Digital Destiny

PEDAGOGICAL FRAMEWORK

Supporting teachers in integrating societal issues into their classrooms with the use of blended learning

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The Digital Destiny Pedagogical Framework provides a structure by which teachers can integrate societal issues into their existing curriculum, employing highly engaging pedagogical methods and blended learning as appropriate.

This framework offers a set of principles which will support teachers in thinking about, developing, and creating thoughtful and carefully designed learning experiences for their students in open and safe classroom environments where all voices are heard.

Digital Destiny introduces a set of learning tools and methods to use with students in a blended learning environment offering a seamless connection between school and home.

Finally, Digital Destiny created a digital learning platform that both supplements and extends on this framework by bridging theory and practice through professional development training materials and educational tools to be used for children 6-10 years old, with special attention to the opportunities of blended learning.

Digital Destiny is the product of an Erasmus + consortium composed of:

NORTH Consulting, Iceland

Djapo vzw, Belgium

Mediawijs vzw, Belgium

Panespistimio Dystikis Makedonias, Greece

Insitutul Intercultural Timisoara, Romania

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Education for Sustainable Development

Education for Sustainable Development (ESD) is commonly understood as education that encourages the development of the competence to act as resilient and conscious citizens by offering learners opportunities to practice with societal issues. ESD aims to empower and equip current and future generations to meet their needs using a balanced and integrated approach to the economic, social and environmental dimensions of sustainable development. The concept of ESD was born from the need for education to address the growing environmental challenges facing the planet. In order to do this, an evolution within ESD is taking place.

Traditionally, ESD is aiming to grasp, describe and prescribe how education can effectively contribute to tackling societal problems. This traditional view on ESD thus translates social and political problems into issues that need 'educational solutions' (Biesta, 2006; Säfström, 2011; Simons and Masschelein, 2006, p. 395; Todd and Säfström, 2008). Using education as a tool to influence human behaviour in a particular direction, contradicts the essence of education. Today, ESD is looking for an approach to education where learners, schools and universities can engage with urgent societal issues without being reduced to instruments for externally determined demands. In this approach, societal issues are seen as interesting drivers for creative and critical inquiry, for finding new ways to inhabit the world and thus for learning.

To do this, Digital Destiny uses an innovative pedagogy grounded in the five pedagogical principles outlined in this framework. The pedagogical principles are the result of an extensive literature review on emancipatory ESD and are designed to enable schools to create rich opportunities for learners to engage in societal issues and learn from them.

Sustainable development

"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Our Common Future, Report of the World Commission on Environment and Development, 1987). It offers a vision of development that encompasses populations, animal and plant species, ecosystems, natural resources – water, air, energy – and that integrates concerns such as the fight against poverty, gender equality, human rights, education for all, health, human security, intercultural dialogue, etc. (UNESCO and Sustainable Development).

In this vision of sustainable development, societal issues and the actions taken within society can be observed and understood from different angles, condensed in the so-called '3 p's': a social, economic, and environmental perspectives. This vision on sustainability has been translated into a tool called 'The Doughnut' which can be seen as a compass for human activity.

The Doughnut consists of two concentric rings: a social foundation, that is to guarantee the right of all humans to have access to life's essentials, and an ecological ceiling, to ensure that we do not overshoot the planetary boundaries of our ecological systems. Between those two boundaries lies a space where it is ecologically safe and socially just to develop human activities (https://doughnuteconomics.org/about-doughnut-economics)

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The 12 dimensions of the social foundation are derived from the social priorities agreed in the Sustainable Development Goals (UN, 2015).The 9 dimensions of the ecological ceiling are the nine planetary boundaries defined by Earth-system scientists (Steffen et al., 2015).

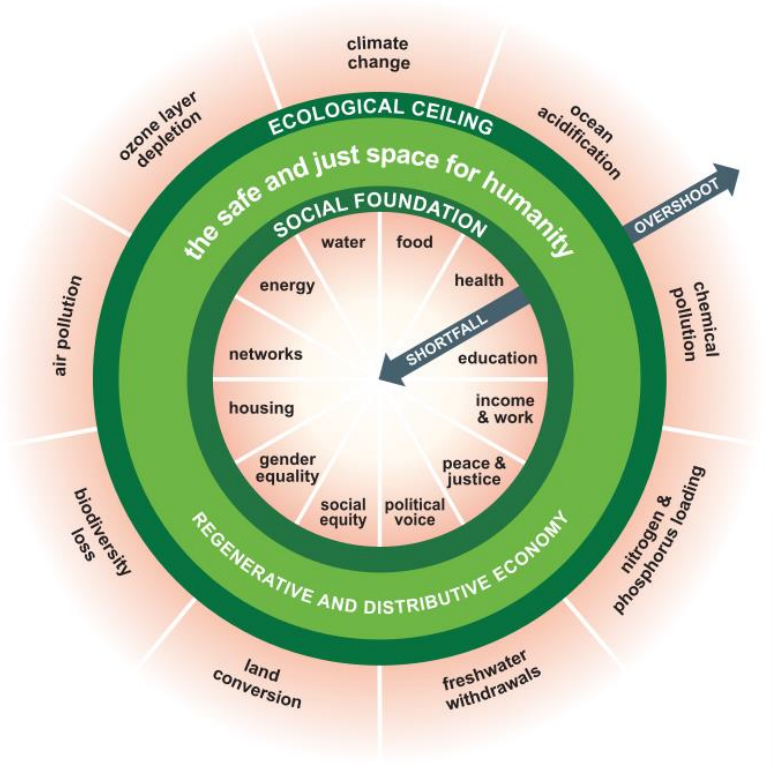

FIGURE 1: THE DOUGHNUT (https://doughnuteconomics.org/tools/11)

Which direction to go with sustainable development?

