Designing the Transition

SEVEN DESIGN PERSPECTIVES TO BUILD CAPACITIES FOR PEOPLE, ORGANISATIONS AND ECOSYSTEMS

Paola Bertola, Carmen Bruno, Erminia D'Itria, Silvia Maria Gramegna, Francesca Mattioli, Michele Melazzini, and Xue Pei

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3.1 Introduction: Academia and the *Real World*

Oftentimes, it happens to hear students and colleagues speak earnestly about "bridging *academia* and the *real world*" – as if the universities were some floating islands, disconnected from reality. This perspective could become comfortable as it allows academic institutions and researchers to distance themselves from the responsibility of driving the cultural shifts required for a sustainable transition. However, academia is not outside the system – it is part of it. It shapes and is shaped by the very ecosystems it claims to analyse. Recognising this embeddedness means acknowledging that academics are active agents of transformation. We, people working in academia, need to feel responsible and understand how our astounding profession can be translated into concrete actions to support this change. The perceived separation between academia and the so-called *real world* is the provoking starting point of the present argument, the

underpinning assumption the chapter seeks to question, and the idea that the ECODeCk project aims to challenge. Indeed, the chapter aims to argue that one of the most powerful ways people working in academia can contribute to this transformation is by adapting their core mission, supporting learning and competence development, to a broader and increasingly plural audience.

The chapter frames ECODeCK from the lens of learning and education, using it as a reflection and result of one of the academics' most valuable assets: designing instruction and supporting learning. This perspective on the project will hopefully provide academics with a rationale for envisioning their roles in promoting the desirable change within and outside academia. To make this role effective, however, we need to conceive of our educational role beyond teaching duties and imagine how we might design instruction to build capacity for contexts other than academic curricula and courses, while employing the know-how and expertise developed there. Fostering the competencies needed to respond to contemporary, complex challenges is not peripheral; it is a direct and pragmatic way to support systemic change and a cultural shift toward more environmentally sustainable and socially just paradigms.

3.2 The Project's Rationale: Design Academics' Responsibility in Promoting Education for Sustainable Development

This section seeks to justify why academics, particularly those in design research, should direct their efforts toward developing design-based education for sustainable development, extending its impact beyond the confines of the classroom. Instead, the three core assumptions presented here will provide a foundation for understanding why all academics, across disciplines, are responsible for contributing to sustainable development education (first assumption). Specifically, design, as both a field of knowledge and research, can play a pivotal role in two critical areas: innovating instructional

practices (second assumption) and fostering sustainability competencies through design-based, hands-on learning (third assumption). This is not a claim of design pedagogy's superiority, nor an assertion that design academics are more prepared, qualified or entitled to lead initiatives in education for sustainable development. The purpose here is to incentivise design academics and educators to engage more critically with their educational projects, and apply them to new contexts beyond the classroom, and apply a designerly mindset to improve their practices iteratively.

3.2.1 First Assumption: Academia Should Nurture People's Competences Beyond the Classroom

Acknowledging the roles of academia within the ecosystem is a crucial step in envisioning its potential role(s) and addressing the significant challenges that need to be tackled to ensure a regenerative future. Among others, one key objective is to ensure sustainable consumption and production patterns, specifically the UN's 12th Sustainable Development Goal. This transformation needs, first and foremost, a paradigm change that informs the conception of production and consumption. Thus, new paradigms must emerge, consolidate, and become the foundation for policy, economies, operations, and practices. Innovation and knowledge-creation models that consider the systemic nature of these processes are allies to understanding *why* we need this change and inform *how* it can be done (Carayannis *et al*., 2012). The interest in considering these models here is to understand the role of academia within this systemic interaction.

The Quintuple Helix innovation model and Mode 3 knowledge are adopted, as they effectively conceptualise the systemic interaction between innovation and knowledge production for social-ecology transition. Carayannis & Campbell (2010) introduced the Quintuple Helix innovation model that works by viewing sustainable development as a result of dynamic interactions among five key societal spheres or 'helices': the education system, economic system, political system, media-based and culture-based public, and the natural environment. The model emphasises the circulation of knowledge and know-how among these helices, with the natural environment recognised as a crucial driver for innovation geared towards socio-eco-

logical transition. Mode 3 knowledge supports this by promoting the coexistence and integration of diverse knowledge production modes and encouraging interdisciplinary and transdisciplinary application. Together, these models provide frameworks that highlight the importance of systemic collaboration and integrated knowledge in addressing environmental challenges and fostering sustainable development. Thus, the *Quintuple Helix* innovation model can effectively help remind us of the key role of academia in shaping innovation through sustainable knowledge production that contributes to sustainable development. More broadly, this sustainable knowledge fosters the circulation of knowledge through education and the capacity building of individuals (i.e., human capital). Indeed, education produces competent people, which in turn becomes an input to the economic system.

