	Country	Key transversal sustainability competencies aligned with national curricula/education policies	Number of papers
1	Maldives	Relevant documents: National Curriculum Framework of Maldives (2015) [100] *Using sustainable practices* *Thinking critically and creatively* *Making meaning* *Using media and technology* *Understanding and managing self-relating to people* [78]	10
2	Spain	Relevant documents: Lucerne Declaration on Geographical Education for Sustainable Development (2007) [101] *Critical and complex thinking* *Comprehension of different situations and perspectives* *Collecting, organizing, evaluating and interpreting information* *Personal initiative for introducing changes and improving trends* *Communicating ideas* *Evaluating alternatives* *Problem solving skills* *Participating and cooperating in decision making* *Justifying and evaluating one's own actions* *Planning the future, forecasting* [87]	
3	South Korea	Relevant documents: Ministry of Education: Revised School Curriculum of the Republic of Korea (2015) [102] *intellect-oriented domain (critical-thinking ability, creativity, problem-solving ability),* *personality-oriented domain (autonomy, ability to reflect, and environmental sensitivity),* *relationship-oriented domain (communication ability, ability to manage conflicts*) [15]	
4	Indonesia	Relevant documents: Adiwiyata - Green School program, Ministry of Education and Ministry of Environment (2006) [103] *Environmental and social-cultural knowledge perspectives, attitudes, as obtained values, feelings of worry, and motivation for participation in environmental progress and protection, and awareness impact students' behaviour and contribute to their self-efficacy* [88]	
5	Germany	Relevant documents: Curriculum Framework: Education for Sustainable Development / Global Development Education (2015) [24] 11 core competencies: *Acquisition and processing of information* *Recognising diversity* *Analysis of global change* *Differentiation between levels of action* *Change of perspectives and empathy* *Critical reflection and comment* *Evaluation of development projects* *Solidarity and shared responsibility* *Understanding and conflict resolution* *Ability to act in times of global change* *Participation und active involvement* [77]	

6	Serbia, Montenegro, Croatia	Relevant documents: National Strategy for Sustainable Development of the Republic of Serbia, 2008. [104] Guidelines on curricula for primary, secondary and grammar schools (Serbia) [105] Decision on the adoption of the curriculum for the interdisciplinary topic Sustainable development for primary and secondary schools (Croatia) [106] The learning objectives for three national curricula emphasize the development of competencies such *as critical thinking, systemic thinking, joint decision-making, and imagining future scenarios, aimed at enabling students to contribute meaningfully to sustainable development and the achievement of the Sustainable Development Goals (SDGs).* [90]	
7	Malaysia	Relevant documents: The Green Skills Agreement, Australia, (2009) [107] *Green Skills model: environmental awareness, green practices, learning skill, career development skill, STEM skill, entrepreneur skill, communication skill, interpersonal skill, self-management skill, intellect skill, attitude, knowledge and values* [30, 68]	
8	Spain	Relevant documents: LOMLOE (Organic Law Amending the Organic Law of Education), 2020 [108]*Seven operational scientific competencies for ESD* [86]	

	Country	**Sustainability competencies, based on relevant global/European education policy documents**	**Number of papers**
1	Guatemala	Relevant documents: Roadmap for Implementing the Global Action Programme on Education for Sustainable Development. UNESCO, 2014 [80] Global Citizenship Education. Preparing Learners for the Challenges of the Twenty-First Century. UNESCO, 2014 [99] *Sustainability competences through Visual Thinking* [14]	9
2	Spain	Relevant documents: Transforming Our World: The 2030 Agenda for Sustainable Development. United Nations, 2015 [109] International, E.C. Earth Charter, 2019 [110] *Scientific competence for ESD* [16]	
3	South Korea	Relevant documents: Definition and Selection of Competencies Theoretical and Conceptual Foundations, OECD, 2001 [19] *Key competencies in Environmental Education* [15]	
4	Germany	Relevant documents: Definition and Selection of Competencies Theoretical and Conceptual Foundations, OECD, 2001 [19] *Key competencies for and beyond sustainable consumption* [13]	
5	Chile	Relevant documents: Education for Sustainable Development Goals. UNESCO, 2017 [25] *Key competencies for SDGs* [89]	
6	Malaysia	Relevant documents: Future Skill Needs for the Green Economy. CEDEFOP, 2009 [74] *Green Skills* [30, 68]	
	Country	**Domain-specific competencies (through the lens of school subjects or education domain)**	**Number of papers**
1	Spain	Geography/*Geographical competencies for ESD* [87]	12
2	Spain	Science/*Scientific competence for ESD* [16]	