Figure 2 reveals the current state of humanity and our planetary home. You can think of it as humanity's 'selfie' in the early days of the 21st century. Each dimension is measured, where possible, with 1 or 2 indicators, and the red wedges show the extent of shortfall and overshoot of the Doughnut's social and planetary boundaries.

It shows us that millions of people still fall short on all 12 of the social dimensions, and that humanity has already overshot at least four planetary boundaries (air pollution and chemical pollution are currently unquantified).

To achieve the 21st century goal of meeting the needs of all within the means of the living planet means eliminating all of the red from the Doughnut diagram, and this must be done from both sides at the same time. (https://doughnuteconomics.org/tools/11)

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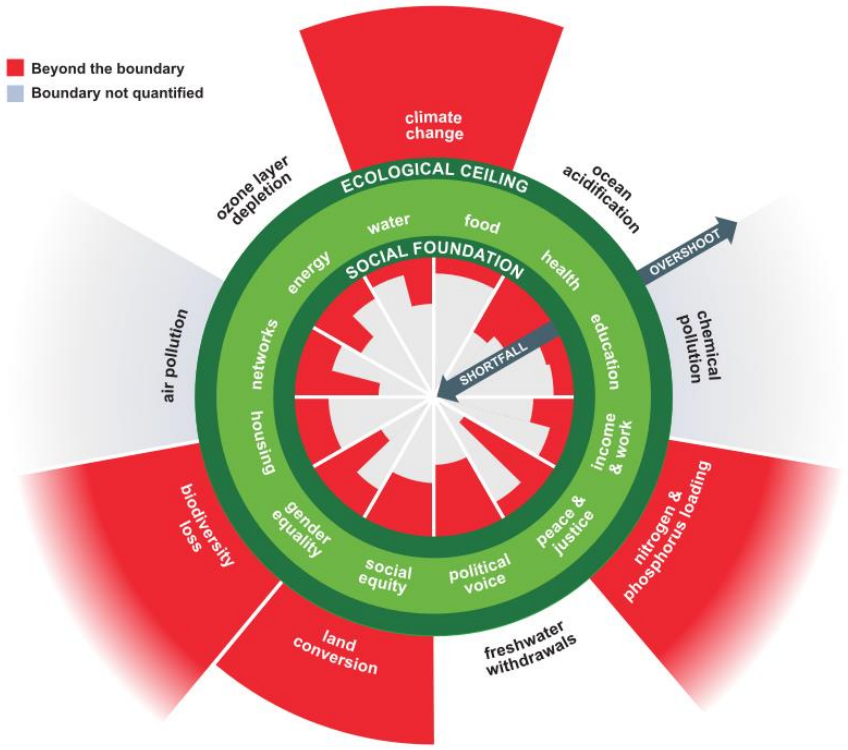

FIGURE 2

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A Pedagogical Framework for Education for Sustainable Development

This pedagogical framework is an integrated set of scientific findings and philosophical considerations about teaching and learning in Education for Sustainable Development. It offers a basis for educators to draw forth their sustainability teaching practices. It is meant as a compass for educators in designing and facilitating learning experiences from societal issues. This pedagogical framework clearly outlines the pedagogical principles on which it is built so that educators can utilize those principles in the learning module and lesson design.

It is important to differentiate between the pedagogical principles the framework provides and the learning objectives of learning modules or lesson. Implementing the pedagogical principles in a way of teaching does not determine which learning outcomes the teaching is seeking to address. As such, the principles act as a scaffold on which the educator builds the module and individual lessons. The framework can offer issues for the educator to consider and provide in-depth understanding about how learners learn.

This pedagogical framework can have multiple applications and does not only apply solely to a school classroom. The nature of the framework allows its use in all types of learning environments such as classrooms, after school activities, at home, and while traveling.

Digital Destiny Pedagogical Framework

The Digital Destiny Pedagogical Framework aims to support educators in Education for Sustainable Development (hereafter ESD) with special attention to the possibilities and added benefits of blended learning. This framework draws a picture of several principles that are fundamental for creating high quality ESD. The framework can be used to offer learners opportunities to create their own story of a sustainable world and to experience a feeling of comfort in the dynamic nature of such a story. This pedagogical framework rests on the following beliefs about education and learning:

- education is a transformational process, both for the teacher and for the learners
- the teacher is a designer, researcher, and learner
- adding digital teaching methodologies can offer benefits for the learners' learning with attention to digital inclusion
- parents support their children's learning

The framework explains...

- ✓ how Digital Destiny will stimulate and support teachers in the creation of a powerful ESD-learning environment, in a blended learning context where applicable or desirable.
- ✓ How effective communication with parents supports their children´s learning in ESD in a blended learning context

This is done on a conceptual level, so that didactical and more practical work can be done within the guidelines of framework.

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Zooming into the Digital Destiny Pedagogical Framework

Five Pedagogical Principles of Digital Destiny

An educator can create developmental opportunities for learners by designing learning activities according to the following five principles of the Digital Destiny Pedagogical Framework. The principles are conceived as a compass for educators, so that they can use them in their lesson design. By no means are they designed as conditions for development, nor are they intended as learning goals in themselves: they are intentionally designed to create opportunities for the learners to engage in societal issues and by doing so, develop the competence to act as resilient and conscious citizens. One way to specify and operationalise this competence is by referring to the Council of Europe's Reference Framework of Competences for Democratic Culture (www.coe.int/rfcdc) which includes values, attitudes, skills, as well as knowledge and critical understanding.