Carayannis *et al*. (2012) effectively represent that the education system is particularly stimulated to produce sustainable knowledge and to build learners' competences toward sustainable transition if it receives high investments from the political system as an input. This model provides an effective key to understanding how the ECODeCK project's underlying idea reflects the systemic role of academia, as it fits coherently into the Quintuple Helix, as depicted in Figure 3.1. The supranational political system (i.e. the European Union) decided to finance national political systems through the Next Generation EU programme. The Italian national system has cascaded funding to the educational and economic systems (i.e., Piano Nazionale di Ripresa e Resilienza) precisely to foster sustainable development at the national level. More specifically, through this funding, the extended partnership between universities and companies was created, Made in Italy Circolare e Sostenibile (MICS), to support the creation and circulation of knowledge in order to promote the socio-ecological transition of Italian manufacturing within key sectors (e.g., fashion, furniture and automation). Within MICS, the project ECODeCK was conceived to develop a capacity-building model for cross-departmental employee groups operating within companies that manufacture goods. Thus, investment in the education system at the supranational and national levels nurtures, through ECODeCK, the development of know-how about effective pedagogies to support the paradigmatic shift within diverse national manufacturing contexts. The idea is that

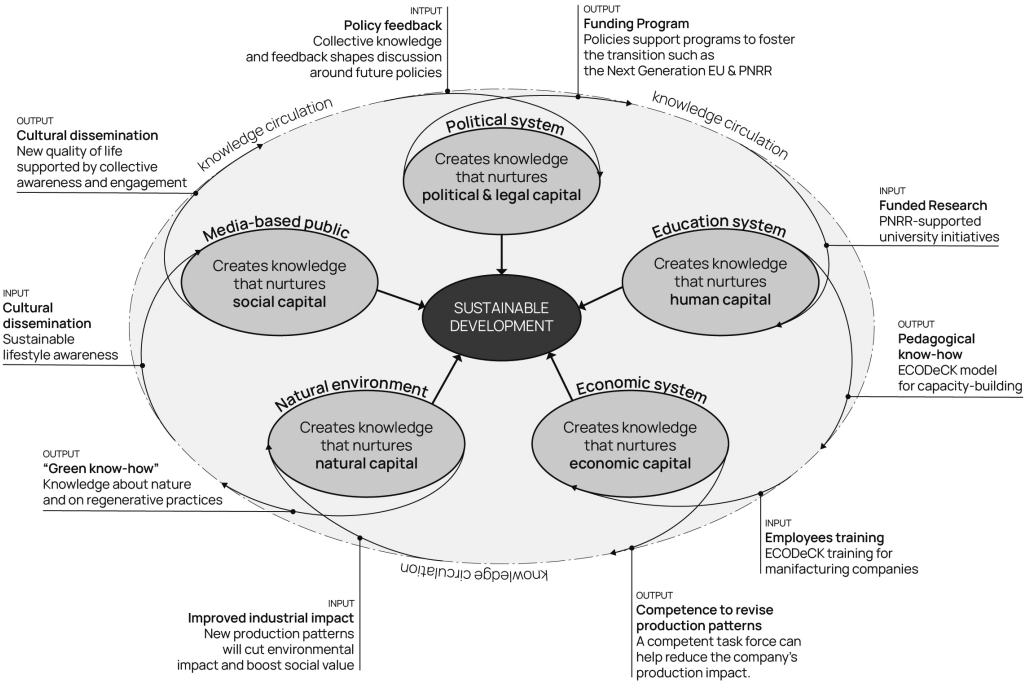

Figure 3.1.
Quintuple Helix model adapted from Carayannis *et al*. (2012) to present ECODeCK rationale.

