

SDG 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

METADATA

Target 4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development

4.7.4 Percentage of students in lower secondary education showing adequate understanding of issues relating to global citizenship and sustainability

Definition

In this report, we use data from ICCS 2016, and PISA 2018 to estimate the proportion of students who reach the targets set by SDG Thematic Indicator 4.7.4 for each country and region with available data. To do that we build on previous work conducted by UNESCO and partially adopt the definitions and operationalization advanced in recent documents (e.g. Hoskins, 2016; IBE, 2016; Sandoval-Hernández & Miranda, 2018; UIS, 2017; UNESCO, 2012a, 2012b, 2013, 2014, 2015). So, drawing on this body of literature we use the following working definitions of GCED and ESD:

Global Citizenship Education (GCED)

Nurtures respect for all, building a sense of belonging to a common humanity and helping learners become responsible and active global citizens. GCED aims to empower learners to assume active roles to face and resolve global challenges and to become proactive contributors to a more peaceful, tolerant, and inclusive and secure world.

Education for Sustainable Development (ESD)

Empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability, and a just society, for present and future generations, while respecting cultural diversity. It is about lifelong learning and is an integral part of quality education.

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The operationalization of these concepts is based on the work of a research team from the International Bureau of Education (IBE) and the Global Education Monitoring Report (GEMR) team that developed a coding scheme (IBE, 2016) to evaluate 78 national curricula for evidence of GCED and ESD content. The exercise involved several pilots, parallel coding with different coders coding the same documents, and resulted in a scheme with seven categories in the knowledge dimension (see Table 1): Interconnectedness and Global Citizenship; Gender Equality; Peace, Non-violence and Human Security; Human Rights; Health and Well-being; Sustainable Development; and Environmental Science. Each of these categories was further divided into sub-categories and then operationalised using the items of international large-scale assessments (ILSA) instruments. The first six categories are considered for indicator 4.7.4 and the last one for indicator 4.7.5.

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Table 1. Global Content Framework for SDG indicators 4.7.4 and 4.7.5

	Category	Sub-category
Global Citizenship Education (GCED)	Interconnectedness and Global Citizenship	Globalization
		Global/international citizen(ship), global culture/identity/community
		Global-local thinking, local-global, think global act local, glocal
		Multicultural(ism)/intercultural(ism)
		Migration, immigration, mobility, movement of people
		Global Competition/competitiveness/globally competitive/international competitiveness
		Global Inequalities/disparities
	Gender Equality	Gender equality / equality / parity
		Empower(ment of) women/girls (female empowerment, encouraging female participation)
	Peace, Non-violence and Human Security	Peace, peace-building
Awareness of forms of abuse/harassment/violence (school-based violence/bullying, household-based violence, gender-based violence, child abuse/harassment, sexual abuse/harassment)		
Human Rights	Human rights, rights and responsibilities (children's rights, cultural rights, indigenous rights, women's rights, disability rights)	
	Freedom (of expression, of speech, of press, of association/organisation), civil liberties	
	Social justice	
	Democracy/democratic rule, democratic values/principles	
Education for Sustainable Development (ESD)	Health and Well-being	Physical health/activity/fitness
		Mental, emotional health, psychological health
		Healthy lifestyle (nutrition, diet, cleanliness, hygiene, sanitation, *clean water, being/staying healthy)
		Awareness of addictions (smoking, drugs, alcohol)
		Sexual and/or reproductive health
	Sustainable Development	Economic sustainability, sustainable growth, sustainable production/consumption, green economy
		Social sustainability, (social cohesion re sustainability)
		Environmental sustainability/environmentally sustainable
		Climate change (global warming, carbon emissions/footprint)
		Renewable energy, alternative energy (sources) (solar, tidal, wind, wave, geothermal, biomass...)
Ecology, ecological sustainability (ecosystems, biodiversity, biosphere, ecology, loss of diversity)		
Environmental Science (geoscience)	Waste management, recycling	
	Physical systems	
	Living systems	
		Earth and space systems

Furthermore, drawing on a review of recent work in the area of global citizenship education, we incorporated the three core dimensions proposed by UNESCO to measure learning outcomes in GCED in this mapping exercise (UNESCO, 2015). These dimensions are interrelated and are presented in Table 2, each indicating the domain of learning they focus on (see Sandoval-Hernández et al., 2019 for further details).

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Table 2. Core conceptual dimensions of global citizenship education

Cognitive
To acquire knowledge, understanding critical thinking necessary to encompassing the range of cognitive processes involved in learning environmental science concepts, and then applying these concepts and reasoning with them.
Socio-emotional
To have intrinsic motivation to learn environmental science.
Behavioural
To have self-confidence or self-concept in their ability to learn environmental science.

