

Evolution, Behavior, and Sustainability

Today's global society faces major challenges in ensuring resource availability, social equality, peaceful coexistence, access to good education, health and human well-being for all. The United Nations has identified 17 global goals for sustainable development, aiming to reach specific markers of success in each area by the year 2030.



The 17 Global Goals for Sustainable Development identified by the United Nations

All of these goals require **collaboration** and **collective learning** across many levels of society, including up to the unprecedented scale of global cooperation.

What can we learn from **other living beings**, from our **evolutionary history as a species**, from our **everyday experiences and behaviors**, and from **communities around the world** about how these challenges of cooperation can be mastered and which factors might hinder this cooperation?

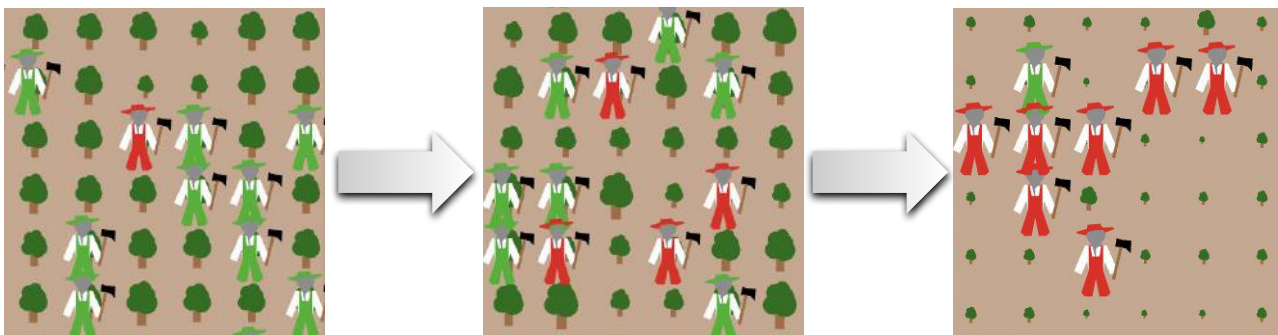
Research in biology, economics, anthropology, psychology, and behavioral sciences offer us clues as to **which conditions and principles play a role** in enabling the sustainable development of diverse communities across multiple scales of social organization.

Evolution, Behavior, and Sustainability

Box 1. The basic dilemma of using shared resources

Sustainable development is, ultimately, about the maintenance of shared, limited, natural and social resources. In such situations there is always the threat of competition between individuals endangering the maintenance of the shared resource, and thus the sustainability of the whole community.

Individuals often have an interest in using as much of the resource as possible (or contributing as little as possible to the conservation of the resource). After all, their behavior may have no immediate negative consequences. However, when most people in the community act like this, the entire resource is endangered, with negative consequences for everyone. This **dilemma between short-term personal advantage and the long-term common good** in the use of shared resources is called the **tragedy of the commons**¹.



The Common-Pool Resource Dilemma: What prevents an individual from taking as much as possible from the resource? Greed and envy may then entice others to increase their resource use as well. After all, nobody wants to be "the fool". However, if everyone does so, resource availability is jeopardized for all.

The tragedy of the commons is an important concept in the evolutionary, behavioral and sustainability sciences, and presented a puzzle for a long time. After all, we can observe that many species of animals, as well as many groups of people, have apparently managed to cooperate and thus prevent the tragedy of the commons.

What conditions and behaviors enable them to do this?

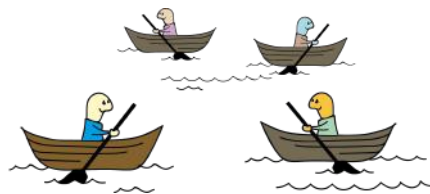
¹ *sensu* Hardin (1968)

Evolution, Behavior, and Sustainability

Box 2. Are we “all in the same boat”?

The use of community resources is a dilemma only when the interests of individuals are not clearly in line with the interests of the community. Biologists, behavioral scientists, and sustainability scientists like to use the **boat-analogy** to describe situations in relation to how individuals' interests are related to the interests of others, whether self-interest and collective interest are in line or opposed.

