

HAPSc Policy Briefs Series

Vol 5, No 1 (2024)

HAPSc Policy Briefs Series



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doi: [10.12681/hapscpbs.38975](https://doi.org/10.12681/hapscpbs.38975)

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To cite this article:

Puri, R., Ghosh, A., & Ketkar, S. (2024). The Role of the G20 Countries in Embedding Climate Literacy in Education: From Knowing to Doing. *HAPSc Policy Briefs Series*, 5(1), 104–112. <https://doi.org/10.12681/hapscpbs.38975>

The Role of the G20 Countries in Embedding Climate Literacy in Education: From Knowing to Doing¹

Roma Puri², Arpita Ghosh³ & Sumita Ketkar⁴

Abstract

Embedding climate literacy in education is a critical enabler in empowering the next generation of learners to achieve the United Nations Sustainable Development Goals (SDGs). An integrated approach across formal education curricula can drive behavioural change in individuals and accelerate the transition towards sustainable consumption. Initiatives such as the 'Greening Educational Partnership' by the United Nations Educational, Scientific and Cultural Organization (UNESCO), bring together key stakeholders across the globe to tackle the challenge of climate change. Nevertheless, considerable variation exists between nations in providing and accessing high-quality education that equips individuals with the relevant knowledge and skills to contribute. If SDG targets are to be met by 2030, educators and learners across the world must be prepared to work towards a sustainable future. Actions taken by the influential Group of Twenty Countries (G20), which contributes about two-thirds of the world population, can be a game changer in this direction. This policy brief focuses on the G20 and offers recommendations including developing 'sustainable' behaviours, teaching skills to support 'green' jobs of the future and offering authentic learning experiences through an integrated approach towards sustainable education across all levels of study.

Keywords: Climate Literacy, G20, Authentic Learning, Green Skills, SDG Goals.

Introduction

Climate change is an intractable challenge that countries need to tackle collaboratively. Actions taken by individual countries may not be sufficient to make any significant change. The role of the G20 (group of twenty countries) which comprises two-thirds of the world's population and nearly 85% of global GDP (OECD, 2019), is particularly critical, as it contributes to 80% of global greenhouse emissions and has significantly higher per capita CO₂ emissions rate (8.14 Metric Tons) compared to the global average of 4.66MT (Statista, 2022).

Evidence shows that acknowledging climate change and awareness campaigns and educational programmes organised locally, nationally and internationally by public and private organisations worldwide do not necessarily translate into a willingness to adopt pro-environmental behaviours (Dechezleprêtre et al., 2022). Misinformation and politicization of climate change compound this

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challenge. The gap in *knowing* and *doing* can be bridged by developing climate literacy and critical thinking skills in the youth as well as more widely through formal education. Indeed, when individuals possess climate literacy, i.e. the knowledge about climate change, as well as green skills and behaviours that will help solve climate issues (Leve et al., 2023), they are likely to feel more empowered to deal with the challenge.

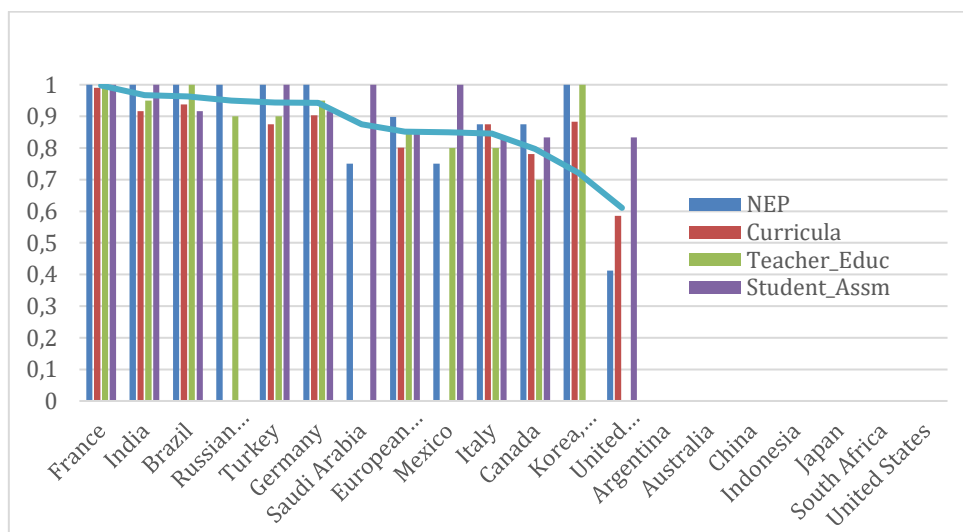
The signing of 'The Declaration on the Common Agenda' (UNESCO, 2024) during recent COP28 by over 40 member states was the first political acknowledgement of the importance of education in the fight against climate change. Similar pledges on climate action have been previously made by the G20 group of countries.