participation in the capacity-building model allows the construction of the competencies needed for the socio-ecological transformation of the human capital of the industrial context involved, contributing to the transformation of production patterns through the review of the manufacturing system (e.g., products, business model, supply chain ecosystem). These new patterns aim to nurture natural capital by reducing the impact of production, for instance, on the local natural environment and social fabric, actively contributing to the environmental regeneration process. In turn, the produced *green know-how*, as named by Carayannis *et al.* (2012), provides new knowledge about nature and fosters the spread of more sustainable and regenerative lifestyles. Media and cultural actors play a crucial role in translating this knowledge into social capital, raising awareness and promoting accessible ways of living sustainably across society. This contributes to the construction of a new quality of life, nurturing the social capital that then flows back into the political system as collective knowledge, shaping discussions that generate new political and legal capital. The outcome is a set of sustainable policies and investments that reinforce the effectiveness of the Quintuple Helix and circulate back into

education, economy, natural environment, and culture, closing the loop of systemic transformation. Thus, the ECODeCK project is rooted in the recognition of academia and the academic profession as a key system contributing to knowledge circulation through education and training, way beyond the classroom.

3.2.2 Second Assumption: Design Academics Should Promote Instructional Design Innovation

The second assumption is rooted in a key understanding, already discussed in previous publications (Mattioli, 2022; Mattioli, Cipriani, *et al*., 2023) that design academics are uniquely positioned to promote innovation of instructional design in situated contexts. This assumption stems from a convergence of insights across educational and design research, highlighting the potential of design culture to enrich and transform teaching practices. As defined in international literature, instructional design refers to developing educational models and strategies that ensure learning is effective, compelling, and stimulating (Bonaiuti, 2019). This field has long acknowledged the need for approaches grounded in actual design practices rather than abstract pedagogical ideals (Tracey & Boling, 2014). Yet, a persistent gap remains in how instructional designers are trained, particularly in understanding real-world design work and in developing effective methods for teaching design as a complex, situated (Tracey & Hutchinson, 2016). In this context, design academics are uniquely positioned to respond to these challenges by integrating their expertise into instructional innovation. They possess the disciplinary grounding and the practical orientation needed to treat teaching itself as a design practice. This perspective aligns with a growing pedagogical shift that frames educators as learning designers (Biggs & Tang, 2007; Kalantzis & Cope, 2010; Sancassani *et al*., 2019), acknowledging that teaching involves crafting learning experiences with intentional structure and creativity. Just as in industrial design, instructional design involves the iterative creation of artefacts – courses, curricula, activities – that respond to ill-defined educational problems through a thoughtful process and evaluation. The parallel suggests that design educators can play a transformative role by consciously applying their design knowledge, such as iterative prototyping, human-centred

analysis, and creative problem framing, to reimagine teaching strategies, environments, and assessment methods. Doing so helps bridge the gap between design theory and educational practice, advancing both fields. Therefore, this research assumes that design academics should adopt instructional design principles and actively drive innovation, using their disciplinary culture to respond to contemporary education's complexities and opportunities.

3.2.3 Third Assumption: Education for Sustainable Development is Coherent with Design

Education for Sustainable Development (ESD) can be defined as a vision of lifelong learning education that seeks to balance human and economic well-being with cultural traditions and respect for the Earth's natural resources. ESD should be framed across disciplines and applied to all types of learning, i.e., implicit, informal, and formal. Hence, ESD learners can be students in formal education or vocational education, as well as trainees in corporate training programs, participants in non-formal learning contexts such as adults attending a community workshop on sustainability organised by a local NGO (UNESCO, 2020). Coherently, ESD educators can be teachers, trainers, community leaders, and family members involved in the learning process (ibid.).

Despite variations, ESD is generally understood as an integrative approach that cannot ignore the interconnections between sustainable development's environmental, social, economic, and cultural aspects (UNESCO, 2007, 2020; Venkataraman, 2009). According to UNESCO (2020) ESD is the means that allows for I) raising awareness of the 17 SDGs in education settings; II) promoting their critical and contextualised understanding of the SDGs; and III) mobilising action towards their achievement. The meaning, priorities, and strategies for ESD can vary based on local realities, history, and political and cultural traditions, affecting whether approaches lean more towards a pedagogical orientation, emphasising learning and participation, or a more instrumental one, emphasising changing behaviour.

