A Guidebook for Learning in Complexity

For anyone who wants to navigate the complex world of healthcare and beyond

Contents

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Introduction

Learning in Complexity

In today's rapidly changing world, our societies face a growing array of interconnected challenges—from climate change and biodiversity loss to widening inequalities in health and income. To address these crises effectively, we must reimagine how we educate future generations, especially those in fields such as health. Over the course of three years, our consortium of healthcare educators and impact organisations have worked on **ECOLAH**, an Erasmus+ funded project in higher education which stands for Embracing Complexity Oriented Learning Approaches in Health. Traditional approaches to education, which often prioritize fragmented, linear thinking and a somewhat static transfer of knowledge, are not always sufficient in preparing students for the complexity of the real world. **This is where systems thinking and complexity-oriented learning approaches come into play: they offer fundamental tools for navigating the intricate web of relationships and interdependencies that define our world. This Guidebook explores the role of higher education in fostering sustainability and societal transformation through a shift toward complexity-oriented learning practices.**
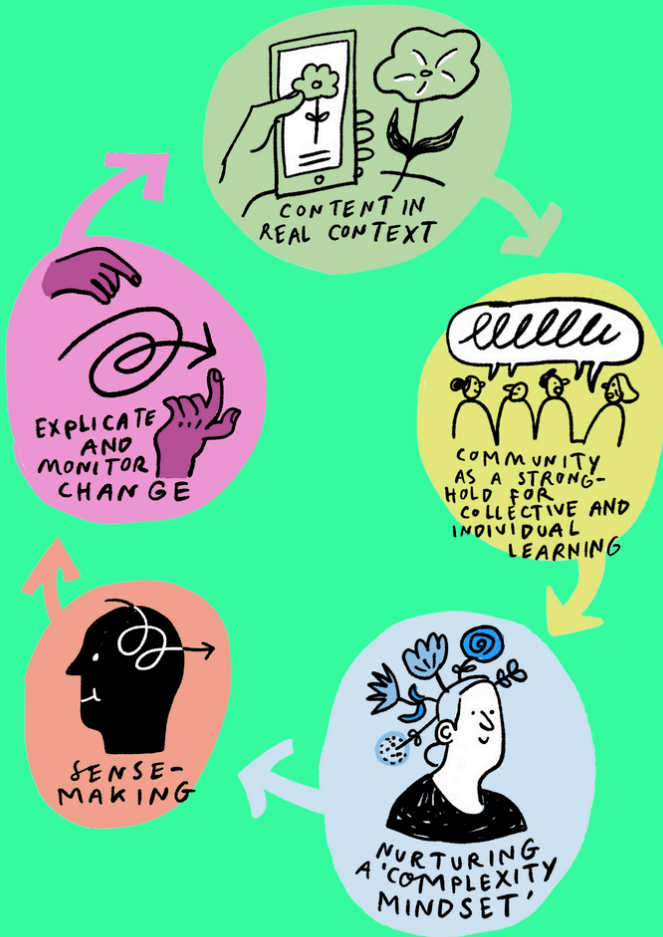
Health, in this broader sense, must be seen as an intrinsic value deserving of care and attention. However, achieving this vision requires a shift in how we perceive and teach health — moving away from linear models to embrace more holistic, interconnected, and context-sensitive approaches. This transformation will not only demand new ways of teaching but also a deep examination of the systems, policies, and values that underpin current educational practices.

This Guidebook aims to step for step highlight the critical importance of rethinking higher education, especially in health, to meet the challenges of the 21st century. By embracing complexity-oriented learning approaches, we can prepare students not only to navigate complex systems but also to actively contribute to societal transformation. The journey to a more sustainable and equitable future begins with an education that nurtures the skills and mindset necessary to understand and engage with the complex, ever-evolving world we live in. Through this exploration, we hope to inspire educators, students, and policymakers to take bold steps toward creating a more just, sustainable, and resilient society.

The current educational paradigm is not sufficiently preparing students to engage with the complexities of the modern world, especially in health-related fields. The need for education that acknowledges complexity is more pressing than ever, as health is increasingly understood as an ongoing process, not confined to healthcare systems but interwoven with our daily lives and environments.

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Guiding principles

During the ECOLAH project, the consortium has developed five key guiding principles for learning in complexity. These guiding principles help navigate complexity oriented education.