1. **Stimulating learning through societal issues** by helping learners connect to relevant issues in their close environment, community, country or globally.
2. **Stimulating learning through interaction** by encouraging learners to engage in interactions and experience the richness of diversity.
3. **Stimulating learning through thinking** by offering learners experiences with the design of effective thinking strategies.
4. **Stimulating learning through reflection and evaluation** by developing a thoughtful process of reflection on both process and outcomes.
5. **Stimulating learning through** structured processes by engaging learners in meaning-making

The pedagogical Basis

The pedagogical principles have their origins in:

- **ESD-research** defining aspects of human actions that are essential to the transformation of our society and explore which aspects of human behaviour are activated when acting as resilient and conscious citizens.
- **Research on effective education**: the methods schools can employ and the learning environments that can enhance learning.
- **Social constructivist theories**: we learn by interacting with others.
- **Research on transfer of learning**: Authentic learning contexts offer learners explicit connections with contexts in society, in which competences that are developed at school are relevant to their lives outside of school. This means that societal issues act, not only as learning contexts which offer opportunities for learners to transfer and apply learned competences, they also offer intrinsic motivation opportunities for children to learn and develop their competences.
- **Research on the thinking-based learning** where teaching practices are based on the idea that one learns by thinking about content.

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- **Diverse pedagogical methods** can be used in an ESD learning environment such as:
    - Problem-based learning: Problem-based learning (PBL) is a learner-centred approach in which learners learn about a subject by working in groups to solve an open-ended problem. This problem is what drives the motivation and the learning.
    - Project-based learning: Project-based Learning (PBL) is a teaching method in which learners learn by actively engaging in real-world and personally meaningful projects.
    - Design Thinking: Design thinking is a non-linear, iterative process that teams use to understand users, challenge assumptions, redefine problems and create innovative solutions to prototype and test. Involving five phases—Empathize, Define, Ideate, Prototype and Test—it is most useful to tackle problems or challenges that are ill-defined or unknown.
    - Storytelling: is the interactive art of using words and actions to reveal the elements and images of a story while encouraging the listener's imagination and enhancing an emotional response by the recipients of the story.

The Creation of a Powerful ESD-Experimental Environment

Digital Destiny supports educators in creating a powerful ESD-learning environment where they offer learners opportunities to develop the competence to act as resilient and conscious citizens. This learning environment is called an **'ESD-experimental environment'**.

The concept '*experimental*' refers to the school as a place where:

- ✓ learners learn from experiences with societal issues;
- ✓ mistakes are understood as opportunities from which to learn;
- ✓ and the development of learners (learning) happens through their engagement and experiments with societal issues.

In an ESD learning environment, attention is paid to several principles with the aim of creating a safe and high-quality learning environment for the development of ESD-competences. The quality of the learning environment can, on some occasions, be enhanced by introducing blended learning methods. Digital Destiny focuses on setting up such a learning environment at school. While the factors that determine a quality ESD experimental environment have been developed for formal education, they can be well applied to all learning contexts.

A safe and high-quality learning environment is:

- ✓ a place where the learners' voices are encouraged and heard.
- ✓ the educator creates a learning community in which everyone is actively involved and to which everyone is accountable.
- ✓ relationships among the learners and between the learners and the educators are well developed and trustworthy.
- ✓ a place where growth mindset is taught and reinforced so that learning is understood as a process and not an outcome.

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Five Pedagogical Principles

Principle 1: Stimulate learning through societal issues

Societal issues are authentic, collective matters of concern in society. They concern society often in a negative way because they entail complex environmental, social, and economic consequences for society. Societal issues provide an interesting context for developing ESD-competences, in an active, conscious way with others. At the same time, learners are given the opportunity to review and renew the world from the safe training ground that schools can provide (Van Poeck & Östman 2020) and to experience that they themselves can be shapers of society. For example, a societal issue could be equal access to schooling. This issue can be approached from a variety of ways which can engage the learners, some of which include physical access to education (who is allowed to go to the school and when e.g., girls with no access to menstrual products often stop attending school access to school building and instruction for the differently abled, and appropriate supports for learning differences.

Societal issues present us with these types of complex and problematic situations. The feeling that we do not have the right knowledge or skills to provide an answer demands that we make a move, by thinking or acting, or both at the same time. An ESD experimental environment, in which this happens, offers opportunities for learning: we learn by going through thinking processes, then through actual action, and finally by reflecting on both. This alternate thinking/doing and reflecting should lead to achievement of our objectives - via new knowledge, skills, change in attitude, reevaluation of values, or insights, an opinion, different possibilities, an analysis, or something else. It is a process in which learners enter into relationships with the world around them. We learn by relating to what comes our way in the social, physical, or emotional world, because in the process we give meaning to it (Taguchi 2007; Östman, Van Poeck & Öhman 2019).

Learning through societal issues requires activities that teachers …

increase learners' awareness of issues in their close environment, communities and in the world that motivate them to explore, investigate, reflect … and by doing so scaffold learning.