The characterisation of the term through the words 'sustainable development' further emphasises this connection with SDG and semantically differentiates it from environmental education ¾ although

there are differing views on the two types of education to the point where some say they are the same thing, while others say they are two separate things (Wals & Kieft, 2010). Despite the open debate around the terms 'sustainable development' and 'environmental', there is increasing attention paid to the pedagogical dimension of ESD, the 'E' of 'education', with a shift from instruction and training towards learning and capacity building for sustainable development (ibid). This enables people to contribute in a meaningful and contextually relevant way to foster sustainable development. It emphasises aspects of learning across disciplines that enhance the transition towards sustainability, such as future education, citizenship education, education for a culture of peace, gender equality, human rights, health education, population education, education for protecting and managing natural resources, and education for sustainable consumption.

A key outcome of ESD is the concept of 'sustainability competence', referring to the qualities people need to possess to act effectively when confronted with a sustainability challenge. In general terms, competences can be described as the capacity to mobilise relevant knowledge (e.g., figures, concepts, ideas, theories), skills (e.g., facilities, procedures, know-how) and attitudes (e.g., dispositions, mindset) to respond appropriately and effectively to the demands of a given context (European Parliament and European Council, 2006; OECD, 2005). Coherently with a constructivist view on learning, education has been increasingly grounded in a competency-based model (Castoldi, 2021). Accordingly, sustainability competences are multifaceted and encompass the relevant knowledge and the ability to think, act, and take responsibility from a holistic perspective. It encompasses working interdisciplinarily, participatory competence, and thinking forward-looking, embedded in a *planetary consciousness* paradigm (Wals & Kieft, 2010). Given the growing emphasis on education for sustainable development, scholars, international bodies, and institutions are increasingly identifying the competencies needed to foster sustainability.

As a result, several sustainability competence frameworks have been recently developed, though a lack of terminological and conceptual clarity around the concept of competence, often used interchangeably with skills, abilities, and capabilities (Baartman *et al*.,

2007; Cebrián & Junyent, 2015; Bianchi, 2022). Despite varied terminologies, these frameworks allow for a shared understanding of what individuals need to be competent for sustainable development.

Finding a framework of design competences or design research competence is more difficult. On the one hand, it is challenging to define design competences (and the profession of designers) given the intrinsic nature of design, which is a relatively young area of knowledge that exists between the science-art paradigm and has evolved throughout its history in response to socio-technical and economic transformations (Rampino, 2022). On the other hand, it is even more challenging to define the design researchers' competences since academic design research often exists at the boundary of other disciplinary areas (Mattioli, Figoli, *et al*., 2023; Stappers & van Boeijen, 2022), often developing knowledge within a pragmatic paradigm and through practice-based approaches that are difficult to position clearly in more structured research paradigms typical of the hard sciences or social sciences. As an example of this, the European Skills, Competences, Qualifications and Occupations framework (ESCO), a multilingual competences classification system across the EU, does not include the role of the design researcher and limits the description of the profession of designers (e.g., industrial, fashion, graphic etc.) to traditional technical skills (Directorate-General for Employment, 2024), reflecting a prevalent understanding of design profession under a technical perspective (Rampino, 2022) and overlooking the cognitive and metacognitive competences widely acknowledged in academic design literature.

Scholars, especially in strategic design as already discussed in chapters (see Chapter 4 and Chapter 7), have extensively discussed the role of design knowledge integration. In the early 2000s', Bertola & Teixeira (2003) identified design as a knowledge agent fostering innovation, claiming it acts as a knowledge integrator in global settings and a knowledge broker in local contexts, collecting, analysing, and synthesising knowledge. Their research showed the ability of design to adapt its approach to different contexts. Manzini (2015) argued that design holds the capacity for social change as designers engage in problem-solving and sense-making. They are critical, creative, and dialogic, using storytelling, visualisation, and relational expertise to

foster collaboration and make things happen, adopting a human-centred approach.

More recently, Melazzini (2021) investigated how design competences (called capabilities), when embedded in human resources practices, can foster individual creative confidence and engagement, contributing to organisational cultural change and how design activates motivation, mindsets, and behaviours that, in turn, influence broader company culture. In parallel, Dastoli (2022) explores how design capabilities support the co-creation of entrepreneurial ecosystems in manufacturing. Her research showed how design enables firms to integrate diverse knowledge sources, navigate technological complexity, and foster cross-organisational collaboration for new product development. The following authors are cited, among others, not to provide an exhaustive review of the literature – an endeavour beyond the scope of this chapter – but to exemplify how design competence has been described, particularly in terms of cognitive abilities that extend beyond traditional technical skills.

