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Climate change and vulnerability from the perspective of psychology and pedagogy[**]

ABSTRACT: From the perspectives of psychology and pedagogy, climate stress provides useful psycho-educational references for professional discourse in various disciplines. Knowledge of the basic concepts of climate change and sustainability opens up possibilities that can bring us closer to understanding the experiences of the younger generation. Awareness and conscious development of sustainability competences will make a major contribution to addressing climate change, which is affecting an increasing number of people. In my study, I also highlight the importance of early prevention, which can reduce anxiety related to climate change.

KEYWORDS: climate change, climate risk, sustainability competences, sustainability awareness, pedagogical methods.

1. Introduction

The concept of sustainability awareness demonstrates that it can be measured in terms of attitudes, thinking and behaviour. Pedagogical aspects provide methodological tools for responsible preparation for a sustainable future. A deeper understanding of the subject also shows that concepts that we might consider traditional, such as talent management, are also worth reinterpreting in the light of sustainability.

2. Basic concepts related to climate risk

Ecopsychology is a transdisciplinary field that draws attention to our relationship with living systems and their psychological implications, thus approaching climate change from a psychological perspective. Its starting

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point is systems thinking.[1] Ecopsychology argues that the human psyche is inseparable from natural systems and that we are intimately connected to nature. By listening to the signals of our natural environment, many questions about the human psyche can be answered. This approach also states that ecological crises can be traced back to deeper psychological and social causes.[2] The practical aim of ecopsychology is to help people develop a positive relationship with nature, thereby promoting sustainable behaviour and active participation in solving environmental problems. It also emphasises the healing power of the natural environment, for example, through forest bathing or nature-based therapies.

In recent years, several new concepts have entered public consciousness and international literature, which must be defined precisely and distinguished clearly. In this chapter, we will review the most important concepts related to negative earth feelings.

Climate stress: in our everyday lives we are increasingly confronted with the ever more threatening consequences of climate change, which threaten not only our environmental but also our psychological well-being. In particular, we are becoming increasingly sensitive to issues affecting younger generations. The concept of 'climate anxiety' is gaining attention as we show emotional reactions to environmental degradation, uncertainty about the future and the impact of the climate crisis. For example, increasingly hot summer periods can be a cause for serious concern. Climate anxiety is often associated with coping mechanisms such as cognitive biases and self-protection strategies. People tend to avoid information that triggers anxiety or even to trivialise the significance of climate change[3]. However, these mechanisms do not reduce anxiety in the long term, they may actually exacerbate the problem. A more severe form of climate anxiety is climate depression, which is dominated by a sense of hopelessness about the future. This condition results from the emotional burden of the ecological crisis and a sense of helplessness due to the lack of a solution.[4]

The issue of climate change and existential anxiety is receiving increasing attention in the psychological literature, especially through the work of Zoltán Kőváry.[5] He explores climate change anxiety as a modern

[1] Molnos, 2020, p. 29.
[2] Roszak, 1992; Fisher, 2013.
[3] Clayton et al, 2017.
[4] Hickman et al, 2021.
[5] Kőváry, 2019. 2021.

existential threat and points out that the environmental crisis is not only an ecological but also a psychological problem, reinforcing people's uncertainty about the future, their existential fears, and the effects on their identity. Climate stress is increasingly becoming a social phenomenon and affects mental health on both an individual and community level. It is important to highlight that climate change anxiety is not necessarily pathological; it can also serve as an opportunity for individuals and society to promote positive change.[6]

Eco-anxiety is an emotional state that arises from the loss of nature or biodiversity due to climate change. This feeling can be similar to the grief associated with personal loss, as we maintain an emotional connection with nature in our everyday lives, albeit to varying degrees.[7]

Nature-deficit disorder describes the adverse effects on the human psyche resulting from a lack of contact with nature, especially in urban settings.[8] This is also reflected in the Sustainability Competency Framework, which points out that "Nature-deficit disorder" indicates the neative consequences of alienation from nature. These include reduced sensory engagements, difficulties in concentration, higher incidences of physical and emotional illnesses, increasing rates of myopia, as well as higher rates of childhood and adult obesity and vitamin D deficiency."[9]

Biophobia, the fear of certain species and aversion to nature, is closely linked to modern society's alienation from nature. Biophobia also has evolutionary roots. It often stems from a fear of potential dangers in nature, such as poisonous snakes or insects. While biophobia can be understood as an adaptive response linked to human survival, in modern urban contexts these fears may prevent individuals from experiencing the positive effects of nature.[10] The psychological relevance of biophobia is closely related to the concept of biophilia, which describes the human attraction to nature. Some research suggests that these opposing emotional responses - biophilia and biophobia - together shape people's connection to nature. For example, one study has shown that even young children associate both positive (e.g. happiness) and negative (e.g. fear) emotions with images of nature,

