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Recommendations on Transformative Education in Bhutan's Schools

Acknowledgement

This study was prepared on behalf of the EU SWITCH-Asia Sustainable Consumption and Production Facility (SCP Facility), by Dr. Laima Galkute under the supervision of Cosima Stahr, Key Expert of the SWITCH-Asia SCP Facility and Dr Zinaida Fadeeva, Team Leader, SWITCH-Asia SCP Facility.

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Foreword

This report is the result of an assignment done as part of the advisory work of the EU SWITCH-Asia SCP Facility for the Government of Bhutan. The assignment seeks to build capacities on SCP issues integration and competence-based, transformative pedagogy. With this report, the SCP Facility seeks to contribute to the important process of mainstreaming SCP and initiating and implementing transformative education.

The European Commission established the SWITCH-Asia SCP Facility in 2017 in Bangkok, Thailand, to better facilitate coordination and implementation of its work on Sustainable Consumption and Production and to function as a backbone for the SWITCH-Asia Programme, thus providing a single platform for all SWITCH-Asia projects. This allows maximisation of their results, to further promote SCP policies and principles, to support the delivery of SDGs.

The assignment in Bhutan aimed to further mainstream SCP issues into education – focusing on school education. SCP is integrated into the curriculum as a cross-cutting topic, and is embedded within the country's policies and activities.

As this report demonstrates, this sets the basis for a broader institutional change, where education and learning further enable a society-wide transformation towards sustainability. At the institutional level, a whole-school or whole-sector approach based on principles of ESD provides the necessary foundation for appropriate learning strategies. Aspirations to connect national education to ESD principles opens avenues for engagement with ongoing ESD and SCP activities. For example, Eco or Green Schools – recognised as innovators in the ESD area – are directly engaging with local communities on SCP issues, acting as co-creators and drivers for SD including SCP. In this regard, ICT can play an important role in improving performance and connectivity of learners.

A comprehensive understanding of SCP education further facilitates policy-processes with relevance for SCP.

The importance of integrating SCP issues into school education has also been highlighted by the European Commission as part of its Green Deal, where "activating education and training" in support of climate, environmental and sustainability issues is stated to be an important driver of a successful transformation.

Engagement of youth has also been mentioned as part of the European Climate Pact, which stated that it is necessary to involve younger generations in dialogue and co-creation of implementation activities and policy.

This report summarises important insights regarding SCP integration for transformative education in schools, and seeks to be of relevance for education stakeholders in Bhutan and beyond.

Dr Zinaida Fadeeva
Team Leader
EU SWITCH-Asia SCP Facility

Recommendations on Transformative Education in Bhutan's Schools

This publication summarises recommendations to curriculum developers and other school education stakeholders on education for sustainable development (ESD). They are based on the analysis of international experiences in reorienting school education towards sustainable development, including SCP as a core theme in ESD, dealing with complexities and integrated problem solving.

1.
The whole school approach for societal transformation

> *To **encourage learners** to become change agents who have the knowledge, means, willingness and courage **to take transformative action for sustainable development**, learning institutions need, themselves, to be transformed. The entire **learning institution needs to be aligned with sustainable development principles**, so that learning content and its pedagogies are reinforced by the way facilities are managed and how decisions are made within the institution. This whole-institution approach to ESD calls for learning environments where learners learn what they live and live what they learn.*
>
> Source: UNESCO guidelines Education for Sustainable Development: A roadmap[1], 2020

The whole school approach in education for sustainable development (ESD) brings together what is learnt, how it is learnt, and the way things are decided and managed at the school. It aims to reorient the whole institution towards an innovative, democratic learning environment that is responsive to community needs and involves a variety of stakeholders. Learning experiences at the school provide a model of civil society and serve as leadership and citizenship training.

1.1. Strategic background

Sustainable development (SD) requires changes in the way we think and act, and education for sustainable development plays a crucial role in reorienting societies towards sustainable development. As is emphasised in the European Union strategy in the European Green Deal[2] (2019): "Schools, training institutions and universities are well placed to engage with pupils, parents, and the wider community on the changes needed for a successful transition."

At the United Nations level, the whole-institution, or institution-wide, approach to ESD was mentioned by the UNESCO Global Action Programme on Education for Sustainable Development (2015-2019)[3] (2013). It requires not only the reorientation of teaching content and methodology, but also infrastructure management that is in line with sustainable development as well as the cooperation of the institution with

1 UNESCO (2020). Education for Sustainable Development: A Roadmap. https://www.gcedclearinghouse.org/sites/default/files/resources/200782eng.pdf

2 EU (2019). The European Green Deal. (Brussels, 11.12.2019 COM (2019) 640 final). https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF

3 UNESCO (2013). Global Action Programme on Education for Sustainable Development (2015-2019) (endorsed by UNESCO Member States through the adoption of 37 C/Resolution 12). https://en.unesco.org/globalactionprogrammeoneducation

sustainable development stakeholders in the community.
Recent UNESCO documents, such as Education for Sustainable Development: A Roadmap (2020) and Berlin Declaration on Education for Sustainable Development[4] (2021) confirm the importance of the whole-institution strategy for ESD as one of the Priority action areas.

In the ESD policy of the United Nations Economic Commission for Europe (UNECE), the whole-institution approach is based on the UNECE ESD Strategy[5] (2005). It responds to the UNESCO ESD policy and is in line with the WHO Global Strategy on Health, Environment and Climate Change[6] (2019) that emphasise the role of schools as centres providing education on healthier and more sustainable approaches and promoting the best practices in the wider community.

UNECE stimulated the whole institution approach based on the ESD School Planning[7] (2014) document. There are 6 core dimensions to be reviewed and addressed in such a planning process: 1) Governance and school community; 2) Curriculum, teaching and learning methods; 3) Facilities and operations; 4) Capacity building and development; 5) Partnerships and cooperation; and 6) Self-assessment.

Particular emphasis is given by UNECE to closely link ESD with all the UN Sustainable Development Goals[8] (SDGs), beyond SDG4 for Education. This is becoming increasingly evident by the fact that both problems and solutions on environment and development having complex socio-cultural and economic consequences are, to a large extent, of regional nature and dimensions rather than global or national.

The whole school approach represents one of the priorities of the Policy Handbook on ESD[9], based on the selection of key success factors from around the world. It was supplemented with research, case studies, field visits, a literature review (particularly of UNESCO's longstanding and extensive work on ESD), and interviews with international ESD experts. The following are suggested as core dimensions of school sustainable development:

- Governance and management;
- Curriculum;
- Learning experiences;
- Infrastructure and operations;
- Partnerships.

The ultimate goal in ESD is to promote transformative competences of learners leading to knowledge-based citizenship. Action competence of students represents the main outcome that could be achieved by the synergy of all dimensions of school life and the mastery of teachers.

The whole school approach provides unique opportunities to facilitate capacity building, competence development and values education both of learners and teachers in a comprehensive manner. Sustainable learning environments, such as eco-schools, green schools, ESD schools, are examples of orienting their activities and daily practices towards principles of sustainability.