This policy brief draws on G20's role in mitigating the climate challenge by embedding climate literacy in formal education and empowering future generations.

Current status

Data from the UN SDG dashboard (Figure 1) indicates the extent to which Global Citizenship Education (GCED) and Education for Sustainable Development (ESD) are mainstreamed in the education systems of the G20 countries. The data, reported every four years, is from 2020 and includes metrics on policies, curricula, teacher education, and student assessment, each measured by combining several measures to give a single score between 0 and 1. Even though only thirteen of the G20 countries have reported their scores on these indicators, causing gaps in data, it is evident that countries which have reported have taken action to include SDGs in their education systems and policies.

Figure 1: SDGs in Education

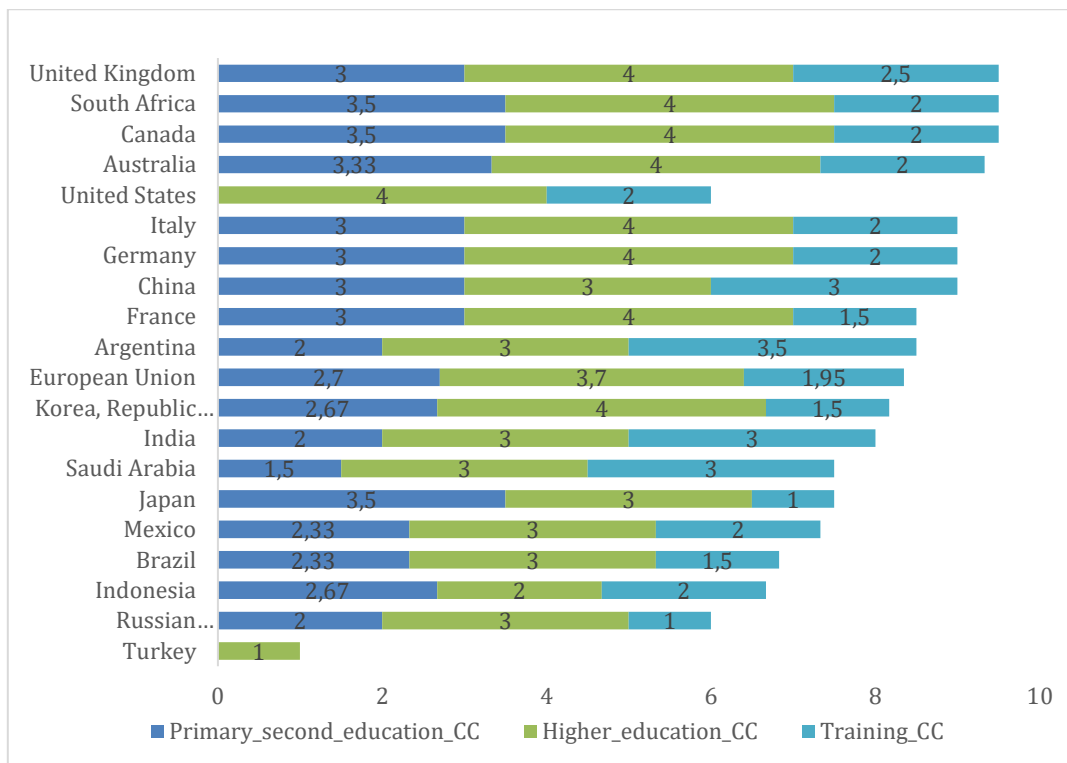


Source: UN SDG data

Figures 2, 3 and 4 examine data sourced from UNESCO and the dashboard developed by the Monitoring and Evaluating Climate Communication and Education Project, (MECCE, 2023). This dashboard includes fourteen indicators to assess CCE in the population including teacher training, embedding CCE across curricula and raising public awareness. The figures below review G20's efforts to embed climate education into their formal curricula and training over the years.

