



# FuturesComp

Competence Framework  
for Futures Literacy  
in Higher Education



 Bundesministerium  
Frauen, Wissenschaft  
und Forschung

# UNIVERSITIES IN A CHANGING WORLD – THE CONTRIBUTION OF FUTURES LITERACY TO HIGHER EDUCATION

## Foreword

Today's higher education institutions face the task of rethinking educational processes amid profound societal, technological, and ecological transformations. Regional, national, and international challenges have become more complex, dynamic, and multi-layered. Students therefore require not only subject-specific expertise but, more than ever, the capacity to navigate uncertainty, situate diverse perspectives, and actively contribute to shaping positive futures.

Against this background, the responsibility of higher education institutions is growing, as they must create spaces in which the future is understood as a shapable field of learning. Particularly in demand are capabilities that enable the future to be recognised as an open, designable process and to be meaningfully integrated into academic practice.

With the "*FuturesComp* – A Competence Framework for Futures Literacy in Higher Education", the Federal Ministry for Women, Science and Research supports an instrument designed to help higher education institutions systematically cultivate these capabilities. Futures literacy – the capacity to anticipate, reflect upon, and productively use futures – is designated by UNESCO as a key competence of the 21st century.

The ***FuturesComp* competence framework** was commissioned by the Federal Ministry for Women, Science and Research (BMFWF) and developed in close collaboration between the UNESCO Chair in Futures Capability for Innovation and Entrepreneurship at MCI | The Entrepreneurial School® (lead institution), and the UNESCO Chair in Learning and Teaching Futures Literacy in the Anthropocene at the University College of Teacher Education Lower Austria, with the involvement of numerous national and international experts.

The *FuturesComp* offers higher education institutions a structured, scientifically grounded framework for systematically embedding futures literacy within teaching, research, and institutional development. It is based on five equally weighted key competences and connects contemporary international discourse with practice-oriented learning outcomes, methods, and examples across various disciplines. At its core lies a future-oriented, inclusive, and sustainability-driven understanding of education. The future is not conceived as a fixed destination but as a dynamic space of possibility.

As an open and continuously evolving document, this competence framework invites educators and higher education leaders to actively integrate futures literacy into their work and to adapt it to their respective institutional contexts.

The Federal Ministry for Women, Science and Research regards fostering futures literacy as a central component of future-capable higher education. We thank all contributors to this project and invite all stakeholders in higher education to use the *FuturesComp* as an impulse for innovative, responsible teaching and institutional development.

Eva-Maria Holzleitner, BSc

Federal Minister for Women, Science and Research

Vienna, January 2026

# EXECUTIVE SUMMARY

DE

Die tiefgreifenden ökologischen, sozialen, kulturellen und wirtschaftlichen Umbrüche im Anthropozän fordern Hochschulen heraus, Bildungsinhalte und -prozesse neu auszurichten. **Futures Literacy (FL)** gilt in diesem Zusammenhang als Schlüsselkompetenz für den konstruktiven Umgang mit Unsicherheit, Komplexität und Wandel. Sie beschreibt die Fähigkeit, verschiedene Zukünfte zu antizipieren, kritisch zu reflektieren und als Ressource für gesellschaftliche Gestaltung zu nutzen. Der Begriff „Zukünfte“ wird dabei bewusst im Plural verwendet, um deutlich zu machen, dass Zukunft kein feststehender Zustand ist, sondern ein gestaltbarer Raum mit unterschiedlichen Möglichkeiten. Hochschulen werden dabei als aktive Akteure transformativer Bildung verstanden, die Räume für dialogisches, fächerübergreifendes und wertebasiertes Lernen schaffen.

Vor diesem Hintergrund wurde im Auftrag des österreichischen Bundesministeriums für Frauen, Wissenschaft und Forschung (BMFWF) ein praxisorientierter **Referenzrahmen für Futures Literacy in der Hochschulbildung**, der **FuturesComp**, entwickelt, der Hochschulen und ihren Akteur\*innen als Orientierung bei der Entwicklung zukunftsgerichteter Lehr- und Lernformate dient. Der **FuturesComp** wurde im Zeitraum Mai 2024 bis Mai 2025 durch ein interdisziplinäres Team in Kooperation zweier UNESCO Chairs in Austria erarbeitet. Die Methodik umfasste eine systematische Auswertung von wissenschaftlicher Literatur, leitfadengestützte Interviews mit nationalen und internationalen Expert\*innen sowie zwei Fokusgruppen-Workshops mit Vertreter\*innen aus dem Wissenschafts- und Hochschulsektor.

Das Ergebnis ist ein **Kompetenzmodell für Futures Literacy**, das sich auf **fünf gleichwertige Schlüsselkompetenzbereiche** stützt: (1) *Erkundung von POLY-Zukünften*, (2) *Mitverantwortung an POLY-Zukünften*, (3) *Gestaltung von POLY-Zukünften*, (4) *Selbstentwicklung in POLY-Zukünften* und (5) *Teilhabe an POLY-Zukünften*. Der Begriff „POLY-Zukünfte“ repräsentiert die Mehrzahl und Vielfalt denkbarer Zukünfte, wie z. B. mögliche, plausible, wahrscheinliche oder dystopische Zukunftsoptionen. Die fünf Kompetenzbereiche sind eng miteinander verwoben und sollten als integrales Ganzes verstanden werden. Ausgehend hiervon benennt der Referenzrahmen konkrete Lernziele und didaktische Beispiele zur Förderung von Futures Literacy in verschiedenen Fachkontexten.

Der **FuturesComp** bietet als Referenzrahmen eine normative und konzeptionelle Grundlage für die Implementierung von Futures Literacy in die Hochschullehre. Die konkrete Ausgestaltung richtet sich nach den jeweiligen institutionellen Gegebenheiten, didaktischen Ansätzen und regionalen Kontexten. Der Referenzrahmen versteht sich als **offenes, lernendes Dokument**, das kontinuierlich weiterentwickelt wird. Alle Akteur\*innen, die Futures Literacy in der Hochschullehre und darüber hinaus verankern möchten, sind eingeladen, sich aktiv daran zu beteiligen.

EN

The profound ecological, social, cultural, and economic upheavals of the Anthropocene are prompting universities to realign their educational content and processes. **Futures literacy (FL)** is regarded as a future key competence for dealing constructively with uncertainty, complexity and change. It describes the ability to anticipate different futures, reflect on them critically and use them as a resource for shaping society. The term “futures” is deliberately used in the plural to underline that the future is not a fixed state but a shapeable space with multiple possibilities. Higher education institutions are regarded as active agents of transformative education, creating spaces for dialogic, interdisciplinary, and value-based learning.

Against this backdrop, a practice-oriented **reference framework for Futures Literacy in higher education** – called the **FuturesComp** – was developed on behalf of the Austrian Federal Ministry for Women, Science and Research (BMFWF). It serves universities and their stakeholders as guidance for designing future-oriented teaching and learning formats. The **FuturesComp** was developed from May 2024 to May 2025 by an interdisciplinary team in cooperation with two UNESCO Chairs in Austria. The methodology included a systematic review of scholarly literature, semi-structured interviews with leading national and international experts, and two focus-group workshops with representatives from the science and higher-education sector.

The result is a **competence model for Futures Literacy** built on **five equivalent key competences**: (1) exploration of POLY-Futures, (2) co-responsibility for POLY-Futures, (3) design of POLY-Futures, (4) self-development in POLY-Futures and (5) participation in POLY-Futures. The term “POLY-Futures” represents the plurality and diversity of conceivable futures (e.g., possible, plausible, probable or dystopian imaginations). These five key competences are closely interwoven and should be understood as an integral whole. On this basis, the framework formulates concrete learning objectives and didactic examples for fostering Futures Literacy across different disciplinary contexts.

The **FuturesComp** reference framework provides a normative and conceptual foundation for integrating Futures Literacy into university teaching. Its specific implementation depends on institutional conditions, didactic approaches and regional contexts. The framework sees itself as an **open, living document** that will be continuously refined. All stakeholders wishing to anchor Futures Literacy in higher education and beyond are invited to participate actively.

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# PREAMBLE

## Global Challenges and the Crisis of Futures Imaginaries

The Anthropocene refers to an epoch shaped by profound human interventions in the Earth system. Consequently, humanity is confronted with ecological, social, cultural, and economic transformations whose simultaneity, complexity, and velocity are historically unprecedented. Climate change, biodiversity loss, resource depletion, and growing global social and economic inequality (Climate Inequality Report, 2023) destabilize established future imaginaries and call seemingly reliable frames of reference into question. The uncertainty generated by multiple, overlapping crises — often referred to as “polycrisis” — impedes collective futures-shaping and fosters social withdrawal, status-quo thinking, and conflicts over shrinking resources.

Recent studies (e.g., Schnetzer & Herczeg, 2024; Friedrich-Ebert-Stiftung, 2024) demonstrate that many young people no longer hold positive expectations regarding the future. What is lacking is not only concrete future visions but also the capacity to imagine, deliberate, evaluate, and co-create alternative and desirable pathways — understood here in the plural as futures, as an open field of possibilities. The authors of this competence framework regard this crisis of future-oriented imagination not merely as a pedagogical issue, but as a societal challenge of the highest order.

Against this background, higher education in the 21st century faces a dual task: qualifying students academically while strengthening their capacity to engage constructively with uncertainty, complexity, and transformation. Hence, traditional problem-solving competencies are insufficient. What is required is transformative learning that places critical and reflective thinking, systemic analysis, anticipation, creativity, and the capacity for moral reasoning at its core.

## Futures Literacy as a Key Competence

In “Reimagining our futures together: A new social contract for education” (UNESCO, 2021), UNESCO highlights futures literacy (FL) as a democratic key competence enabling individuals and societies to remain capable of action within a dynamic and often contradictory world. Futures literacy does not merely describe the ability to anticipate different futures; rather, it refers to the capacity to use the future, to actively mobilize imagination to reinterpret the present and shape it in the light of desirable futures. This competence opens spaces for plural, diverse, and just futures beyond linear expectations or deterministic worldviews.

According to UNESCO (n.d.), futures literacy unfolds its transformative potential along three dimensions:

**Using Imaginations and Imaginaries of Futures to Rethink the Present:** When individuals deliberately immerse themselves in probable, desirable, and radically novel visions of the future, they sharpen their awareness of the blind spots of the present. Exploring alternative possibilities reveals assumptions, values, and power structures embedded in dominant visions of the future — including

those we inherit unconsciously. This critical distance opens space to question prevailing narratives, unsettle entrenched ways of framing problems, and reveal overlooked paths for action.

**Fostering the Diversity of Futures:** Futures literacy strengthens the capacity to engage with diverse visions of the future and renders the societal value of difference, transformation, and uncertainty tangible and actionable. By understanding future developments not as linear extensions of the present but as an open field of alternatives, futures literacy enhances sensitivity to diverse perspectives, cultures, and life trajectories. Change is not treated as disruption but as a natural driver of societal and individual transformation.

**Strengthening Agency and Empowerment:** By integrating multiple voices — across social, cultural, and disciplinary contexts — futures literacy opens new spaces of possibility for innovation, creativity, and diversification of decision-making. Uncertainty becomes productive: rather than paralyzing action, it invites experimentation. Futures literacy thus represents not merely an intellectual exercise, but a cultural stance characterized by openness, resilience, and the joy of shaping futures.

## The Competence Framework as a Contribution to Future-Oriented Higher Education

The *FuturesComp* Competence Framework for Futures Literacy in Higher Education contributes to future-oriented, inclusive, and sustainability-driven tertiary education. It rests on a normative foundation grounded in **sustainability, diversity, inclusion, and equity** and aligns with UNESCO’s “Transforming our world: the 2030 Agenda for Sustainable Development” and the United Nations **Sustainable Development Goals** (SDGs). Futures literacy expands the educational mandate by enabling learners to recognize diversity not only as social reality but as a resource for shaping sustainable and just futures for all.

Higher education institutions assume a central role in this regard. As spaces of knowledge generation and reflection, social innovation, and cultural dialogue, institutions of higher education are uniquely positioned to create learning environments where disciplinary perspectives, worldviews, and experiential horizons intersect productively. Futures literacy particularly unfolds within transdisciplinary learning formats, such as **Futures Literacy Laboratories** (FLLs), where students, educators, and stakeholders across society jointly explore alternative futures, question assumptions, and expand action horizons (Miller, 2018; Kazemier et al., 2021).

Futures never emerge in a vacuum — they are culturally, economically, and politically framed. The sociologist Jens Beckert conceptualizes economic and political action as motivated by ‘fictional expectations’ (Beckert, 2016, 2024). Visions of the future function as socially ordering resources: they structure perception, motivate action, and legitimize decisions. Futures literacy treats these fictions

not as illusions but as productive resources, strengthening the capacity to develop reflective, plural visions of the future that enable collective action toward desirable futures.

Empirically, the educational mandate in the Anthropocene is underscored by the “**Great Acceleration**” since the mid-20th century (Steffen et al., 2015; Sippl et al., 2020; Head et al., 2021): the exponential rise in socio-economic and ecological indicators – from population growth and resource consumption to carbon dioxide emissions and biodiversity loss – occurring almost simultaneously across continents. This parallel, high-velocity dynamic illustrates the depth and speed with which human activity reshapes the Earth system. Futures literacy connects analytical skills to interpret these dynamics with a transformative orientation that not only describes change but actively shapes it (Sippl et al., 2023).