Principle 2: Stimulate learning through dialogue and interaction

Understanding, knowledge and meaning-making all happen in the context of interaction which can include dialogue (both live and across time), engagement with diverse ideas as presented by live people and through other modes of communication and expression (online, texts, artifacts, media, etc). For example, an educator can create an environment that supports learners´ dialogues through a variety of methods, that includes clear and supportive guidelines for a class discussion or debate, or through a silent conversation on large poster paper hung throughout the room. They could also create a closed community "social media" platform for virtual conversation that can continue at home and even with parental input.

Learning through interaction as a pedagogical principle considers the **impact of the social environment surrounding on learners**: the learners are seen as 'transforming' because of multiple encounters and inter-relations. Each encounter with the world around them, is a stimulus for

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transformation. Each encounter, each interaction, makes learners competent in different ways. For example, a girl standing up for a vulnerable classmate makes the girl a (potentially) confident defender of the vulnerable only because she can experiment with standing up for her values. Without the experience she would not be able to become such a girl (Hultman & Lenz Taguchi, 2010; Hultman, 2011; Taguchi 2011). Interactions between peers are important for individual learning because when learners are in relation to other (learners´) perspectives, their perspective is re-actualized and developed (Rudsberg et al. 2017; Van Poeck, Öhman & Östman, 2019). **Interaction** designates the expression, exploration, and investigation of ...

- perspectives, of others* and our own
- thoughts, ideas, emotions, but also the physical, material world
- by interacting with others, whether in person, online or offline**, and the material and non-human world.

*Others could be peers, teachers, societal actors such as parents, professionals from the community of the school, politicians, neighbours, but even people from the other side of the world

** 'offline' includes books, articles, documentaries, etc.

In many cases, the learners actively elaborate on other people's reasoning. In this way, learners develop their arguments by for example paraphrasing a shared position, completing the arguments of others, elaborating on others' views, showing that the opinions of others have not been satisfactorily justified and critiquing other learners'/ideas' reasoning for missing an important distinction.

Learning by interacting with other perspectives requires that teachers …

- ✓ stimulate interactions between the learner's perspective and other perspectives.
- ✓ create a learning environment which promotes and encourages respectful expression of information and opinions.
- ✓ create a learning environment which promotes careful listening and experiences in which learners can consider other's perspectives and their own allowing for everyone to grow and change in relation to their learning.

Principle 3: Stimulate learning through thinking

Thinking is essential for learning; in fact, it is inextricably intertwined with learning. Thinking refers to, among other things, critical and creative thinking skills and problem-solving. Critical thinking incorporates reasoning, logical judgment, metacognition, reflection, and many other mental processes. It involves evaluation, analysis, systems-thinking and interpreting the problems to find out the solution. The relationship between learning and thinking can be understood in various ways: people learn about thinking, think about learning, learn to think, and think to learn. The latter is a most interesting understanding of thinking in the process of learning in ESD. In many ways, education is about teaching learners to know what to do when they don't know the answer. This is even more important when confronted with problems in society. Focusing on teaching thinking, in an explicit way, helps the development of thinking strategies that are needed in every day and

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professional decision-making. The development of metacognition, which encompasses both the intellectual and emotional states and processes, is an important factor for the learner.

In this framework, we focus on learning because of thinking (Perkins, 1992). Teachers will therefore create learning opportunities for thinking about societal issues that are relevant for learners and can spark their interest. By thinking about the issue, learners learn not only content-related competences, but also how to think.

Action-oriented thinking

In this pedagogical principle, special attention is paid to a kind of thinking that is key for ESD: **action-oriented thinking.** Action oriented thinking implies thinking processes that are applied to achieve a desired goal in relation to a societal issue. For example, the learners, while learning about the ecosystems in oceans, think about the problems facing ocean ecosystems, and decide on a goal to address a specific problem. This goal can be about societal change and likewise it can be to bring about a change in one's mind, either their own minds or the minds of others (raising awareness, or even simply gain understanding about a complex issue).

An action...

- is taking on the process of working toward a desired outcome;
- is any possible final result expressed in the challenge;
- aims at transformation on a societal or personal level.

As mentioned above, this transformation can be envisioned in society but also in one's own thinking, such as bringing clarity to an issue by means of an exploration of opinions on the matter, an analysis, a brainstorm, a comparison etc. Objectives aiming at societal transformation can be either direct or indirect. Whereas direct action is aimed at an immediate transformation, indirect action is aimed at others who can make a transformation possible (Sass et al. 2020).

Although action can be taken individually, there is a great need for collective action (Levy & Zint, 2013), where a group of people is acting toward a common goal. An important element of action-oriented thinking is thus **goal-orientedness.** The whole process is carefully designed according to an equally carefully formulated goal (Swartz et al. 2008), which is ideally set by the learners themselves based on intrinsic motivation and which is expressed in the challenge. This challenge determines the strategic, goal-oriented thinking process (Perkins 1981).

Importance of Action-oriented thinking in an ESD environment

Action-oriented thinking is key for ESD; when incorporated in lesson-design, it can build learners' confidence around their own competence to shape society (Sass et al. 2020). Learners are offered opportunities to experience themselves shaping society by developing the necessary knowledge (Jensen & Schnack, 2006), courage, commitment, and willingness to act upon- controversial problems (Sass et al, 2022). The societal issue is the start of a process in which pupils learn to work purposefully towards a desired end-result, as a function of that issue. This principle leads teachers to design learning activities that offer learners opportunities to experiment with acting on societal issues, by formulating challenges, setting goals, designing the processes to get there, and finally

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reflecting on both process and achievement to gain confidence in their own ability to act upon societal issues.