[6] Kőváry, 2021.
[7] Albrecht, 2012.
[8] Louv, 2008.
[9] Bianchi, Pisiotis and Cabrera, 2022, p. 19.
[10] Britannica, 2023; APA Dictionary of Psychology, 2023.

depending on how safe or threatening they appear.[11] The educational and design implications of biophobia are also significant: in addition to creating a natural environment, schools are increasingly focused on providing practical knowledge about the living environment. In contrast, *necrophilia* - a preference for the dead, inanimate, artificial - often results from the overuse of technology and neglect of the natural environment. According to Fromm, necrophilia is one of the most damaging psychological tendencies of modern society.[12] The generation growing up in the digital space could be at real risk of the latter.

2.1. The role of early prevention and socialisation in tackling climate risk

Prevention must begin at a very early age, particularly regarding sustainability and mental health. The family and the school environments play crucial roles in helping children learn the basics of sustainable living and develop skills to protect their mental health.[13] Emotional education, the development of constructive problem-solving skills and the reinforcement of community values all help children cope with anxiety and stress. Above all, parental role modeling is crucial. Moreover, talent management should not focus solely on cognitive development but also on increasing emotional intelligence, which is also important in addressing climate stress. [14]

A very important part of early prevention is ensuring that adults understand the ecological model of health, which states that an individual's mental and physical well-being is closely linked to the natural environment. This holistic approach emphasizes that individuals, especially younger generation, can only be truly healthy if they develop constructive social relationships and adapt effectively to changing environmental and social stressors.[15] An individual's health depends not only on their physical condition but also on their social relationships, their ability to cope with stress, and their life goals. Therefore, a combination of mental, physical and social dimensions is necessary for a healthy life. However, climate change poses serious challenges for both adults and young people, often leading to anxiety, depression or detachment from nature.[16] A balanced approach to

[11] Olivos-Jara et al., 2020
[12] Fromm, 1964.
[13] Bronfenbrenner, 1979.
[14] Sternberg and Davidson, 2005.
[15] Capra, 1996.
[16] Clayton et al, 2017.

the ecological model of health can help address these issues, as individuals must consider not only physical health but also mental, social and environmental contexts.

3. Psychological aspects of the sustainability competence framework

Accurate knowledge of sustainability competences has become indispensable. Sustainability is a key priority for the European Commission for the period 2019-2024, and the European Sustainability Competences Framework was developed and published in January 2022.[17] GreenComp's main objective is to promote learning about environmental sustainability. Incorporating this topic into our education and training systems is a priority, as the multi-factorial socialisation process that can lead to sustainable living, work and activities must begin at an early age. The pedagogical and psychological importance of this starts at the level of skills and attitudes.

The purpose of the Framework of Reference for Sustainability Competences is multifaceted. It includes reviewing curricula against the Framework, developing teacher training programmes, and encouraging thematic self-evaluation and reflection. The long-term goal of making the EU a climate-neutral continent by 2050 requires that sustainability competences be developed at all levels of education and training. "Let's bring nature back into our lives!"[18] This mission fits well with the concept of lifelong learning, which integrates sustainability issues throughout learning process. GreenComp provides learners with a common basis of concepts and competences, as well as a precise guidelines for educators to develop a solid, practice-oriented vision of sustainability. The Sustainability Competency Framework is the result of professional consultation with 75 experts and groups. Although the framework has not yet been tested in real-life contexts, it should be treated as a living document.[19] Critical and systemic thinking on the part of teachers is also highlighted. The notion of sustainability is multidimensional, which is why the term „sustainability" is retained of environmental sustainability.

"Sustainability means prioritising the needs of the planet and all life forms while ensuring that human activity does not exceed the limits of our

[17] Bianchi, Pisiotis and Cabrera, 2022.
[18] Bianchi, Pisiotis and Cabrera, 2022. p. 3.
[19] Bianchi, Pisiotis and Cabrera, 2022. p. 9.

planet's tolerance".[20] Viewed from a life-cycle perspective, this definition uses abstract concepts that can be difficult to grasp, even for adolescents. When understanding sustainability, it is important to recognize that it requires a certain level of cognitive development, the ability to think abstractly, and the ability to analyze complex systems. It is crucial that GreenComp is relevant to all ages, types of learning, and areas of life. Understanding and internalizing the concept requires mature cognitive processes and must be interpreted not only in an age-specific manner but also in a way that builds on experiential and prior knowledge, translating into tangible experiences that children can grasp. "Sustainability literacy enables learners to embody sustainability values and consider complex systems in order to take or articulate actions that restore and preserve ecosystem health and enhance equity, enabling them to envision different sustainable futures." The central idea of environmental sustainability learning is that humans are part of nature and dependent on it. This needs to be integrated into everyday thinking from childhood to adulthood, developing and mastering sustainability competences.