The implementation of futures literacy in higher education requires **approaches sensitive to diverse disciplinary starting points and epistemic cultures**. The relevance and articulation of this future-shaping competence must be contextualized within specific disciplinary logics – whether in STEM, social sciences, humanities, economics, or life sciences. Discipline-specific networks and communities are as essential as institutional support structures to cultivate engagement and cross-disciplinary resonance.

This competence framework is conceived as an **open and living document**. It establishes normative and conceptual foundations for the curricular integration of futures literacy and provides orientation for educators, decision-makers, and policy actors without prescribing uniform implementation. Concrete realization remains the responsibility of individual institutions – adapted to institutional profiles, pedagogical approaches, and regional contexts.

The impact of futures literacy can only be assessed through **continuous reflection** and **systematic evaluation**. Accompanying measures for competence assessment, impact evaluation, and iterative development are therefore essential. Simultaneously, educators require spaces for exchange, collegial consultation, and trans-disciplinary collaboration to learn from good practice and generate new impulses.

This preamble defines the direction, guiding principles, and theoretical reference points of the *FuturesComp* framework. It makes clear: In the context of the Anthropocene, futures literacy is not an optional add-on but an educational-policy necessity and an ethical imperative for higher education that assumes responsibility and actively co-creates futures.

# 1 BUILDING THE FRAMEWORK

## 1.1 Objectives

*“We are currently preparing students for jobs that don’t yet exist, Using technologies that haven’t been invented, In order to solve problems we don’t even know are problems yet.” („Did you know?” Video by Karl Fisch, Scott McLeod, and Jeff Brenman)*

The digital and sustainability-driven transformation of society confronts higher education institutions with the task of fostering competences that go beyond mere subject-specific knowledge. Students must be enabled to engage constructively with uncertainty, complexity, and openness and to actively participate in the shaping of futures. In this context, “**futures literacy**” (FL) is gaining relevance.

The *FuturesComp* Competence Framework for Futures Literacy in Higher Education (hereafter: *FuturesComp*) documents the results of a project addressing the question of **how futures literacy can be fostered and institutionally embedded within the framework conditions of Austrian higher education**. The aim was to develop a practice-oriented **competence framework for futures literacy** that provides guidance to higher education institutions and their stakeholders in designing future-oriented teaching and learning formats and supports the preparation of students for the challenges of tomorrow.

The *FuturesComp* is structured as follows: The introductory chapter outlines the societal and educational-policy context of futures literacy. Futures literacy is then theoretically situated as a key competence of the 21st century. Subsequently, the methodological steps for the development of the competence framework are presented. These include the identification of key competences, the development of a nuanced competence model, the derivation of projected learning outcomes, and the formulation of recommendations for implementation in higher education didactics.

The primary target group of this framework comprises educators, higher education developers, curriculum committees, and decision-makers responsible for ensuring that higher education remains futures-ready. It may serve as a foundation for the further development of study programmes, teaching strategies, and institutional transformation processes.

Furthermore, the framework is understood as a bridge between the academic research community and the higher education sector.

The *FuturesComp* contributes toward enabling higher education institutions to systematically foster the capacity for conscious engagement with futures – not merely as a reaction to change, but as active co-creation of a sustainable, resilient, and inclusive society.

## 1.2 Methodology

Building on this starting point and its objectives, the guiding question was how futures literacy can be promoted and institutionally anchored within Austrian higher education under existing framework conditions. To address this question systematically, a multi-stage research project was conducted between May 2024 and May 2025. The project was commissioned directly by the Austrian Federal Ministry for Women, Science and Research (BMFWF) and implemented in close collaboration between MCI | The Entrepreneurial School® with the UNESCO Chair in Futures Capability for Innovation and Entrepreneurship, and the University College of Teacher Education Lower Austria, hosting the UNESCO Chair in Learning and Teaching Futures Literacy in the Anthropocene.

The conceptual development of the competence framework followed several sequential analytical steps (see Figure 1).



Figure 1: Methodology

The methodological starting point consisted of a **comprehensive analysis of existing competence models** as well as theoretical and conceptual foundations of Futures Education and Futures Studies. A total of 121 national and international scientific publications and existing competence frameworks (e.g., *EntreComp*, *GreenComp*, *LifeComp*, *LOUIS*, *Reference Framework of Competences for Democratic Culture*) were systematically analysed to identify core components of futures literacy. This analysis was complemented by content condensation and prioritisation of key competences considered essential for the development of futures literacy in higher education.

To broaden the diversity of perspectives and ensure practical applicability, ten **semi-structured interviews** were conducted with recognised experts in academia, higher education didactics, and educational development at national and international levels. Findings were analysed using qualitative content analysis according to Mayring (2022), generating valuable impulses for both the structure and substantive design of the competence framework.

The analytical groundwork formed the basis for the design of a structured **competence model for futures literacy**. The model systematically organises identified key competences and sub-competences and relates them to one another. A holistic, action-oriented understanding of competence was applied, incorporating cognitive, motivational, and social components (Weinert, 2001). The model was developed iteratively through internal project workshops.

The drafted competence model was subsequently validated and further refined through two **online focus group workshops**. One workshop with eight internationally recognised experts provided feedback on theoretical robustness and international alignment in the field of futures literacy; a second workshop with ten national educational experts focused on practical feasibility within Austrian higher education. The results were again analysed using qualitative content analysis (Mayring, 2022) and directly integrated into the final competence model.

## 1.3 Methodological Limitations

The qualitative orientation of the project entails contextual specificity: The findings relate primarily to European higher education; other educational sectors (e.g., primary or secondary education) were not addressed. Moreover, the developed competence framework represents a **snapshot** within an evolving field. It reflects the current state of discourse and remains open to further development in response to new scientific, societal, and policy-related requirements.

Interview partners were selected based on defined criteria aligned with the research question (Kuckartz, 2018) and available resources. It is possible that additional perspectives might have enriched the analysis. Interpretation of qualitative data is inevitably shaped by the researchers' perspectives (Kuckartz, 2018). This lim-

Based on the competence model, concrete **learning outcomes** were formulated to support the cultivation of futures literacy in higher education. These learning outcomes draw on transformative learning, which aims to critically reflect and expand deeply embedded interpretative frameworks – including cognitive, emotional, and cultural dimensions (see Section 2.3). Futures literacy is thus understood not as an accumulation of knowledge or skills but as a reflective, anticipatory process enabling learners to act responsibly, autonomously, and with foresight in complex and uncertain situations. The learning outcomes were developed collaboratively in interdisciplinary workshops within the project team and specified regarding diverse higher education teaching and learning contexts.

Simultaneously, practice-oriented implementation guidelines were developed in the form of **Next Practice examples** for integrating futures literacy into higher education teaching. The examples aim at providing educators at varying levels of experience with flexible approaches and methods, ranging from initial encounters with plural futures to advanced educational formats such as FLLs. Development of these examples was closely aligned with the learning outcomes and emphasised clarity, practical relevance, transferability, and thematic breadth. To further support implementation and knowledge transfer, dedicated implementation workshops follow the publication of the project report.

itation was addressed through continuous interdisciplinary exchange, inclusion of external experts, and close collaboration with the commissioning ministry.

Selected elements of the framework have already been piloted in higher education teaching. However, systematic large-scale implementation and accompanying impact research remain outstanding and constitute a central **potential for further development** and cross-contextual application. Furthermore, the competence model and associated learning outcomes were developed primarily from a higher education perspective. The perspectives of students as central actors within this system have not yet been systematically integrated.

While transformative learning provides a robust theoretical foundation, further research is required regarding the empirical measurement and targeted fostering of transformative learning processes.

# 2 FUTURES LITERACY IN THE CONTEXT OF TRANSFORMATIVE LEARNING

## 2.1 Futures Literacy as Competence: Conceptual Clarification

This competence framework is grounded in the understanding of futures literacy as a competence to actively shape futures. 'Future' is defined as a "time that is to come" or "what is going to happen" (Merriam-Webster, 2026). Although initially abstract, the concept of the 'future' acquires an individual dimension when understood as a personal life trajectory. The imagination of possible, probable, plausible, or desirable futures – for the global community as well as for societies and individuals – therefore requires the plural form, '**futures**', to acknowledge the multiplicity, diversity, and heterogeneity of internal and external individual imaginations and collective imaginaries. Within the *FuturesComp*, the term '**POLY-futures**' is introduced to emphasise not only plurality but also the diversity of futures (possible, plausible, desirable, dystopian, etc.). This terminology primarily serves readability while maintaining conceptual precision.

Central to the development of futures literacy is the deliberate imagination of futures, enabling individuals to reinterpret the present and actively shape it through anticipatory engagement (Miller, 2018; UNESCO, 2025). The concept of futures literacy is situated within the field of '**Futures Studies**', an interdisciplinary and transdisciplinary research field dedicated to the systematic analysis of futures imaginaries in order to establish a knowledge base and discursive foundation for shaping futures (Gidley, 2017; Poli, 2024).

The term '**literacy**' denotes foundational reading and writing skills that enable individuals to participate in society (Rowell & Pahl, 2015; Jambor-Fahlen & Hippmann, 2018). Reading and writing are culturally situated and embedded in multimodal social communication practices (Häggström & Schmidt, 2021), permeating all domains of life. Consequently, educational theory advocates for the

plural 'multiliteracies' (New London Group, 1996; Anstey & Bull, 2018).

Beyond its literal meaning, 'literacy' is used metaphorically to describe skills and competences within specific domains (e.g., Reading Literacy, Science Literacy, Visual Literacy, AI Literacy), as reflected in PISA assessments (OECD, 2025). In combination with 'futures', this implies understanding '**futures literacy**' as an integrated set of skills and competences that should be accessible to all individuals or should be made accessible in a socially just and inclusive manner through access to quality education (cf. SDG 4, UNRIC, 2024).

The **concept of competence** in German educational discourse was introduced by Heinrich Roth (1971), distinguishing subject competence, social competence, and self-competence. Franz E. Weinert defines competences as "the cognitive abilities and skills available in or learnable by individuals to solve specific problems, as well as the associated motivational, volitional, and social dispositions and abilities required to use these problem solutions successfully and responsibly in variable situations" (Weinert, 2001, pp. 27f., our translation). From the perspective of the psychology of learning, capacity for action (conation) emerges from the interplay of knowledge (cognition), motivation (willingness), and volition (will), within social contexts, with particular relevance attributed to goal orientation and self-organisation (Bolten, 2024; Ehlers, 2020; Huitt & Cain, 2005). Competence fosters motivation through experiences of self-efficacy, which in turn promotes autonomous learning (Deci & Ryan, 2000), creating a cyclical process of competence development. In English, 'competence' (pl. 'competences') denotes "a complex characteristic from a holistic viewpoint" (Blömeke et al., 2015, p. 5), whereas the more analytically oriented term 'competency' (pl. 'competencies') captures cognitive, conative, affective, and motivational dimensions (ibid.). These can be assessed and measured at the level of individual performance (ibid.).

## 2.2 Learning to Act for Sustainable Futures

While futures literacy is not primarily concerned with measurability, it foregrounds solidary modes of being and relating (Scherrer & Obex, 2023), practised through cooperation and collaboration (Bolten, 2024). In the context of the Anthropocene as “a turning point” (Horn & Bergthaller, 2020, p. 20), this orientation is reinforced through a planetary perspective on human-environment interactions and networked thinking aimed at socially just and sustainable futures for all (Dürbeck & Hüpkes, 2020; Probst, 2023). This corresponds with the objectives of the United Nations Sustainable Development Goals (SDGs) and the framework of Education for Sustainable Development (ESD) (UNESCO/DUK, 2021). ESD integrates knowledge, skills, values, and attitudes, promoting competences such as empathy, solidarity, and action so that education contributes not only to individual success but to collective survival and global prosperity (UNESCO/DUK, 2021, p. 14). Futures literacy as a sustainable educational concept aligns particularly with SDG target 4.7 – “By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development” (ibid.) – though its temporal horizon extends far beyond 2030.

Competence-oriented learning and teaching apply within specific knowledge domains but emphasise transferability across contexts. This structure is reflected in European competence frameworks such as the *GreenComp*, *EntreComp*, and *DigiComp*, which are organised around overarching competence areas and sub-competences rather than knowledge domains. The *FuturesComp* follows this approach by defining five key competences each composed by associated sub-competences.

The *FuturesComp* defines Futures literacy through five competence areas — Exploration, Co-responsibility, Shaping, Self-development, and Participation — each of whose sub-competences is articulated along four dimensions: The **cognitive dimension** (Cog) refers to knowledge acquisition and future-relevant analytical processes such as expectation-building, planning, and problem-solving (Kiesel & Koch, 2012). The **affective dimension** (A) refers to emotions and feelings triggered by imagined or experienced future interactions,

influencing motivation and value formation (Cortés-Rivera & Fossa, 2024). The **imaginative dimension** (I) refers to the cultivation of imagination and possibility thinking as foundational to futures thinking (Gosetti-Ferencei, 2023). Finally, the **conative dimension** (Con) refers to the development and encouragement of agency, enabling focused and goal-oriented shaping of desirable futures (Huitt & Cain, 2005).

