Wit, 2021). Furthermore, a perceived consistence between the message of any communicator and the communicator's own behaviour is important, that means messengers 'walking the talk' by adopting pro-climate lifestyle changes, and letting people know about it (Attari *et al.*, 2019; Attari *et al.*, 2016; Sparkman and Attari, 2020).

3. Research, test, and don't trust your own instincts

Climate communication researchers have acknowledged they need to engage more with practitioners, and in that course need to make use of their own findings to do this effectively (Moser, 2016). Vice versa, practitioners in climate communication can benefit from adopting an attitude of 'reflective practitioner', and taking into account scientific evidence. Everybody is deeply involved in their own issues, and can therefore not depend on their own intuition to tell them what would work for other people. Therefore, climate communication must make a deliberate effort to really understand a target group. This can be done by consulting existing research (e.g. for the UK Wang *et al.*, 2020, 2021; for Germany Melloh *et al.*, 2022) or doing their own research – from informal conversations to more formal research designs such as narrative workshops (Shaw and Corner, 2017) or surveys. Testing before publishing widely is advisable, and there is a need for evaluation in order to identify successful examples (Whitmarsh *et al.*, 2013).

The following four principles focus on what has been found supportive in *reaching people's minds and hearts* – that is how communicators can address both people's more rational *and* more emotional parts:

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4. Bring climate home – highlighting solutions

Although climate impacts have grown in salience during the last years, climate is still sometimes presented and perceived as an issue far away. Such perceived distance leads our brains to ignore the threat (e.g. Gifford, 2011). Showing examples of relevant climate action and climate impacts on a local (or regional and national) level can help create the salience needed (Loy and Spence, 2020; Howe *et al.*, 2019; Scannell and Gifford, 2013). While risk perception *can* motivate people (e.g. Smith and Mayer 2018), overall people are not likely to engage with climate, when they are overwhelmed by fear; furthermore, frequent alarmistic messages may also numb people (Gifford, 2011). Positive emotions like hope in contrast have been found to favour climate actions (Schneider *et al.*, 2021; Nabi *et al.*, 2018), and showing climate solutions can inspire such hope (Feldman and Hart, 2018). Striking the right balance between inspiring hope and not painting an unrealistically rosy picture of how the future will be may be especially important.

5. Use frames and narratives in a considered way

Intentionally or unintentionally, all messages about climate change are 'framed' by the words and narratives we use to describe the issue in a simplified way. One person may describe climate change as an 'environmental issue', another as a 'risk to the economy', and still another as a 'public health issue'. There has been a lot of research showing that the framing of climate influences the associations people have (Balludovich *et al.*, 2020), depending on whether the frames used resonate with their world views, values and identity (Corner *et al.*, 2014). In order to connect to a target group in a positive way, climate communication can build on this knowledge (Nisbet, 2009). To give one example, a number of studies tested narratives of climate with more conservative groups in Great Britain (Climate Outreach, 2022; Corner *et al.*, 2016; Whitmarsh and Corner, 2017), and found the following framings to resonate with conservative British audiences when talking about renewable energies: 'avoiding waste' (for energy-efficiency), 'clean energy and dirty fossil fuels', and 'renewing the energy system'.

6. Use imagery to tell powerful stories

As humans, we tend to make sense of any given issue through stories we tell each other about it and the images they create in our minds (e.g. Bruner, 1991). There is scientific evidence that personal stories can shift climate change beliefs (Gustafson *et al.*, 2020). By showing the human faces behind an otherwise abstract issue, stories speak to the more emotional part of our brains, which is not easily reached by graphs or statistics, but central for our moral risk-perception and motivational processes (Roeser, 2012). In general, important components for a good story seem to be: a structure including e.g. challenges, planning and emotional high points, describing in some detail the objects and meaningful events involved (McCabe and Peterson, 1984).

The 'visual language' used to communicate climate is also crucial, and images, if used in the right way, are a powerful tool to complement a message (Feldman and Hart, 2018; O'Neill and Smith, 2014; Wang *et al.*, 2018). Some guidance for imagery in climate communication has been formulated by scientists (Chapman *et al.*, 2016), and informed the creation of an evidence-based image library (Climate Visuals, 2022).