Thanks to a structured conversation held at the DRS2024 conference (Pei *et al*., 2024), which confirmed our assumption further. After a short introduction, we invited participants to share their experiences regarding design-based capacity building for sustainability. The main design competences that participants pointed out as coherent with sustainability competencies encompassed:

- **problem framing and solving**, as design provides an orientation toward wicked problems and disciplinary proficiency to handle uncertain and complex situations related to sustainability issues;
- **adaptive capacity**, as the iterative nature of design involves testing, experimentation, feedback, and refinement, which aligns with the uncertain nature of sustainability outcomes;
- **cross-disciplinary and cross-cultural collaboration**, as the design requires interdisciplinary and transdisciplinary collaboration as well as collaboration among diverse stakeholders by using engaging storytelling and making complex matters more accessible;
- **visioning and future orientation**, as design focuses on potential opportunities through creativity and proposes defining

new values to break away from traditional patterns, which is key for sustainable transition.

According to this, we assume that design (as a field of knowledge) and design competencies have much to offer to ESD, as they are profoundly aligned with sustainability competencies, as is here discussed more thoroughly latter chapter (see Chapter 5, Chapter 6).

3.3 Designing a Project to Support Learning About Sustainable Development

The previous section allowed to clarify the *whys* that justify the need for academics, especially those operating within design research, to dedicate their efforts to the development of design-based education for sustainable development, beyond the classroom. This section aims to articulate *how* we, a group of design researchers and educators, constructed an instructional project to foster ESD in an organisational setting of the manufacturing sector through design. In other words, the section allows re-reading ECODeCK and its components through the lens of instructional design.

3.3.1 Laying the Project's Foundations: Learning as Socio-Constructive, Transformative and Participatory

Before presenting the ECODeCK's project components, a clarification on the perspective of its theoretical foundation is needed. Jickling & Wals (2008) use a two-axis heuristic to position ideas about education for sustainable development curricula and the social role of the educated person. One axis contrasts conceptions of education from transmissive to socio-constructivist and transformative. The other axis ranges from an authoritative and compliant educated citizen to a participatory and active one. This framework helps analyse the dynamic relationship between educational approaches and the desired role of the learner in society, especially to determine learners' agency and, thus, coherently design their involvement in participatory activities.

A key question to be raised is: how aware or conscious are those supporting, designing, implementing, monitoring and evaluating

> **these projects and activities of the nature of participation that is offered or allowed? Such awareness and reflection on the underlying assumptions and their resulting implications for the role of citizens in these projects, is critical if only to avoid that people are unwittingly being used to advance an agenda entirely set by outside authorities or are given the illusion of full participation whereas in reality their space for self-determination and autonomy is limited by a glass ceiling (Wals & Kieft, 2010, p. 18).**

Hence, this heuristic can also be an analytical and critical tool for ECODeCK. It helps position our educational ideas and reflect on how our instructional designs shape the intended learning outcomes and the role of the learner. This two-axis framework is employed here to discuss the theoretical foundation of the project, in the belief that making ECODeCK's positioning clear is a key passage to understanding the learning experience it envisions as coherent and compelling.

Within ECODeCK the idea of learning is grounded in a constructivist epistemology and an interpretive paradigm. This perspective posits that learning is an individual construction profoundly influenced by contextual, experiential, individual, and social factors (Bada, 2015; Clements, 2011; Vrasidas, 2000). From a constructivist viewpoint, learning occurs whenever individuals encounter a new situation that compels them to reconstruct novel knowledge (Cobb, 1994). While this happens daily through life experiences, formal learning occurs in educational settings where instruction is intentionally designed. The constructivist view on learning has become common ground in contemporary education, influencing the way educators design instruction (Clements, 1997). Despite different conceptualisations of the constructivist view on learning, the essence across constructivist perspectives is that learners construct knowledge and skills through direct experience and mindful interactions with others and the environment.