- ❖ **Does everyone sit in his or her own boat**, only concerned with their own direction? Is it irrelevant to one's survival how those in the other boats behave? **Then there is no social interaction, neither competition nor cooperation.**



- ❖ **Is everyone sitting in the same boat?** Is the success or failure of one the success or failure of the others? Then we can expect that, over time, cooperation emerges - everyone has the same aim, because everyone is interested in moving their boat together towards a safe destination. **Those groups that cooperate better than other groups will have an advantage in the long-term.**



- ❖ **Does everyone sit in his or her own boat, and are all boats in a race?** Does the victory of one equal the defeat of the others? Then we can expect that there is competition - all are interested in defeating the other boats. **Those who are faster, stronger, more efficient, or smarter than the others, will have the long-term advantage.**

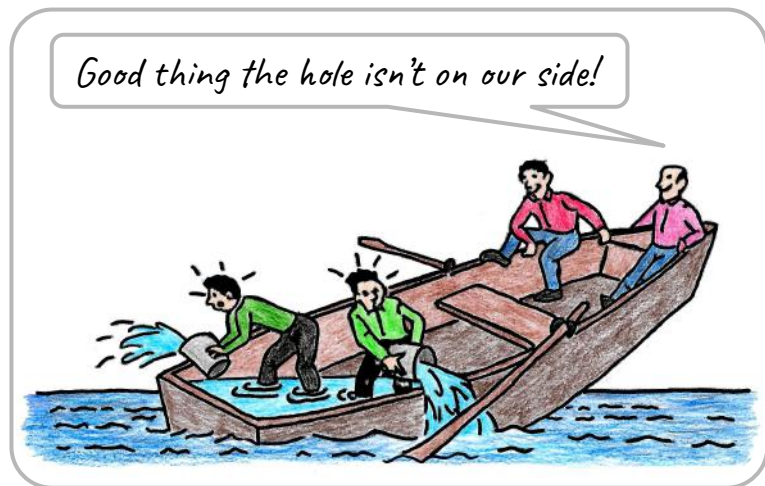


Evolution, Behavior, and Sustainability

Box 2. (continued) Are we “all in the same boat”?

In reality, situations rarely fall cleanly into one of these boat scenarios, or situations are constantly changing. Often self-interest and the common good are neither perfectly aligned, nor perfectly opposed. Selfish behavior is often worthwhile in the short term, but not in the long term. These unclear situations lead to a dilemma - between short-term individual advantage and long-term common good.

When everyone is in the same boat, it is beneficial for everyone to work together. Competition or cheating within the group can, sooner or later, lead to the downfall for everyone.



“Suppose that two people, Art and Bud, are at sea in a rowboat, trying to stay ahead of a violent storm. Neither will survive unless both row as hard as possible. Here self-interest and collective interest (in this case, a collective of two) are in perfect harmony. For both Art and Bud, doing what’s best for “Me” and what’s best for “Us” is the same. In other cases, cooperation is impossible. Suppose, for example, that Art and Bud’s boat is now sinking and that they’ve only one life vest, which can’t be shared. Here there is no Us, just two different Me’s.

When cooperation is easy or impossible, as in the two scenarios above, there’s no social problem to be solved. Cooperation becomes a challenging but solvable problem when, as in [the tragedy of the commons], individual interest and collective interest are neither perfectly aligned nor perfectly opposed. (...) The problem of cooperation, then, is the problem of getting collective interest to triumph over individual interest, when possible. The problem of cooperation is the central problem of social existence.”

Joshua Greene (2013), p. 20

Evolution, Behavior, and Sustainability

Challenges of sustainable development are not fundamentally new to us humans. Throughout our **evolutionary history**, our species has been confronted time and again with **challenges of collaboration**, collective decision-making, and the sharing of limited resources. This is because our ancestors lived in groups where everyone was **“in the same boat”** - everyone was dependent on preserving the group and its resources, both natural and social. These challenges have significantly **shaped the cognitive and social skills, as well as behaviors and cultures of our species**.

In this context, an **understanding of the causes and consequences of human behavior**, as well as of the **causal relationships that have shaped our past, shape our present, and will shape our future**, can help us understand today's challenges to human well-being and sustainable development. Understanding the context of these challenges is central to our capacities to evaluate possible solutions.

Exploring **human behavior** in the classroom offers further learning opportunities. Students of all grades, and humans in general, are very interested in human behavior - **we experience it on a daily basis** and we are constantly concerned with and imagine its causes and consequences. In addition, human behavior is **implicitly or explicitly integrated in the curricula of many subjects**, especially in biology, social studies, history, geography, and ethics.

The research questions, concepts, methods and findings of evolutionary anthropology, behavioral science, psychology, and sustainability sciences offer unique opportunities to explore the causes and consequences of human behavior in the classroom. They thus can contribute to a fascinating and interdisciplinary education that connects to our shared everyday experience and is relevant to pressing societal challenges.