This pedagogical principle strives to make the teacher aware of the importance of creating opportunities for learners to engage in goal-oriented, conscious thinking, and to learn by doing so. By offering learners multiple opportunities to engage in thinking, and to reflect on the thinking processes they engaged in, Digital Destiny offers learners methods to develop their competency and a mindset of "good thinking" and of finding answers to issues to which they don't have the answers.

This is particularly important when confronted with societal issues where answers are not readily available, nor is the way to get to those answers clearly defined. Societal issues are characterized by the controversies they cause, both regarding norms and values, and the scientific basis of knowledge needed to find answers. They therefore are excellent training material for learners to learn, representing authentic questions with which the learners can engage, in an environment that encourages various thinking processes and multiple pathways and answers to address the issues. These thinking processes could span out a micro-thinking process, such as deciding which transport to use, to the design of a project that leads from a simple idea to an actual action aiming at transforming society. Offering this kind of learning opportunity starts by making thinking processes explicit, and therefore observable and discussable. This can be done in various ways, such as using very specific language to indicate what you as a teacher do when you're solving a problem: I first go and look for the problem, I define the problem as precisely as I can, I go and look for all possible solutions that exist already, I define all these existing solutions, I compare them and evaluate them, I brainstorm for other, better solutions, I categorize the solutions, … Once learners understand this language, the teacher can use the language to give assignments to learners to use the thinking processes and to experience what they can do with it. Ultimately learners will get to know which thinking processes to engage in when confronted with a situation they want to act upon.

An important learning outcome of promoting action-oriented thinking is the learners' confidence in his/her own transformative competencies. In addition, reflection on the processes leading to action, as well as on the action itself, are indispensable to building this confidence in their transformative competencies.

Learning through thinking requires activities that…

- ✓ explicitly focus on stimulating thinking processes by making learners aware of the societal issue, and the importance of a good and clear definition of the challenge or the result, to design the thinking process that may lead to the desired result.
- ✓ make learners aware of the specific thinking processes they use when they are working toward a specific desired outcome.
- ✓ develop reflective practices for children to develop their meta-cognitive processes.

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Principle 4: Stimulate Learning through reflection & evaluation

Evaluative and reflective thinking processes are an essential aspect of education, both for the learners and the educators. By incorporating these processes in daily classroom practice, educators and learners learn to both model and internalize them so that they become life-long learning practices, rooted in careful consideration of both the processes and the outcomes of a given task.

Reflection

Reflection is a set of mental activities during which an individual consciously observes and thinks about their own and shared/common experiences and/or behaviours. In essence, reflection is a meaning-making process which can be done both individually and in a group.

In general reflection is the thread that makes the continuity of learning possible, and ensures the progress of the individual and, ultimately, society. To teach learners to reflect, it must be approached as a systematic, rigorous, and disciplined way of thinking. Like teaching thinking as a pedagogical principle, teaching reflection in a purposeful way is essential for learners to adopt a habit of reflection, at school, at home and elsewhere. In building a reflective practice, teachers explicitly work to develop an attitude that values the personal and intellectual growth of oneself and of others. Reflection can be done on an individual basis and can be enriched by reflecting within a group.

Some of the benefits of collaborative reflection are:

1. Affirmation of the value of one's experience: In isolation what matters can be too easily dismissed as unimportant.
2. Seeing things in a new perspective: Others offer alternative meanings, broadening the field of understanding regarding (past) experiences.
3. When one is accountable to a group, one feels a responsibility toward others that is more compelling than the responsibility one might feel too only oneself.

(Rodgers, 2002)

Reflection and the reflective thinking processes that encompass reflection are essential aspects of ESD due to the dynamic, uncertain, and incomplete nature of societal issues. This learning process within ESD is one in which learners are given opportunities to engage in relationships with the social, physical, and emotional world around them (Östman, Van Poeck & Öhman 2019). By doing so they engage in meaning-making, and are thus empowered to act as conscious citizens, who make their own choices and create a society that they themselves envision.

Evaluation

Evaluation is the systematic collection and analysis of a process and the result to determine the merit, worth or value of a result or process.

Evaluation is important for:
- supporting the development of a teaching activity or a learning process (formative evaluation).
- assessing the final impact of the learning or teaching activity (summative evaluation)

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- formulating a judgement based on internal and/or external criteria formulated by yourself as educator and/or by the learner.

In order to collect these data and analyze them, evaluative thinking is done. This kind of thinking involves thinking processes such as questioning, observing, comparing, prioritizing…. Making evaluative thinking processes explicit is not only a way to teach thinking, it teaches students how to evaluate, and it is a powerful way to create a culture in classroom where evaluation is valued explicitly.

Learning through evaluation requires the teacher to purposefully design activities that induce learners to learning from evaluating both process and achievement. In addition, the teacher uses evaluation and reflection to update learning plans based on the learning from them. While reflection and evaluation are each distinct in their objectives, they can provide different aspects of feedback, and while doing such they are both essential elements of learning processes within ESD.

Learning through reflection and evaluation requires activities that …

- ✓ are explicit in their learning outcomes and the methods they will use to reflect upon and evaluate the learning and the process.
- ✓ create multiple and diverse opportunities for learners to reflect, not only on their learning process, individually and in groups, but also on societal issues.