Therefore, a constructive understanding of learning identifies a broader paradigm where individual, social and contextual elements play a crucial role. Among others, the CSSC paradigm proposed by De Corte (2010) provides the four key features of this contemporary learning paradigm: learning is constructive (C), self-regulated (S), sit-

uated (S), and collaborative (C). As already mentioned, constructive means that learners actively construct knowledge and skills through experience and interaction. Knowledge is not something the instructor *transfers* or *transmits* as for objectivist views on learning. Instead, knowledge is built individually by each learner and socially among learners, cumulatively drawing on prior understanding. Self-regulation means that learners manage their learning process, iteratively acquiring skills and knowledge, developing metacognitive abilities and engaging in execution and reflection. Situated means that learning occurs within a specific context, affecting and influencing learning. Lastly, since constructive learning involves social interaction, learning must be understood as a collaborative process rather than a solo effort. The CSSC paradigm helps conceptualise further how learning occurs from a constructivist perspective. Moreover, the choice of adopting transformative learning as the overarching pedagogical approach (Mezirow, 2003) further emphasises the socio-constructivist foundation of ECODeCK. Transformative learning extends the constructivist view by explicitly focusing on critical reflection and perspective transformation as essential processes through which learners make meaning. Learning becomes not only a process of constructing knowledge, but also one of questioning assumptions and shifting worldviews – a process deeply embedded in social interaction and dialogic engagement. Both socio-constructivism and transformative learning thus imply collaboration and emphasise the relevance of the social dimension of learning. They reject the notion of the learner as a passive recipient and instead position the learner as an active agent engaged in co-constructing knowledge through meaningful participation and shared experiences. This inherently aligns with the idea of education as a participatory and emancipatory practice, as represented by the right side of the heuristics by Jickling & Wals (2008). Hence, given this socio-constructivist and transformative paradigm, from our perspective, the participatory and social dimension follows as a paradigmatic condition for ECODeCK to be conceived. The project's learning activities are designed to foster co-agency and critical engagement, allowing learners to explore and challenge their assumptions in authentic, collaborative settings. In this light, ECODeCK is clearly positioned in quadrant IV of the framework proposed

by Jickling & Wals (2008), where education is both transformative in its pedagogical intent and participatory in its societal engagement. This positioning is a theoretical stance and a deliberate design choice that shapes every aspect of the project's implementation.

3.3.2 Designing a Solution: ECODeCK as an Instructional Project and Its Components

Now, it is finally possible to read the ECODeCK project through the lens of an instructional design. Much like industrial design, instructional design involves addressing ill-defined problems through creating purposeful artefacts – here, aimed at guiding learning toward defined goals (Mattioli, 2022). Following this parallel, two core aspects are relevant: the artefact produced (i.e., the instructional project) and its creation process. Each project can be examined through Kerr's framework (Castoldi, 2021; Kerr, 1968), which outlines the project and divides it into four components: I) *objectives* that are the strategic learning goals (in this case, as already mentioned, sustainability competence); II) *processes*, referring to the pedagogical and operational strategies used; III) *contents* that are the disciplinary and experiential knowledge to be conveyed; and IV) *evaluation*, the assessment of both student learning and instructional effectiveness. Concerning ECODeCK, the design of the instructional project encompassed the framing of all four components.

I) Objectives

The learning *objectives* (I) to guide ECODeCK have been refined thanks to the construction of the Sustainable Transition Comp (ST Comp), which acts as the core competence framework for the ECODeCK project, explicitly designed to support manufacturing companies in their sustainable transformation through employee capacity building. This framework is built upon the European Green Comp (Bianchi *et al*., 2022), the sustainability competence framework for lifelong learning developed by the European Joint Research Center (JRC). The adaptation process for ST Comp involved three steps – analysis, synthesis, and refinement – guided by the key lenses of organisational culture and design (Bruno *et al*., 2025). This rigorous approach ensured the ST Comp was tailored to the manu-

facturing sector's specific context, challenges, and training needs, differentiating it from the more general Green Comp. The design lens, in particular, aligned the framework with ECODeCK's design-based training approach, fostering competencies needed for innovative problem-solving and enacting change within organisations. By defining these context-specific competencies across four areas, ST Comp provides strategic learning goals for employees to embed sustainability and drive transition in their daily work.

II) Processes

In order to meet the strategic goals identified through the ST Comp and to leverage design competences within the ECODeCK instructional project, we identified as *processes* (II) three key pedagogical and operational strategies to be employed: design-based, collaborative and future-oriented processes. Design-based learning is a key pedagogical approach widely employed in design education, and it involves learners constructing knowledge, skills, and abilities by self-directing the process of creating solutions to real, open-ended problems in a situated context (Mattioli, 2022). This approach is effective for fostering holistic competence development and, if framed within a planetary-conscious paradigm, can also build the capacity to take responsible action for a sustainable transition. The focus on tackling real, often ill-defined problems in a situated context makes design-based learning well-suited to develop sustainability competences, including engagement with global issues like environmental sustainability through projects.