3	South Korea	Environment/*Key competencies in Environmental Education* [15]	
4	Malaysia	Design and technology, Life skills, Science/*Green Skills* [30, 68]	
5	Maldives	Climate change education, Social sciences [78]	
6	Israel	Science, technology, environment, society, economy, and policy (STESEP), environmental education and STEM [96]	
7	Germany	Biology, Mathematics, Geography, Law, Civics and Economics, German [83]	
8	Chile	English as a foreign language [89]	
9	Spain	Climate change education [86]	
10	Germany	Education for sustainable consumption [13]	
	Country	**Domain-specific competencies (through the lens of teaching-learning approach)**	**Number of papers**
1	Germany	*Competencies for handling issues in ESD at classroom* level Teaching/learning approach: classroom research, discussion [82]	11
2	Sweden	Fostering of *transition skills/knowledge capabilities* [76] Teaching/learning approach: project-based learning	
3	Maldives	Climate Change Education [78] Teaching/learning approach: project-based learning	
4	Sweden	*Ability to apply a systems perspective (anticipation)* *Action competence - ability to engage and work for desired effects* *Competence to learn - creativity (student engagement)* *Competence to critically reflect upon own's knowledge and ways of being - critical thinking* [84] Teaching/learning approach: storytelling method	
5	Israel	STEM/STES/STESEP Education for "Sustainability Thinking" Teaching/learning approach: flipped classroom, problem-based learning, self-assessment [96]	
6	India	Fostering of key sustainability competencies through connection to the real-life problems and situations Teaching/learning approach: authentic learning [72]	
7	Belgium	*Action competence* within powerful learning environments Teaching/learning approach: holistic and pluralistic learning, action-oriented teaching [71]	
8	Sweden	Effectiveness of *action competence/sustainability consciousness* Teaching/learning approach: holistic and pluralistic learner-centered learning [61]	
9	Spain	*Scientific competence for ESD* Teaching/learning approach: open educational resources (*www.zapatoons.info*) [16]	
10	Guatemala	Acquisition of sustainability competences through Visual Thinking *Holistic (systemic competence or reflection);* *Contextual (collaborative decision making);* *Critique (critical analysis);* *Transformative (sense of responsibility towards present and future generations)* Teaching/learning approach: visual thinking approach [14]	
11	UK	*Action competence through the agency approach* Teaching/learning approach: students-led sustainability projects [95]	
	Country	**Set of key sustainability competencies, originated from relevant conceptual research**	**Number of papers**

1	Ukraine	Environmental, social-economic, legal, ethical and moral components of the ESD, which include building knowledge, skills, attitudes towards sustainability [70]	10
3	Sweden	*Ability to apply a systems perspective (anticipation)* *Action competence - ability to engage and work for desired effects* *Competence to learn - creativity (student engagement)* *Competence to critically reflect upon own's knowledge and ways of being - critical thinking* [84]	
4	Belgium	*Action competence within powerful learning environments:* *action-taking,* *students' leadership in their learning and teaching,* *peer interaction,* *community involvement and interdisciplinarity* [71]	
5	Sweden	*Knowledge capabilities:* *- take command* *- collaborate in a team* *- be prepared* *- act in a transdisciplinary manner* *- lead others towards a holistic understanding* [76]	
6	Germany	11 core competencies from Curriculum Framework for ESD (refer to above) [77]	
7	India	Key sustainability competencies for secondary school [72] *Systems-thinking competence* *Anticipatory competency* *Normative competency* *Strategic competence* *Interpersonal competence* *Problem-solving competence*	
8	Germany	Shaping competence (*Gestaltungskompetenz*) [11] *gather knowledge in a spirit of openness to the world, integrating new perspectives;* *think and act in a forward-looking manner;* *acquire knowledge and acting in an interdisciplinary manner;* *deal with incomplete and overly complex information;* *co-operate in decision-making processes;* *cope with individual dilemmatic situation of decision-making;* *participate in collective decision-making processes;* *motivate oneself as well as others to become active;* *reflect upon one's own principles and those of others;* *refer to the idea of equity in decision-making and planning action;* *plan and act autonomously;* *show empathy for and solidarity with the disadvantaged*	
9	USA	Competencies for transformative action [75] *systems thinking;* *understanding of interconnectedness;* *long-term, foresighted reasoning and strategizing;* *stakeholder engagement;* *group collaboration;* *action-orientation;* *change- agent skills;*	