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4 UNESCO (2021). Berlin Declaration on Education for Sustainable Development (published on the UNESCO World Conference on Education for Sustainable Development. Berlin, 17-19 May 2021).
https://en.unesco.org/sites/default/files/esdfor2030-berlin-declaration-en.pdf

5 UNECE (2005). Strategy for Education for Sustainable Development (United Nations CEP/AC.13/2005/3/Rev.1).
https://unece.org/DAM/env/documents/2005/cep/ac.13/cep.ac.13.2005.3.rev.1.e.pdf

6 WHO (2019). Global Strategy on Health, Environment and Climate Change (A72/15).
https://apps.who.int/gb/ebwha/pdf_files/WHA72/A72_15-en.pdf?ua=1

7 UNECE (2014). Working Group on 'ESD School Planning': Outcomes Information Paper 4 (presented to the UNECE Steering Committee on ESD on its 9th meeting, 3 and 4 April 2014).
http://www.ECE.org/fileadmin/DAM/env/Information_document_4_school_planning_02.pdf

8 United Nations (2015). Transforming our World: The 2030 Agenda for Sustainable Development, A/RES/70/1.
https://sdgs.un.org/2030agenda

9 Advancing Education for Sustainable Development: Key Success Factors for Policy and Practice.
https://www.worldfuturecouncil.org/esd-handbook-2019/

1.2. International school networks

Existing relevant international/inter-institutional school networks are mobilised in order to facilitate mutual support such as peer-to-peer learning on a whole-institution approach to ESD, and to increase the visibility of the approach to promote it as a framework for adaptation.

Eco-Schools is the largest global sustainable schools programme. It starts in the classroom and expands to the community by engaging the next generation in action-based learning. The Eco-Schools programme consists of three structural elements - The Seven Steps Framework, the Eco-Schools Themes, and Assessment for the Green Flag. FEE EcoCampus is an award programme that provides a framework to guide higher education institutions on their sustainable journey and model sustainability as an integral part of campus life while involving staff, teachers and the student body by empowering them to become forward thinkers and lead the way towards sustainable development. Working with SDGs represents a special programme within the network.

UNESCO Associated Schools Project Network (ASPnet) links educational institutions across the world around a common goal to support international understanding, peace, intercultural dialogue, sustainable development and quality education in practice.

Sustainability and Environmental Education (SEEd) has been at the forefront of promoting whole-institution approaches based on a developmental learning model. The Sustainable Schools Alliance (SSA) membership programme for schools is a project of SEEd and helps schools embed sustainability and learning for sustainability throughout the school. The SSA is a network of schools across the UK who are working towards a Whole School Approach and can apply for recognition of the work they do on an annual basis.

Environment and School Initiatives (ENSI) is an international network that has supported educational developments, environmental understanding, active approaches to teaching and learning, through research and the exchange of experiences internationally. Collaboration between school and community is a notable feature of the network.

Particular networks and (or) countries are more advanced in institution-oriented ESD, so their best practices as well as self-assessment frameworks are referred below:

- Eco-Schools: Green Flag[10]
- ASPnet: Getting Climate-Ready: A Guide for Schools on Climate Action[11]
- SEEd: Sustainable Schools Alliance[12]
- ENSI: Quality Criteria for ESD-Schools[13]
- ECORoad: A Roadmap to an ESD-school[14]
- Australia: Sustainable Schools NSW[15]
- Canada: Sustainable Schools Best Practices Guide[16]
- Canada: Guide for Sustainable Schools in Manitoba[17]
- Finland: Sustainability Criteria for Educational Establishments[18]
- Japan: A Guide to Promoting ESD[19]

10 https://www.eco-schools.org.uk/about/eco-schools-green-flag-other-awards/

11 https://unesdoc.unesco.org/ark:/48223/pf0000246740

12 https://se-ed.co.uk/sustainable-schools-alliance/doorway-resources/

13 https://www.ensi.org/global/downloads/Publications/208/QC-GB.pdf

14 https://ecoroad.weebly.com/uploads/3/5/3/8/3538216/ecoroad_roadmap_to_an_esd_school.pdf

15 https://www.sustainableschoolsnsw.org.au/

16 https://www2.gov.bc.ca/assets/gov/education/kindergarten-to-grade-12/teach/teaching-tools/environmental learning/sustbestpractices.pdf

17 https://www.edu.gov.mb.ca/k12/esd/pdfs/sustainable_guide.pdf

18 https://koulujaymparisto.fi/wp-content/uploads/SD_CRITERIA_General_ed.pdf

19 https://www.mext.go.jp/component/english/__icsFiles/afieldfile/2016/11/21/1379653_01_1.pdf

- New Zealand: A Framework for Whole-School Approaches to Education for Sustainability (EfS)[20]
- Scotland: Learning for Sustainability (LfS) self-evaluation and improvement framework[21]
- United Kingdom: s3: Sustainable School Self-evaluation[22]
- USA: The Whole-School Sustainability Framework[23].

1.3. Dimensions and targets of school sustainable development

There are three central aspects and five important dimensions to school sustainable development. The central aspects are school vision, its values and principles. The five dimensions implement the values. For this purpose, they can be formulated as targets, thereby allowing for strategy development and checking of progress as well as deeper reflection on the interrelationship and dependencies between the central aspects and the dimensions and also in-between dimensions.

In the following section, these concepts are portrayed briefly.

School vision
The school vision defines an inspiring image of a sustainable future (”the future we want “).

Values
All the school stakeholders are aware about the school’s values and ethos compatible with sustainable development, such as democracy, diversity, equality and mutual respect, solidarity. School culture is determined by the values which guide the way people work and behave at the school.

Principles
Principles of sustainable development (e.g., values-orientation, systemic approach, multiple partnerships, collaboration, reflexivity) are reflected specifically in all school procedures and activities.

20 http://www.tlri.org.nz/sites/default/files/projects/9245_Appendix%20C.pdf

21 https://education.gov.scot/improvement/self-evaluation/whole-school-and-community-approach-to-learning-for-sustainability-lfs-self-evaluation-and-improvement-framework/

22 http://www.aeiforum.eu/images/bibliography/en/School_Self-evaluation_V3.pdf

23 https://centerforgreenschools.org/sites/default/files/resource-files/Whole-School_Sustainability_Framework.pd

Governance

To bring the vision into action, all stakeholders define clear goals and a strategic plan. These goals are ambitious, requiring involvement of the entire school community, but are still achievable. The strategy of a school, and ultimately its culture, are oriented towards sustainable development. Management and leadership are based on democratic decision-making, consensus and commitment to the goals of all members of the institution.

Target: Sustainable development values and principles are mainstreamed into all activities based on the school strategy.

Curriculum

The development of transformative competences by learners (e.g., systems thinking, creativity and innovation, communication, collaboration, citizenship) is a prerequisite for action for sustainable development. Competency-based curriculum is action-oriented, interdisciplinary, exploring authentic contexts and real-life situations. Innovative pedagogy is applied to enable learners to address key local and global sustainable development challenges, including Sustainable Development Goals, across all relevant subjects.

Target: Sustainable development concept, based in SDGs, is incorporated in the school curriculum as well as in teaching and learning.

Learning experiences

Teaching and learning are learner-centred, inclusive and exploratory, providing space for students' initiatives and collaboration. Students are involved in different planning processes (e.g., learning courses, projects, events) and how their activities can be linked to the life in school and local community. Learning experiences at the school provide a model of civil society and serve as leadership and citizenship training.

Target: Students are empowered and motivated to implement knowledge-based actions and initiatives.

Partnerships

Partnerships and communication provide understanding about socio-cultural, economic and environmental realities for school development. On the other hand, different community actors (NGOs, civil society groups, local authorities, other schools, etc.) are valuable learning resources and collaborators in joint efforts towards sustainable development in the local community, and at a broader scale.

Target: School establishes long-term partnerships with different organisations in the community and with ESD schools.

Infrastructure and operations

School infrastructure, facilities, as well as internal and external school operations are oriented towards sustainable development and ensure that the school puts into practice what it teaches. These are a teaching tool not only on how buildings, grounds and operations can, in the local context, contribute to sustainable development, but also how they can be operated as a pedagogical means for promoting place-based learning, interactive and experiential, connected with their real-life situations.

Target: Good sustainability practices are modelled in school operations and related decision-making.