The final selection of items was then used to produce a score for each subcategory and to estimate the proportion of the students who reached each of the standards evaluated. Finally, these proportions were combined in a global indicator indicating the proportion of students who reached any of the standards evaluated.

In what follows, we describe our analytical strategy, and, in order to aid the interpretation of the indicators, we present the definition of the cut off points used to consider students to have reached the standards evaluated.

The indicator and its methodology have been reviewed and endorsed by UNESCO's [Technical Cooperation Group on the Indicators for SDG 4-Education 2030](#) (TCG), which is responsible for the development and maintenance of the thematic indicator framework for the follow-up and review of SDG 4. The TCG is composed of 38 regionally representative experts from UNESCO Member States (nominated by the respective geographic groups of UNESCO), as well as international partners, civil society, and the Co-Chair of the [Education 2030 Steering Committee](#). The [UNESCO Institute for Statistics](#) acts as the Secretariat.

Calculation method

The analytical strategy includes five main steps: verify the availability of observed responses to the items proposed by the mapping exercise described above, test the unidimensionality of the intended constructs, fit the corresponding measurement models to obtain scores for each standard, estimate the cut-off points to identify the students who reach each of the standards evaluated.

Once the final set of items to be included in each scale was identified based on the availability of responses and the analysis of unidimensionality, we used a latent variable model approach to obtain the corresponding scores. More specifically, we use a partial credit model (Masters & Wright, 1997). Formally, this model can be described by Equation 1 (see Wu et al., 2016):

$$Pr(Y_{ip} = j | \theta_p) = \frac{\exp \sum_{k=0}^j (\theta_p - \delta_{ik})}{\sum_{h=0}^{m_i} \exp \sum_{k=0}^h (\theta_p - \delta_{ik})} \quad (1)$$

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In this model, the probability of answering an item (Y_{ip}), with a category of response 0, 1, 2, ..., m_i by a person p , depends on the propensity of the response of the person p (θ_p). For the first category of response, there is a constraint: $\sum_{k=0}^0 (\theta_p - \delta_{ik}) = 1$. Thus, for the first category of response, the numerator in equation 1 is 1. The item parameters δ_{ik} needed are one less the number of response categories for each item. Therefore, if all items are dichotomous a single δ parameter is estimated per item. However, if all items present 4 categories of responses, then three δ parameters are estimated for each item.

Then, using the cut-off points established for each scale, we estimated the proportion of students reaching the standards within each country or region as a simple proportion (see Equation 2).

$$P = \frac{X}{n} \quad (2)$$

Where X is the number of students that reach a standard in each country and n is the total number of students in the same country.

We also estimated the proportion of students who meet any of the standards stipulated by indicator 4.7.4, for each country and region for which data is available. To this end, we estimated a mean score that summarizes all the standards that a student has met. This mean score varies from 0 to 1, where the maximum is achievable by a student if and only if this student has met all the standards where he or she was classified. Zero was assigned if a student did not meet any of the proposed standards. Likewise, if a student satisfied two out of three standards, then he or she was attributed a score of .66 (2/3). This calculation is expressed in Equation 3.

$$\bar{D}_i = \frac{\sum_i^{n_D} D_i}{n_D} \quad (3)$$

In this equation, D_i represents a binary variable that classifies if a student i met a standard. This variable uses a 1 if the student i meet the standard, and a value of zero if it doesn't. n_D represent the number of standards. Because D_i is a binary variable, this mean score can be interpreted as the proportion of standards a student has met.

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Data source

The data was sourced from the latest cycles of two major International Large-Scale Assessments: the 2016 IEA International Civic and Citizenship Study ([ICCS](#)) and the 2018 OECD Programme for International Student Assessment ([PISA](#)). Due to availability and comparability issues, PISA was only used for the Health and well-being scale (See Sandoval-Hernández et al., 2019 for more details).

ICCS is an ongoing, comparative research programme that investigates the ways in which young people are prepared to undertake their roles as citizens. ICCS reports on levels of students' civic knowledge, their understanding of concepts and issues related to civics and citizenship, as well as their civic attitudes and engagement. In addition, ICCS collects and reports on a rich array of contextual data from policymakers, teachers, school principals, and the students themselves, about the organization and content of civic and citizenship education in the curriculum, teacher qualifications and experiences, school climate, home and community support. In 2016 ICCS collected data from approximately 95,000 (8th grade) students and 50,000 teachers from 3,600 schools in 24 countries.

PISA is an international assessment that measures 15-year-old students' reading, mathematics, and science literacy every three years. In every cycle, PISA also includes rotating measures of general or cross-curricular competencies, such as collaborative problem solving in 2015, financial literacy in 2018, creative thinking in 2022 etc. In PISA, students answer a background questionnaire providing information about themselves, their learning environment, their home and their attitudes to learning. In addition, principals and teachers included in the PISA sample complete questionnaires about their schools. By design, PISA emphasizes functional skills that students have acquired as they near the end of compulsory schooling. Around 600,000 students in 79 economies took part in the PISA 2018.