Establishing world-relation in open learning processes, understood as resonance (Rosa, 2019), is particularly significant for futures literacy. The future is to be used while it is emerging, as “*co-becoming with the world*” (Peschl & Fundneider, 2023, emphasis in the original). World-relation may be developed as a planetary sense of possibility (Probst, 2023) when the environment is not understood merely as surrounding world (*Umwelt*), but as us-world (*Unswelt*), a world of which humans are not external observers but integral parts (Leinfelder, 2011, 2020a, 2020b, Leinfelder & Hamann, 2025). In pedagogical contexts, *Umwelt* (environment) can be explored as knowledge of the world, while *Mitwelt* (co-world) refers to the shared space of human life. *Unswelt* (“us-world”) may be understood as embodied and sensory experience that fosters an understanding of a solidaristic future in the form of *Wirwelt* (“we-world”), grounded in ethically co-responsible action (Rauscher, 2020).

Table 1 (based on Leinfelder & Rauscher, 2025) operationalises the four learning dimensions (cognitive, affective, imaginative, conative) across these world-relations for pedagogical application. Building on this, the *FuturesComp* develops a **competence-based framework** explicitly aimed at enabling actors to navigate and shape future realities in the Anthropocene. Each of the four future-worlds (*Umwelt*, *Mitwelt*, *Unswelt*, *Wirwelt*) can be mapped to a competence domain of the *FuturesComp* and interconnected with the four learning dimensions. The five key competences (Exploration, Co-responsibility, Shaping, Self-development, Participation) operationalise the **procedural dimension of futures-oriented action**. They describe **how** systemic complexity can be analysed, normative tensions negotiated, and collective transformation processes initiated. Apparent redundancies (e.g., between the cognitive dimension of “future environment” and the sub-competence “systemic thinking”) are thus understood as **complementary articulations at different levels of abstraction**. Whereas the future-worlds model structures the thematic space, the competence model specifies the key and sub-competences required to shape this space. Together, they provide orientation for educators seeking to establish futures-oriented world-relations within their disciplines.

Table 1: The “Future Worlds in the Anthropocene” (simplified illustration based on Leinfelder & Rauscher, 2025; translated in Sippl, 2025).

Worldly Relation	Cognitive Aspect	Affective Aspect	Imaginative Aspect	Conative Aspect
Recognising and learning about and with future environments ( <i>Umwelt</i> )	Recognise and understand complex systemic relationships between humans and nature, culture and technology in spatial and temporal dimensions	Be able to deal flexibly and resiliently with uncertainties in relation to transformations caused by global challenges	Develop an enquiring and curious attitude towards possible, probable, plausible, alternative, just, desirable futures	Recognise the steps for realising desirable futures, assess the consequences and plan implementation options
Experiencing and living future co-worlds ( <i>Mitwelt</i> )	Analyse social and ecological systems in their complexity and recognise the effects of human activity on the environment	Feel empathy and compassion for people and nature as a common whole and develop appreciation and ecological consciousness	Envision alternative futures collaboratively, utilising intuition and creativity in open, respectful exchange with others	Develop creative problem solutions and strategies in a cooperative and collaborative manner, taking into account inter-/transdisciplinary approaches
Shaping and crafting future us-worlds ( <i>Unswelt</i> )	Reflect on ethical principles and values that underpin a planetary caring culture and evaluate them with a view to desirable futures	Wish a good future for all, respecting diversity, developing an emotional connection with the environment as us-world	Anticipate regenerative and solidarity-based futures, raising awareness of the importance of peace and the common good	Strengthen solidarity with courage and perseverance, living democracy in community projects, promoting the transition to sustainability
Taking responsibility and hoping for future we-worlds ( <i>Wirwelt</i> )	Practise critical thinking with a view to technological innovations and culturally shaped assumptions, and recognising own potentials and possibilities for shaping the future	Think openly and positively about adaptation options in uncertain, ambiguous, risky situations and developments, strengthen decision-making and experience self-efficacy	Develop stories and images that inspire others to imagine just and desirable futures; use perception with all senses to realise creative potentials and possibilities	Proactively take co-responsibility for shaping sustainable futures on a personal and a societal level, based on diversity and inclusion

## 2.3 Transformative Learning for Futures Literacy

In the light of the complex societal challenges outlined above and the associated experiences of anxiety and overwhelm, an understanding of education that focuses on the necessary transformation of individuals and societies toward **greater sustainability, intergenerational justice, and decolonisation** (i.e., overcoming Western-dominated power structures) gains increasing importance. Anticipation, imagination, and shaping of POLY-futures, which futures literacy seeks to enable, constitute key capabilities for navigating transformation at both individual and collective levels.

The **concept of transformative learning** provides a robust theoretical framework for this purpose. It serves as a foundation for competence models that aim at self-reflection, critical thinking, decolonisation, and societal co-creation (Singer-Brodowski, 2016b; Wintersteiner et al., 2024 – particularly within the contexts of Education for Sustainable Development (ESD) and Global Citizenship Education (GCED). More broadly, it can function as a foundational learning theory for fostering futures literacy in the Anthropocene (Singer-Brodowski & Taigel, 2020).

Transformative learning originates in Jack Mezirow's work in adult education (Mezirow, 1978, 2000). It was subsequently empirically investigated in sustainability contexts (Ball, 1999) and later linked to the German concept of 'Bildung' (Nohl, 2015; Grund et al., 2024; Singer-Brodowski, 2016b). **Transformative learning** describes learning processes in which deeply embedded meaning perspectives – that is, cognitive, emotional, and cultural interpretative frameworks – are critically reflected upon and transformed. The aim is heightening reflexivity and the capacity to act consciously, responsibly, and autonomously in complex and uncertain situations.

Transformative learning does not follow a linear accumulation of knowledge. Rather, it is a **processual, identity-relevant, and often crisis-like development**. It is typically triggered by disorienting dilemmas or existential experiences that call previously held assumptions into question. New perspectives emerge through critical self-reflection, dialogical exchange with others, and practical experiences of action which may lead to a transformed relationship to self and world. Drawing on Mezirow's (2000) ten phases of transformative learning and their summary by Fett (2017, cited in Singer-Brodowski & Taigel, 2020), Grund et al. (2024, pp. 310–311) outline the process as follows:

1. *Novel Experience*: Learners encounter a disorienting dilemma or destabilising experience that challenges their existing worldview.

2. *Reflection*: Learners critically examine the new experience and question previously held epistemic, socio-cultural, or psychological assumptions.

3. *Social Exchange*: Through interaction with others, learners find resonance for their ideas and emotions, experience support, and become open to change.

4. *Shift of Action*: Learners experiment with new roles and behaviours, explore and establish new ways of acting, and develop new competences.

5. *Shift of Meaning*: Learners experience a fundamental shift in how they perceive (physically, sensorially, emotionally, motivationally) and conceptualise the world.

Transformative learning is situated within an interdisciplinary theoretical field. It is grounded in constructivist assumptions, humanistic educational philosophy, and critical theory of the Frankfurt School (Singer-Brodowski & Taigel, 2020, p. 360). From the perspective of **critical theory**, structures of domination and ideological systems are to be recognised and questioned, aiming at emancipation (Singer-Brodowski, 2016a). From a (moderate) **constructivist** perspective, meaning is understood as subjectively constructed within social contexts. **Humanistic** dimensions are reflected in the emphasis on holistic personal development, self-efficacy, and responsibility. **Postcolonial** and **decolonial** approaches contribute by questioning Eurocentric worldviews and knowledge systems in order to cultivate a more comprehensive understanding of the world and its (including non-human) inhabitants, while recognising epistemic plurality (Singer-Brodowski & Taigel, 2020; Wintersteiner et al., 2023).

A competence framework grounded in transformative learning should not merely describe functional skills or knowledge acquisition. It should recognise reflexivity as a core competence, foster tolerance of ambiguity and critical thinking, integrate participation, dialogue, and perspective-taking, include emotional and ethical dimensions of learning, and address learners as active agents of societal transformation. Transformative learning thus provides a theoretically robust and multi-layered foundation for competence models in the 21st century (Grund et al., 2024; Hoggan, 2016; Singer-Brodowski, 2016a). It enables an educational framing oriented toward 'Subjektwerdung' (subject formation), critical world-relations, and societal agency – all central to educational processes aimed at sustainability, justice, and democratic participation, such as those articulated in the *FuturesComp*.

# 3 THE *FUTURESCOMP* – A STRATEGIC COMPETENCE FRAMEWORK FOR THE INTEGRATION OF FUTURES LITERACY INTO HIGHER EDUCATION

The *FuturesComp* constitutes a scientifically grounded competence framework designed to support the systematic integration of futures literacy (FL) into higher education. It is specifically addressed to educators who seek to further develop their courses in a futures-oriented manner without overburdening existing curricula. Rather than adding additional content layers, the framework builds upon **established higher education learning objectives, key competence models, and disciplinary content**. It **demonstrates how futures literacy can be embedded as a transversal educational element** across diverse disciplinary contexts.

## 3.1 Structure and Orientation of the *FuturesComp*

The *FuturesComp* is built around three interrelated dimensions: how competences are facilitated, how they are acquired, and how they are assessed. These are not understood as separate processes but as components of an iterative teaching-learning cycle that supports planning, evaluation, and continuous development of teaching and learning formats. Educators are thus provided with a practice-oriented instrument for designing learning environments in which students are enabled to address complex future-related questions creatively, critically, systemically, and responsibly.

The competence framework is structured along **five equally weighted key competences**, each operationalised through specific sub-competences. Together, these five areas constitute the foundational architecture of futures literacy. The key competences are deeply interwoven and should be understood as an integral whole. However, learners are not expected to reach identical depth or uniform levels across all sub-competences. Instead, the *FuturesComp* enables the targeted development of selected competences and their alignment with existing learning objectives and disciplinary content, depending on the discipline, learner group, pedagogical orientation, and teaching context.

Furthermore, the *FuturesComp* follows an open and process-oriented understanding of competence. Futures literacy is not a static or discrete ability with clearly defined hierarchical levels. Rather, it represents a **lifelong learning process that can be activated, reflected upon, and deepened in different contexts**. Everyone can – depending on their starting point and context – develop, expand, and refine personal approaches to engaging with futures. These ex-

pressions may evolve over the life course and across learning environments, without requiring the attainment of an absolute “highest” or “complete” level. The aim is to foster reflexive and transformative learning processes through repeated engagement with and deliberate use of future perspectives – both individually and collectively.

Accordingly, the *FuturesComp* is not understood as an assessment instrument. Instead, it serves as **a source of impulses, an orientation framework, and a reflective tool** for the continued development of teaching, learning, and institutional educational strategies in the sense of futures-oriented higher education transformation.

Section 3.2 introduces the competence dimensions through the five key competences and their sub-competences. Section 3.3 translates these competence dimensions into concrete learning outcome descriptions.

## 3.2 The Competence Dimensions of the *FuturesComp*

The *FuturesComp* comprises five key competences, each consisting of four to five sub-competences:

- **Exploration** of POLY-futures
- **Co-responsibility** for POLY-futures
- **Shaping** POLY-futures
- **Self-development** within POLY-futures
- **Participation** in POLY-futures

Figure 2 gives a visual representation of the *FuturesComp*. The visualisation illustrates the interrelations between the key competences and their respective sub-competences. The five key competences are listed in the following tables (Tables 2-6). Each key competence is accompanied by a concise description summarising the associated sub-competences and their intended objectives. The sub-competences are differentiated according to the four dimensions: cognitive (Cog), affective (A), imaginative (I), and conative (Con) (see Section 2.2).

# Futures Literacy

## Key Competences and Sub-Competences



### Participation in POLY-Futures

- Empathy
- Communication
- Openness
- Collective Intelligence

### Exploration of POLY-Futures

- Imagination
- Anticipation
- Perception of Time
- Systemic Thinking
- Critical and Reflective Thinking



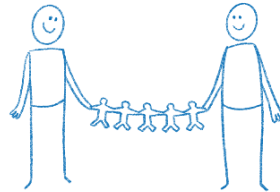
### Self-Development within POLY-Futures

- Dealing with Uncertainty and Ambiguity
- Flexibility
- Adaptability
- Self-Efficacy



### Co-Responsibility for POLY-Futures

- Reflexivity
- Value Orientation
- Impact Assessment
- Sustainability



### Shaping POLY-Futures

- Initiative
- Creativity
- Decision-Making Capacity
- Improvisation

Figure 2: Futures literacy key competences and sub-competences.