7. Provide accurate information

Accurate information on its own is not sufficient for effective public engagement (Shi *et al.*, 2016; Sturgis and Allum, 2004). However, information plays an important role. There is often a rather superficial public understanding for climate change (Moser, 2016). For example, many people do not connect the dots between climate change and energy (Climate Outreach, 2022). This needs correct information, communicated in an easily understandable way.

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Climate science often includes sources of uncertainty, and there may also be conflicting information e.g. from diverging model estimates (Kause *et al.*, 2021). That is why, for example, a range of variability is given for climate scenarios, or why specific extreme weather events are allocated to climate change with a certain probability. It seems helpful here to lead with what is known for certain (Corner *et al.*, 2018), and explain reasons for uncertainty (Kause *et al.*, 2021).

The last three principles focus on what has been found supportive in *turning concern into action*: What has climate communication research got to say about bridging possible gaps between attitude and behaviour?

8. Make climate communication interactive

Traditionally climate communication has been understood as 'strategic messaging', often elite-led – with people as passive receivers of optimised messages (Moser, 2016; Pearce *et al.*, 2015). Scholars argue that this unidirectional approach needs to be expanded and people need to become active parts of conversations, if public engagement is to be strengthened (e.g. Badullovich, 2022; Brulle, 2010). This is in accordance with a paradigm shift from 'transmission' to 'interaction' in broader communication theory (Ballantyne, 2016).

A number of possibilities are proposed, of how climate communication can become more interactive. To start with, climate conversations with friends and families seem to have positive effects, in that people can learn about climate and see that their loved ones care about climate (Goldberg *et al.*, 2019); and such conversations have also been found to increase political activism (Roser-Renouf *et al.*, 2014). Webster and Marshall (2019) provide some practical guidance on how to nurture such conversations. Then, climate communication can also host climate dialogues between science, society and politics. Examples for this include a science-society dialogue held in Tasmania (Kelly *et al.*, 2020); a proposal for the IPCC to engage in dialogue with lay people in order to integrate alternative, non-scientific forms of knowledge (Dudman and de Wit, 2021); dialogic and deliberative processes in climate policy-making, which potentially enhances acceptance and engagement of people (Pearce *et al.*, 2015); and nurturing constructive discussions and relationship-building between the different actors involved in implementation of climate solutions (Badullovich, 2022).

9. Make climate action an issue of social belonging

There are few influences more powerful on people's attitudes and behaviours, than their friends and social networks, and the beliefs and behaviours they perceive as normal around them (Mackay *et al.*, 2021; Hawkins *et al.*, 2019). Such 'second-order beliefs' establish social norms (Mildenberger and Tingley, 2019), and they can motivate climate action and support for climate policies (Nolan, 2021; Fielding and Hornsey, 2016). If climate communication succeeds in delivering social proof that 'people like you and me are taking action', it can shift social norms. The challenge posed by the fact that climate action is often not yet the dominant behaviour in a group can be overcome by showing proof of others *changing* their behaviour, which underlines the wider evolvement of norms over time (Sparkman *et al.*, 2021). Showing a range of action, including engagement beyond consumer choices, is valuable in that it broadens common perspectives on what constitutes individual climate action.

10. Offer possibilities for meaningful personal action

Motivating and empowering people to take climate action is obviously a purpose of public engagement efforts, and thus also a core objective of climate communication. While from a system's perspective, cumulated personal actions are the building blocks of the energy transition, from an individual perspective personal action can help to cope with eco-anxiety (Baudon and Jachens, 2021; Gunasiri *et al.*, 2022), and to reduce cognitive dissonance – a widespread phenomenon where one's behaviour is inconsistent with one's values (e.g. Stoknes, 2015).