Principle 5: Stimulate learning through structured processes

As mentioned before, one of the core objectives of education today is that learners know what to do when they don't know the answer to a problem. This means that learners need to feel the relevance of the knowledge and skills offered at school. Relevance becomes clear when learners are encouraged to make the transfer of the things they learn at school to future contexts. In other words, using already acquired knowledge to new situations. Transfer of knowledge indicates meaningful learning (Mayer, 2001, 2002; Haskell, 2001). The key idea in meaningful learning is that the learner integrates gradually new pieces of knowledge within existing pathways in his own cognitive structure (Mintzes et al., 2005).

The teacher plays an important role in setting the stage for the learners to make those connections. Various methodologies and approaches exist for the teacher to scaffold meaning making and thus transferto which some of them we'll take a closer look: storytelling, design thinking, problem-based learning, and project-based learning. One of the overall characteristics of these methodologies is the structured approach, offering a structured strategy to build meaning and understanding.

Storytelling

Stories existed in the world essentially since people appeared on earth. Each nation or culture has unique stories that are transmitted orally or in writing. People have always had the need to communicate, to share, to transmit, and this need was largely expressed through stories. According to McDonald (1998) storytelling was a fundamental way of teaching basic social principles. Egan (1989) highlights its value for teaching/preserving cultural capital, moral values, and history, as also Bruner (1990) considers that storytelling preserves the values of a civilization. Modern society is

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characterized by the abundance of digital technologies which have gradually affected the way we tell and share stories. It should not go unnoticed that even in modern applications, such as Facebook and Instagram, they have incorporated the meaning of the story (typical is the term Insta or Instagram Stories).

Exchanging stories is a way to engage in relationships with the world; the world as it is, or the world as we would like it to be. Storytelling is a powerful way to imagine the world, re-imagine it, and to make conscious choices to act with agency in society (Djapo, 2022). To be a storyteller is an incredible position from which to bring to life our own and other's experiences in such a way that resonates with others (Molthan-Hill et al. 2020). We communicate, relate, educate, and make our world meaningful through stories.

Different perspective, different story

Societal issues and the variety of perspectives of them, are seen as powerful stories, integrated in the world. When we tell our story, we communicate our perspective on the world to others and enable them to enrich their own view on the world. Storytelling as an educational approach can be utilized by teachers to bring learners to construct and re-construct knowledge about the world, to demonstrate how to act on pending issues and re-create their own stories.

Lived experience in stories

A part of storytelling is 'storyknowing', which is a tacit mode of knowledge that brings in lived experience, making lived experience explicit and easy to think of. Stories can be used in education as a reflexive participatory practice used to make sense of complex issues (Sustainability Stories to Encounter Competences for Sustainability 149 Journal of Education for Sustainable Development 15:1 (2021): 146–160) (see Alterio & McDrury, 2003; Facer, 2019; Hadzigeorgiou & Judson, 2017; Jehangir, 2010). Schank (1990) in his work of "Tell Me a Story". Narrative and Intelligence» reflects upon Vygotsky's (1978) view of stories as means of connecting with prior knowledge and improving memory differently.

Critical thinking

It must be recognized that stories have the potential as rhetorical tools for manipulation (Cronon, 1992). Thinking about serious stories in the context of ESD, that is, sustainability stories, requires that our attention goes beyond the sustainability content, and adds the outlined ESD competencies, empowering individuals to reflect as well as act. (Uhrqvist et al, 2021).

Stories as tools for learning

Stories can be used as:

- starting points for learning
- as a way to process information and acquire knowledge
- as an understanding performance

Stories can be told:

- by the learners

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- by the teachers
- by other actors in society
- Individually or collaboratively

Learning through storytelling requires that teachers …

- ✓ design activities in which learners engage in the world and in meaning making by telling stories.
- ✓ use storytelling as a didactical device to connect issues of sustainable development with the learners.
- ✓ Use storytelling tools and techniques to analyse and understand aspects of issues and concepts, acquiring different perspectives.

Design Thinking

Design thinking is both a mindset and an approach to learning which encourages learners to develop their curiosity and practices of inquiry as well as flexibility in responsiveness to new information and understanding, well before working toward a solution to a given issue or challenge. Design thinking supports the development of empathy, curiosity, ideation (creating new ideas) and iteration (continually reassessing and redesigning).

Design thinking is a five-step structured approach to (1) identifying a challenge, (2) gathering information about that challenge, (3) brainstorming potential solutions, (4) refining those ideas, and (5) testing the solutions. From the get-go it is an empathetic process rooted in the needs of the end user – the person or people whose challenge or need one is trying to address. The five steps are also named:

- Empathize
- Define
- Ideate
- Prototype
- Test

Learning through design-thinking requires activities where teachers …

- ✓ plan effectively for the time needed to engage in a careful and thoughtful design-thinking process and decide the scope and purpose for using the approach
- ✓ emphasize the process of empathy through interaction and direct engagement with the challenge and the people impacted by that challenge
- ✓ design highly collaborative activities in and outside of the classroom

Problem-Based Learning

Problem-based learning is a student-centred approach in which learners learn about a subject by working in groups to solve an open-ended problem. This problem is what drives the motivation and the learning. In Problem-Based Learning, the problem is presented to the learners first and then they are generally:

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- examine and define the problem;
- explore what they already know about related underlying issues;
- determine what they need to learn and where they can acquire the information and tools necessary to solve the problem;
- evaluate possible ways to solve the problem;
- solve the problem and;
- report on their findings.

Problem-based learning can be used for long-term as well as short projects and learning modules. It leads to more flexible and generative application of the knowledge later. It's a matter of hugging (keeping the instruction close to the very target performances one wants to cultivate, so that transfer is less of a problem) Because learners learned the knowledge in the context of problem-solving tasks, the knowledge is better organized in their minds for later problem solving. (Perkins, 1992, p. 127).