CONTENT IN REAL CONTEXT

COMMUNITY AS A STRONGHOLD FOR COLLECTIVE AND INDIVIDUAL LEARNING

NURTURING A 'COMPLEXITY MINDSET'

SENSE-MAKING

EXPLICATE AND MONITOR CHANGE

Guiding principles

Content in real context

A complex challenge involves unpredictable outcomes shaped by dynamic, context-specific interactions and non-linear patterns. These challenges often intertwine individual and collective interests with environmental and societal factors, increasing complexity. Learning activities addressing such challenges must be adaptable, context-sensitive, and designed to foster sense-making and responsiveness to emergent and historical dynamics.

Community as a stronghold for collective and individual learning

Complex challenges require collaborative approaches involving diverse stakeholders, where collective goals take precedence over individual ones. Communities addressing such challenges must cultivate inclusiveness, adaptability, and shared responsibility, fostering balanced power dynamics and open learning climates. Roles and contributions evolve dynamically, enabling the group to co-create evidence-based solutions while valuing every member's input and meeting their fundamental needs.

Nurturing a 'complexity mindset'

Complex systems differ from complicated systems in that they involve dynamic, interconnected components where outcomes cannot be predefined and solutions continuously evolve as circumstances change. Learners must adopt a "complexity mindset, emphasizing reflexive learning, adaptability, and lifelong growth in understanding, navigating, and acting within complex systems. This mindset embraces uncertainty, fosters curiosity, and integrates sensemaking and anticipatory actions to adapt to the ever-changing nature of complex systems.

Guiding principles

Sense making

To help individuals and systems navigate dynamic, evolving challenges effectively, sense making has to be emphasized. In complex situations, system behavior emerges unpredictably from interactions among components, requiring adaptability and iterative approaches. to enable learning and action by exploring patterns, creating shared understanding (sense), and responding to stabilize desirable outcomes or disrupt undesirable ones.

Explicate and monitor change

Addressing complex problems requires understanding and influencing dynamic systems with many interacting components, where changes can lead to both intended and unintended consequences. Learners are guided to embrace a "complexity mindset," anticipate system evolution, and implement purposeful change by engaging stakeholders, fostering innovation, and monitoring both short- and long-term impacts. Through a learning-by-doing approach, the module encourages confidence, commitment, and celebrating progress, motivating learners to sustain meaningful change within complex systems.

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Learning in complexity courses

The consortium has designed courses on learning in complexity specifically for health education. These courses focus on fostering adaptive and collaborative learning approaches, enabling students and professionals to navigate the ambiguity and complexity inherent in real-world healthcare environments. The curriculum features four core courses: **Becoming in Complexity, Futures Literacy, Complex and Adaptive Systems, and Holding and Facilitating**. Rooted in the consortium's expertise and informed by a comprehensive literature review, these courses can be used in class rooms that have been tested in contexts all aorund europe, highlighting the significance of flexible, context-aware content to support complex learning and prepare participants for dynamic challenges in healthcare.

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Module 1
Description

Complex adaptive systems

Well-being and health are shaped by a web of complex and interrelated factors, requiring a systemic approach that considers the broader health ecosystem. This approach focuses on addressing root causes rather than just symptoms, emphasizing the importance of collaboration and integrating diverse expertise to effectively tackle health issues.

In complex adaptive systems, all actors are interdependent, meaning that changes within one part can have unpredictable, broad effects due to the "law of unintended consequences." The dynamic and evolving nature of these systems, with their fuzzy boundaries, makes them difficult to predict and manage using traditional linear approaches. Therefore, understanding these systems requires a perspective that embraces their complexity and anticipates both intended and unintended outcomes within their specific contexts.

To effectively address complex health issues, a process of co-creative learning and innovation is necessary. This involves transdisciplinary collaboration, where diverse perspectives are integrated from the start to build meaningful partnerships and mutual understanding. Systematic co-development, as illustrated by models like the participatory research partnership, offers a collaborative approach that helps navigate the complexities of adaptive systems and avoid traditional implementation problems, ensuring that all stakeholders participate equally in the process.

When faced with a complex adaptive system, you can fall back on the tools provided here, understanding that the system is always dependent on its specific context, including its inherent culture, history, and societal structures. The outcomes may not be fully defined from the beginning, and the steps to follow will be situated, negotiated, and follow non-linear patterns and causalities. By adopting a complexity orientation, you can secure a perspective that focuses on the functioning of the whole system and remains open to interactions, while anticipating both intended and unintended consequences in real contexts.