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There are essentially two directions of personal climate action that are needed for overall change: Firstly, reducing individual 'carbon footprints', and secondly, acceptance for climate regulations and engaging with the political processes needed to bring about these regulations. The latter also includes acting collectively, and such social organising has been found to underpin social change, e.g. by 'shifting the possibility space of public policy on climate change mitigation' (IPCC WGIII, 2022. p.5-83). To both ends, climate communication can play an important role (Ockwell *et al.*, 2009). Up to now, there has however been a lack of attention on how to engage people regarding the political (Carvalho *et al.*, 2017).

Key principles of climate communication for effective public engagement
How to open the door: 1. Start with people's values and search common ground 2. Nurture trust in messengers 3. Research, test, and don't trust your own instincts
How to reach people's minds and hearts: 4. Bring climate home – highlighting solutions 5. Use frames and narratives in a considered way 6. Use imagery to tell powerful stories 7. Provide accurate information
How to turn concern into action: 8. Make climate communication interactive 9. Make climate action an issue of social belonging 10. Offer possibilities for meaningful personal action

Table 1: Overview of the key principles presented

Limitations

The presented overview of key principles for climate communication is a summary, and by nature a simplified picture of the rich and complex field of climate communication research – and more detailed information would be available for all principles. Furthermore, there are areas that seem increasingly relevant for public engagement and climate communication, but have not been researched in depth and are thus not covered in the summary. One example is how we build resilience to deal with the negative impacts of the climate crisis both on a personal and societal level, and what role climate communication can play to this end.

It should also be kept in mind, that research findings are specific to social, cultural, and political circumstances in the societies they researched, e.g. differing between societies that are highly polarised on the issue like the US, or that already have high levels of concern across society like the UK or Germany. There is so far a lack of research in many countries, especially in the developing world, and in summarising existing research this article has the same shortcoming.

Exploration – what can sustainability in higher education learn?

The following presents some reflections, on how the presented findings of climate communication research can inform and potentially strengthen the transformative work of universities and university members. These reflections are based on the author's perspective as a 'reflective practitioner' in the field of sustainability in higher education. That means the following section is conceptual, and based

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primarily on the author's knowledge and experiences. It provides an invitation for readers' own reflections and further discussions.

Universities contribute to the sustainability transition in four areas: Teaching, research, third mission, and greening their operations (Velazquez *et al.*, 2006). This section explores some implications for each of these areas, with an emphasis on teaching. It then outlines a specific project idea, that may gradually involve all of the four areas.

1. Teaching

It seems that teaching could integrate the presented knowledge base in two ways: First, in order to prepare students for their roles in shaping the sustainability transition, 'climate communication literacy', and a longing to apply this literacy, may be an important competence teaching wants to convey in students. This may be especially relevant in study programmes with a climate or sustainability focus, as there is a high probability that students will end up communicating around climate in their jobs. Such teaching could be in specific courses. For example, based on the ten key principles presented, we designed a new course "Climate Communication" with three credits in winter semester 2022/23. The course was offered as part of Studium Generale (General Studies) and as an elective course. The course provided 13 students with knowledge and competencies for effective climate communication, with interactive exercises e.g. on values and active listening. Accompanying the course, each student had to find a sparring partner which they assumed was not yet convinced of the necessity of climate action. Each student conducted three conversations with their partner: The first focussed on listening and identifying the partner's values, attitudes and questions towards climate, the second focussed on reaching the other person and bringing climate action closer to them, and the third conversation focussed on reflecting how this series of conversations was perceived by the partner and the student. Results from the first run of this course are encouraging: All students were able to find an external partner. They were highly motivated to put the theoretical knowledge gained during the lessons into practice. All students assessed the conversations they had led as "positive" or "very positive". For future conversations they identified the following aspects as especially important: Relax, listen carefully, stay authentic, devote attention on how to conduct the conversation (meeting in person preferably, consider to eat climate friendly food together), – and just do it.

Climate communication literacy could also come as an addition to existing courses – e.g. project-based teaching could provide students' with basic information on effective climate communication and then ask them to develop a piece of communication that is informed by this information.