Learning through Problem-Based Learning requires activities where teachers …

- ✓ explicitly articulate the outcomes of the learning
- ✓ decide on a societal issue (a ready-made rich and nuanced problem) to present to the learners
- ✓ Introduce clear and concise group project guidelines and consider assigning roles to the learners

Project-Based Learning

Project Based Learning is a teaching method in which learners gain knowledge and skills, usually by working for an extended period to investigate and respond to an authentic, engaging, and complex question, problem, or challenge. In this method, the process of working toward a final project is the vehicle for learners to learn important knowledge and skills. The project itself contains and frames the curriculum, instruction and the group process the learners undertake. This method requires critical thinking, problem solving, collaboration, and various forms of communication. As the learners work to answer driving questions and create high-quality work, they develop and practice higher-order thinking skills and learn to work as a team.

Project-Based Learning is a method that is often mis-used. The assignment and completion of a project is not Project Based Learning. Considerable thought and planning create both sufficient structure and freedom for learners, of all ages, to engage in meaningful, intellectually rigorous work, developing a range of interpersonal skills including but not limited to systems thinking, collaboration, critical thinking, negotiation, and connection to their environment.

Learning through project-based learning requires activities that …

- ✓ Provide an intellectual challenge in which learners engage the topic deeply, think critically, and strive for excellence.
- ✓ Are authentic, and in which learners work on projects that are meaningful and relevant to their culture, their lives, and their future.
- ✓ Result in the learners' work being publicly displayed, discussed, and critiqued.

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- ✓ Require learners to collaborate with other learners in person or online and/or receive guidance from adult mentors and experts.
- ✓ Help learners use a project management process that enables them to proceed effectively from project initiation to completion.

Choosing the appropriate approach

There are many approaches you can choose as an educator for structured, highly engaging and student-centred learning, and many of them overlap in several ways.

Problem based learning is when the educator provides (or helps the learners come up with) a complex issue/problem and then the learners work *toward* solving or addressing that problem. The goal isn't necessarily to solve the problem presented, but to create a clear structure in which the learners can take charge of their learning, research, and learn in depth about an issue.

With Project based learning there is a specific project/product that is implemented/created in the end, and which is generally presented in an authentic and public way. This is one of the primary ways it is different from Problem Based Learning. The product or presentation at the end *can* offer a solution, and it can also share the process. The main difference from Problem based learning is that here a goal should be met, and learning occurs through the process and meeting the goal, whereas in Problem based learning it may occur only through analysing the problem itself.

For either of these methods you can choose to use Design Thinking as a tool and in-depth process that focuses on the end user and a final product that offers a solution. Once the end user is well understood/empathized with, then there is a process of defining, ideating, prototyping, and testing. This is a complex process from beginning to end. It is important to note that as an educator you don't have to take this to the end, and you can use aspects of the process with your learners. For example, when working on problem-based learning your emphasis may be on understanding who the issue impacts and working with the learners to create an empathy map.

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Using the benefits of a blended learning context to stimulate learning

This section of the framework digs deeper into blended learning.

What is blended learning?

Blended learning is the thoughtful integration of classroom face-to-face learning experiences with online learning experiences (Garrison and Kanuka, 2004, p. 96). Digital Destiny assumes a physical classroom setting in which either digital tools are used or in which a physical lesson is followed by online processing at home or digital homework is given prior to the lesson. Consequently, schools need to have minimal equipment before this blended method can be deployed, such as: WiFi, laptops, tablets, desktops, smartphones, digital board... Schools don't only need the right equipment (hardware & software), but learners and teachers also need a minimum of digital competences (unless the purpose of the lesson is only to teach digital competences).

Blended learning is different from distance learning, although the interpretation of both concepts often differs between schools and even between individual teachers. Distance learning is learning that is mostly happening online with limited face-to-face interaction. Digital Destiny focuses on blended learning, where the primary learning is happening in face-to-face interaction and is blended with digital learning as appropriate.

There are four main blended learning methods that are being used in education.

- Station rotation model: learners shift between different assignments/stations according to a set schedule or teacher preference. At least one of the assignments/stations is online learning.
- Lab rotation model: learners shift between different classrooms in school according to a set schedule or teacher preference. Learners work online in a digital lab (computer, tablets, smartphones, VR...). In. contrast to station rotation, learners here do not stay in one classroom.
- Flipped classroom model: learning is done both at home and in the classroom. Learners prepare their lesson through online instruction at home. When the learners return to the classroom, the teacher goes deeper into the processing of the content. It is the reverse of "traditional teaching", where the instruction is processed at home and the processing of the subject matter is done in the classroom.
- Individual rotation model: learners individually shift from station/assignment to station/assignment according to a set schedule. At least one of the assignments is online learning. Each pupil's schedule is customized, and they can contact the teacher if there are any questions (like contract work) (Staker & Horn, 2012).

Blended learning gives learners more learning options by differentiating content, process, or product. Blended learning environments also allow learners to choose the best location, path, and pace for achieving their goals. This allows the teacher to differentiate for all learners (Boelens, Voet, De Wever, 2018; Vermissen et al., 2022). The variety of working forms and tools can prompt their

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interest and can motivate learners, and it may also reduce the teacher's workload. For example, online individualized activities may enable differentiated instruction in large classrooms to be more manageable (McKenzie et al., 2013). At the same time learners get to work on their digital competences, which are indispensable. Learners grow up in a world where digital technologies are ubiquitous. But this does not mean they already have the right skills to use them efficiently and consciously (DigcompEdu, 2017). Blended learning can be a way to meet these needs.