These demonstrate that on average, the G20 countries focused more on higher education (average level of 3.33, proxied by climate change focus in peer-reviewed publications) compared to primary and secondary levels (average of 2.72). The focus on embedding this in vocational training programmes is much lower (average of 2.07).

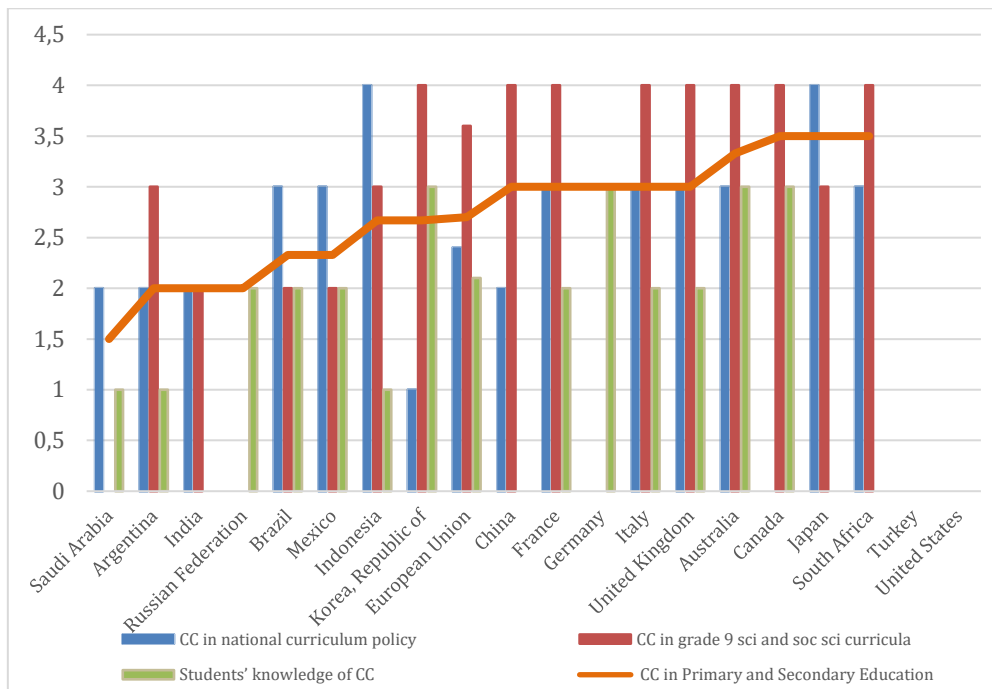
Figure 2: Climate change in Education and Training in G20 countries.



Source: Calculated by authors based on data on MECCE interactive data platform (2023)

Figure 3 further decomposes primary and secondary education and shows that, on average, countries showed better progress on integrating climate change in grade 9 and above in science and social sciences curriculum (average of 3.37) than on integrating this in their national curriculum policy (average 2.69). Interestingly, students' self-declared knowledge of CC, which can be taken as a proxy for recall of climate knowledge or the impact of climate education policies, was much lower, with an average of 2.07.

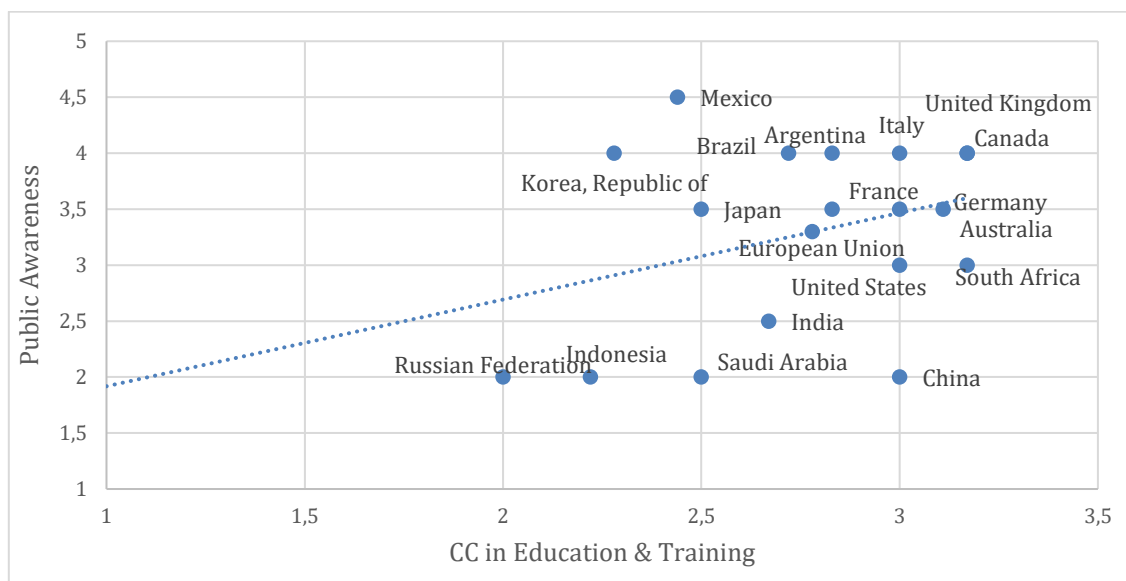
Figure 3: G20 Climate in Primary and Secondary Education