Definition of cut-off points (standards)

Cognitive

At the threshold, students make connections between the processes of social and political organization and influence, and the legal and institutional mechanisms used to control them in relation with global citizenship and sustainability. They generate accurate hypotheses on the benefits, motivations, and likely outcomes of institutional policies and citizens' actions. They integrate, justify, and evaluate given positions, policies or laws based on the principles that underpin them. Students demonstrate familiarity with broad international economic forces and the strategic nature of active participation.

Non-cognitive

Interconnectedness and Global Citizenship

This category is measured through two sub-categories: 'Global-local thinking' and 'Multicultural(ism)/intercultural(ism)'.

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Global-local thinking

At the threshold, students have more than 50% chances to express positives attitudes towards their country of residence. Most of the students at or above the cut-off score agree a lot to expressions such as “I am proud to live in <country of test>.”, “In <country of test> we should be proud of what we have achieved”, or “I have great respect for <country of test>.”

Multicultural(ism)/intercultural(ism)

At the threshold, students have more than 50% chances to express positives attitudes towards ethnic/racial minorities. Most of the students at or above the cut-off score agree a lot to expressions such as “<Members of all ethnic/racial groups> should be encouraged to run in elections for political office”, “<Members of all ethnic/racial groups> should have equal access to education”, or “<Members of all ethnic/racial groups> should have equal chances to get a good job in <country of test>.”

Gender Equality

At the threshold, students have more than 50% chances to strongly endorse gender equality. Most of the students at or above the cut-off score agree a lot to expressions such as “Men and women should have equal opportunities to take part in government” or “Men and women should get equal pay when they are doing the same jobs”. Complementary, most of the students at or above the cut-off score express strong disagreement to expressions such as “Women should stay out of politics” or “Men are better qualified to be political leaders than women”.

Peace, Non-violence and Human Security

At the threshold, students have more than 50% chances of reporting not experiencing bullying. Most of the students at or above the cut-off score report not having experienced at all situations such as “being called by an offensive nickname”, “being threatened to be hurt”, or “other students posting offensive pictures or texts about them”.

Human Rights

This category is measured through two sub-categories: ‘Freedom (of expression, of speech, of press, of association/organisation)’ and ‘Social Justice’.

Freedom (of expression, of speech, of press, of association/organisation)

At the threshold, students have more than 50% chances of identifying situations that are deemed good for democracy, as well as those situations that are deemed bad for democracy. Most of the students at or above the cut-off score consider that situations like “People are allowed to publicly criticize the government” or “All adult citizens have the right to elect their political leaders” are good for democracy. Complementary, most of the students at or above the cut-off score consider that situations like “Political leaders give

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government jobs to their family members” or “One company or the government owns all newspapers in the country” are bad for democracy.

Social Justice

At the threshold, students have more than 50% chances to highly endorse the importance of social participation in social movements. Most of the students at or above the cut-off score consider that behaviours such as “Participating in protests against laws believed to be unjust”, “Participating in activities to benefit people in the local community” or “ Taking part in activities to protect the environment” are very important for being a good citizen.

Health and well-being

At the threshold, students have more than 50% chances to participate in those activities that promote their psychological, cognitive, social and physical functioning and capabilities that they need to live a happy and fulfilling life. These students are more likely to sleep well, attend to physical education classes at least, once week, at least two days of moderate physical activity, and more than one day of vigorous physical activity. Likewise, these students are less likely to feel depress and less likely to feel anxious.

Sustainable Development

At the threshold, students have more than 50% chances of identifying threats to the world's future and reporting that they would definitely make personal efforts to avoid them. Most of the students at or above the cut-off score consider that, to a large extent, issues like “Pollution”, “global financial crisis”, “Violent conflicts” or “climate change” are a threat to the world's future; and that they would certainly make personal efforts to help the environment.

Disaggregation

Each of the standards described above are published disaggregated by student sex, school location, socio-economic status, and parental level of education. Information on the disaggregation for Indicator 4.7.4 is presented in the following table.