Children and young adults are growing up in a world where digital technologies are ubiquitous. They do not and cannot know any different. This does not mean, however, that they are naturally equipped with the right skills to use digital technologies effectively and conscientiously.

Blended learning is an effective tool for involving learners' families in the learning process. Technology and apps can be used to communicate with parents about content and they can also be used for collaboration through online surveys, dialogue, video recording, digital storytelling, etc.

When to use blended learning?

To create a blending learning context, the following elements need to be considered:

1. First the goal, then the tool: there needs to be an added value in used blended learning (means to an end). To ensure the added value, The SAMR model is a tool for digitizing existing teaching materials or existing work forms and will be used as a guideline to create blended learning tools (Romrell et al., 2014). The model consists of four levels: (a) substitution: technology is used as a substitute tool; (b) augmentation: the technology is used as a replacement tool and provides a functional improvement; (c) modification: the technology leads to an improvement of the task and (d) redefinition: technology is used in a transformative way for an assignment, which would not have been possible without the app or digital application.
2. The use of blended learning needs to be functional and purposeful.
3. There needs to be a well-thought-out mix of assignments and materials.
4. The blended learning environment is class context depended.
5. Blended learning needs to be interactive.
6. There is a need for a safe and stimulating learning environment (Resonansgroep OBPWO-project blended (NT2)-education for (low-literate) adults, 2021).
7. Have attention to simplicity in blended learning (De Wilde, 2021).

How to facilitate blended learning?

To facilitate blended learning:

- the school needs to provide a minimum of devices such as computers or laptops, a digital smartboard, software, and access to WIFI;
- the learners have basic digital skills and are able to operate buttons;
- the teacher can support learners in navigating in a digital environment or tool;
- the teacher can organize and structure content and;
- the teacher can produce digital content and is comfortable facilitating the learners' production of digital content.

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Depending on the context of the classroom and the skills of the learners, it is possible to set up a tutor working form (for example pairs made up of a younger and older pupil; or those with more and less experience using digital tools) in which they can help each other with the digital skills. When designing blended learning it is essential that both the learners' skills and the competence of a teacher to set up and facilitate learning are taken into consideration.

Attention for digital inclusion in the framework

Digital Destiny pays special attention to digital inclusion in the framework, where we understand 'digital inclusion' as actions and solutions needed to prevent digital exclusion so that everyone can fully participate in the digital society. In the creation of tools and the online learning platform, Digital Destiny takes some building blocks into account for a sustainable framework regarding digital inclusion, proposed by Mediawijs, the Flemish Knowledge Centre of Digital and Media Literacy.

Digital inclusion is a focus of Digital Destiny. To ensure that everyone may fully engage in the digital society, "digital inclusion" refers to the efforts and solutions required to prevent digital exclusion. On the one hand, it entails getting rid of ICT-related obstacles including digital skills and access to technology and the internet. On the other hand, people need to be supported and given the chance to find their own digital paths, for instance by creating user-friendly websites and tools (Mediawijs, 2021).

Digital Destiny focuses on the needs and opportunities of learners, teachers, and parents to create strong blended tools. The online learning platform will also serve as a hub to ensure that parents and teachers receive accurate information on how to use blended learning to promote sustainable development. All the blended learning tools will focus on basic digital competences so everyone with different digital competences and profiles can participate. The Digital Destiny materials will be simple for everyone in the educational setting to use and handle thanks to the usage of inclusive design (Mediawijs, 2021).

Combining the digital competences, ESD-competences and digital inclusion that are needed in blended learning activities

Digital competences are often a precondition to creating ESD-competence learning opportunities. As society is becoming more and more digital, people need to be able to navigate the digital and technological world. Nevertheless, not everyone is 'on the digital boat' and some people are digitally excluded from society. This is the case, not only with adults, but also with children. With a focus on digital inclusion, the Digital Destiny materials will be created with a focus on inclusive design. The tools will be easy to use with simple language so everyone is able to handle them. By combining inclusive design, ESD and blended learning activities, Digital Destiny creates the opportunity to close the digital exclusion gap. Learners can learn from each other how to use specific devices through social constructed learning, in which the teacher fills the gap with other digital skills the learners need to acquire to live in a modern digital society.

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Definition of Terms

Growth Mindset: A belief that people's talents can be developed through hard work, good strategies, and input from others.

Experimental Learning environment: is a learning environment where educators actively create an environment for learns to develop the competence to act as resilient and conscious citizens by offering them opportunities to engage with societal issues and learn from this engagement. It is an environment where the learners' mistakes are not seen as 'errors' but as opportunities to learn from.

Safe Learning environment: an environment in which all learners feel comfortable to express themselves, make mistakes, are treated with respect and dignity, can change their minds, and not know.

Transformative competence: Transformative disposition is the disposition to intervene at one or more leverage points to initiate fundamental change in one or more systems. Transformative competence can be seen as the driver of change (Lotz-Sisitka 2015; Wals 2017; Djapo 2022).

Resilience: the capacity to adapt well when faced with adversity or stress. It helps people stave off the potential negative psychological effects of challenging experiences. It involves more than continuing to persist despite difficulty: resilient learners interpret academic or social challenges in a positive way. This may include increasing effort, developing new strategies, or practicing conflict resolution.

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