Second, teaching itself is an act of communication, and the following aspects may be promising in order to make this communication more effective in terms of engaging students:

- *Connecting climate to the values of students* and framing climate in a way that resonates with these values. This might include bringing in climate messengers from the broader community of students, that students connect easily with (e.g. by showing a respective youtuber, sport star or musician that is genuinely involved in climate action). Finding analogies that speak to the specific disciplinary background of a study course may also be helpful. For example, a colleague gives MBA students the task to view planet earth as a business and come up with a business strategy, which regularly leads them to develop very ambitious sustainability pathways.
- *Increasing teachers' credibility and trustworthiness*, by not only providing accurate information, but by also being tangible as a human being that responds to this information, for example by sharing one's own story of how one became involved with climate, and what one has chosen to do about it. Consistency between one's message and one's own behaviour

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has been found to matter a lot – and university teachers should be aware that with their own behaviour they have a rather high influence on what students perceive as social norms (e.g. Westlake (2017) for the high influence of professors that gave up flying).

- *Telling climate also as a story*, in order to complement graphs, facts and scientific language. This can include making use of powerful imagery, in order to address not only the rational but also the emotional side of students. Presenting tangible real life examples of meaningful climate impacts and climate action on the local (or regional and national) level can bring climate home and make it feel more salient.
- *Bringing in persons from outside university*, that have relevant experience and expertise in the area of interest (e.g. farmers, health workers, renewable energy engineers, climate officers from local administration, CEOs from local sustainability champions). This shows students the human faces behind the theoretical knowledge, and sharing climate solutions may be especially important as it nurtures hope. Bringing in external people into a course has been greatly simplified by the grown literacy and equipment for video conferences.
- *Providing space for interaction and connecting* instead of pure one-way teaching. A teaching format that the author finds especially effective towards this end includes a so-called 'personal change experiment' (Climatechallenge, 2022), which encourages and empowers students to take climate action for a trial phase during the course, both towards reducing carbon footprints and as social citizens. Besides experiences of self-efficacy, this leads to the emergence of personal stories of climate action and their exchange among students and beyond.

2. Research

Considering research and how it can be informed by climate communication science, this depends on a university's research profile. Four aspects may be relevant: First, climate communication can be made the subject of research, and some fields less explored so far include: all aspects of climate communication in most developing countries, how to evaluate the effectiveness of climate communication, how to include more interactive forms of communication, how climate communication can deal with the growing despair in face of the climate crisis (Moser, 2016). Second, applied research can be helpful in order to analyse and prepare information and material so climate can be presented as a local and regional issue (e.g. climate related local changes in weather, forests, farming, or health system; as well as local increases in PV and wind energy installation, or building insulation). Third, applied research could evaluate teaching approaches and their effectiveness in promoting students' climate stewardship. Fourth, the climate communication evidence base can inform climate scientists (and sustainability scientists more broadly) on how to effectively communicate findings to lay people.

3. Third mission

How a university's third mission activities could build on the climate communication evidence base depends again on the university's profile, and on the sustainability challenges of the community and society it is part of. There may be a case for organising climate dialogues, with a special focus to include participation of all parts of society. It could also be interesting to partner with regional news corporations, providing them with science-based localised information related to climate, and sharing insights on effective climate communication. Knowledge about effective climate communication could also be interesting for other local stakeholders, and it could become part of a university's knowledge transfer.

4. Greening university operations

Becoming a carbon neutral university involves technical changes like installation of renewable energies or building energy efficiency measures. However, a significant share of emissions is also directly attributable to behaviours of university members (such as commuting choices, travel

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behaviour, dietary choices in the cafeteria, and energy-saving behaviours in class rooms, offices and laboratories). Furthermore, decisions on technical changes are also taken (at least partly) by members of the university. The sustainability transition within universities depends highly on the acceptance and participation of university members, therefore communication for effective engagement probably plays a key role. Universities should recognise this and build an 'engagement infrastructure', that gets university members on board for the envisioned changes, so that they want to be part of that change and 'do their share'.