1.4. Example: High-performing schools in Bhutan

According to the Bhutan Education Blueprint 2014-2024[24], one of recommended education shifts is dedicated to ensuring high-performing schools and school leaders (Shift Five). High-performing schools should help every student reach his or her full potential by facilitating effective teaching learning programmes, creating formal and informal opportunities for students to work in teams and to take on leadership roles.

The following game-changing initiatives are defined in the Blueprint:

i. empower schools to promote good governance;
ii. ensure high-performing school leaders;
iii. empower teachers to enhance student learning;
iv. strengthen involvement of parents and communities;
v. ensure classroom and school infrastructure meet the minimum standards;
vi. anchor the system to common goals;
vii. ensure financial sustainability and accountability.

There is a clear interplay between the components of the whole school strategy and the game-changing initiatives:

Governance and management → initiatives i, ii, vi, vii

Curriculum and Learning experiences → initiative iii

Partnerships → initiative iv

Infrastructure and operations → initiative v.

To reorient school strategy towards sustainability, the previously presented links on examples for implementing the whole school approach can provide practices and insights.

24 Bhutan Education Blueprint 2014-2024: Rethinking Education. Ministry of Education, Royal Government of Bhutan, Thimphu, 2014.
http://www.education.gov.bt/wp-content/downloads/publications/publication/Bhutan-Education-Blueprint-2014-2024.pdf

2.

Action-oriented teaching and learning

Sustainable development requires active, creative and critical citizens who are good at overcoming problems and conflicts in cooperation, and are able to combine theoretical knowledge with practical innovations and ideas. Transformative education involves teaching and learning that motivates and empowers learners to take informed decisions and actions at the individual, community and global levels.

> Pedagogy should be organized around the principles of cooperation, collaboration, and solidarity. It should foster the intellectual, social, and moral capacities of students to work together and transform the world with empathy and compassion.
>
> Source: Reimagining Our Futures Together: A new social contract for education[25], page 4

Teaching methodology for transformative learning is characterised by two main features[26] (Sterling, 2001): it is constructive, since it supports a perspective of learning as a construction of knowledge and meaning, and, at the same time, it is participative, aiming to fostering a more active, reflective and autonomous role of students, guided by the teacher as the learning facilitator.

Communication represents an essential condition for social learning by stimulating discussion, negotiation, exchange of ideas and potential revision of personal views.

Implementation of competence-based curricula requires the transformation both of the role of teachers and learners[27]. Unlike subject content, competence cannot be simply transmitted to learners. By fostering learner agency, leadership and ownership of their own learning, competence-based curricula promote learners' intrinsic motivation, fulfilment and enjoyment of learning. Table 1 presents the main characteristics of the changing role of learners.

Table 1
Changing role of learners in competence-based curricula

Source: UNESCO (2017). Transforming Teaching, Learning, and Assessment. To support competence-based curricula.

Teacher-led transmission	Learner-led enquiry
From passive recipients of an accepted body of knowledge	To developing increasing responsibility for their own learning
From memorisation and regurgitation	To active enquiry, interrogation and management of a variety of competing information sources

25 Reimagining Our Futures Together: A new social contract for education. Report from the international commission on the futures of education, 2021. https://unesdoc.unesco.org/ark:/48223/pf0000379707.locale=en

26 Sterling, S. (2001). Sustainable education: Re-visioning learning and change. Green Books, Cambridge.

27 UNESCO (2017), Transforming Teaching, Learning, and Assessment. To support competence-based curricula. UNESCO, International Bureau of Education.
http://www.ibe.unesco.org/sites/default/files/resources/transforming_teaching_learning_and_assessment.pdf

From compliance without engagement	To co-construction and enthusiastic engagement in framing enquiries and outcomes
From answering teacher questions	To framing and exploring learners' own questions
From competing against one another	To collaborating with one another and with the teacher
From compartmentalised learning in single subjects	To integrated, multi-disciplinary connections across subjects
From 'silo-based' subject learning that lacks connection with learner background and context	To relevant learning, drawing on prior knowledge and cultural context to clarify and refine conceptual understanding
From shallow, surface learning (and extrinsic motivation) reliant on teacher talk and demonstration to pass exams	To deep learning and intrinsic motivation: • investigating a range of perspectives/ways of looking at issues/problems • subjecting information and processes to critical interrogation • examining alternatives and seeking creative solutions • justifying conclusions/decisions/choices based on evidence/evaluation

Teachers are supposed to set up supportive learning environments and facilitate learner engagement in the learning process by

- encouraging learner voice and co-construction of relevant and meaningful activities that support the development of competences;
- exploring what students already know and clarifying any misconceptions at the outset;
- explicitly emphasising key principles/concepts and examples;
- engaging learners actively through group work and enquiry/ problem-based learning;
- delegating roles and responsibilities to learners;
- emphasising depth of learning rather than breadth of coverage;
- encouraging experimentation and learning from mistakes;
- offering learners choice about how they wish to demonstrate their progressive development of competence;
- assessing conceptual understanding and connections rather than individual ideas or facts;
- developing learner understanding of assessment for learning processes.

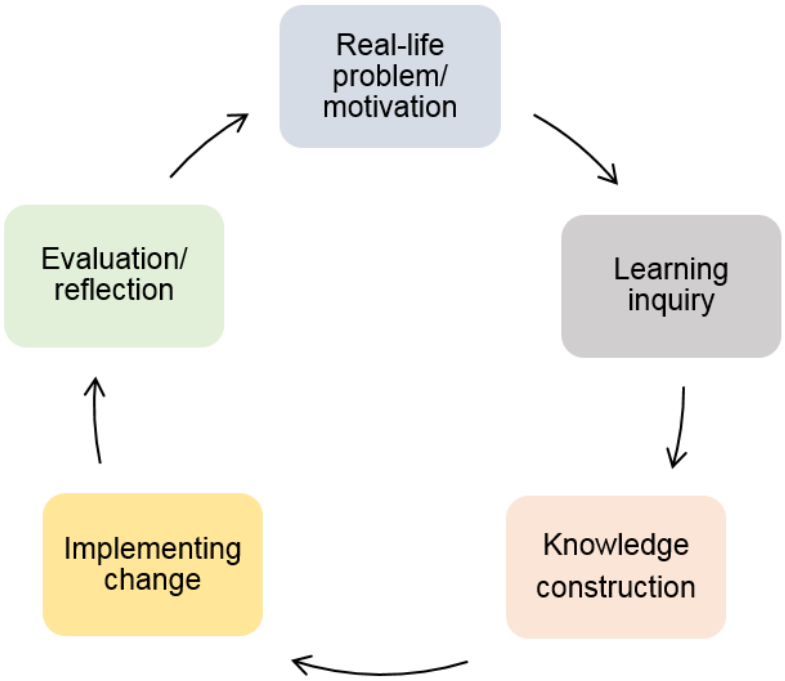
Techniques such as group discussions, problem-based learning, critical reading and writing, debates, vision building exercises, role-playing, outdoor field work, modelling and case studies are increasingly employed. These approaches are highly valued as they encourage learners to ask critical reflective questions, clarify values, envision more positive and sustainable futures and think systemically.

The complex issues of sustainable development can hardly be explored within the limits of a single academic discipline. Complexity calls for an integrated or cross-curricular approach, that is, an approach to formulating a curriculum that favours the dynamic use of learning topics and themes to be covered and skills/ competences to be developed in a number of learning areas across the curriculum. In a transdisciplinary approach the focus is on an authentic real-world issue rather than on the disciplinary theme.