Source: MECCE interactive data platform

This possible lack of impact of policies/ initiatives becomes more evident in Figure 4, which indicates that embedding of climate education/ training by the G20 countries does not necessarily correspond with increased public awareness about climate change, though there seems to be some positive association.

Figure 4: Relationship between CC in Education/Training and Public Awareness



Source: MECCE interactive data platform

Research investigating climate change education in the G20 countries suggests several reasons for the limited impact of climate education on developing green skills and behaviours (UNESCO, 2023). First, the focus has been mainly on acquiring knowledge (Knowing) through content about climate change, but not on skill building or behavioural/ attitudinal change (Glackin and King, 2023). Second, national policies often overlook the importance of the professional development of teachers in innovative pedagogies. A study found that only 20% of teachers were confident in providing practical guidance on climate action (UNESCO 2021). Training of specialist educators in climate change is also limited. Even though countries like South Korea and France are front-runners in providing teacher training, most countries offer limited support. Third, climate education in many countries does not engage diverse learner populations such as rural and/or indigenous people, women, or those with special needs. Finally, in some countries like Indonesia and Russia, due to the politicization of climate change, its inclusion in education has suffered.

The following section puts forth actionable recommendations.

Recommendations:

Creating a shared repository of best practices

The MECCE reports are among the limited sources of information about climate literacy initiatives in different countries. While fairly comprehensive, these reports provide a macro-picture of country profiles. In addition to these, a more bottom-up approach is needed. Academic institutions across member countries could share case studies of pedagogical successes and challenges, projects co-created with students and other research through a shared repository to facilitate collaboration and develop cross-country communities of practice (COPs). Such pooling of knowledge, expertise, and experiences can help develop innovative approaches to teaching climate literacy. The collaboration can also lead to setting up pedagogical research grants, faculty exchange programmes, and access to conferences.

Scaffolding pro-environmental behaviours

Most G20 countries have implemented policies for embedding climate education in the curricula. Some have taken a topic-based approach (where climate topics are taught at different levels of education), while others have introduced new subjects at the secondary education level. Some have taken an integrated approach where climate change/ action is a part of the learning outcomes of one or more subjects during the school year.

Despite the focus on including climate education in the curricula, there continues to be a gap between Knowing about climate literacy and Doing (demonstrating pro-environmental behaviours (UNESCO, 2023). Therefore policies/initiatives should involve scaffolding not just the content but also behaviors through different levels of education (Sezen-Barrie et al., 2020). This could be done in different ways.

First, technology-based pedagogical approaches can be cascaded across different levels to make climate education interactive and engaging. Age-appropriate simulations, virtual and augmented reality, gamification, and affordable alternatives such as real-time climate data visualizations and online climate calculators can provide immersive learning experiences.

Second, across the education curricula, learning outcomes can be assessed through authentic methods (that evaluate pro-environmental behaviours and skills required for future jobs) rather than through traditional assessments such as examinations and tests. Authentic assessment could be tailored to the level of education (Frey, 2013) and include real experiences through project work and community problem-solving thereby developing valuable skill sets that will foster creativity and innovation. While this may be easier for G20 countries, which are ahead of the curve in successfully embedding climate literacy in their curricula, this will take perseverance for others.