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Table 3. Data disaggregation

STUDY	DEFINITION	METRICS	ITEM AND DESCRIPTION	CATEGORIES	INSTRUMENT
PISA 2018	Sex of students	Nominal	Are you female or male?	Female, Male	Student questionnaire (link)
ICCS 2016	Sex of students	Nominal	Are you a girl or a boy?	Girl, Boy	Student questionnaire (link)
PISA 2018	School location	Ordinal	Which of the following definitions best describes the community in which your school is located? * Response categories were collapsed into 'urban' (more than 100000 people) and 'non-urban' (the rest)	- A village, hamlet or rural area (fewer than 3000 people) - A small town (3000 to about 15000 people) - A town (15000 to about 100000 people) - A city (100000 to about 1000000 people) - A large city (with over 1000000 people)	School questionnaire (link)
ICCS 2016	School location	Ordinal	Which best describes the immediate area in which this school is located? * Response categories were collapsed into 'urban' (more than 100000 people) and 'non-urban' (the rest)	- A village, hamlet or rural area (fewer than 3000 people) - A small town (3000 to about 15000 people) - A town (15000 to about 100000 people) - A city (100000 to about 1000000 people) - A large city (with over 1000000 people)	School questionnaire (link)

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STUDY	DEFINITION	METRICS	ITEM AND DESCRIPTION	CATEGORIES	INSTRUMENT
PISA 2018	Socio-economic status	Scale	Index of Economic, Social and Cultural Status (ESCS), which is derived from several variables related to students' family background: parents' education, parents' occupations, a number of home possessions that can be taken as proxies for material wealth, and the number of books and other educational resources available in the home. * This index was re-coded into two categories corresponding to above and below the mean ESCS within each country.		Student questionnaire (link) Details on the construction of the index can be found in the PISA 2018 Technical Report (link)
ICCS 21016	Socio-economic status	Scale	National index of students' socioeconomic background (NISB), which is derived from the following indices: highest occupational status of parents, highest educational level of parents, and the number of books at home. * This index was re-coded into two categories corresponding to above and below the mean NISB within each country.		Student questionnaire (link) Details on the construction of the index are in the ICCS 2016 Technical Report (link)
PISA 2018	Parental education	Ordinal	What is the <highest level of schooling> completed by your mother/father? * Response categories were collapsed into 'higher education' (ISCED 5A and above) and 'non-higher education' (the rest)	<ul style="list-style-type: none"> - None, - ISCED 1 (primary education) - ISCED 2 (lower secondary) - ISCED Level 3B or 3C (vocational/pre-vocational upper secondary) - ISCED 3A (general upper secondary) and/or ISCED 4 (non-tertiary post-secondary) - ISCED 5B (vocational tertiary) - ISCED 5A and ISCED 6 (theoretically oriented) 	Student questionnaire (link) Details on the combination of the responses for father and mother education can be found in the PISA 2018 Technical Report (link)

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STUDY	DEFINITION	METRICS	ITEM AND DESCRIPTION	CATEGORIES	INSTRUMENT
				tertiary and post-graduate)	
ICCS 2018	Parental education	Ordinal	<p>What is the highest level of education completed by your mother/father or <female/male guardian>? * Response categories were collapsed into 'higher education' (Completion of ISCED level 6 and above) and 'non-higher education' (the rest)</p>	<ul style="list-style-type: none"> - Did not complete ISCED level 2 - ISCED level 2 (lower-secondary) - ISCED level 3 (upper-secondary) - Completion of ISCED level 4 (non-tertiary post-secondary) or ISCED level 5 (short-cycle tertiary education) - Completion of ISCED level 6 (bachelor or equivalent), ISCED level 7 (masters or equivalent) or ISCED level 8 (doctoral or equivalent) 	<p>Student questionnaire (link) Details on the combination of the responses for father and mother education can be found in the ICCS 2016 Technical Report (link)</p>

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Limitations

In very simple terms, cut-off scores refer to a point in a scale used to classify individuals, according to the level of the attribute under study, between those above and below a threshold. As such, this threshold should represent a meaningful interpretation of the level of the attribute under study, in this case 'understanding issues related to global citizenship and sustainability'. In other words, students scoring above the threshold should be able to demonstrate "adequate understanding of issues relating to global citizenship and sustainability". In this report, we have used a well-established statistical method (wright-maps) to determine the thresholds for the scales we constructed, and we have provided a description of what these thresholds mean according to the ICCS and PISA frameworks (e.g. how much students know and understand, what their perceptions about different issues are and how are they willing to act on them). Nevertheless, the exact position of the thresholds in the different scales could be open for discussion among stakeholders.

ILSA data are uniquely suited to contribute to measuring SDGs because their methods ensure that comparable student, school and system information is collected across all participating countries. This is a significant advantage compared to the alternative of compiling and harmonizing national datasets or developing a purpose-built study. However, it is important to keep in mind that neither ICCS nor PISA were designed to measure SDG 7.4.4. For this reason, the information used here has limitations related to availability (e.g. the country coverage), sufficiency (e.g. there are not items to cover all the dimensions and subcategories established in the global content framework), and relevance (e.g. the scales produced here can only be considered as proxy measures of the concepts established in SDG 4.7.4).

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