Table 2: Exploration of POLY-Futures

Exploration of POLY-Futures		
Sub-Competence	Competence Dimension	
Description of the Key Competence	The key competence “Exploration of POLY-futures” comprises five sub-competences concerned with the systematic exploration and development of futures. <i>Imagination</i> serves to disrupt dominant individual and societal patterns of thought and to open alternative perspectives and enables engagement with emerging possibilities. <i>Anticipation</i> supports forward-looking orientation. <i>Perception of Time</i> focuses on the perception and assessment of time horizons to evaluate potential consequences. <i>Systemic Thinking</i> and <i>Critical Thinking</i> support the understanding and questioning of (established) interrelations and underlying assumptions.	
Imagination	To create rich and detailed inner images of POLY-futures to disrupt dominant patterns of thought at individual and societal levels and explore alternative perspectives	<p>Imagination for the exploration of POLY-futures includes:</p> <ul style="list-style-type: none"> <li>– Exploratory thinking and cognitive flexibility to break established patterns of thought (Cog)</li> <li>– Openness to engaging with new possibilities and allowing alternative perspectives (A)</li> <li>– Creating internal images and visions of diverse futures (I)</li> <li>– Making ideas and visions of the future as well as the various pathways leading to them comprehensible and accessible through appropriate methods (Con)</li> </ul>
Anticipation	To engage in conscious, forward-looking thinking to explore POLY-futures and critically examine the underlying assumptions	<p>Anticipation for the exploration of POLY-futures includes:</p> <ul style="list-style-type: none"> <li>– Identifying underlying assumptions of futures, linking them to knowledge from the past, and recognising how these assumptions shape present actions and perceptions (Cog)</li> <li>– Openness to engage with emergent futures and willingness to critically reflect on one’s own assumptions (A)</li> <li>– Creatively and reflectively employing different assumptions to explore POLY-futures (I)</li> <li>– Applying techniques and methods for the anticipation of futures (Con)</li> </ul>
Perception of Time	To develop individual and collective understandings of time and awareness of temporal dimensions of POLY-futures to assess and comprehend events and their consequences.	<p>Perception of Time for the exploration of POLY-futures includes:</p> <ul style="list-style-type: none"> <li>– Recognising and understanding connections between events and their impacts across past, present, and futures (Cog)</li> <li>– Perceiving evolving value systems over time (A)</li> <li>– Envisioning actions and consequences within POLY-futures while considering past and present events (I)</li> <li>– Integrating shifting value systems and potential consequences of events into decision-making and action (Con)</li> </ul>
Systemic Thinking	To analyse relationships, dynamics, and interdependencies within existing and emergent systems and/or system elements to account for actions and consequences within and between complex systems when exploring POLY-futures.	<p>Systemic thinking for the exploration of POLY-futures includes:</p> <ul style="list-style-type: none"> <li>– Identifying, analysing, and understanding relationships, interactions, and dynamics within and between existing and emergent systems (Cog)</li> <li>– Recognising roles within systems, empathically adopting different perspectives, and reflecting on role shifts (A)</li> <li>– Envisioning diverse future visions while considering systemic interconnections (I)</li> <li>– Integrating a holistic perspective on complex systems into decision-making processes (Con)</li> </ul>

## Exploration of POLY-Futures

### Critical and Reflective Thinking

To identify biases, perceptions, information, practices, norms, and arguments to critically reflect their influence on assumptions and visions of POLY-futures.

Critical and reflective thinking for the exploration of POLY-futures includes:

- Critically analysing information, norms, practices, and arguments (Cog)
- Reflecting on values, perceptions, and assumptions shaped by personal, social, and cultural contexts, and adopting a critical stance toward the status quo and dominant narratives of emergent futures (A)
- Envisioning POLY-futures through critical examination of the status quo (I)
- Explicitly questioning the status quo, overcoming perceptual filters (e.g., techno-centrism, stereotypes), and adapting underlying assumptions accordingly (Con)



Table 3: Co-responsibility for POLY-futures.

Co-responsibility for POLY-futures		
Sub-Competence	Competence Dimension	
Description of the Key Competence	The key competence “Co-responsibility for POLY-futures” comprises four sub-competences concerned with co-responsibility for the shaping of futures. It includes <i>reflexivity</i> to examine and reconsider existing assumptions, <i>value orientation</i> to critically question convictions and values in dialogue with others, <i>impact assessment</i> to take into account implications across different visions of the future, and <i>sustainability</i> with regard to the contribution of individuals to the shaping of sustainable and intergenerationally just futures.	
Reflexivity	To examine the assumptions underlying visions of the future and to disclose socio-culturally shaped individual and collective patterns of thought and attitudes to learn from past experiences, democratise knowledge, and make value-oriented decisions regarding POLY-futures	<p>Reflexivity in relation to co-responsibility for POLY-futures includes:</p> <ul style="list-style-type: none"> <li>Structurally analysing information, assumptions, and interconnections, and comparing them with prior knowledge, experiences, and underlying orientations to generate new insights (Cog)</li> <li>Recognising socio-culturally shaped patterns of thought and attitudes and engaging with them openly yet critically (A)</li> <li>Envisioning POLY-futures in which colonial modes of thinking are overcome and where open reflection on experiences, knowledge, and inherited values is enabled (I)</li> <li>Making value-oriented, responsible, and reflective decisions that contribute to the multi-perspective shaping of POLY-futures (Con)</li> </ul>
Value Orientation	To reflect upon and critically question one’s own convictions and democratic values in dialogue with others – and, if necessary, further develop them – to collectively shape POLY-futures in a value-oriented and co-responsible manner	<p>Value orientation in relation to co-responsibility for POLY-futures includes:</p> <ul style="list-style-type: none"> <li>Knowing democratic fundamental values and ethical principles guiding human-world relations and being aware of their individual, societal, and temporal dimensions (Cog)</li> <li>Approaching the plurality of values with openness and empathy and reflecting on their socio-cultural conditioning in a futures-oriented manner (A)</li> <li>Imagining POLY-futures in which equality and justice are lived realities and critically questioning potential alternatives (I)</li> <li>Engaging in and/or supporting initiatives that promote value-oriented futures-shaping through participatory processes (Con)</li> </ul>
Impact Assessment	To systematically analyse the limits and vulnerabilities of complex systems and diverse visions of the future to assess the ethical and social implications of decisions and consider sustainable alternatives when shaping POLY-futures	<p>Impact assessment in relation to co-responsibility for POLY-futures includes:</p> <ul style="list-style-type: none"> <li>Critically analysing data and information to identify ethical and social implications (Cog)</li> <li>Taking ethical and social implications into account when evaluating consequences (A)</li> <li>Envisioning different futures while considering ethical and social consequences (I)</li> <li>Acting co-responsibly with awareness of ethical and social consequences (Con)</li> </ul>
Sustainability	To critically examine individual imaginations and collective imaginaries regarding their social, economic, cultural, and ecological impacts to make responsible decisions for shaping sustainable and intergenerationally just POLY-futures	<p>Sustainability in relation to co-responsibility for POLY-futures includes:</p> <ul style="list-style-type: none"> <li>Critically analysing data and information to understand the interactions between social, economic, cultural, and ecological impacts (Cog)</li> <li>Developing a sense of responsibility and openness toward diverse sustainability perspectives in futures-shaping (A)</li> <li>Examining social, economic, cultural, and ecological implications of various visions of the future from multiple perspectives (I)</li> <li>Assuming co-responsibility in shaping sustainable and intergenerationally just futures (Con)</li> </ul>

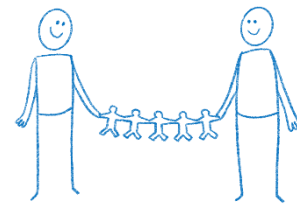


Table 4: Shaping POLY-Futures

Shaping POLY-Futures		
Sub-Competence	Competence Dimension	
Description of the Key Competence	The key competence “Shaping POLY-futures” focuses on four creative sub-competences related to visions of the future. <i>Initiative, creativity, decision-making, and improvisation</i> support the ability to imagine different futures and to influence them.	
Creativity	To develop novel and authentic ideas to effectively shape POLY-futures and create added value for others	<p>Creativity in relation to shaping POLY-futures includes:</p> <ul style="list-style-type: none"> <li>– Viewing complex problems from multiple perspectives and (collaboratively) developing innovative solutions (Cog)</li> <li>– Experiencing curiosity, openness, and tolerance toward POLY-futures as integral elements of the creative process (A)</li> <li>– Translating individual imaginations and collective imaginaries of alternative, emergent, and utopian futures, ideas, and possibilities into creative solutions or innovations (I)</li> <li>– Overcoming mental barriers and obstacles, applying creativity methods individually and in groups, and consistently advancing future-oriented creative concepts toward implementation (Con)</li> </ul>
Initiative	To act proactively in the face of POLY-futures and to inspire and support others in collectively initiating sustainable and innovative solutions	<p>Initiative in relation to the shaping POLY-futures includes:</p> <ul style="list-style-type: none"> <li>– Demonstrating initiative, persuasiveness, negotiation skills, and inclusive thinking (Cog)</li> <li>– Acting with enthusiasm, inspiration, and empathy to mobilise others for the co-creation of POLY-futures (A)</li> <li>– Creating inspiring visions of POLY-futures (I)</li> <li>– Applying techniques and methods that promote participation in shaping futures, such as participatory and consensus-building activities (Con)</li> </ul>
Decision-Making	To make adaptive and courageous decisions for shaping POLY-futures in complex and uncertain situations	<p>Decision-making in relation to shaping of POLY-futures includes:</p> <ul style="list-style-type: none"> <li>– Recognising decision-making needs through systems thinking and intuition, gathering available information, evaluating alternatives, and considering potential consequences (Cog)</li> <li>– Regulating emotions such as fear or stress and maintaining confidence in one’s own decision-making and assertiveness in challenging situations (A)</li> <li>– Empathically envisioning potential impacts of decisions on other actors, social entities, or social, technical, or ecological systems (I)</li> <li>– Making courageous decisions in uncertain situations where information is incomplete, and continuously adapting and implementing decisions based on their effects, consequences, and newly emerging insights (Con)</li> </ul>
Improvisation	To act spontaneously, situationally, and intuitively to remain capable of action beyond established approaches and existing knowledge in unfamiliar, open, and challenging present situations	<p>Improvisation in relation to shaping POLY-futures includes:</p> <ul style="list-style-type: none"> <li>– Rapidly and situationally weighing alternatives and selecting appropriate courses of action (Cog)</li> <li>– Remaining calm, optimistic, and courageous even when confronted with unexpected events, trusting in one’s capacity to act and to find spontaneous solutions (A)</li> <li>– Anticipating possible future developments through imagination and spontaneously considering potential solutions (I)</li> <li>– Determining and implementing ad hoc, intuitive strategies for shaping POLY-futures in the present moment – even when circumstances remain unclear (Con)</li> </ul>



Table 5: Self-development within POLY-futures.

Self-development within POLY-futures		
Sub-Competence	Competence Dimension	
Description of the Key Competence	The key competence “Self-development within POLY-futures” comprises four sub-competences. It includes <i>dealing with uncertainty and ambiguity</i> in order to navigate contradictions and multiple meanings across different visions of the future, <i>flexibility</i> in relation to uncertainty and spontaneous change, <i>adaptability</i> and the capacity for reorientation, as well as <i>self-efficacy</i> as confidence in one’s own capacity to act.	
Dealing with Uncertainty and Ambiguity	To engage flexibly, calmly, and constructively with dynamic and unpredictable futures, to experiment, and to tolerate contradictions and ambiguity without losing the capacity for action	Dealing with uncertainty and ambiguity in the context of self-development in POLY-futures includes: <ul style="list-style-type: none"> <li>– Analysing contradictory or incomplete information, integrating the unknown and the new, assessing risks, adopting multiple perspectives, and developing flexible approaches to thinking in unfamiliar and ambiguous situations (Cog)</li> <li>– Maintaining emotional stability in unclear situations, remaining calm and confident in the face of uncertainty, avoiding excessive fear or stress, and recognising opportunities for further development (A)</li> <li>– Imagining POLY-futures and possible responses to potential risks and opportunities even before concrete information is available (I)</li> <li>– Remaining proactive and goal-oriented in dynamic and chaotic contexts, experimenting, learning from failure, and applying action strategies that advance desirable future developments despite uncertain outcomes (Con)</li> </ul>
Flexibility	To respond situationally and sometimes spontaneously to the unknown, to new information, ideas, or circumstances, and to adapt perspectives or approaches accordingly	Flexibility in the context of self-development in POLY-futures includes: <ul style="list-style-type: none"> <li>– Keeping multiple possibilities open, integrating new information, weighing alternatives situationally, and adjusting methods when necessary (Cog)</li> <li>– Demonstrating willingness to engage with different solution pathways (A)</li> <li>– Mentally exploring alternative approaches, modes of thinking, or strategies for action independently of immediate pressure to act (I)</li> <li>– Continuously revising approaches when a more effective method becomes available, even if previous methods are still functioning (Con)</li> </ul>
Adaptability	To proactively reflect on assumptions about future developments and undertake holistic reorientation to remain effective over the long term	Adaptability in the context of self-development in POLY-futures includes: <ul style="list-style-type: none"> <li>– Identifying and reflecting on knowledge gaps and the need for adaptation to establish new ways of thinking and behavioural patterns (Cog)</li> <li>– Cultivating an open and positive mindset that strengthens self-confidence and optimism and sustains agency in uncertain futures (A)</li> <li>– Developing visionary ideas for shaping futures and adopting an anticipatory, open mode of thinking (I)</li> <li>– Actively questioning assumptions, embracing new insights, making decisions, and taking concrete steps to adjust strategies to future requirements in ways that align with both personal and societal long-term goals (Con)</li> </ul>
Self-Efficacy	Confidence in one’s own capacity to shape futures, to address future challenges, and to navigate complexity	Self-efficacy in the context of self-development in POLY-futures includes: <ul style="list-style-type: none"> <li>– Reflecting upon and evaluating one’s own knowledge and abilities (Cog)</li> <li>– Thinking confidently about one’s own potential and capacity for action in exploring and shaping futures (A)</li> <li>– Envisioning one’s own role in shaping futures (I)</li> <li>– Demonstrating willingness to contribute to the shaping of futures and to experiment proactively (Con)</li> </ul>