A real-life problem or task makes learning authentic and meaningful, because it

- often is a current situation or students' own interests that generate the starting point;
- deals with complex, transdisciplinary issues;
- generates issues or questions to pursue through inquiry;
- requires students to acquire information and construct knowledge;
- strengthens relationships between the community, the school and other students;
- connects school learning with students' own knowledge and experiences;
- stimulates making something useful!

Learning becomes more powerful when content, proof and skills are developed in meaningful ways, and at the same time students construct their own learning. When teachers try to infuse sustainable development issues in their teaching and learning, inquiry-based learning can be applied to help teachers ensure that the students have opportunities to examine the complexity of sustainable development issues, seek strategies to solve the problems and initiate some actions.



A scheme for competence development

Transformative learning goes beyond acquisition of skills and knowledge, to support learners in critiquing how knowledge is acquired and communicated. This can lead to changes in thinking, perceptions, beliefs and values which can transform how the learners interpret the world around them. It also requires different sets of educational measures rooted in the local socio-cultural contexts and engaging learners as researchers or co-developers of practices. There is a need to start changing processes based around local resources and capacities, enabling learning throughout the process.

Example: Transformative education in Bhutan

> We must prioritise self-discovery and exploration, and involve learners in the creation of knowledge rather than making them mere consumers of it.
>
> Source: The Druk Gyalpo, Royal Kasho on Education Reform[28]

Bhutan's National Education Policy[29] notes that learners should be provided opportunities to understand the world through different disciplines, to think rationally, be reflective, and foster aesthetic appreciation and strive for global harmony. It states that "curriculum shall emphasize the use of pedagogical approaches that promote active student participation, communication, collaboration, creativity and critical thinking, development of competencies, and the use of ICT in teaching and learning" (page 9). Transformative citizenship is defined as "citizenship that is concerned about reconstructing society by developing a critical understanding of and engagement with social issues and institutions"[30]

The recent study of transformative education in Bhutan[31] (2022) aimed to clarify how transformative education teaching and learning ideas have been incorporated into sustainable-development-focused education in line with GNH-focused education. It should be noted, that sustainable development is included in various ways in the Educating for Gross National Happiness Training Manual (GNH TM) developed by the Ministry of Education of Bhutan in 2013. GNH-focused education aims at developing students' respect and critical thinking for the well-being of human beings and the environment.

The results of the study show that transformative education is reflected in many ways in the teaching goals, objectives, content and methods introduced in the GNH TM units. Consequently, transformative education and teaching have become a part of teaching in Bhutan's schools, with an emphasis on sustainable development and protection of the environment. However, for a sustainable future, active student-centred teaching and learning methods should be used in a more diverse way.

28 Royal Kasho on Education Reform, 2020. http://www.bbs.bt/news/?p=143221

29 National Education Policy (draft, 2019). http://www.education.gov.bt/wp-content/uploads/2021/09/National-Education-Policy-2019-Draft.pdf

30 ibid, page 27.

31 Jeronen, E. , P. Ahonen, R.-L. Korkeamäki (2022). Connections of Transformative Education with Bhutan's Pedagogical Ideas for Promoting Sustainability Education. Sustainability, , 14: 163. https://www.mdpi.com/2071-1050/14/1/163

3.

Competences in education for sustainable development

3.1 Defining a competence: From knowledge to action

During the last decades curriculum policies increasingly focused on competences that students are expected to develop during the whole process of learning. It means a shift from input-oriented educational policies to outcome-oriented ones (Tiana, 2004[32]). In educational practice it means a shift from teacher-centred approach to student-centred approach including teaching - learning - assessment relationships.

Competence is traditionally understood as a combination of knowledge, skills and attitudes to be applied in a defined context or situation. Understanding of competences as learning outcomes is still evolving, encompassing different dimensions of learning, namely, cognitive, social and emotional, and behavioural (UNESCO, 2019)[33].

Within the European Union, the definitions of the elements of competence are extended and described as follows (EU, 2018)[34]:

- "knowledge is composed of the facts and figures, concepts, ideas and theories which are already established and support the understanding of a certain area or subject;
- skills are defined as the ability and capacity to carry out processes and use the existing knowledge to achieve results;
- attitudes describe the disposition and mind-sets to act or react to ideas, persons or situations."

It is critical that learners can intelligently make connections across elements of a competence, integrate, and interactively apply them to respond to contextual demands as well as to change their contexts. "It is no longer sufficient to enable learners to acquire discrete knowledge, skills, values, etc." (UNESCO, 2017, p. 27). An integrity and values orientation is particularly reflected in the definition of a competence provided by UNESCO[35]: "***Competence is herein defined as the developmental capacity to interactively mobilize and ethically use information, data, knowledge, skills, values, attitudes, and technology to engage effectively and act across diverse 21st century contexts to attain individual, collective, and global good***".

Growing complexity, interconnectedness, rapid change as well as uncertainty and risks are characteristic for different spheres of life. The OECD position paper *The Future of Education and Skills*[36] also highlights complex, evolving circumstances and interdisciplinarity: "Disciplinary knowledge will continue to be important, as the raw material from which new knowledge is developed, together with the capacity to think across the boundaries of disciplines and 'connect the dots'" (OECD, 2018, p. 5). It implies a shift from domain-specific competences towards general/transversal competences, relevant to all domains or subjects.

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32 Tiana, A. (2004). Developing key competencies in education systems: some lessons from international studies and national experiences. In, *Developing key competencies in education*, pp.35-80. UNESCO: International Bureau of Education. https://www.voced.edu.au/content/ngv%3A6871

33 UNESCO (2019). Educational content up close: Examining the learning dimensions of Education for Sustainable Development and Global Citizenship Education. https://unesdoc.unesco.org/search/e7d52571-9946-477c-b306-024445c73c3d

34 EU (2018) Council Recommendation of 22 May 2018 on Key Competences for Lifelong Learning (Brussels, 2018/C 189/01). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018H0604%2801%29

35 UNESCO (2017b). Future Competences and the Future of Curriculum. A Global Reference for Curricula Transformation, UNESCO, International Bureau of Education. http://www.ibe.unesco.org/en/news/future-competences-and-future-curriculum-global-reference-curriculum-transformation

36 OECD (2018). The Future of Education and Skills: Education 2030. https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf

'Competencies' and 'skills' mean different things, although often they are used interchangeably. "Competencies are broader in scope. They refer to the ability to use knowledge – understood broadly as encompassing information, understanding, skills, values, and attitudes – in specific contexts and to meet demands" (UNESCO, 2015, p. 40)[37].

In the twenty-first century, education faces the challenge of enabling individuals to develop and apply their potential in very complex, rapidly changing realities and become responsible co-creators of the future society. An integrated and humanistic approach to education, based on 'four pillars' as presented in the Delors Report[38] (UNESCO, 1997) is important in today's world even more than before. Actually, cognitive, social and emotional, and behavioural dimensions of learning (which are reflected in different competence frameworks) found their roots in the 'four pillars'.

Table 2
Association between Four Pillars and the Dimensions of learning

"Four pillars"	Dimensions of learning[39]
Learning to know, by combining a sufficiently broad general knowledge with the opportunity to work in depth on a small number of subjects. This also means learning to learn, so as to benefit from the opportunities education provides throughout life.	**Cognitive:** to acquire knowledge, understanding and critical thinking about global, regional, national and local issues, the interconnectedness and interdependency of different countries and populations, as well as social, economic and environmental aspects of sustainable development.
Learning to be, so as to develop one's personality better and be able to act with ever greater autonomy, judgment and personal responsibility.	**Social and emotional**: to have a sense of belonging to a common humanity, sharing values and responsibilities, empathy, solidarity and respect for differences and diversity, as well as feel and assume a sense of responsibility for the future.
Learning to live together, by developing an understanding of other people and an appreciation of interdependence – carrying out joint projects and learning to manage conflicts – in a spirit of respect for the values of pluralism, mutual understanding and peace.	
Learning to do, in order to acquire not only an occupational skill but also, more broadly, the competence to deal with many situations and to work in teams.	**Behavioural**: to act effectively and responsibly at local, national and global levels for a more peaceful and sustainable world.