The four competency areas cover a total of 12 competences, which comprehensively cover the different dimensions of sustainability. Importantly, the Recommendation provides precise definitions to guide teachers. 'Like the other EU competences frameworks, GreenComp is not prescriptive. It provides a conceptual reference model that can be used by all stakeholders in lifelong learning with different objectives.'[21] The 12 sustainability competences are presented in the table below.

Table 1 *The 12 sustainability competences*

Territory	**Competence**	**Description**
1. Embodying sustainability values	1.1. Assessing sustainability	Reflecting on personal values; identifying and explaining how values diverge across individuals and over time, while critically assessing how they align with sustainability values
	1.2. Promoting fairness	Promoting equity and justice for present and future generations, and learning from previous

[20] Bianchi, Pisiotis and Cabrera, 2022. p. 12.
[21] Bianchi, Pisiotis and Cabrera, 2022, p. 30; Dessart, 2022.

		generations for sustainability.
	1.3. Promoting nature	Recognising that humans are part of nature; and respecting the needs and rights of other species and nature to restore and regenerate healthy and resilient ecosystems.
2. Taking into account the complexity of sustainability	2.1. Systems thinking	Approaching sustainability problems from all possible angles; consider time, space and context to understand how elements interact within and across systems.
	2.2. Critical thinking	Evaluating information and arguments, identifying assumptions, questioning the status quo and reflecting on how personal, social and cultural backgrounds influence thinking and conclusions.
	2.3. Outline of the problems	The formulation of current or potential challenges as sustainability problems in terms of difficulties, people involved, time and geographical scope, in order to anticipate and prevent problems and to identify approaches to mitigate and adapt to existing problems .
3. Outlining sustainable visions	3.1. Future literacy	Outlining possible sustainable futures by imagining and developing alternative scenarios and identifying the steps leading to the preferred sustainable future.
	3.2. Adaptability	Managing transitions and challenges in complex sustainability situations and making decisions about the future

		in a context of uncertainty, ambiguity and risk.
	3.3. Exploratory thinking	Developing a relational mindset by exploring and connecting different disciplines, thinking creatively and experimenting with new ideas or methods.
4. Action for sustainability	4.1. Political self-determination	Navigating the political system, identifying political responsibility and accountability for unsustainable behaviour, and demanding effective policies for sustainability.
	4.2. Collective action	Acting with others for change.
	4.3. Individual initiative	Identifying own sustainability potential and actively contribute to improving the prospects of your community and the planet.

Source: Bianchi, Pisiotis, Cabrera, 2022, pp. 14-15, own ed.

For each of the 12 competences, a list of knowledge, skills and attitudes has been developed, which can be particularly useful in education and serve as a basis for developing training courses or integrating them into existing training courses.[22]

3.1 Methodological options, pedagogical perspective

The long-term goal is to develop a sustainable mindset and the ability to change attitudes in the emerging generation. Sustainability competences are fundamentally transversal, i.e. they cut across disciplines and subjects. This calls for both a systems approach and a holistic approach to sustainability at all levels of educational institutions. This interdisciplinarity can also a pose challenges in the educational arena, as it affects all subjects yet does not belong exclusively to any one discipline.[23] 'The other problem is that as a

[22] Bianchi, Pisiotis and Cabrera, 2022, pp. 43-54.
[23] Réti and Varga, 2008.

consequence of "overloading" a subject, the additional activity is lost, especially if the output regulation (graduation requirements) does not support it.'[24]

From a pedagogical methodological point of view, the Recommendation highlights several potential pedagogical practices:

- experiential learning, which is essential for the acquisition of sustainability competences
- project-based learning
- analysis of real life case studies
- gamification, role-playing games
- learner- and activity-centred methods [25]

This can only be effective if teachers develop a school-wide culture of sustainability. Sustainability competences can also be integrated into psychology courses, provided they address topics such as:

- self and peer knowledge
- social psychology, cooperation
- problem-solving thinking and decision-making
- themes of responsibility and the development of indentity.