Table 6: Participation in POLY-Futures

Participation in POLY-Futures		
Sub-Competence	Competence Dimension	
Description of the Key Competence	The key competence "Participation in POLY-futures" comprises four sub-competences that are relevant for the joint exploration of possible visions of the future. It builds on <i>empathy</i> to understand different perspectives, <i>communication</i> to exchange ideas, <i>openness</i> to integrate new approaches and viewpoints, and <i>collective intelligence</i> to develop innovative solutions through collaboration. The aim is to explore future-capable pathways in inclusive and cooperative ways.	
Empathy	To communicate one's own perspective while understanding the viewpoints of others, to recognise needs, fears, hopes, experiences, and values related to POLY-futures and to shape them collaboratively	Empathy in the context of participation in POLY-futures includes: <ul style="list-style-type: none"> <li>– Developing understanding of others' perspectives, values, and experiences to recognise their needs, fears, and hopes (Cog)</li> <li>– Demonstrating compassion and emotional sensitivity toward the feelings and concerns of others, and valuing them (A)</li> <li>– Taking the perspectives of others to co-create diverse visions of POLY-futures (I)</li> <li>– Promoting actions grounded in empathy that deliberately consider diverse viewpoints and essential needs (Con)</li> </ul>
Communication	To employ multimodal communication to share and reflect upon POLY-futures empathically and openly, and to engage in exchange across diverse perspectives	Communication in the context of participation in POLY-futures includes: <ul style="list-style-type: none"> <li>– Analysing complex information and preparing it in a manner appropriate to different target audiences (Cog)</li> <li>– Recognising that different audiences respond differently to images, texts, and narratives, and approaching this diversity with openness and tolerance (A)</li> <li>– Using creative impulses to develop inspiring forms of communication (I)</li> <li>– Implementing multimedia and audience-oriented communication strategies effectively (Con)</li> </ul>
Openness	To incorporate diverse disciplinary and cultural backgrounds in communicative and collaborative contexts to holistically understand POLY-futures in their complexity	Openness in the context of participation in POLY-futures includes: <ul style="list-style-type: none"> <li>– Acquiring up-to-date knowledge of diverse disciplinary and cultural perspectives and recognising the importance of responsible intercultural engagement (Cog)</li> <li>– Approaching diversity with tolerance and respect, fostering appreciative exchange across cultural and disciplinary backgrounds (A)</li> <li>– Co-creating shared visions of POLY-futures that holistically integrate cultural, linguistic, and generational diversity (I)</li> <li>– Shaping actions based on a holistic perspective that actively integrates the multidimensionality and diversity of societies (Con)</li> </ul>
Collective Intelligence	To utilise diverse forms of collaboration in transdisciplinary and intercultural exchange to imagine visions of POLY-futures and develop creative solutions	Collective intelligence in the context of participation in POLY-futures includes: <ul style="list-style-type: none"> <li>– Knowing and applying a variety of participatory methods and processes (Cog)</li> <li>– Engaging respectfully and appreciatively with diverse approaches and critically reflecting upon one's own patterns of thought (A)</li> <li>– Creating value-oriented narratives within collaborative processes (I)</li> <li>– Planning and facilitating collaborative processes in a self- and co-responsible manner, employing diverse methodological approaches (Con)</li> </ul>

## 3.3 Learning Outcomes

This section presents the learning outcome descriptions derived from the operationalised formulations of the sub-competences. For each sub-competence, the corresponding learning outcomes encompass the four dimensions, i.e., a cognitive aspect, an imaginative aspect, an affective aspect, and a conative aspect (see Section 2.2 for further elaboration).

### 3.3.1 Learning Outcomes for the Key Competence “Exploration of POLY-Futures”

The key competence “Exploration of POLY-futures” comprises five sub-competences concerned with the systematic exploration and development of futures. *Imagination* serves to disrupt dominant individual and societal patterns of thought and to explore alternative perspectives; *anticipation* supports forward-looking orientation; *perception of time* focuses on the perception and assessment of temporal dimensions in order to evaluate consequences; and *systemic* and *critical and reflective thinking* support the understanding and questioning of (established) interrelations.

Table 7: Learning outcomes for the key competence “Exploration of POLY-futures”

Sub-Competence	Learning Outcomes
<b>Imagination for the exploration of POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... use exploratory thinking and cognitive flexibility to break established patterns of thought (Cog)</li> <li>... show openness to engaging with new possibilities and allowing alternative perspectives (A)</li> <li>... create internal images and visions of diverse futures (I)</li> <li>... explore ideas and visions of the future as well as the various options and pathways leading to them in order to make them comprehensible and accessible through methods (Con)</li> </ul>
<b>Anticipation for the exploration of POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... identify underlying assumptions of futures, link them to knowledge from the past, and recognise how these assumptions shape present actions and perceptions (Cog)</li> <li>... engage openly with emergent futures and critically reflect on their own assumptions (A)</li> <li>... creatively and reflectively employ different assumptions to explore POLY-futures (I)</li> <li>... apply techniques and methods for the anticipation of futures (Con)</li> </ul>
<b>Perception of time for the exploration of POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... recognise and understand connections between events and their impacts across past, present, and futures (Cog)</li> <li>... perceive evolving value systems over time (A)</li> <li>... envision actions and consequences within POLY-futures while considering events in the past and present (I)</li> <li>... integrate shifting value systems and potential consequences of events into action (Con)</li> </ul>
<b>Systemic thinking for the exploration of POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... identify, analyse, and understand relationships, interactions, and dynamics within and between existing and emergent systems (Cog)</li> <li>... recognise roles within systems, empathically adopt different perspectives, and reflect on role shifts (A)</li> <li>... envision diverse future visions while considering systemic interconnections (I)</li> <li>... integrate a holistic perspective on complex systems into decision-making processes (Con)</li> </ul>
<b>Critical and reflective thinking for the exploration of POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... critically analyse information, norms, practices, and arguments (Cog)</li> <li>... reflect on values, perceptions, and assumptions shaped by personal, social, and cultural contexts, and adopt a critical stance toward the status quo and dominant narratives of emergent futures (A)</li> <li>... envision POLY-futures through critical examination of the status quo (I)</li> <li>... explicitly question the status quo, overcome perceptual filters (e.g. techno-centrism, stereotypes, ...) and adapt their assumptions accordingly (Con)</li> </ul>

### 3.3.2 Learning Outcomes for the Key Competence “Co-responsibility for POLY-futures”

The key competence “Co-responsibility for POLY-futures” comprises four sub-competences concerned with co-responsibility for the shaping of futures. It includes *reflexivity* to examine and reconsider existing assumptions, *value orientation* to critically question convictions and values in exchange with others, *impact assessment* to consider implications in different visions of the future, and *sustainability* with regard to the contribution of individuals to the shaping of sustainable and intergenerationally just futures.

Table 8: Learning outcomes for the key competence “Co-responsibility for POLY-futures”

Sub-Competence	Learning Outcomes
<b>Reflexivity in relation to co-responsibility for POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... structurally analyse information, assumptions, and interconnections, and compare them with prior knowledge, experiences, and underlying orientations to generate new insights (Cog)</li> <li>... recognise socio-culturally shaped patterns of thought and attitudes and engage with them openly yet critically (A)</li> <li>... envision POLY-futures in which colonial modes of thinking are overcome and where open reflection on experiences, knowledge, and inherited values is enabled (I)</li> <li>... make value-oriented, responsible, and reflective decisions that contribute to the multi-perspective shaping of POLY-futures (Con)</li> </ul>
<b>Value orientation in relation to co-responsibility for POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... know democratic fundamental values and ethical principles guiding human-world relations and are aware of their individual, societal, and temporal dimensions (Cog)</li> <li>... approach the plurality of values with openness and empathy and reflect on their socio-cultural conditioning in a futures-oriented manner (A)</li> <li>... imagine POLY-futures in which equality and justice are lived realities and critically question potential alternatives (I)</li> <li>... engage in and/or support initiatives that promote value-oriented futures-shaping through participatory processes (Con)</li> </ul>
<b>Impact assessment in relation to co-responsibility for POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... critically analyse data and information to identify ethical and social implications (Cog)</li> <li>... take ethical and social implications into account when evaluating consequences (A)</li> <li>... envision different futures while considering ethical and social consequences (I)</li> <li>... act co-responsibly with awareness of ethical and social consequences (Con)</li> </ul>
<b>Sustainability in relation to co-responsibility for POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... critically analyse data and information to understand the interactions between social, economic, cultural, and ecological impacts (Cog)</li> <li>... develop a sense of responsibility and openness toward diverse sustainability perspectives in futures-shaping (A)</li> <li>... examine social, economic, cultural, and ecological implications of various visions of the future from multiple perspectives (I)</li> <li>... assume co-responsibility in shaping sustainable and intergenerationally just futures (Con)</li> </ul>

### 3.3.3 Learning Outcomes for the Key Competence „Shaping POLY-Futures“

The key competence “Shaping POLY-futures” focuses on four creative sub-competences in relation to visions of the future. *Initiative, creativity, decision-making, and improvisation* help to imagine different futures and to influence them.

Table 9: Learning outcomes for the key competence „Shaping POLY-Futures“

Sub-Competence	Learning Outcomes
<b>Creativity in relation to shaping POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... view complex problems from multiple perspectives and (collaboratively) develop innovative solutions (Cog)</li> <li>... experience curiosity, openness, and tolerance toward POLY-futures as integral elements of the creative process (A)</li> <li>... translate individual imaginations of alternative, emergent, and utopian futures, ideas, and possibilities into creative solutions or innovations (I)</li> <li>... overcome mental barriers and obstacles and apply creativity methods individually and in groups, as well as consistently advance future-oriented creative concepts toward implementation (Con)</li> </ul>
<b>Initiative in relation to shaping POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... demonstrate initiative, persuasiveness, negotiation skills, and inclusive thinking (Cog)</li> <li>... act with enthusiasm, inspiration, and empathy to mobilise others for the co-creation of POLY-futures (A)</li> <li>... create inspiring visions of POLY-futures (I)</li> <li>... apply techniques and methods that promote participation in shaping futures, such as participatory and consensus-building activities (Con)</li> </ul>
<b>Decision-Making in relation to shaping POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... recognise decision-making needs through systems thinking and intuition, gather available information, evaluate alternatives, and consider potential consequences (Cog)</li> <li>... regulate emotions such as fear or stress and maintain confidence in their own decision-making and assertiveness in challenging situations (A)</li> <li>... empathically envision potential impacts of decisions on other actors, social entities, or social, technical, or ecological systems (I)</li> <li>... make courageous decisions in uncertain situations where information is incomplete, and continuously adapt and implement decisions based on their effects, consequences, and newly emerging insights (Con)</li> </ul>
<b>Improvisation in relation to shaping POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... rapidly and situationally weigh alternatives and select appropriate courses of action (Cog)</li> <li>... remain calm, optimistic, and courageous even when confronted with unexpected events, trusting in their capacity to act and to find spontaneous solutions (A)</li> <li>... anticipate possible future developments through imagination and spontaneously consider potential solutions (I)</li> <li>... determine and implement ad hoc, intuitive strategies for shaping POLY-futures in the present moment – even when circumstances remain unclear (Con)</li> </ul>

### 3.3.4 Learning Outcomes for the Key Competence “Self-Development within POLY-Futures”

The key competence “Self-development within POLY-futures” comprises four sub-competences. It includes *dealing with uncertainty and ambiguity* in order to cope with contradictions and ambiguities in different visions of the future, *flexibility* in relation to uncertainties and spontaneous changes, *adaptability* and the capacity for reorientation, as well as *self-efficacy* as confidence in one’s own capacity to act.

