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Innovation in Higher Education and its Role for Sustainable Development – an Introduction to the Book

The world is facing major ecological, social, political and economic challenges. Sustainability and responsibility are key concepts that more and more guide the political discourse as well as strategic decisions in companies. The Sustainable Development Goals (SDGs), adopted in 2015 as part of the Agenda 2030 by the United Nations General Assembly, define specific areas where action is necessary to support sustainable development. They underline the importance of joint efforts of countries, communities, companies and other non- and for-profit organisations as well as individuals to reach these goals (United Nations General Assembly, 2015).

Higher Education Institutions (HEIs) play a crucial role in the transformation to sustainable economies. First, they may act as role models by operating their own institutions in a sustainable, responsible and ethical way. Second, they contribute with their research to knowledge development in the area of sustainability and responsibility. Third, and perhaps most importantly, HEIs may enhance values, skills and competencies that allow students to take responsible decisions in their future roles as professionals as well as individuals (Littledyke et al., 2013).

There is a long history of sustainability education, beginning with environmental and ethical education since the 70s of the last century and developing to the idea of sustainability education with the increasing awareness that social, environmental and economic issues need to be systematically integrated (Kirchherr & Piscicelli, 2019; Pauw et al., 2015). The United Nations coined the term "Education for Sustainable Development" (ESD), which refers to teaching and learning that includes key sustainable development issues (e.g. climate change, biodiversity, poverty reduction, and sustainable consumption) (UNESCO, 2013). In order to embrace teaching concepts with sustainability, but also with ethics or responsibility contents, this book will use the term "teaching for sustainability" and refers with that to all teaching and learning that fosters knowledge, skills, values, attitudes and according competencies to behave re-

sponsibly and take decisions that contribute to the SDGs set by the United Nations.

Due to the increasing popularity of the topic, the amount of literature on sustainability-related learning objectives and competencies and appropriate teaching approaches and methods has been on the rise (Bianchi et al., 2022; Brundiers et al., 2021; Lozano & Barreiro-Gen, 2021; Rieckmann, 2018). However, a holistic view on the factors influencing the effective delivery of these objectives and the successful nurturing of respective competencies is still missing (Medeiros et al., 2017). Consensus seems to apply to the notion that traditional pedagogies (e.g. lecturing) alone are not very effective in making the mission of more sustainable futures a reality (Lozano & Barreiro-Gen, 2021; Lozano et al., 2019), neither the mere digital enhancement (Serdyukov, 2017). Consequently, the UNESCO (2017) stated that it is essential to move towards more "innovative" pedagogical approaches and aligned pedagogical methods. According to Major et al. (2020, p. 12) "innovative pedagogies are teaching approaches and practices that are new or different in a particular context, and which are designed to purposefully and responsively benefit student experiences and outcomes in that context". Innovativeness may refer to novel teaching methods, innovative adopted technologies used for teaching and/or to contemporary topics in the field of sustainability (Dieleman et al., 2022). Innovations can be radically different or just incrementally change an approach that was used before, where the degree of innovativeness depends on the specific context (Major et al., 2020).

Investigating the effectiveness of innovative and novel pedagogies requires not only a clear definition and classification of teaching approaches and methods, but also the formulation of the goals and objectives of teaching and learning as well as hypotheses about variables that influence the effective delivery of teaching objectives. This book is therefore divided into two parts: a conceptual and methodological first part explaining the rationale behind the description of different teaching formats presented in a more practically oriented second part.

In the first part, chapter one sets the frame and conceptualizes the path between learning objectives and sustainable behaviour, explaining influencing factors such as pedagogical impact variables, behavioural predictors and competencies. Besides, teaching approaches and methods referred to in other chapters of the book are defined. Chapter two presents the general framework that is used to describe innovative teaching formats throughout the second part of the book. In chapter three, a survey about innovative teaching formats related to sustainability, ethics and responsibility, covering countries from six continents, is introduced. It gives insights into approaches and methods commonly used for innovative teaching and learning.

In the second part, a more detailed description of selected courses from the survey is presented (chapters 4 to 26). The chapters cover a short description of the course in question, an outline of the learning objectives and the course structure, an overview of the most important teaching approaches, methods and exercises used in the course, the form of assessment, prerequisites, recommended resources as well as tips for educators. The courses that are presented in this book cover the entire continuum between incremental and radical innovations. They emphasize the domains of novel teaching approaches and methods yet complemented by aspects of digital tools and contemporary topics, bringing forth innovative teaching formats.

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