'The pedagogy of sustainable development is an opportunity for both methodological and content innovation.'[26] The same is true for the psychological aspects of sustainable development, an opportunity for methodological and content renewal along the themes, further deepening self-awareness competences and coping points of the personality.

3.2. Sustainability awareness

In parallel with the systematization of sustainability competences, a psychological construct has emerged, encompassing knowledge, attitudes and behaviours related to sustainability. This construct summarizes sustainability competences from a broader perspective. In Hungary, several initiatives have been taken in this field, such as the sustainability guide of the BGE (Budapest University of Economics and Business).[27] The aim of this study is to show how sustainability can be integrated into education with a focus on multidisciplinary approaches. It presents practical ways of

[24] Réti and Varga, 2008, p. 28.
[25] Réti and Varga, 2008, p. 27. Sourgiadaki and Karkalakos, 2023.
[26] Réti and Varga, 2008, p. 27.
[27] Budapest University of Economics and Business (BGE) (2023). *Guide to teaching sustainability and responsibility*. EFFORT project.

applying sustainability and responsibility concepts in educational programmes across different disciplines. The study from the University of Szeged discusses the development and socio-economic context of sustainability concepts in detail.[28] After presenting the historical and theoretical foundations of sustainable development, the study highlights challenges arising from the post-industrial era, such as natural resource depletion and the unsustainability of economic growth. Earlier works have focused on the social and economic dimensions of sustainability,[29] including sociological, legal and regional science aspects, analyzing how sustainability can be understood from the social sciences' perspective and applied to the economy and everyday life.

The SCQ-S (Sustainability Consciousness Questionnaire - Short form)[30] is a psychometric instrument that measures various aspects of sustainability awareness. The questionnaire is based on the three pillars of sustainability (environmental, social and economic dimensions). The shortened version (SCQ-S) contains 27 items that reliably measure the secondary (sustainability knowledge, attitudes and behaviours) and tertiary (sustainability awareness) constructs. The instrument has excellent psychometric properties and is widely applicable in educational and research contexts, as well as for assessing the effectiveness of sustainability initiatives. This paper presents the instrument, and empirical research results will be reported in a future publication. The questionnaire is suitable for measuring the effectiveness of educational programmes and interventions and for identifying areas for improvement at individual and group level. It is particularly relevant in education as it helps to assess the preparedness of the younger generations to address sustainability challenges. Positive experiences with the questionnaire have been documented, for example Ariza et al. (2021), who used the SCQ to investigate the impact of educational interventions in developing sustainability awareness. Their research indicated significant positive effects ont he knowledge and attitude dimensions in countries such as Spain and Belgium.[31]

[28] Kincses et al., 2023.
[29] Láng and Pálinkás, 2010.
[30] Gericke et al., 2019.
[31] Ariza et al., 2021.

3.3. Sustainable talent

A whole new perspective is offered by the horizon of understanding sustainability. Knowledge grows through learning, work, and diligence, which is now accelerated by talent and creativity. These qualities are increasingly scare and becoming bottlenecks, making their personalized development more critical. Access to opportunities is becoming more important than ownership, and this idea underpins a re-interpretion of the concept of talent. For every individual, family and community, access to the essential goods - such as education, housing, quality healthcare, and knowledge – is fundamental fpr nurturing talent and creativity.

Research[32] suggests the following steps to consider in integrating sustainability and talent management:

- Integrate sustainability competences into talent management programmes, for example through the GreenComp framework.
- Providing real-life learning opportunities that help people understand and solve environmental problems.
- Community projects and interdisciplinary learning models in which gifted students can be active participants.

Linking talent management and sustainability gives talented students the opportunity to contribute to more sustainable future while developing their individual skills. Such integrated approaches play an important role in connecting education with social responsibility and represent a holistic method that fits into a systems approach to sustainability, opening up new directions for thinking about gifted education.

3. Conclusions

The aim of the study was primarily to provide a literature review that informs and raises awareness of the importance of sustainability issues for legal professionals, and to provide an accurate understanding of sustainability competences. It is intended to inspire further questions rather than offer concrete answers or a definitive recipe for knowledge transfer processes and methods. However, the issue of sustainability is relevant to all professionals, and education must prepare young people for the challenges of climate change. The catalysts for this change are the teaching materials and curricula. The focal points and watchwords for learning sustainability

[32] Adams et al., 2021; Taber et al., 2017.

are: practice-oriented, socio-emotional, interdisciplinary, lifelong. These elements, developed at the level of practical skills, form a complex and constructive repertoire for coping with climate risk.

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