Table 10: Learning outcomes for the key competence “Self-development within POLY-Futures”

Sub-Competence	Learning Outcomes
<b>Dealing with uncertainty and ambiguity in the context of self-development within POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... analyse contradictory or incomplete information, integrate the unknown and the new, assess risks, adopt multiple perspectives, and develop flexible approaches to thinking in unfamiliar and ambiguous situations (Cog)</li> <li>... maintain emotional stability in unclear situations, remain calm and confident in the face of uncertainty, avoid excessive fear or stress, and recognise opportunities for further development (A)</li> <li>... imagine POLY-futures and possible responses to potential risks and opportunities even before concrete information is available (I)</li> <li>... remain proactive and goal-oriented in dynamic and chaotic contexts, experiment, learn from failure, and apply action strategies that advance desirable future developments despite uncertain outcomes (Con)</li> </ul>
<b>Flexibility in the context of self-development within POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... keep multiple possibilities open, integrate new information, weigh alternatives situationally, and adjust methods where necessary (Cog)</li> <li>... are willing to engage with different solution pathways (A)</li> <li>... mentally explore alternative approaches, modes of thinking, or strategies for action independently of immediate pressure to act (I)</li> <li>... continuously revise their approaches when a more effective method becomes available, even if previous methods are still functioning (Con)</li> </ul>
<b>Adaptability in the context of self-development within POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... identify and reflect on knowledge gaps and the need for adaptation to establish new ways of thinking and behaviour patterns (Cog)</li> <li>... cultivate an open and positive mindset to strengthen self-confidence and optimism and sustain agency in unfamiliar futures (A)</li> <li>... develop visionary ideas for shaping futures and adopt an anticipatory, open mindset (I)</li> <li>... actively question assumptions, embrace new insights, make decisions, and take concrete steps that align with both personal and societal long-term goals (Con)</li> </ul>
<b>Self-Efficacy in the context of self-development within POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... reflect upon and continuously evaluate their own capabilities and knowledge (Cog)</li> <li>... think confidently about their own potential and their own capacity for action in exploring and shaping futures (A)</li> <li>... envision their own role in shaping futures (I)</li> <li>... are willing to contribute to the shaping of futures and to experiment proactively (Con)</li> </ul>

### 3.3.5 Learning Outcomes for the Key Competence “Participation in POLY-Futures”

The key competence “Participation in POLY-futures” comprises four sub-competences that are relevant for the joint exploration of possible visions of the future. It builds on *empathy* to understand different perspectives, *communication* to exchange ideas, *openness* to integrate new approaches and viewpoints, and *collective intelligence* to develop innovative solutions through collaboration. The aim is to explore future-capable pathways in inclusive and cooperative ways

Table 11: Learning outcomes for the key competence “Participation in POLY-futures”

Sub-Competence	Learning Outcomes
<b>Empathy in the context of participation in POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... develop understanding for the perspectives, values, and experiences of others in order to recognise their needs, fears, and hopes (Cog)</li> <li>... demonstrate compassion and emotional sensitivity for the feelings and concerns of other people, and value them (A)</li> <li>... take perspectives of others to co-create diverse visions of POLY-futures (I)</li> <li>... promote actions grounded in empathy that deliberately consider diverse viewpoints and essential needs (Con)</li> </ul>
<b>Communication in the context of participation in POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... analyse complex information and prepare it in a target-group-oriented manner (Cog)</li> <li>... recognise that different target groups respond differently to images, texts, and narratives, and approach this diversity with openness and tolerance (A)</li> <li>... use creative impulses to develop inspiring forms of communication (I)</li> <li>... implement multimedia and audience-oriented communication strategies effectively (Con)</li> </ul>
<b>Openness in the context of participation in POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... acquire up-to-date knowledge of diverse disciplinary and cultural perspectives and recognise the importance of responsible intercultural engagement (Cog)</li> <li>... approach diversity with tolerance and respect, fostering appreciative exchange across cultural and disciplinary backgrounds (A)</li> <li>... co-create shared visions of POLY-futures that holistically integrate cultural, linguistic, and generational diversity (I)</li> <li>... shape actions based on a holistic perspective that actively integrates the multidimensionality and diversity of societies (Con)</li> </ul>
<b>Collective intelligence in the context of participation in POLY-futures</b>	<p>The students ...</p> <ul style="list-style-type: none"> <li>... know and apply a variety of participatory methods and processes (Cog)</li> <li>... engage respectfully and appreciatively with diverse approaches and critically reflect upon their own patterns of thought (A)</li> <li>... create value-oriented narratives within collaborative processes (I)</li> <li>... plan and facilitate collaborative processes with individual and shared responsibility and shape them through a diversity of methods (Con)</li> </ul>

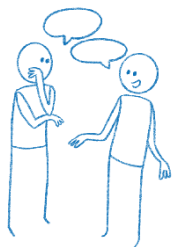
# 4 SELECTED NEXT-PRACTICE EXAMPLES FOR THE COMPETENCES PRESENTED IN THE *FUTURESCOMP*

The following section presents selected next-practice examples, offering insights into short learning sequences, each with a clear focus on one specific key competence. These examples illustrate the diversity of possible implementations (see figure 3). We warmly invite readers to contribute their own experiences and approaches and to share them with the community – as shared knowledge strengthens collective futures literacy.

The examples introduce methods particularly suited to the cultivation and development of futures literacy. Each example is situated within a different disciplinary context to demonstrate how the competence framework, the associated learning outcomes, and the selected methods can be integrated across diverse fields of study. The intention is to provide impulses and inspiration for application within one's own teaching practice.

Each example opens with a brief description of the teaching-learning context and identifies the relevant learning outcomes from the competence framework. This is accompanied by a didactic commentary that addresses thematic positioning, required prior knowledge, the methods and social formats employed (e.g., individual, group, or plenary work), and considerations around assessment and feedback. Finally, a detailed outline of the concrete implementation of the learning sequence consisting of one or more teaching units comprising 45 minutes is given. Each example concludes with a short profile of the highlighted futures literacy method used within the sequence.

## Futures Literacy A Selection of Next-Practice Examples



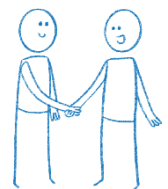
**Participation in POLY-Futures**  
Oil in Focus – Analysis Using De Bono's Six Thinking Hats

**Exploration of POLY-Futures**  
Futures Literacy Lab on the "Futures of Work"



**Self-Development within POLY-Futures**  
Reflecting Self-Efficacy Using the Polak Game

**Co-Responsibility for POLY-Futures**  
Communication and the Future – The Sign Model and the Tower of Babel



**Shaping POLY-Futures**  
Scenario Development – Future Mobility Solutions

Figure 3: A selection of next-practice examples

# 4.1 Next-Practice Example: Futures Literacy Lab on the “Futures of Work”

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## Next-Practice Example “Exploration of POLY-futures”

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This next-practice example presents a learning environment in which the key competence “Exploration of POLY-futures” is developed using the concept of “New Work” as an example from the field of economics.

### Setting:

- Time: at least 4 teaching units
- Target group: students in business-related disciplines
- Relevance: transformation of the world of work through digitalisation, automation, and new work models
- Format: possible online and on-site

### Associated learning outcomes from the “Exploration” dimension of the *FuturesComp*:

- The students ...
- ... use exploratory thinking and cognitive flexibility to break established patterns of thought (*Cog/Imagination*)
  - ... explore ideas and visions of the future as well as the various options and pathways leading to them in order to make them comprehensible and accessible through methods (*Con/Imagination*)
  - ... engage openly with emergent futures and critically reflect on their own assumptions (*A/Anticipation*)
  - ... recognise and understand connections between events and their impacts across past, present, and futures (*Cog/Perception of Time*)
  - ... envision diverse future visions while considering systemic interconnections (*I/Systemic Thinking*)
  - ... envision POLY-futures through critical examination of the status quo (*I/Critical and Reflective Thinking*)

**Context:** transformation of the world of work, agile organisations, value change in companies, Work 4.0

**Prior knowledge:** fundamentals of business administration, management approaches, societal and technological (mega-)trends

**Social forms:** individual work, group discussion, plenary

**Methods:** *Futures Literacy Lab* according to UNESCO and Riel Miller; futures work in four phases; exploration of probable, desirable, and alternative futures; facilitation by at least two moderators

**Media:** impulse texts, videos, canvas templates, digital whiteboards

**Assessment/feedback:** reflective journal, peer feedback on assumptions about the future, discussion outcomes, reflection of individual and collective imagination processes

### Description of implementation:

Following a brief input on Futures Literacy as a competence, students are guided through a Futures Literacy Lab. In the first phase, they explore dominant conceptions of “New Work” and analyse the underlying assumptions (reveal). In the second phase, these assumptions are questioned and unknown, desirable, and alternative “other futures” are developed (reframe). In the third phase, students collectively reflect on the previously imagined futures, which reflect their values and insights (rethink), and revise or generate new assumptions. The aim is to critically and creatively rethink forms of work and organisational frameworks associated with “New Work”. Finally, insights as well as the individual and collective imagination process are reflected upon and discussed in relation to present-day courses of action.

**Expected outcomes and reflection:** awareness, deconstruction, and further development of individual and collective assumptions about the future; development of diverse conceptions of work; dialogue on social, ethical, and economic dimensions of the futures of work

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## Next-Practice Example “Exploration of POLY-futures”

### Method profile: Futures Literacy Lab (UNESCO)

The Futures Literacy Lab (FLL) enables participants to uncover, reconsider, and reframe the assumptions they use to imagine the future. Based on UNESCO’s Futures Literacy framework, it fosters knowledge exchange and creative exploration of diverse future images. The FLL does not aim to predict the future but to explore POLY-futures in order to question biases and reflect on social, cultural, economic, ecological, and technological influences. The lab can be conducted over half a day to two days and consists of three participatory small-group phases. Using digital or analogue boards and post-its, students develop future visions in the form of collages, stories, metaphors, or headlines. The structure includes:

- an introduction to the topic and method,
- the imagination of probable futures,
- the imagination of desirable futures,
- making underlying assumptions visible (reveal),
- developing unknown and alternative futures (reframe),
- individual reflection and generation of new questions (rethink),
- derivation of possible action steps, and
- a final plenary discussion and group reflection.

### References:

Riel, M. (2024). *Transforming the Future. Anticipation in the 21st Century*. Routledge. <https://doi.org/10.4324/9781351048002>

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Shaw, V., Zinkstock, E., Alvial, Palavicino, C., Gulbrandsen, E., Koch, P., Miller, R. & Scordato, L. (2023). *Futures Literacy Lab tool*. <https://tipresourcelab.net/resource/tool-futures-literacy-lab/>

UNESCO. (2023). *Futures literacy laboratory playbook. An essentials guide for co-designing a lab to explore how and why we anticipate*. <https://doi.org/10.54678/KSWO4445>

## 4.2 Next-Practice Example: Communication and the Future – The Linguistic Sign and the Tower of Babel

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### Next-Practice Example “Co-responsibility for POLY-futures”

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This next-practice example presents a learning environment in which the key competence “Co-responsibility for POLY-futures” is developed through a central disciplinary topic in semiotics, namely the linguistic sign.

#### Setting:

- Time: 2–3 teaching units
- Target group: students in language studies, humanities, or cultural studies
- Relevance: in a globalised and digitalised world, a deeper understanding of language is essential for intercultural communication and societal participation
- Format: possible online and on-site

**Context:** The linguistic sign by Ferdinand de Saussure serves as a foundation for understanding language and communication and is reflected upon and applied in the context of global futures issues (e.g. multilingualism, intercultural communication, AI).

**Social forms:** individual work, pair work, group discussions, plenary

#### Associated learning outcomes from the “Co-responsibility” dimension of *FuturesComp*:

The students ...

- ... structurally analyse information, assumptions, and interconnections, and compare them with prior knowledge, experiences, and underlying orientations to generate new insights (*Cog/Reflexivity*)
- ... approach the plurality of values with openness and empathy and reflect on their socio-cultural conditioning in a futures-oriented manner (*A/Value Orientation*)
- ... envision different futures while considering ethical and social consequences (*I/Impact Assessment*)

**Prior knowledge:** basic knowledge of communication and language; prior knowledge of semiotic models is not required

**Methods:** “interpreting” activity, rotating partner discussion (carousel), peer feedback

**Media:** infographics, scientific articles, newspaper articles, images, videos, digital whiteboards, presentation software, collaborative online tools

**Assessment/feedback:** formative evaluation through peer and instructor feedback, written or oral reflection on individual and collective learning processes, final group discussion

#### Description of implementation:

At the beginning of the session, students are introduced to the topic of language through an associative entry activity. They first reflect individually and in plenary on what language means to them and how they define it. This is followed by an introduction to Ferdinand de Saussure’s sign model, in which key concepts such as signifier and signified as well as the concept of the linguistic sign are explained and illustrated using contemporary examples (e.g. emojis, youth language, cultural codes).

Subsequently, students engage in a structured rotating partner discussion (carousel format) addressing the question of whether language can be universally understood or whether it is always bound to culture and context. In this method, two circles of participants (an inner and an outer circle) face each other and exchange ideas. After a set time, partners rotate systematically, allowing students to encounter new perspectives. This discussion is extended through the motif of the Tower of Babel, which serves as a symbol of the challenges and potentials of linguistic diversity. Connections are made to current topics such as globalisation, migration, artificial intelligence, and digital communication. Central guiding questions include: Will there be a common language in the future – and would that be desirable? What might the language of the future sound like? Will languages diverge further, perhaps into new dialects and communication forms? Which factors (e.g. technology, migration, societal change) might influence this development?

These reflections lead into the method of “interpreting”, which is implemented in a playful and communicative format: In pairs, one student takes on the role of a time traveller or visitor from the future who speaks an invented fictional language. The other student acts as an interpreter, translating the message into the language of instruction based solely on facial expressions, gestures, tone, and creativity. After-

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### Next-Practice Example “Co-responsibility for POLY-futures”

wards, both reflect on whether the translation corresponded to the intended meaning or whether misunderstandings occurred—thus making processes of interpretation and meaning-making tangible. The activity highlights the central relevance of Saussure’s distinction between signifier and signified and illustrates how fragile this relationship can be in practice.