It should be noted that learning dimensions and the 'four pillars' call for open-ended, emancipatory learning processes, adequate for the post-modernistic society. However, dimensions of learning, in comparison with the 'four pillars', are more targeted to sustainability as a central concern of global development. In this way, learning dimensions reflect an orientation towards appropriate learning outcomes (competences). An integrated approach emphasises their mutual interrelationship and synergy that leads to knowledge-based and values-oriented actions. These categories are also compatible with the social constructivism theory in education.

37 UNESCO (2015). Rethinking Education: Towards a Global Common Good? https://unevoc.unesco.org/e-forum/RethinkingEducation.pdf

38 UNESCO (1996). Learning: The Treasure Within. https://unesdoc.unesco.org/ark:/48223/pf0000102734

39 UNESCO (2019). Educational content up close: examining the learning dimensions of Education for Sustainable Development and Global Citizenship Education, page 7.

On the other hand, orientation towards sustainability implies a revision of abstract 21st century skills and competences from the point of view of a more just and sustainable future. In this respect, competences for sustainable development are transformative and futuristic.

Sustainable development is not a scientific concept but rather a general political commitment to ensure human well-being, societal health and limited environmental impact. The Sustainable Development Goals[40] (United Nations, 2015) invite us to a long-term engagement and joint efforts, locally and globally. Achieving these goals requires a profound transformation in the way we live, think and act. Education is the most powerful instrument in achieving transformation towards sustainability both at the personal and societal level.

To be efficient, education for sustainable development should reflect principles of sustainable development itself. While there could be various interpretations of sustainability principles depending on the specific implementation area, four principles are fundamental[41]:

- the normativity principle
- the equity principle
- the integration principle
- the dynamism principle.

Sustainability principles bring important aspects to all learning dimensions as well as to corresponding domains of learning outcomes. To some extent, these principles could be considered as quality criteria for their assessment.

The humanistic values, such as respect for life and human dignity, equal rights and social justice, cultural and social diversity, and a sense of human solidarity and shared responsibility for our common future are equally important for sustainable development and education for sustainable development. On the other hand, an initiative of positive change in the community requires considering citizenship as an indispensable component of education for sustainable development.

A holistic worldview requires inter- and transdisciplinary approaches in education in order to address complexities in exploring social, cultural, economic and environmental issues. Rapid changes in different areas of life call for continuous learning and reflection processes, exploring controversial issues and dilemmas, where appropriate decisions and solutions may change as our experience increases.

3.2 Building teachers' ESD competences

Teachers are key actors in facilitating learners to understand the complex choices that sustainable development requires, and to motivate them to contribute to it. In order to guide and empower learners, teachers themselves need to be empowered and equipped with the knowledge, skills, values and professional behaviour that are required for implementing this role. Therefore, in addition to the eight key sustainability competences (i.e., systems and critical thinking, normative, anticipatory, self-awareness, strategic, collaboration and integrated problem-solving), teachers need competences in education for sustainable development (ESD), which define the capacity of teachers to develop the learners' abilities and motivation to participate in social change towards sustainability.

It should be noted that not only teachers in the formal education system, but also school leaders as well as leaders of non-formal education organisations (e.g., non-governmental and community organisations, youth clubs, etc.) should consider their preparedness to deal with issues of sustainable development and to orient their teaching practice to this concept.

40 United Nations (2015). Transforming our World: The 2030 Agenda for Sustainable Development, A/RES/70/1. https://sdgs.un.org/2030agenda

41 Waas,T., Hugé, J., Verbruggen, A., Wright, T. (2011). Sustainable Development: A Bird's Eye View. Sustainability, 3: 1637-1661. https://www.mdpi.com/2071-1050/3/10/1637

The document *Learning for the Future: Competences in ESD for educators*[42], by the United Nations Economic Commission for Europe (UNECE), represents a significant attempt to identify competences in a systematic and comprehensive way. It is the only international document initiated by a United Nations agency that describes competences in ESD based on sustainability competences of learners. It includes cognitive (Learning to know), non-cognitive (Learning to live together and Learning to be) as well as behavioural (Learning to do) components. The competences are clustered around three essential characteristics of ESD — a holistic approach; envisioning change; and achieving transformation. They go beyond the competences that individual educators would have in order to provide a good quality education in their discipline, so cross-curriculum approach seems to be a necessary precondition. Table 2 presents a set of competences for educators to be effective and efficient in education for sustainable development.

Table 3
Competences for educators in education for sustainable development

Source: Learning for the future. Competences in ESD for educators, ECE/CEP/AC.13/2011/6

	Holistic Approach **Integrative thinking and practice**	**Envisioning Change** **Past, present and future**	**Achieving Transformation** **People, pedagogy and education systems**
	The educator understands….		
Learning to know Cognitive competence	• the basics of systems thinking • ways in which natural, social and economic systems function and how they may be interrelated • the interdependent nature of relationships within the present generation and between generations, as well as those between rich and poor and between humans and nature • their personal world view and cultural assumptions and seek to understand those of others • the connection between sustainable futures and the way we think, live and work • their own thinking and action in relation to sustainable development	• the root causes of unsustainable development • that sustainable development is an evolving concept • the urgent need for change from unsustainable practices towards advancing quality of life, equity, solidarity and environmental sustainability • the importance of problem setting, critical reflection, visioning and creative thinking in planning the future and effecting change • the importance of preparedness for the unforeseen and a precautionary approach • the importance of scientific evidence in supporting sustainable development	• why there is a need to transform the education systems that support learning • why there is a need to transform the way we educate/learn • why it is important to prepare learners to meet new challenges • the importance of building on the experience of learners as a basis for transformation • how engagement in real-world issues enhances learning outcomes and helps learners to make a difference in practice

42 UNECE (2011). Learning for the Future: Competences in ESD for educators, ECE/CEP/AC.13/2011/6. http://www.unece.org/fileadmin/DAM/env/esd/ESD_Publications/Competences_Publication.pdf

	Holistic Approach Integrative thinking and practice	Envisioning Change Past, present and future	Achieving Transformation People, pedagogy and education systems
	The educator works with others in ways that….		
Learning to live together	• actively engage different groups across generations, cultures, places and disciplines	• facilitate the emergence of new worldviews that address sustainable development • encourage negotiation of alternative futures	• challenge unsustainable practices across educational systems, including at the institutional level • help learners clarify their own and others worldviews through dialogue, and recognise that alternative frameworks exist
	The educator is someone who….		
Learning to be	• is inclusive of different disciplines, cultures and perspectives, including indigenous knowledge and worldviews	• is motivated to make a positive contribution to other people and their social and natural environment, locally and globally • is willing to take considered action even in situations of uncertainty	• is willing to challenge assumptions underlying unsustainable practices • is a facilitator and participant in the learning process • is a critically reflective practitioner • inspires creativity and innovation • engages with learners in ways that build positive relationships
	The educator is able to….		
Learning to do	• create opportunities for sharing ideas and experiences from different disciplines/ places/cultures/generations without prejudice and preconceptions • work with different perspectives on dilemmas, issues, tensions and conflicts • connect the learner to their local and global spheres of influence	• critically assess processes of change in society and envision sustainable futures • communicate a sense of urgency for change and inspire hope • facilitate the evaluation of potential consequences of different decisions and actions • use the natural, social and built environment, including their own institution, as a context and source of learning	• facilitate participatory and learner-centred education that develops critical thinking and active citizenship • assess learning outcomes in terms of changes and achievements in relation to sustainable development

Example: Bhutan's competences in ESD

The *Bhutan professional standards for teachers*[43] explain teacher quality within a framework of seven Standards, which are further divided into 37 Focus Areas that refer to specific dimensions of teacher practices. For each Focus Area descriptors are provided for different categories of teacher qualification (Beginning, Proficient, Accomplished, Distinguished teacher) showing the development of a particular professional ability. Based on the Standards, teachers can judge the success of their own learning by self-reflection and self-assessment.