Third, educational establishments should be mandated to engage with nature and the communities around them actively. For younger learners, this could be in the form of outdoor learning or field visits, while for older children and young people, this could be through engaging in community-based initiatives. Evidence shows that those who feel connected with nature tend to demonstrate higher pro-environmental behaviours (Pirchio et al., 2021).

For all the recommended approaches, there needs to be flexibility and autonomy in early years/primary education levels so that educators can design the content and pedagogy to match diverse learners' needs and make it context specific. A more standardized approach should be taken for higher levels of education, for example through the country's National Education Policy. Even so, some flexibility should be given to adapt the requirements and make the subject relevant to the learners. A wide variation is found in G20 countries where countries follow different approaches. Flexibility and autonomy are likely to increase the chances of making climate education effective and translate into pro-environmental behaviour and skills.

Research shows that there may be a link between environmental education and climate anxiety although the evidence is mixed (Asgarizadeh et al., 2023). Given the mental health pandemic, pedagogical approaches towards developing climate literacy must address negative emotions (Hickman et al., 2022). Therefore, climate pedagogy needs to move beyond relaying negative content

and instead focus on climate change-related scientific evidence, developing critical thinking to assess wider-ranging information, and developing skills to empower individuals to find solutions. Training of teachers is critical in achieving this.

Green Skills Gap Analysis

As countries transition to green economies, the need for green skills increases. As per an estimate, 8.4 million additional jobs for young people aged 15–29 will be created by 2030 but this cannot be met by the current education system (ILO, 2022). Currently, the education system has not sufficiently responded to the green skills gap (Kwauk and Casey, 2022). Barring some exceptions, such as South Africa, where a voluntary coalition of organizations has conducted a skill gaps analysis through their ‘National Business Initiative’, G20 countries have not done much work on a national level. Governments are encouraged to commission studies by research institutions and statistical organizations to forecast the green skills needed in the next decade and to map the extent to which the current educational curriculum provides knowledge and competencies to fill these for the future.

Bridging the data gap

Among the G20 countries, only a handful are collecting detailed data on climate literacy. For instance, the interactive dashboard created by MECCE Project includes fourteen indicators to assess climate education through different metrics but lacks data on green skills, and an objective assessment of the impact of initiatives and policies on the acquisition of relevant knowledge, skills, behaviors, and attitudes. For any substantive policy on climate literacy and subsequently its implementation, continuous assessment and monitoring, reliable data will be needed. Recently steps have been taken in the form of developing a high-level work plan for a new Data Gaps Initiative (DGI). Governments need to expedite this by enlisting the support of governmental agencies/ research institutions to conduct annual surveys on climate literacy and pro-environmental behaviour.

Broader Stakeholder Engagement

Broader stakeholder engagement that considers diverse perspectives for designing policies and curricula will be more effective in meeting climate literacy goals through education. Groups could include under 18s, young people, teachers, policymakers, employers, parents of the students, individuals from different social and economic backgrounds, educational institutions, and communities (including indigenous, local, and national level groups). Schools in England have taken a similar approach by encouraging the participation of schoolchildren in designing curricula).

Often, people with different abilities or those from marginalized communities and socio-economic backgrounds are ignored in policymaking. Pedagogical methods and curricula must be inclusive and

ensure that no one is left behind. Therefore, climate literacy needs to be embedded in not only sciences but also in humanities and other subjects. Given that men tend to be over-represented in STEM jobs due to socio-cultural reasons, excessive integration of climate education with STEM may exclude women and other marginalized groups. To avoid this, pedagogy could focus on not just green skills for jobs, but also Green Life Skills and Green Transformation Skills (Kwauk and Casey, 2022). While green skills are likely to be technical, an adaptive approach to transition to green economy would require the development of various competencies and mindsets underscoring the need for Green Life Skills and Green Transformation Skills. Education should equip learners to be proficient in green life skills as well as transformative skills to facilitate the move to a greener economy.

Conclusion

This policy brief deals with a very important issue of promoting climate literacy through the active intervention of the G20 countries. As the G20 comprises a diverse set of developed and emerging economies, collectively they can make an impact in enhancing climate awareness and pro-environmental behaviour by integrating climate literacy with general education. Some of the measures to embed climate literacy at the school and higher education level were bringing about changes in pedagogy and curricula, using authentic education techniques, promoting green skills and ensuring that the learners are encouraged to take up climate education as a life-long learning goal.

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