Moreover, the collaborative learning approach employed allows for enriching the design-based approach by underlying the relevance of collective processes in defining solutions to sustainability problems. Thus, collaboration among employees from different departments or areas within the same company allows a broader understanding of organisational practices as well as opportunities and constraints for action. Adopting a collaborative overarching approach, ECODeCK aims to support the creation of a cross-departmental group that could act as a collaborative task force, promoting sustainable transition within the organisation.

Finally, the implementation of future-oriented processes introduces a strategic foresight dimension to the ECODeCK instructional

project. These processes are designed to support participants in envisioning desirable futures and identifying the actions and innovations needed in the present to move toward them. Rooted in the field of futures studies, this approach not only encourages anticipatory thinking and long-term planning but also allows for critical reflection on the past. By exploring how different choices or trajectories could have led to alternative presents, participants can question established assumptions and expand their capacity to imagine transformative pathways forward (Ianniello, 2023). In the context of ECODeCK, future-oriented processes are operationalised through scenario-building and speculative design activities that foreground ecological, social, and organisational implications. This reflective and imaginative stance empowers participants to not only respond to immediate challenges but also to reframe their understanding of change, enabling more conscious and responsible engagement in sustainability-oriented innovation.

III) Contents

The content (III) of the ECODeCK instructional project acts as the connective tissue that integrates objectives and processes into a coherent learning experience. Rather than delivering predefined disciplinary knowledge, ECODeCK relies on immersive and participatory activities where a cross-departmental group of employees is engaged in a reflective exploration of their own organisational practices. Through this process, participants surface and critically analyse existing routines, uncovering unsustainable patterns embedded in the company's current strategies and operations. This analysis of the present is paired with a historical reconstruction of past practices, creating a diachronic understanding of the company's trajectory. Simultaneously, participants are prompted to envision alternative futures within a regenerative and sustainable paradigm, leveraging speculative and scenario-based design activities. The training model provides prompts, scaffolding, and facilitation structures to support this co-construction of knowledge, but the participants' lived experience and situated knowledge constitute the core contents. In this way, ECODeCK transforms organisational knowledge into both subject and object of learning – foregrounding it as the foundation

for reimagining future practices. As such, content in ECODeCK is not something to be transmitted but something to be activated, analysed, and redesigned through situated and collaborative engagement.

IV) Evaluation

ECODeCK frames evaluation (IV) as an ongoing process of assessment-as-learning (Yan & Boud, 2022), where assessment is not only a means to measure learning outcomes but a powerful tool to generate learning itself. Within this paradigm, evaluative activities are designed to foster the capacity for critical self-assessment among participants – encouraging them to interrogate their own practices and those of their organisation through the lens of sustainable development. Assessment becomes an opportunity for deep reflection, empowering learners to internalise sustainability criteria and use them as a framework for future decision-making. This approach aligns with the adoption of transformative learning, which emphasises the process through which individuals critically examine and potentially revise their assumptions, beliefs, and worldviews – a process that is inherently reflective and dialogical. Both transformative learning and socio-constructivism underpin ECODeCK's emphasis on collaboration, co-construction of meaning, and the centrality of the social dimension of learning. Therefore, evaluation in ECODeCK cannot be separated from its participatory foundation: it is embedded in peer discussions, collaborative critiques, and iterative scenario testing.

3.4 Conclusion: Beyond an Instructional Project, a Model by Design

This chapter began by challenging the notion of academia as a separate entity from the *real world*, arguing instead for its embeddedness within the socio-ecological system and the responsibility of academics to act as agents of transformation. We posited that a powerful means for academics to contribute to this transformation is by adapting their core educational mission to support learning and competence development for broader audiences. Specifically, we argued that design academics are uniquely positioned to drive