Although the document of Bhutan professional standards for teachers is not oriented directly towards ESD, there are relevant Focus Areas which are compatible with the UNECE framework for competences in ESD and could be guided by corresponding statements. Table 3 presents Standards and Focus Areas that could be used as a basis for an in-depth discussion on ESD aspects.

Table 4
Standards for teacher professional development, particularly important for the whole school approach
Source: Bhutan Professional Standards for Teachers (2020)

Standards	Focus Area	Descriptors for teacher qualification categories	
		Beginning →	Distinguished
1. Diversity of learners	1.2 Physical, social, emotional and intellectual development	Demonstrate knowledge and understanding of physical, social, emotional and intellectual development of learners	Lead colleagues in developing appropriate and effective teaching strategies based on strong understanding of physical, social, emotional and intellectual development of learners
2. Learning environment	2.4 Support for learner participation	Demonstrate an understanding of supportive learning environment that nurtures and inspires learner participation	Lead colleagues in the regular review of the school's learning environment to ensure effectiveness in nurturing and inspiring learners to participate; cooperate and collaborate in teaching and learning process.
3. Content and pedagogical knowledge	3.5 Higher-order thinking skills	Describe teaching strategies that develop learners' higher-order thinking skills	Develop and apply innovative and effective teaching strategies that strengthen learners' higher-order thinking skills
4. Planning and teaching	4.1 Learning outcomes aligned with learning competencies	Identify learning outcomes that are aligned with learning competencies	Exhibit high-level skills and lead colleagues in setting achievable and challenging learning outcomes that are aligned with learning competencies.
	4.5 Community contexts and learning	Demonstrate an understanding of the use of community contexts to enrich the teaching and learning process	Model exemplary practices in using community contexts to enrich teaching and learning

43 Professional standards for teachers (2020).
http://www.education.gov.bt/wp-content/uploads/2020/09/BPST.pdf

5. Assessment and reporting	5.3 Feedback to improve teaching and learning	Identify strategies to provide timely, accurate and constructive feedback to improve learner performance	Design and implement effective and efficient strategies to provide timely, accurate and constructive feedback to encourage learners to reflect on and improve their learning
6. Personal growth and professional development	6.5 Professional networks with colleagues	Seek opportunities to participate in professional networks to enhance practice	Lead and support colleagues' engagement in professional networks at the school and national level to advance knowledge and practice
7. Professional engagement and Bhutanese values	7.1 Engagement of parents and community	Demonstrate an understanding of the importance of engaging parents/guardians and community in the educative process	Consolidate networks that strengthen relationships with parents/guardians and the wider community to maximise their involvement in the educative process
	7.3 School policies and procedures	Demonstrate understanding of school policies and procedures for harmonious relationships with stakeholders in implementing school programmes	Promote implementation of school policies and lead discourses for change

However, there is an essential difference between the UNECE framework and *Bhutan professional standards for teachers*. The UNECE model of competences in ESD is mainly based on the relationship between teachers and society: understanding of complexities and challenges in societal development, appreciation of different partnerships as well as engagement in social transformation through education. Guided by the philosophy of GNH, which is reflected in the education policy as well, some Standards in Bhutan include strong social-emotional abilities of teachers:

- Standard 1: Diversity of Learners highlights the teachers' role in responding to diversity in the classroom and using learning settings that are responsive to the learners' diverse learning needs.

- Standard 2: Learning Environment refers to the psycho-social ambience that facilitate effective learning. Teachers are expected to create constructive classroom environments where learners are inspired to attain high degrees of knowledge, understanding and skills.

- Standard 7: Professional Engagement and Bhutanese Values underscore the importance of teachers collaborating with parents and the community for shared responsibility in achieving the goal of providing quality education to learners as well as promoting values of *tha damtshig ley gju-drey* and Bhutanese etiquette in day-to-day life.

These characteristics are important for education in general, but they also bring an added value especially to transformative education. Upholding of the unique Bhutanese culture and values supports the statement of SDG 4.7 target on "appreciation of cultural diversity and of culture's contribution to sustainable development".

4.

Information and communication technologies as an instrument in quality education

The role and application of information and communication technologies (ICT) *per se* is not included in the UNECE framework on competences in ESD. However, rapid advancements in computer-based systems and the availability of huge sets of digital data are having a notable impact on our societies, particularly on education and access to information. "ICT is a tool that is used to facilitate inclusiveness by enabling citizens to access information and knowledge, and to make education more relevant and easier to administer".[44]

In relation with SDG 4 on quality education as well as with targets SDG 12.8 ("By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature") and 13.3 ("Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning"), there are additional enablers defined by the following targets and indicators:

- **SDG 9.c:** Significantly increase access to information and communication technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020

  Indicator: 9.c.1 Proportion of population covered by a mobile network, by technology.

- **SDG 5.b:** Enhance the use of enabling technology, in particular information and communication technology, to promote the empowerment of women

  Indicator: 5.b.1 Proportion of individuals who own a mobile telephone, by sex.

At the same time, ICT is transforming models of how scientific knowledge is acquired and used. The most important drivers for integrating technologies in education are **pedagogical** (Game-based learning/ Gamification, Problem- and Project-based learning, Action-oriented learning, Blended learning, etc.) as well as **innovative technologies** (e.g., Cloud computing, Artificial intelligence, Internet of things, Digital games, Augmented reality, Social networks, Educational software).

Being a powerful and engaging instrument for collaborative and creative learning, technology can facilitate more personalised, flexible and student-centred learning. It can also help learners and educators access, create and share digital content, providing more independence on physical location and timetable.

At minimum, an effective ICT system for educational settings requires internet access and broadband connectivity and/or Wi-Fi network, computers and mobile devices, and display technologies. It should be noted that technology is just a tool to enhance performance of learners.

Recommendation on promotion of the use of technology in the classroom is dedicated to implementation of the *iSherig-2 Education ICT Master Plan 2019-2023*[45], approved by the Ministry of Education, Royal Government of Bhutan. In particular, it supports the outcome "Effective teaching and learning".

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44 Bhutan Education Blueprint 2014-2024: Rethinking Education. Ministry of Education, Royal Government of Bhutan, Thimphu, 2014, page 84.
http://www.education.gov.bt/wp-content/downloads/publications/publication/Bhutan-Education-Blueprint-2014-2024.pdf

45 iSherig-2 Education ICT Master Plan 2019-2023.
http://www.education.gov.bt/wp-content/uploads/2019/05/iSherig-2-Education-ICT-MNasterplan-2019-2023.pdf

Effective teaching and learning
ICT-integrated curricula and interdisciplinary digital pedagogy facilitates collaboration among educators and learners. It provides learners with personalised and active learning experiences through the use of digital resources which are curated or created.

Source: iSherig-2 Education ICT Master Plan 2019-2023, page 2.

There are two interrelated aspects of digital education to be discussed: **digital competence of teachers** and **learning resources**.

Many countries have already developed, or are currently in the process of developing or revising frameworks, self-assessment tools and training programmes to ensure necessary digital competence of teachers. *Digital Competence Framework for Educators (DigCompEdu)*[46], designed by the European Commission's Joint Research Centre, represents a coherent model that reflects on existing experiences. The Framework is recommended as a reference point for the debate on developing necessary preconditions to support ICT-led teaching and learning in Bhutan.