The educational **design concept** presented in this document offers practical guidance for the development of teaching materials, lessons, and units that aim to support students and teachers in **reflecting on the everyday experience of human behavior in the light of evolution and sustainability**.

Design Concept

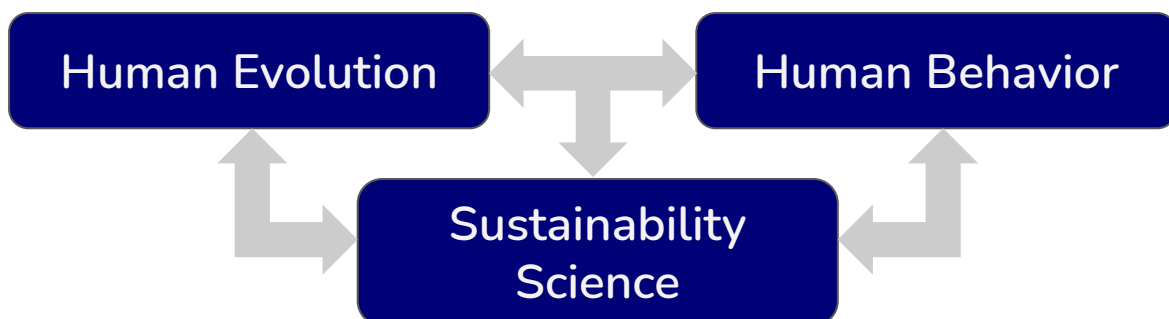
Our **educational design concept** aims to help students and teachers develop the skills to reflect on the causes and consequences of everyday human behaviors, and transfer these competencies to their own lives and to diverse sustainable development issues.

To achieve deeper understandings on the nature of human behavior and sustainability, isolated lessons are not enough. Rather, we need to think on several levels, including on the level of units and curricula.

The **strength of the educational opportunities provided by evolution, behavior and sustainability sciences** lies in the rich interdisciplinary nature of their core concepts, principles, methods, and skills. These fields are characterized by the exploration of transferable principles across contexts, enabling interdisciplinary discourse, and supporting engagement in the complex problems of human society. This richness in concepts and principles provides opportunities for achieving the competency aims of Education for Sustainable Development, and of interdisciplinary education more generally (→ p. 12).

For educators to leverage these opportunities, however, we **need to identify the key concepts, principles, methods, and skills that characterize these fields**, to subsequently formulate overarching understandings, essential questions, knowledge, and skills and identify a diversity of pedagogical approaches best suited for supporting specific learning processes.

Our design concept integrates all these elements and thus aims to support you in adapting these ideas to your own teaching aims and school context.



Design Concept

What kinds of **teaching methods, content, and teaching tools** can help students and teachers develop the skills to reflect on the causes and consequences of **everyday human behaviors**, and transfer these understandings to **sustainable development issues**?