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Module 1

Toolbox

Complex adaptive systems

The toolbox is your guide for navigating the world of learning in complexity. Use these tools as your guide to use whenever the going gets tough in the land of complex learning.

These tools will help you navigate complex adaptive systems.

Learn about complex dynamics
of complex systems
Triangle exercise

Collaborate in complexity
Lego game

Embody complexity learning
Sensing a CAS

Creating dialogue
Timeout

Facilitate deeper dialogue
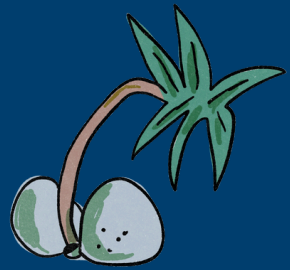**Fish bowl**

Building partnerships
Participatory

Harnessing multiple perspectives
What is in a name?

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Literature

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Module 2
Introduction

Epistemic and futures literacy

Birds are creatures of habit.
There is a time for eating, for drinking and for a siesta; a season for seduction, reproduction and rearing young. [..]
These habits are not mindless rituals, but actions that follow the rhythms of nature. The shifts in sunrise and sunset as the year progresses. Rain, wind, heatwaves.. Mist or storms.
For creatures that live in the open, life is far from predictable.
Birds must constantly adapt to whatever the day brings, for better or for worse
'A short philosophy of birds'

— P.J. Dubois & Elise Rousseau

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Description

Epistemic and futures literacy

Embark on a transformative journey where, much like birds finding sanctuary amidst rituals, participants will learn to balance openness with meaningful practice. This experience explores how planned rituals and spontaneous activities create fertile ground for personal and collective growth. By embracing uncertainty and appreciating complexity, learners will develop the skills needed for intentional navigation towards new possibilities.

Key to this journey are four essential capabilities: the ability to use the future across various contexts and purposes, envision multiple futures, reframe assumptions about the future, and enhance present-day perception to recognize novelty. These skills are crucial for navigating complexity and making informed decisions, enabling individuals to transcend linear thinking and engage with a richer array of possibilities.

Central to the approach is the connection between Futures Literacy and embracing complexity. Based on Sen's capability approach framework, Futures Literacy empowers individuals to imagine and shape their futures, contributing to overall well-being. Understanding that the future is a realm of possibilities shaped by imagination helps participants adapt and innovate in the face of change.

The learning experience includes continuous reflection and growth through sanctuaries, disruptive activities such as Futures Literacy Laboratories and Polak Games, and creative exercises aimed at reframing perspectives. Ongoing feedback sessions provide opportunities for contextual evaluation and adaptation, fostering a dynamic environment that encourages exploration of diverse knowledge conceptions and reassessment of assumptions.

Participants are advised to prepare by warming up their imaginative capabilities, considering the impact of their environment and allowing time for emotional reflection. Collaborative facilitation is encouraged to leverage collective insights and perspectives, ensuring that participants are equipped to navigate complexity and envision futures that support both personal and societal well-being.

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Module 2
Toolbox

Epistemic and futures literacy

The toolbox is your guide for navigating the world of learning in complexity. Use these tools as your guide to use whenever the going gets tough in the land of complex learning.

These tools will help you embrace futures literacy.

Exploring alternative futures
Out of the box

Developing agency
Facilitatorlexity Polak

Become comfortable with the uncertain
Futures Literacy Lab 1

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Literature

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UNESCO Futures Literacy Playbook; essential guide to Futures Literacy laboratories

Description

Becoming in complexity

In the context of health education, "becoming" refers to the transformative process of personal and intellectual growth as individuals engage with complex learning environments. This process involves developing critical thinking, lifelong learning, and intercultural maturity, moving beyond mere knowledge acquisition to actively shaping one's educational journey. It emphasizes creating meaning and understanding the dynamic nature of health and professional practice, fostering a systematic evaluative judgment and recognizing the interconnectedness within the health ecosystem.

The need for "becoming" arises because traditional educational programs often focus on acquiring knowledge and skills without integrating these elements into professional identity. Such programs might overlook the ontological aspect of learning—understanding the essence of being in complex situations.