Example 1: Digital Competence Framework in EU

The *European Framework for the Digital Competence of Educators* indicates six different areas which focus on different aspects of educators' professional activities. Table 4 presents areas of the digital competence of teachers.

Table 5
Digital competence of teachers

Source: European Framework for the Digital Competence of Educators

1. Professional engagement	**1.1. Organisational communication** To use digital technologies to enhance organisational communication with learners, parents and third parties. To contribute to collaboratively developing and improving organisational communication strategies. **1.2. Professional collaboration** To use digital technologies to engage in collaboration with other educators, sharing and exchanging knowledge and experiences, and collaboratively innovating pedagogic practices. **1.3. Reflective practice** To individually and collectively reflect on, critically assess and actively develop one's own digital pedagogical practice and that of one's educational community. **1.4. Digital Continuous Professional Development (CPD)** To use digital sources and resources for continuous professional development.

46 European Framework for the Digital Competence of Educators: DigCompEdu. Punie, Y. (ed). Publications Office of the European Union, Luxembourg, 2017. https://joint-research-centre.ec.europa.eu/digcompedu_en

2. Digital resources	**2.1. Selecting digital resources** To identify, assess and select digital resources for teaching and learning. To consider the specific learning objective, context, pedagogical approach and learner group when selecting digital resources and planning their use. **2.2. Creating and modifying digital resources** To modify and build on existing openly-licensed and other resources where permitted. To create or co-create new digital educational resources. To consider the specific learning objective, context, pedagogical approach and learner group when designing digital resources and planning their use. **2.3. Managing, protecting and sharing digital resources** To organise digital content and make it available to learners, parents and other educators. To effectively protect sensitive digital content. To respect and correctly apply privacy and copyright rules. To understand the use and creation of open licenses and open educational resources, including their proper attribution.
3. Teaching and learning	**3.1. Teaching** To plan for and implement digital devices and resources in the teaching process, so as to enhance the effectiveness of teaching interventions. To appropriately manage and orchestrate digital teaching interventions. To experiment with and develop new formats and pedagogical methods for instruction. **3.2. Guidance** To use digital technologies and services to enhance the interaction with learners, individually and collectively, within and outside the learning session. To use digital technologies to offer timely and targeted guidance and assistance. To experiment with and develop new forms and formats for offering guidance and support. **3.3. Collaborative learning** To use digital technologies to foster and enhance learner collaboration. To enable learners to use digital technologies as part of collaborative assignments, as a means of enhancing communication, collaboration and collaborative knowledge creation. **3.4. Self-regulated learning** To use digital technologies to support self-regulated learning processes, that is, to enable learners to plan, monitor and reflect on their own learning, provide evidence of progress, share insights and come up with creative solutions.
4. Assessment	**4.1 Assessment strategies** To use digital technologies for formative and summative assessment. To enhance the diversity and suitability of assessment formats and approaches. **4.2 Analysing evidence** To generate, select, critically analyse and interpret digital evidence on learner activity, performance and progress, in order to inform teaching and learning. **4.3 Feedback and planning** To use digital technologies to provide targeted and timely feedback to learners. To adapt teaching strategies and to provide targeted support, based on the evidence generated by the digital technologies used. To enable learners and parents to understand the evidence provided by digital technologies and use it for decision-making.

5. Empowering learners	**5.1 Accessibility and inclusion** To ensure accessibility to learning resources and activities, for all learners, including those with special needs. To consider and respond to learners' (digital) expectations, abilities, uses and misconceptions, as well as contextual, physical or cognitive constraints to their use of digital technologies. **5.2 Differentiation and personalisation** To use digital technologies to address learners' diverse learning needs, by allowing learners to advance at different levels and speeds, and to follow individual learning pathways and objectives. **5.3 Actively engaging learners** To use digital technologies to foster learners' active and creative engagement with a subject matter. To use digital technologies within pedagogic strategies that foster learners' transversal skills, deep thinking and creative expression. To open up learning to new, real-world contexts, which involve learners themselves in hands-on activities, scientific investigation or complex problem solving, or in other ways increase learners' active involvement in complex subject matters.
6. Facilitating learners' digital competence	**6.1 Information and media literacy** To incorporate learning activities, assignments and assessments which require learners to articulate information needs; to find information and resources in digital environments; to organise, process, analyse and interpret information; and to compare and critically evaluate the credibility and reliability of information and its sources. **6.2 Digital communication & collaboration** To incorporate learning activities, assignments and assessments which require learners to effectively and responsibly use digital technologies for communication, collaboration and civic participation. **6.3 Digital content creation** To incorporate learning activities, assignments and assessments which require learners to express themselves through digital means, and to modify and create digital content in different formats. To teach learners how copyright and licenses apply to digital content, how to reference sources and attribute licenses. **6.4. Responsible use** To take measures to ensure learners' physical, psychological and social wellbeing while using digital technologies. To empower learners to manage risks and use digital technologies safely and responsibly. **6.5 Digital problem solving** To incorporate learning activities, assignments and assessments which require learners to identify and solve technical problems, or to transfer technological knowledge creatively to new situations.

For a comprehensive description, see the document *European Framework for the Digital Competence of Educator*. It provides in-depth information on how educators can develop their digital competence, including competence descriptors complemented by a list of typical activities. A progression model for digital competence development along six levels is proposed, for which a rubric with proficiency statements for self-assessment is supplied.

The term *Digital learning resource* (DLR) refers to materials that engage students in learning activities and support students' learning goals, including graphics images or photos; audio and video; simulations; animations; applications (apps); and programmed learning modules. DLRs are produced in a variety of settings, many of which do not include quality control procedures or pedagogical recommendations. There is no single international body for standardising, evaluating or establishing criteria for evaluating the

quality of the DLR. However, at the national level, countries (e.g., Norway[47] and Scotland[48]) have established corresponding schemes.

The recommended instrument for examination and evaluation of the quality of a DLR[49] includes four components: **academic**, **pedagogical, didactic** and **technical**. Table 5 presents quality criteria of digital resources.

Examples of digital resources available to teachers:

- https://www.golabz.eu/
- https://www.education.vic.gov.au/school/teachers/teachingresources/digital/Pages/tools.aspx
- https://www.kialo-edu.com/
- https://accessibledigitallearning.org/resources/
- https://digitalpromise.org/online-learning/online-learning-resources/
- https://www.discoveryeducation.com/

Table 6
Quality criteria of digital resources

Criterion	Focus
1. Academic quality (Quality of information presented in the Digital Learning Resource)	
1.1. Information reliability	• Is the information presented reliable?
1.2. Information relevance	• Is the information presented relevant?
2. Pedagogical quality (Relevance of DLR purpose, objectives, teaching strategies and assessment)	
2.1. Pedagogical formulation (instructions for tasks)	• Is the quality of content simplification good? • Does the educational content present overviews and summaries?
2.2. Pedagogical construction	• Is the content clearly structured? • Whether the structure of the digital learning resource corresponds to the expediency of its use in the pedagogical context: logic of organisation, mode of browsing between the elements.
2.3. Pedagogical strategies	• Are the learning objectives clearly defined? • Is learning based on learner-centeredness? • Are there any problem-solving tasks fostering a constructive learning? • Is diversity of learners taken into account by providing different strategies and tasks according to learning styles? • Does the tool present activities that create interactions among learners?
2.4. Assessment methods	• Does the resource provide an (self) assessment procedure?