At the end of the session, students reflect both on the content and the methods used: What insights about language and communication emerged? What challenges became visible in the role-play? In a written or oral reflection (e.g. using the 3–2–1 method: 3 insights, 2 questions, 1 impulse for the future), students summarise key findings and formulate their own perspectives on the role of language in an increasingly interconnected and multilingual world.

#### Method profile: “Interpreting” activity

The “interpreting” method begins with the following scenario: “Imagine we have a visitor from the future! However, in this future, people speak a language we don’t understand yet. The visitor has therefore brought a translator to help explain what they want to share with us.” Students work in pairs: One person takes on the role of the visitor from the future and communicates using an invented fictional language supported by gestures and facial expressions. The other person acts as the interpreter and translates the message creatively into the language of instruction. After a short preparation phase (e.g. choosing a topic such as life in the future, technology, or education), pairs perform their dialogues. If time allows, selected groups can present their interactions in plenary, offering insights into different creative communication styles. Optionally, the audience may ask questions or attempt to interpret meanings.

#### References:

Capatu, I. (2024). Interpret. In: *Method mosaic of the UNESCO Chair in Learning and Teaching Futures Literacy in the Anthropocene*. <https://www.ph-noe.ac.at/unesco-chair>

De Saussure, F. (1916). *Cours de linguistique générale*. Payot.

## 4.3 Next-Practice Example: Scenario Development – Future Mobility Solutions

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### Next-Practice Example “Shaping POLY-futures”

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This next-practice example presents the key competence “**Shaping POLY-futures**” in a learning environment for computer science that focuses on future mobility solutions.

#### Setting:

- Time: 2–3 teaching units
- Target group: students of computer science and business informatics
- Relevance: digital innovation and data management in the context of sustainable mobility
- Format: preferably on-site (for scenario-based group work)

#### Associated learning outcomes from the “Shaping” dimension of *FuturesComp*:

The students ...

- ... view complex problems from multiple perspectives and (collaboratively) develop innovative solutions (*Cog/Creativity*)
- ... experience curiosity, openness, and tolerance toward POLY-futures as integral elements of the creative process (*A/Creativity*)
- ... overcome mental barriers and obstacles and apply creativity methods individually and in groups, as well as consistently advance future-oriented creative concepts toward implementation (*Con/Creativity*)
- ... act with enthusiasm, inspiration, and empathy to mobilise others for the co-creation of POLY-futures (*A/Initiative*)
- ... create inspiring visions of POLY-futures (*I/Initiative*)
- ... anticipate possible future developments through imagination and spontaneously consider potential solutions (*I/Improvisation*)

**Context:** smart mobility, sustainable mobility, data infrastructure, urban systems

**Prior knowledge:** fundamentals of data management, computer systems, basic understanding of urban infrastructure

**Social forms:** group work, scenario workshops

**Methods:** scenario development using the *Future Mobility Box* („Zukunftsbox Mobilität“) by Futurium

**Media:** cards and working materials from the Future Box, digital tools, sketches, visualisations

**Assessment/feedback:** evaluation of scenarios according to criteria such as plausibility, diversity, creativity, and value orientation; group feedback

#### Description of implementation:

Students begin by analysing current challenges and trends in the field of mobility. Using the Future Box developed by Futurium and its challenge cards, impulse cards, trend cards, perspective cards, and wildcard cards, they systematically develop different scenarios for future mobility solutions (e.g. data-driven, locally ecological, collective, disruptive). Each scenario is elaborated while considering ecological, economic, and social factors. Following the scenario work, these future visions are linked to concrete technical solution approaches and prepared in the form of a prototype, data model, or concept.

**Expected outcomes and reflection:** development of diverse scenarios; critical engagement with the consequences of technology; linking technical expertise with societal responsibility

**Method profile:** Scenario development with the Future Box “Future of Mobility”

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### Next-Practice Example “Shaping POLY-futures”

The Future Box is a didactic tool for creative and collaborative futures-shaping, designed for use in teams of five. Depending on the box, it contains five to six different sets of cards as well as methodological guidance enabling learners to develop their own future scenarios:

- Trend cards/category cards contain future trends related to different thematic areas, supported by images and texts. They serve to develop scenarios and foster differentiation.
- Megatrend cards describe long-term global developments. Students analyse their possible impacts and develop hypotheses based on them.
- Wildcard cards present unlikely but possible extreme scenarios and encourage the consideration of unexpected events.
- Perspective cards make it possible to examine a topic from different societal perspectives (e.g. politics, environment, technology), represented by fictional persons.
- Impulse cards pose polarising decision-making questions on the topic and are therefore particularly suitable as an entry into discussion.
- Challenge cards prompt creative solution approaches to concrete future-related questions.
- Scenario guides provide structured support throughout the scenario development process.

The box is complemented by digital materials for preparing and conducting teaching, which are available on the Futurium website. Students engage with different future trends and perspectives, develop hypotheses, and design their own future scenarios. Teamwork, creativity, and multi-perspective thinking are at the centre of the process. The mobility box includes perspective cards, challenge cards, impulse cards, megatrend cards, trend cards, and wildcard cards, but currently does not yet include a scenario guide.

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Futurium (2026). *Future Box*. <https://futurium.de/en/future-box> (on the topics of cities, food, energy, work, health, transport, democracy and the oceans in German and mobility in English)

## 4.4 Next-Practice Example: Reflecting Self-Efficacy Using the Polak Game

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### Next-Practice Example “Self-development within POLY-futures”

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This next-practice example presents a learning environment in which the key competence “Self-development within POLY-futures” is developed in the context of self-perception and life planning using the Polak Game.

#### Setting:

- Time: approx. 1 teaching unit
- Target group: students from various disciplines (e.g. psychology, natural sciences, business, social sciences)
- Relevance: development of individual futures competence and self-efficacy
- Format: possible online and on-site

#### Associated learning outcomes from the “Self-development” dimension of *FuturesComp*:

The students ...

- ... maintain emotional stability in unclear situations, remain calm and confident in the face of uncertainty, avoid excessive fear or stress, and recognise opportunities for further development (*A/Dealing with Uncertainty and Ambiguity*)
- ... imagine POLY-futures and possible responses to potential risks and opportunities even before concrete information is available (*I/Dealing with Uncertainty and Ambiguity*)
- ... mentally explore alternative approaches, modes of thinking, or strategies for action independently of immediate pressure to act (*I/Flexibility*)
- ... cultivate an open and positive mindset to strengthen self-confidence and optimism and sustain agency in unfamiliar futures (*A/Adaptability*)
- ... reflect upon and continuously evaluate their own capabilities and knowledge (*Cog/Self-Efficacy*)
- ... think confidently about their own potential and their own capacity for action in exploring and shaping futures (*A/Self-Efficacy*)
- ... envision their own role in shaping futures (*I/Self-Efficacy*)
- ... are willing to contribute to the shaping of futures and to experiment proactively (*Con/Self-Efficacy*)

**Context:** self-perception, self-efficacy, life planning, individual futures-shaping

**Prior knowledge:** not required – suitable for interdisciplinary groups

**Social forms:** individual work, pair work, group discussion

**Methods:** *Polak Game* for reflecting future images

**Media:** visual templates, reflection cards, texts on future images, digital whiteboards (for online settings)

**Assessment/feedback:** no formal assessment – focus on self-reflection, group reflection, peer coaching, optional voluntary feedback

#### Description of implementation:

At the centre of the activity is the Polak Game, in which students identify and reflect on their individual image of the future and its orientation (optimistic/pessimistic; active/participatory vs. passive). The starting point is the guiding question: “What does my future look like, how does it influence my actions today, and what role can and do I want to take in shaping this future?” During the process, participants discuss in small groups which societal and personal factors shape their perspectives. The aim is to consciously reflect on one’s own image of the future, to further develop it, and to use it as a resource for strengthening self-efficacy.

**Expected outcomes and reflection:** awareness and possible reorientation of one’s own image of the future; emotional strengthening; strengthening of group cohesion; impulses for personal and professional development

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## Next-Practice Example “Self-development within POLY-futures”

### Method profile: Polak Game for reflecting futures images and self-efficacy

The Polak Game is a participatory method for making individual and collective expectations of the future visible, as well as perceived self-efficacy in relation to future developments. It is based on the assumption that our images of the future strongly influence our present thinking, feeling, and acting. The aim of the game is to make futures images within a group visible, initiate dialogue about them, and provide a basis for reflective engagement with futures imaginaries.

The method is designed for groups of approximately five to fifty participants and requires sufficient space for free movement. The duration varies between ten and thirty minutes depending on group size and facilitation style. The procedure consists of several steps: Participants position themselves physically in the room according to their individual assessment of the future. The facilitator poses two central questions: “What will the world look like in 25 years?” Participants position themselves along a continuum between an optimistic pole (“The world will be significantly better”) and a pessimistic pole (“The world will be significantly worse”). “What influence do I personally have on this future?” Participants position themselves along a second continuum between a high degree of influence and a sense of powerlessness. This is followed by a moderated reflection phase: participants explain the reasons for their positioning, either in an open discussion or through selected contributions. The overall group pattern is then reflected: Which attitudes dominate? What was surprising? Are there commonalities, clusters, polarities, or outliers? Optionally, the group concludes with a plenary discussion in a circle.

The Polak Game is particularly suitable as an entry into futures-oriented learning settings or participatory scenario development (e.g. in combination with the Future Box). It supports both individual self-reflection and collective negotiation processes and can be considered a low-threshold yet highly effective method for initiating futures dialogue.

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Dark Horse Innovation (2023). Polak Game: Moderationsleitfaden. <https://www.thedarkhorse.de/pdfs/Template-Polak-Spiel-Moderationsleitfaden.pdf>

Hayward, P., & Candy, S. (2017). The polak game, or: Where do you stand. *Journal of Futures Studies*, 22(2), 5-14. [https://doi.org/10.6531/JFS.2017.22\(2\).A5](https://doi.org/10.6531/JFS.2017.22(2).A5)

## 4.5 Next-Practice Example: Oil in Focus – Analysis Using De Bono’s Six Thinking Hats

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### Next-Practice Example “Participation in POLY-futures”

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This next-practice example presents a learning environment in which the key competence “Participation in POLY-futures” is developed through a central topic in the natural sciences, namely petroleum.

#### Setting:

- Time: 2–3 teaching units
- Target group: students in natural sciences, business, or social sciences
- Relevance: high societal relevance due to the global energy crisis, environmental challenges, and economic dependencies
- Format: possible online and on-site

#### Associated learning outcomes from the “Participation” dimension of *FuturesComp*:

The students ...

- ... develop understanding for the perspectives, values, and experiences of others in order to recognise their needs, fears, and hopes (*Cog/Empathy*)
- ... analyse complex information and prepare it in a target-group-oriented manner (*Cog/Communication*)
- ... recognise that different target groups respond differently to images, texts, and narratives, and approach this diversity with openness and tolerance (*A/Communication*)
- ... use creative impulses to develop inspiring forms of communication (*I/Communication*)
- ... setzen Kommunikationsstrategien multimedial und adressatengerichtet um (*Con/Communication*)
- ... implement multimedia and audience-oriented communication strategies effectively (*I/Collective Intelligence*)

**Context:** scientific perspectives on petroleum, its formation, use, and ecological impacts on industry and society

**Prior knowledge:** basics of geology and chemistry (e.g. formation of fossil fuels), basic knowledge of energy systems and climate change; basic understanding of argumentation and communication methods

**Social forms:** group work, plenary discussions

**Methods:** *Six Thinking Hats* (Edward de Bono), mind mapping, moderated discussions (e.g. fishbowl discussion, role-based discussion)

**Media:** infographics, scientific articles, newspaper articles, images, videos, digital whiteboards, collaborative online tools, presentation software

**Assessment/feedback:** formative evaluation through peer and instructor feedback, reflection on individual and collective learning processes, evaluation of structured argumentation and creative solution approaches

#### Description of implementation:

Students first develop an understanding of the geological and chemical foundations of petroleum, including its role in energy production, society, and industry. They then apply Edward de Bono’s Six Thinking Hats method (De Bono, 1990) to analyse the topic from multiple perspectives. During the process, students document their insights (e.g. through mind maps for each “hat”) and use these as a basis for a moderated discussion in which the different perspectives are brought together. This discussion may be implemented as a fishbowl discussion with distributed roles (each seat representing one “hat”) in order to explore and integrate the six perspectives. For preparation, students may either work on all hats individually or be assigned to groups focusing on one specific hat, thereby strengthening collaboration. Finally, students reflect – particularly from the perspective of the blue hat – on the meta-level and envision possible future implications of dependence on petroleum as well as different future scenarios based on past and present developments.