Design Principles

Overarching principles for the identification of content and teaching methods

Content Anchors

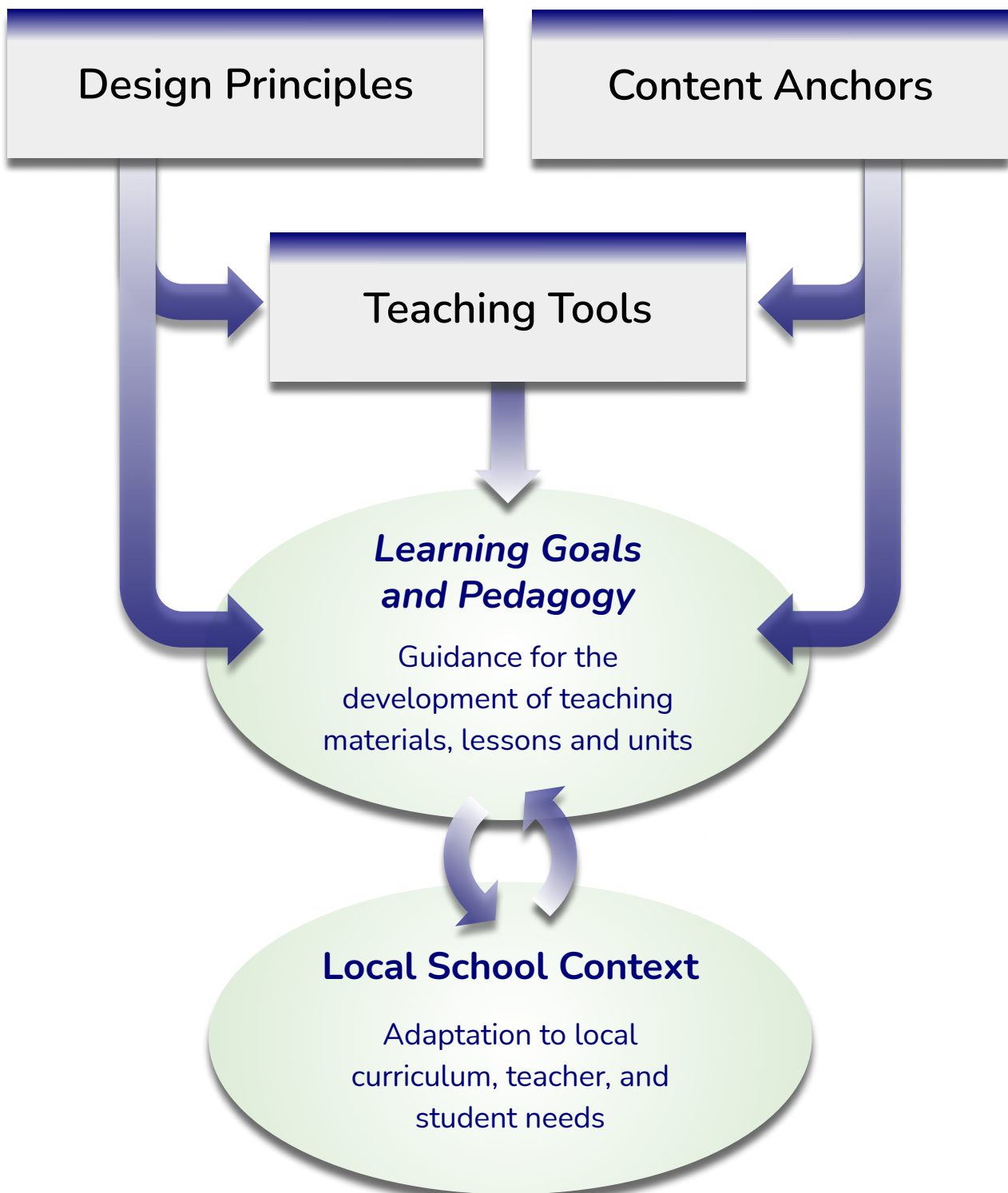
Cross-cutting content anchors reflect the methods and fields of inquiry of evolutionary anthropology, behavioral and sustainability science. From these, we identify content for the development of educational materials that can be used to explore concepts and essential questions around human evolution, behavior, and sustainability.

Teaching Tools

Teaching tools are used across diverse lessons to develop the skills that evolutionary anthropologists and sustainability scientists use in exploring the causes and consequences of human behavior, as well as the complex relationships in social-ecological systems.

Design Concept

Design Principles, Content Anchors and Teaching Tools inform learning goals and pedagogical approaches



Design Concept

Design Principles

Higher-level guidelines for identifying teaching content and methods for unit or lesson design

Focus on Human Behaviors

Focus on the aspects and everyday experience of human behaviors relevant to human well-being and sustainable development (e.g., prosociality, cooperation, sense of belonging, curiosity and creativity, learning and teaching, empathy and compassion, sense of fairness, perspective taking, flexibility, self-control, goals and values, health, prevention). *Focusing on human behaviors helps students relate to and understand the causes of everyday experience and societal phenomena.*

Explore Complex Causality

Explore and reflect on the many causes and consequences of human behavior and on the complex causal relationships in human evolution, behavior, and social-ecological systems: How do immediate internal and external factors, as well as individual development and evolutionary history, function as causes of human behavior? Why do these mechanisms and patterns of behavior exist compared to other possibilities? What consequences do behaviors have for individuals and their environment, in the short-term and in the long-term? Diverse teaching tools such as causal maps and payoff matrices help in reflecting on these questions. *Exploring complex causality helps students understand and relate causal factors in the emergence of human behaviors.*

Teach for Transfer

Ensure students can **transfer** understandings to novel phenomena, everyday experience and relevant problems of sustainable development across multiple scales and contexts of global society, with the help of analogies, analogy maps, and other teaching tools. *Teaching for transfer requires the iterative exploration of diverse human behaviors and contexts.*

Design Concept

Content anchors

Content anchors help us explore concepts and essential questions around human evolution, behavior, and sustainability.