5. Project idea: University Storytelling Exchange

Inspired by the Local Storytelling Exchange pilot project in the UK (Corner, 2022), the following outlines a project idea that builds on quite some of the climate communication insights presented previously. A University Storytelling Exchange could identify and prepare real-world stories on meaningful climate action by university members. The selection of stories and persons, and the way stories are prepared would be informed by the key principles of climate communication, and stories would also include doubts and challenges. This could be stories about a professor leading the university's carbon accounting working group, an officer installing new energy management devices in the heating system, a student engaging in the students' 'green office', the cafeteria chief integrating gradually more climate-friendly meals, or the president of the university advocating for better funding for the university's building retrofit. Stories could be shared via the university's existing communication channels, including social media.

This project could include teaching, in that the preparation of stories could be part of study projects (probably communication study courses are especially well equipped to do so), and future teaching on climate at the university could include the stories as teaching material. Research could try to evaluate the effect of the storytelling exchange. With regards to third mission, the university story exchange could share stories with the broader local and regional community. People would perceive the university as taking action on climate, which may contribute to local change dynamics. Furthermore, the project could also search for local partners like green businesses, that also want to engage their staff for the sustainability transition, and tandem with them in setting up a company storytelling exchange.

Conclusion

There is broad scientific evidence that, while facts and figures are important, they do generally *not* shift views. A still widespread approach to climate communication based on the 'information-deficit-model', and primarily wanting to better inform people, can be considered to have failed. Instead, people tend to care about climate when they are touched cognitively *and* emotionally. It has been shown, that to do so, climate communication needs to go far beyond delivering information. The ten key principles presented in this paper illustrate this in more detail: Connecting to the values and world views of people is essential for effective communication – and considered use of framings and promotion of trusted messengers are ways to do so. In order to reach people effectively, it is also important to present climate as a local issue with human faces behind it. Finally, to turn concern into action, it seems that interactive communication can be crucial, including exchange of stories on how people like you and me have begun to take different kinds of climate action.

This article then reflects on what sustainability in higher education might learn from the evidence base on climate communication. Some suggestions have been provided for teaching (e.g. complement information provided with consistent behaviour by the lecturer; integrate external voices and localised stories; and provide students with basic skills to communicate climate

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effectively), for research (e.g. make teaching for effective engagement of students the subject of applied research), for third mission (e.g. provide trainings to empower local stakeholders for effective climate communication), and greening the campus (build up a proper engagement infrastructure). A project idea of a 'University Storytelling Exchange' has been briefly presented. By identifying and preparing stories of relevant climate action by all kinds of university members, this could put many of the principles into practice. It could be one building block of a university's engagement infrastructure, and it could also become the nucleus for a broader local storytelling exchange in the region.

This paper presents reflections on how to apply the scientific evidence on climate communication in higher education for sustainability. These reflections are explorative and interpretative in nature, and they present an invitation for discussion. Future research could bring each principle of climate communication together with the scientific evidence base on education for sustainable development. By doing so, it might also be interesting to analyse what climate communication can learn from the evidence base on sustainability in higher education.