47 Quality Criteria for Digital Learning Resources, 2012. https://www.udir.no/globalassets/filer/tall-og-forskning/rapporter/2012/quality_criteria_dlr-eng.pdf

48 Quality Standards for Digital Learning Resources: guidance on design, development, delivery, evaluation and maintenance, 2017. https://learn.nes.nhs.scot/9927/guidance-for-educators/quality-standards-for-digital-learning-resources-guidance-on-design-development-delivery-evaluation-and-maintenance

49 Mhouti, A., Nasseh,A., Erradi, M. (2013). How to evaluate the quality of digital learning resources? *International journal of computer science research and application*, 3, 27-36. https://www.researchgate.net/publication/260392089_How_to_evaluate_the_quality_of_digital_learning_resources

3. Didactic quality (Quality of learning activities, disciplinary content and epistemology)	
3.1. Learning activities	• Do tasks/ activities refer to real-life (authentic) problems which the learner may face outside the classroom?
3.2. Learning content	• Is the content of the DLR relevant to the learning objectives and target audience?
4. Technical quality (Relevance of design and organisation of the DLR)	
4.1. Design	• Are multimedia techniques (visual graphics, interactivity) in favour of information provision and pedagogy?
4.2. Browsing	• Is browsing between different elements of the DLR product clear and logical?
4.3. Technological ingenuity	• Are innovative techniques used to enhance transfer and assimilation of knowledge by learners?

Example 2: Digital Competence Framework in Bhutan

Two Standards in the *Bhutan professional standards for teachers* include ICT:

- Standard 3: Content and pedagogical knowledge calls for Focus Area of Positive use of ICT leading to the following performance of the distinguished teacher: "Show exemplary skills and mentor colleagues in the positive use of ICT in teaching and learning within or beyond the school".

- Standard 4: Planning and teaching refers to Teaching-Learning resources including ICT and the ability of distinguished teacher to "lead colleagues in the design, development and evaluation of teaching and learning resources including ICT for use within and beyond the school to address learning goals".

To summarise, ICT can enable learning, and increase performance and connectivity of students, which is an important aspect for young learners in a globalised world. Blended learning – a combination of in-school and distance learning – was established as a flexible model that can support a project or course of study to progress. It was used widely during the COVID-19 crisis, but as a tool to solve a crisis, this mode often did not correspond with pedagogical understanding. Helpful guidelines for school education were provided by the European Commission in 2020.

5.

Guidelines for teacher training

ESD requires a unique set of competences by teachers, and continuous professional development. As emphasised in the UNECE document[50], competences in ESD should not be considered as a "minimum standard" to be met by all educators, but rather a goal to which all educators should aspire. It provides a framework for the professional development of educators to empower them as important agents of change within education systems. Partnerships and networks should be established and supported as an important strategy for developing and practising the Competences. It is also recommended by the UNECE to adopt a whole school approach for the continuing professional development of teachers in their workplace.

Example of Bhutan

Similarly, Shift Five in the Bhutan Education Blueprint 2014-2024[51] (Ensuring high-performing schools and school leaders) states, "Institutionalize induction and CPD [continuing professional development] Programmes and institute Professional Learning Community (PLC) in all schools to enhance learning and ensure continuous professional development of the principals, teachers and staffs".

Teacher training for ESD

It is important to note that it is not sufficient to simply include topics of sustainability such as climate change or recycling. Even if these issues are indicated in the National School Curriculum, a perspective of sustainable development brings new interpretation.

Teacher training needs are strongly contextualised. The following essential components should be defined:

1. Basic concepts of sustainable development (from a local, national and international perspectives); key examples of sustainability challenges.
2. Education for sustainable development, the main principles and characteristics.
3. Sustainable Development Goals; transformation of SDGs/targets into cross-curriculum themes and learning objectives for particular Key Stage.
4. The role of the whole school approach in societal transformation; quality criteria for school development.
5. Students' initiatives in defining and solving local problems and/or implementing meaningful and value-oriented change personally, in a family and in the community.

A teacher's questionnaire presented in the Annex will help to define some characteristics of a starting situation.

50 UNECE (2011). Learning for the future. Competences in ESD for educators, ECE/CEP/AC.13/2011/6. http://www.unece.org/fileadmin/DAM/env/esd/ESD_Publications/Competences_Publication.pdf

51 Bhutan Education Blueprint 2014-2024: Rethinking Education, Ministry of Education, Royal Government of Bhutan, Thimphu, 2014, page 82.
http://www.education.gov.bt/wp-content/downloads/publications/publication/Bhutan-Education-Blueprint-2014-2024.pdf

Topics of sustainability need to be embedded into their contexts, and various aspects within the themes need to be discussed, including:

- interdependence - of processes in society, economy and nature;
- appreciation of diversity - cultural, social, economic and biological;
- prediction of the consequences of actions;
- meaning of local actions in the global context;
- taking into account needs and rights of future generations;
- equity in achieving a better quality of life;
- citizenship - rights and responsibilities, participation and cooperation in problem solving.

The development of ESD always implies an interplay between education and sustainable development: integration of education into sustainable development and integration of sustainable development into education. Therefore, learning on the basis of real societal challenges in local contexts requires cooperation with external partners (e.g., governmental institutions, non-governmental and community organisations). Collaboration among different actors involved in education will help to ensure that the system embraces ESD.

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Annex

Questionnaire for Teachers

A. What factors would be helpful in incorporating SCP (Sustainable Development Goals, in a broader scope) in formal education?				
	Not important	Less important	More important	Important
1) Relevant content, connected with school curriculum				
2) Methodological materials				
3) In-service training (both on content and teaching)				
4) Expert consultation (both on SD and teaching)				
5) Collaboration with other teachers, peer counselling				

B. What factors are important in motivating students' action for sustainable development? (Teacher's opinion)				
	Not important	Less important	More important	Important
1) Exploring real-life situations				
2) Showing connections between global problems and students' everyday life				
3) Discussion on alternative future scenarios				
4) Possibility to choose problem under consideration autonomously				
5) Possibility to solve a real problem				
6) Discussion about the meaning/ value of planned/ implemented activities				
7) Example by peers				
8) Example by teacher/ other adults				

C. What kind of in-service training is the most relevant to your personal needs?
Please, select up to 3 priority factors (1st/ 2nd/ 3rd priority)

Characteristics	Rating		
	1st	2nd	3rd
1) Focused on innovation for teaching subject			
2) Focused on sustainable development issues			
3) Interactive, adapted to the teacher's personal development needs			
4) Opportunities for collaborative learning			
5) Involves most colleagues from the teacher's school			
6) Opportunities to practise new ideas in the teacher's own classroom			
7) Provides follow-up activities, discussion on the results			
8) Includes individual consultations with expert/ lecturer			

D. How informed are you about the particular Sustainable Development Goals (SDGs)?
Please mark one response in each row.

	I have never heard of this	I have heard about this but I would not be able to explain what it is really about	I know something about this and could explain the general issue	I am familiar with this and I would be able to explain this well
SDG-1. End poverty in all its forms everywhere				
SDG-2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture				
SDG-3. Ensure healthy lives and promote well-being for all at all ages				
SDG-4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all				
SDG-5. Achieve gender equality and empower all women and girls				

SDG-6. Ensure availability and sustainable management of water and sanitation for all				
SDG-7. Ensure access to affordable, reliable, sustainable and clean energy for all				
SDG-8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all				
SDG-9. Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation				
SDG-10. Reduce inequality within and among countries				
SDG-11. Make cities and human settlements inclusive, safe, resilient and sustainable				
SDG-12. Ensure sustainable consumption and production patterns				
SDG-13. Take urgent action to combat climate change and its impacts				
SDG-14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development				
SDG-15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss				
SDG-16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels				
SDG-17. Strengthen the means of implementation and revitalise the global partnership for sustainable development				

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