10	UK	Action competence broken into 4 steps: • *Investigation (researching issues);* • *Visioning (considering alternatives/planning);* • *Action (making decisions and being responsible for these);* • *Change (evaluating impact of the action)* [95]
11	Spain	7 scientific competencies for SDGs based on • *Critical analysis* • *Systemic reflection* • *Collaborative decision-making* *Sense of responsibility towards present and future generations*

	Country	Structural model for the relevant cognitive abilities, skills and attitudes	Number of papers
1	Sweden, Taiwan	The concept of **sustainability consciousness** taps into students' knowingness (K), attitudes (A), and behavior (B) in relation to the sub-themes to the environmental (ENV), social (SOC), and economic (ECO) dimensions of SD. [60, 61, 67]	11
2	Germany	The **frame model of sustainability subcompetencies** distinguishes between two basic (and an elaborated level of) sustainability competencies. In the context of school learning, the focus is on cross-curricular (cross-disciplinary) competencies (Level 1) and a basic level of more subject-specific competencies (Level 2). At each level, a distinction is made between cognitive, affective-motivational, and behavioral aspects, and additional subcompetencies. Additional subcompetencies (d) are specific cognitive abilities to solve partial aspects of sustainability-relevant problems, like *system competency, the ability to solve complex dynamic problems with the help of a systemic approach, or the evaluation competency for ethical questions, as a cognitive ability to make well-founded decisions in sustainability-relevant contexts,* but also *to be able to critically reflect on decisions*. [25, 69, 81]	
3	Indonesia	ESD competency consists of 3 components: knowledge, attitudes and behaviour with regard to challenges. **Knowledge** of ESD can be reviewed through two perspectives: socio-cultural (human rights, peace, security, gender equality, cultural diversity, and intercultural understanding, health, HIV/AIDS, governance) and environmental perspective (natural resources (energy, water, agriculture, and biodiversity), climate change, rural development, sustainable urban communities, disaster prevention, and mitigation) **Attitude** is an obtained value, feelings of worry, and motivation for participation in environmental progress and protection. **Behaviour** is about taking own action in a sustainable manner by taking into account their current and future social, cultural, economic and environmental impacts from both a local and a global perspective [88]	

4	Germany	ESD competencies can be specified in the three classic areas of knowledge, evaluation and action (Erkennen, Bewerten, Handeln). Knowledge -- system competence, interdisciplinary knowledge, ability to assimilate knowledge. Values -- evaluation competence, intercultural acceptance and tolerance. Action -- organisational competence, cooperative and participatory skills [80].
5	Denmark	The concept of **action competence** includes the capacity to be able to act, now and in the future, and to be **responsible for one's actions**. A conscious making up of one's mind about an action and actions addressed to solutions of the problem, which is being studied, are key perspectives of an action competence. A critical perspective is necessary and must be related to a concrete action. Action competence makes focus on collaborative activities and decisions, rather on individualistic ones [12].
6	Sweden	Sustainability commitment – a relational (personal and situational) and informed ongoing dedication to addressing sustainability issues. Sustainability commitment is driven by motivation and assertiveness and based on scientific knowledge, as well as ethical and political insights [85].