For healthcare students, aligning individual learning with collective experiences and focusing on evolving from knowledge acquisition to a deeper understanding of 'becoming' is crucial for effectively addressing complex issues in their professional practice.

Students engaged in complex educational experiences are expected to develop confidence and comfort in handling novel and ambiguous situations. The process of "becoming" involves continuous improvement, problem-solving, and strategic thinking, fostering lifelong learning and cultural awareness. It encourages students to embrace ambiguity, enhance independent decision-making, and define their professional identity, thereby contributing meaningfully to their fields and society.

Module 3

Toolbox

Becoming in complexity

The toolbox is your guide for navigating the world of learning in complexity. Use these tools as your guide to use whenever the going gets tough in the land of complex learning.

These tools will help you to become in complexity.

Personal and team development
Reflection Canvas 2.0

Enhancing learning assessment
Assessment for Learning

Structured reflective learning
Gibbs Reflective Cycle

Creating dynamic narratives
Storytelling 2.0

Exploring collaborative insights
Focus group

Empowering personal growth
Personal learning plans

Discovering meaning in complexity
Reflective diaries

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Literature

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Introduction

Holding facilitating environment

"I take my guidance from the forests, who teach us something about change. The forces of creation and destruction are so tightly linked that sometimes we can't tell where one begins and the other leaves off. A long-lived overstory can dominate the forest for generations, setting the ecological conditions for its own thriving while suppressing others by exploiting all the resources with a self-serving dominance. But all the while it sets the stage for what happens next, and something always happens that is more powerful than that overstory: a fire, a windstorm, a disease [another complex challenge]. Eventually, the old forest is disrupted and replaced by the understory, by the buried seedbank that has been readying itself for this moment of transformation and renewal. A whole new ecosystem rises to replace that which no longer works in a changing world."

– Robin Wall Kimmerer

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Description

Holding facilitating environment

While we don't exactly know how the understory will progress, we do know that the understory involves a mind-shift and fundamental systemic changes in societal regimes, including the field of higher education. The understory will lead us through moments of euphoria as well as moments of deep uncertainty. This means that we need to balance between offering a safe environment and the incentive to endure the complexity and to develop further as an (always relative) autonomous reflective learner.

In creating a holding and facilitating environment, **holding** refers to creating a safe and supportive learning environment where learners can feel comfortable taking risks, asking questions, and experimenting with innovative ideas. In a complex environment, where the outcomes may be unpredictable and the path forward may be uncertain, learners need a sense of safety and security to be able to engage fully in the learning process.

Facilitation refers to the process of guiding learners through the learning experience. In a complex learning environment, facilitation is important because it helps learners make connections between ideas and concepts, and it helps them navigate the complexity more effectively.

This module on creating a 'Holding and facilitating environment' prepares learners for an under-current of relations, border crossing, and (caring) ethics. It nurtures (collective) sensemaking, empathy, and intuitive (expert) reasoning. It is done by offering a trusted, resilient learning space in which basic psychological needs (Deci & Ryan, 2000) are met and that allows for not-knowing and experimenting. Together we can adapt more adequately, handle uncertainty better, and learn/innovate/experiment more (Strout et al., 2018).

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Module 3
Toolbox

Becoming in complexity

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These tools will help you to become in complexity.

Personal and team development
Reflection Canvas 2.0

Enhancing learning assessment
Assessment for Learning

Structured reflective learning
Gibbs Reflective Cycle

Creating dynamic narratives
Storytelling 2.0

Exploring collaborative insights
Focus group

Empowering personal growth
Personal learning plans

Discovering meaning in complexity
Reflective diaries

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Module 4
Toolbox

Becoming in complexity

The toolbox is your guide for navigating the world of learning in complexity. Use these tools as your guide to use whenever the going gets tough in the land of complex learning.

These tools will help you create a facilitating environment for learning in complexity.

Facilitating meaningful collaboration
Building partnerships

Increasing wellbeing
Positive things

Connecting to others
For facilitators

Exploring different purposes
Role playing

Escape your comfort zone
Improv

Embracing interconnectivity
Systematic literature review

Adapting through complexity
Monitoring comfort agency

Exploring complex challenges
Paradox navigator

Supporting a learning environment
Monitoring complexity

Dealing with complexity
Periodic onboarding

Literature

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