#### 1. White Hat (Facts):

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### Next-Practice Example “Participation in POLY-futures”

- What do we know about petroleum and its future availability?
  - What scientific knowledge exists regarding its formation, extraction, and use now and in the future?
  - How are global reserves and market trends developing?
  - What questions remain open regarding petroleum?
- 2. Red Hat (Feelings):**
- What emotions are associated with dependence on petroleum?
  - What fears exist regarding environmental pollution, economic uncertainty, and geopolitical dependency?
  - What hopes exist regarding new technologies and alternative energy sources?
- 3. Black Hat (Critical perspective):**
- What risks and challenges are associated with petroleum use?
  - What environmental and health impacts may arise in the future?
  - What geopolitical conflicts result from dependence on petroleum?
- 4. Yellow Hat (Benefits):**
- What opportunities does petroleum offer, and how are these context-dependent?
  - Why is petroleum (still) an indispensable resource? Why might it remain so?
  - What economic and technological benefits arise from its use?
- 5. Green Hat (Creativity):**
- What alternatives to petroleum or fossil fuels exist or could emerge in the future?
  - What new technologies might be used for fuel production or heating?
  - What political and economic concepts could reduce dependence on petroleum?
- 6. Blue Hat (Meta-perspective):**
- How can the discussion be structured and guided toward consensus?
  - What courses of action and future visions emerge from the analysis?
  - How can insights be communicated in a sustainable way?

**Expected outcomes and reflection:** differentiated perspectives on petroleum from multiple viewpoints; awareness of emotional, critical, and creative dimensions of energy debates; development of concise and audience-oriented narratives; collaborative development of sustainable courses of action for intergenerationally just futures; reflection on both the process and the outcomes in a concluding discussion or presentation

### Method profile: Six Thinking Hats in futures-oriented education

Edward de Bono’s Six Thinking Hats model provides a structured method for examining complex issues from different perspectives and collaboratively developing well-founded solutions. Students successively adopt six different “thinking hats”, each representing a specific mode of thinking:

- White Hat: facts, data, and objective information
- Red Hat: feelings, intuitions, and personal impressions
- Black Hat: risks, critique, and concerns
- Yellow Hat: opportunities, benefits, and positive perspectives
- Green Hat: creativity, new ideas, and unconventional approaches

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### Next-Practice Example “Participation in POLY-futures”

- Blue Hat: overview, structure, and process management

By consciously shifting perspectives, entrenched patterns of thinking can be questioned, discussions become more balanced, and more informed and creative decisions can be reached. In the context of futures-related questions, this method is particularly effective: Students may first gather data and facts about current developments (White Hat), express emotions, hopes, and fears regarding possible futures (Red Hat), critically reflect on risks (Black Hat), identify opportunities (Yellow Hat), develop creative alternatives and future scenarios (Green Hat), and finally integrate all perspectives into a coherent and reflective future strategy (Blue Hat).

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## 5 OUTLOOK

Whilst developing the *FuturesComp*, it became clear once again that futures literacy constitutes a central element of future-oriented higher education. This competence framework provides practice-oriented, theoretically grounded, and transferable guidance for supporting institutions of higher education in systematically fostering futures literacy. Looking ahead, the approaches presented for cultivating futures literacy must be further expanded, tested, and accompanied by rigorous research. In particular, the curricular integration of futures literacy beyond individual courses represents a key challenge. Addressing this challenge requires a high degree of institutional commitment and didactic innovation within higher education. Implementation workshops provide opportunities to exchange experiences, make good practices visible, and generate shared impulses for further development.

A further step lies in the systematic inclusion of student perspectives. As the target group of competence development, students possess valuable insights into the relevance and effectiveness of the learning formats and content. Their experiences can contribute to refining educational approaches and aligning them more closely with the needs of a diverse student population.

Moreover, the *FuturesComp* offers considerable potential for international alignment and collaboration. Its orientation toward existing European Union and UNESCO competence frameworks as well as cooperation with international higher education networks engaged in transformative education and futures literacy has already strengthened the quality of the framework. Such partnerships can play a central role in its continued refinement. Futures are dynamic – as are the demands placed upon education. To remain effective over the long term, futures literacy must be understood as a learning practice: open to new insights, flexible adaptations, and creative advancement. The *FuturesComp* is therefore not intended as a rigid

framework but as a living impulse for the transformative potential of higher education in the 21st century.

In the context of the Anthropocene, futures literacy should be understood not as an optional extension of higher education, but as a core competence for engaging with future challenges. In the light of ecological, social, cultural, and economic transformations, the capacity to explore, critically reflect upon, and actively shape diverse futures is central to a transformative educational landscape. The *FuturesComp* is conceived as a contribution to the systematic anchoring of this competence within Austrian higher education – not merely as a response to change, but as an active co-creation of a sustainable, resilient, and inclusive society.

This **competence framework** establishes a normative and conceptual foundation for the curricular integration of futures literacy. It supports educators, higher education developers, curriculum committees, and policy decision-makers in creating futures-oriented learning environments. Rather than promoting standardisation, the *FuturesComp* emphasises adaptability. Its implementation is context-sensitive and aligned with institutional profiles, pedagogical approaches, and regional conditions.

As an **open and living document**, the *FuturesComp* also serves as an impulse for collective development. The described key competences and learning outcomes invite institutions to initiate, experiment with, and further refine their own higher education implementations in dialogue with others. In a rapidly changing world, spaces for shared learning and co-creation are essential – and higher education institutions can become such spaces.

In this spirit, we invite all interested stakeholders to bring their experiences and perspectives to the continued evolution of the *FuturesComp*. After all, the future is not something we predict – it is something we shape together.

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# COLLABORATING EXPERTS & INSTITUTIONS

Last Name, First Name	Institution	Country
Brandhofer, Gerhard	University College of Teacher Education Lower Austria	Austria
Braunsteiner, Maria-Luise	University College of Teacher Education Lower Austria	Austria
Buck, Susanne	Federal Ministry for Women, Science and Research	Austria
Buzeczki, Barbara	Federal Ministry for Women, Science and Research	Austria
Calice, Jakob	Innovation Foundation for Education (Innovationsstiftung für Bildung), OeAD GmbH - Agency for Education and Internationalisation	Austria
Cuhls, Kerstin	Fraunhofer Institute for Systems and Innovation Research	Germany
Damhof, Loes	Hanze University of Applied Sciences Groningen	Netherlands
Gulmans, Jitske	Hanze University of Applied Sciences Groningen	Netherlands
Heino, Hanna	University of Turku - Finland Futures Research Centre	Finland
Hichert, Tanja	Stellenbosch University	South Africa
Jokinen, Leena	University of Turku - Finland Futures Research Centre	Finland
Karavasian, Christine	United Nations Educational, Scientific and Cultural Organization	France
Ketonen-Oksi, Sanna	Laurea University of Applied Sciences	Finland
Kofler, Klaus	Future Design Academy	Austria
Leinfelder, Reinhold	Freie Universität Berlin	Germany
Mayr, Helga	University College of Teacher Education Tyrol	Austria
Miller, Riel	Founder of consultancy Xperidox	France Canada Norway
	École des Ponts Business School	
	University of New Brunswick University of Stavanger former United Nations Educational, Scientific and Cultural Organization	
Obexer, Regina	MCI   The Entrepreneurial School®	Austria
Ollenburg, Stefanie	Braunschweig University of Art (Hochschule für Bildende Künste Braunschweig) Founding member of the ZUKÜNFTE Network	Germany
Pajula, Liisi	University of Tartu	Estonia
Peschl, Markus	University of Vienna	Austria
Peterbauer, Helene	European University Association (EUA)	Austria
Pratt, Susanne	University of Technology Sydney	Australia
Raab, Christina	Leopold Franzens University of Innsbruck	Austria
Rauch, Franz	Ökolog – Austria's largest network for schools and the environment	Austria
Richards, Martyn	University of Turku - Finland Futures Research Centre	Finland
Schmitz, Marina	Bled School of Management	Slovenia Germany
	Polymundo AG	
Schratz, Michael	Leopold Franzens University of Innsbruck	Austria
Seidl, Tobias	Stuttgart Media University (Hochschule der Medien Stuttgart)	Germany
Tulis-Oswald, Maria	Paris Lodron University of Salzburg	Austria

Institutions participating in the implementation workshop (December 2025):

University of Klagenfurt (Alpen-Adria University Klagenfurt), Federal Ministry of Education (BMB), Federal Ministry for Women, Science and Research (BMFWF), CAMPUS 02 University of Applied Sciences Graz, University of Applied Sciences for Health Professions Upper Austria, University of Applied Sciences Upper Austria, University of Applied Sciences Technikum Vienna, Vienna University of Applied Sciences of the Vienna Chamber of Commerce, Future Design Academy, University College of Teacher Education Vienna/Lower Austria (KPH Vienna/Lower Austria), MCI | The Entrepreneurial School®, University College of Teacher Education Lower Austria, Salzburg University College of Teacher Education Stefan Zweig, Private University College of Teacher Education Augustinum, Research Group for Empirical Migration Research Salzburg, Graz University of Technology, Austrian UNESCO Commission, University of Applied Arts Vienna, University of Natural Resources and Life Sciences Vienna (BOKU), University of Music and Performing Arts Vienna, University for Continuing Education Krems (Danube University Krems), University of Vechta, University of Vienna, Adult Education Centres (Volkshochschule).

# AUTHORS

**Prof. (FH) Mag. Dr.in Antje Bierwisch** is Professor and Head of the Department of Innovation Management, Entrepreneurship and Foresight at MCI | The Entrepreneurial School® and holder of the UNESCO Chair in “Futures Capability in Innovation and Entrepreneurship”. She designs, develops, and leads national and international futures and transformation projects at both political and corporate levels. Her research focuses on Futures Literacy, Corporate Foresight, and sustainable innovation. She is also a member of the advisory board “Transformative Education and Global Citizenship” of the Austrian UNESCO Commission and is regularly invited as a keynote speaker at international conferences and professional events.

**Mag. phil. Ioana Capatu** is a research associate at the Center Futures Literacy and the UNESCO Chair in Learning and Teaching Futures Literacy in the Anthropocene at the University College of Teacher Education Lower Austria and a lecturer in the field of diversity. Her areas of expertise include multilingualism and German as a foreign and second language, theatre and drama pedagogy, the Anthropocene, Futures literacy, and creative writing.

**Mag. Dr. Rita Elisabeth Krebs, BA**, is a research associate at the UNESCO Chair in Learning and Teaching Futures Literacy in the Anthropocene and at the Center Futures Literacy at the University College of Teacher Education Lower Austria. She is also a lecturer in chemistry education at the University of Vienna and at the University of Applied Sciences Wiener Neustadt, where she teaches at the Institute of Languages with a focus on sustainability reporting. Her research focuses on science education, language education, and Futures literacy.

**Juliana Pattermann-Gunsch, BAMA MSc**, is a research associate at MCI | The Entrepreneurial School®. Through her studies in international business and business education, her teaching experience at vocational secondary schools, universities, and universities of applied sciences, and her involvement in curriculum development in higher education, she has developed extensive (subject-)didactic expertise. Her research focuses on higher education didactics and futures studies, particularly the development of learning interventions and theory-building to foster Futures Literacy.

**HS-Prof. Mag. Dr. Carmen Sippl, MA**, is Chairholder of the UNESCO Chair in Learning and Teaching Futures Literacy in the Anthropocene, Professor of Cultural Semiotics and Plurilingualism, and Head

of the Center Futures Literacy at the University College of Teacher Education Lower Austria. She is also a lecturer at the Faculty of Philosophical and Cultural Studies at the University of Vienna. Her teaching and research focus on the Anthropocene and literature, cultural ecology and literature education, Futures literacy, and academic writing.

**Prof. (FH) Mag. Dr. Oliver Som** is Professor of Innovation and Technology Management at MCI | The Entrepreneurial School®, Innsbruck. He also leads the research focus “Entrepreneurship” and serves as Chief Scientific Officer of the ULYSSEUS Innovation Hub “Sustainable Entrepreneurship & Impact” at MCI. His teaching and research focus on strategic foresight, future-robust innovation strategies, sustainability and artificial intelligence in the context of innovation management, as well as creativity, improvisation, and entrepreneurial thinking. Oliver Som is an advisory expert on innovation and technology policy for the German federal government, the European Commission, as well as associations and political decision-makers nationally and internationally.

**HS-Prof. Karin Tengler, BEd MAMEd PhD**, is Co-Chairholder of the UNESCO Chair in Learning and Teaching Futures Literacy in the Anthropocene and Professor of Media Education and Futures Literacy at the University College of Teacher Education Lower Austria. Her teaching and research focus on media education, computational thinking, Futures literacy, and artificial intelligence in higher education.

**Julia Vögele, BA MA**, is a doctoral candidate and project researcher at the UNESCO Chair in “Futures Capability in Innovation and Entrepreneurship” at MCI | The Entrepreneurial School®. Her research focuses on futures studies, entrepreneurship, and sustainable innovation. In her work for Tirol Werbung, she explored global megatrends and their impact on the transformation of the Tyrolean tourism industry and society towards desirable futures. Since then, she has been closely connected with the local entrepreneurial and start-up community in Tyrol. With her research focus on Futures Literacy and entrepreneurship, she has presented at international conferences, given guest lectures, and led workshops – most recently with a focus on women in entrepreneurship.

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Authors: Antje Bierwisch, Ioana Capatu, Rita Krebs, Juliana Pattermann-Gunsch, Carmen Sippl, Oliver Som, Karin Tengler, Julia Vögele

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