innovation in instructional design for Education for Sustainable Development (ESD), given the inherent coherence between design competencies and the competencies required for sustainable development. We presented ECODeCK not merely as a completed project but as a reflection of this argument, demonstrating how design expertise can be applied to instructional design to foster sustainability competencies in contexts beyond traditional academic settings. The project's rationale is rooted in the understanding that academia must nurture competencies beyond the classroom, aligning with systemic innovation models such as the Quintuple Helix, which highlights the education system's crucial role in driving sustainable development through knowledge production and circulation. The design of ECODeCK was then detailed through Kerr's framework, outlining its specific objectives grounded in the Sustainable Transition Comp (ST Comp) framework, its processes centered on design-based, collaborative, and future-oriented approaches, its situated and reflective contents, and its evaluation as an ongoing, participatory assessment-as-learning process. Underlying these components is a foundation in socio-constructivist, transformative, and participatory learning theories, positioning ECODeCK as deliberately transformative in intent and participatory in engagement. Viewed through this lens, ECODeCK emerges as more than a single instructional project; it is designed as a flexible model for capacity building to foster sustainable transition. The intentional structuring of its components – objectives, processes, contents, and evaluation – guided by a robust theoretical learning framework, provides a blueprint that can be adapted and applied across diverse contexts. The model demonstrates adaptability to multiple sectors. While the initial application and the ST Comp framework were specifically tailored for the manufacturing sector, the underlying principles of design-based problem-solving, situated learning, and competence development for sustainable transition are not limited to this area. The process of adapting the ST Comp involved analysing and refining competencies for a specific context, a methodology that can be replicated for other sectors. Similarly, the focus on participant-generated content, derived from exploring their own practices, ensures relevance across various industries – an example of relevance in the fashion design

industry can be seen in Chapter 8. Furthermore, the ECODeCK model can be adapted to address multiple needs within sustainable development. The ST Comp defines a broad set of competencies across four areas, but the model's flexible nature allows for a focus on specific subsets of competencies or particular sustainability challenges depending on the organisation's needs. The design-based, collaborative, and future-oriented processes, coupled with the situated content approach, enable tailoring the learning experience to the most pressing issues faced by the participants, whether related to production efficiency, supply chain sustainability, social equity, or other aspects of the transition. The model is also relevant across multiple entrepreneurial ecosystems. As discussed through the lens of the Quintuple Helix model, sustainable development is driven by interactions between various societal spheres, including the economic and education systems. ECODeCK's genesis within an extended partnership between universities and companies, supported by political funding, exemplifies this interaction. The model provides a structured approach for fostering competence circulation within the economic system, which is a key mechanism for driving change regardless of the specific national or regional entrepreneurial ecosystem. The core pedagogical approach is universally applicable, although the specific manifestation of political will and economic engagement may vary. Finally, while ECODeCK was implemented in a for-profit manufacturing context, its principles extend beyond profit organisations. ESD is defined as lifelong learning applicable across all types of learning and audiences, including participants in non-formal settings and community workshops. The shift in ESD towards learning and capacity building rather than just instruction and training, and the emphasis on participatory and emancipatory practices, make the ECODeCK model's foundation highly relevant also for non-profit organisations, public institutions, and community groups engaged in sustainable development efforts. The focus on developing sustainability competence, defined as the capacity to mobilise knowledge, skills, and attitudes to act effectively in sustainability challenges, is universally valuable. Adapting the 'contents' to the specific practices and challenges of a non-profit or public context, and potentially adjusting the 'objectives' framework while retaining the core partic-

ipatory and transformative processes, would allow for applying this model to drive sustainable transition in a wider array of organisational and societal settings.

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The urgent need for sustainable transformation calls for innovative approaches that integrate design as a strategic force for systemic change. *Designing the Transition* explores how design can build capacities for individuals, organizations, and ecosystems, enabling them to navigate the complexities of sustainability transitions. Structured in two parts, the book first introduces the *ECODeCK* project, a design-driven capacity-building model developed to support sustainable transitions in the manufacturing sector. This section outlines its theoretical underpinnings, including the Sustainable Transition Competence framework and the role of design in transformative learning. The second part articulates seven key design perspectives, each addressing a critical dimension of sustainability: participatory action, collaborative systems, regenerative creativity, organizational culture, circular manufacturing, learning processes, and systemic change. These perspectives illustrate how design can facilitate innovation, cultural shifts, and strategic interventions across different levels, from individual behaviours to broader systemic transformations, positioning design not only as a problem-solving tool but as a mindset capable of enabling transitions toward a more resilient and sustainable future.

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