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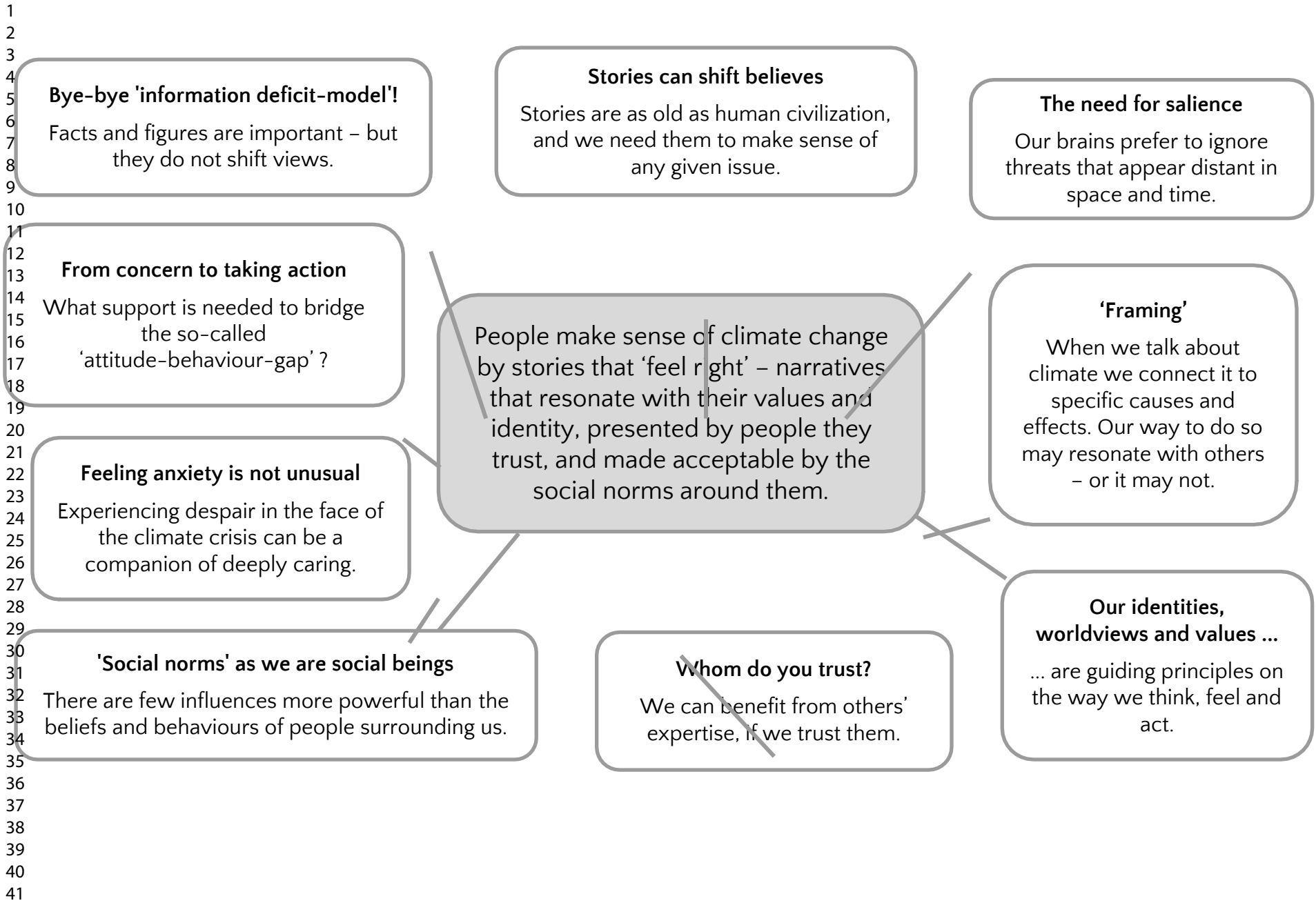
Bye-bye 'information deficit-model'!
Facts and figures are important – but they do not shift views.
Stories can shift believes
Stories are as old as human civilization, and we need them to make sense of any given issue.
The need for salience
Our brains prefer to ignore threats that appear distant in space and time.
From concern to taking action
What support is needed to bridge the so-called 'attitude-behaviour-gap' ?
People make sense of climate change by stories that 'feel right' – narratives that resonate with their values and identity, presented by people they trust, and made acceptable by the social norms around them.
'Framing'
When we talk about climate we connect it to specific causes and effects. Our way to do so may resonate with others – or it may not.
Feeling anxiety is not unusual
Experiencing despair in the face of the climate crisis can be a companion of deeply caring.
'Social norms' as we are social beings
There are few influences more powerful than the beliefs and behaviours of people surrounding us.
Whom do you trust?
We can benefit from others' expertise, if we trust them.
Our identities, worldviews and values ...
... are guiding principles on the way we think, feel and act.

Key principles of climate communication for effective public engagement
How to open the door: 1. Start with people's values and search common ground 2. Nurture trust in messengers 3. Research, test, and don't trust your own instincts
How to reach people's minds and hearts: 4. Bring climate home – highlighting solutions 5. Use frames and narratives in a considered way 6. Use imagery to tell powerful stories 7. Provide accurate information
How to turn concern into action: 8. Make climate communication interactive 9. Make climate action an issue of social belonging 10. Offer possibilities for meaningful personal action

Table 1

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