



SySTEM 2020 Policy recommendations for equitable informal science education

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.788317





1 Introduction

Scientific and technological literacy has been recognised as an important skill for active citizenship in contemporary societies. In this context, Science Learning Outside the Classroom (SLOC) has a great potential for supporting meaningful engagements with science that enable learners to recognise science in their lives and develop the confidence, knowledge, and skills to actively participate in society through science and technology. Equity in SLOC is inextricably linked to social justice. Guaranteeing equal opportunities to participate in science learning activities is a necessary priority in SLOC and contributes to strengthening democracy.

Informal science learning offers an alternate pathway into science engagement for many learners who may otherwise not connect with science for a variety of reasons. This policy brief encourages leaders of SLOC organisations to embed equity into institutional policies and procedures to increase this impact. It also encourages Governmental bodies and funding agencies to provide long-term support for this valuable sector, and to provide robust pathways for their collaboration with formal science education, research and industry.

This policy brief aims to summarise the key messages and recommendations from the [SySTEM 2020 project](#), funded by the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 788317.

2 SySTEM 2020 key messages and recommendations

2.1 Equity is a process and a goal

It is essential to consider equity as a process, rather than an outcome, in science learning contexts. Rather than an add-on after learning activities and programmes have been developed, equity should be a key consideration in its own right, with time devoted to it early on during all planning processes. Equity has deep implications in terms of principles, values and practices that permeate all processes in organisations and societies.

2.1.1 Recommendations

- Require organisations to develop plans to support equity internally and externally.
- Support organisations to embrace participatory approaches by providing funding for actions that include stakeholders in decision-making processes.



2.2 Equity requires proactivity and commitment

Supporting equity involves working to dismantle societal divides based on systems of privilege and exclusion. In SLOC, deconstructing the processes that reproduce exclusion and inequality for marginalised groups in science is of utmost importance. This should take place through a proactive approach which embraces concrete actions.

2.2.1 Recommendations

- Support the creation of structures such as committees and working groups with members from diverse groups to steer equity work - within and between organisations.
- Provide stable sources of funding for equity-oriented actions. This is key in order to develop strategies that have long-term impacts.
- Provide ongoing professional development on equity issues for those working in SLOC. This is important for creating a culture of inclusion and making conversations around equity part of the everyday organisational practices.

2.3 Equity is a collective endeavour

Building equitable systems requires a collective endeavour, and participation of stakeholders across a range of sectors. The involvement of multiple actors such as civic associations, enterprises, funding bodies, governmental agencies and formal education, as well as learners, their families and general audiences is key in advancing towards equitable science learning opportunities for all young people.

2.3.1 Recommendations

- Provide structures to foster collaboration between informal science learning environments and formal education. Encouraging partnerships between science organisations and societal actors from minority groups in science education helps organisations understand equity issues and ensures relevant action.
- Support informal science learning organisations to embrace participatory approaches at all levels of their activity - from the ideation to the assessment of programmes and initiatives.



2.4 Equity-focused science education requires a critical approach to the culture of science

Historically, science has been connected to Western values and world views. Thus, science has been linked to a very particular culture that is neither universal nor value-neutral. Understanding science from a cultural perspective helps to explain the challenges for access, diversity, and inclusion that non-dominant groups experience. A critical approach to the culture of science involves recognising the exclusionary nature of such restrictive views of science, and actively supporting more diverse ways of doing science and being scientific.

2.4.1 Recommendations

- Promote culturally responsive pedagogical approaches in SLOC, as well as a broad range of literacies beyond scientific literacy and technical skills.
- Recognise and foster transformative pedagogy, as well as approaches to learning which support critical thinking and analysis.

2.5 Inequalities in informal science education need to be addressed from an intersectional perspective

The inequalities that permeate learners' engagements with science do not respond to isolated factors such as gender, race or class, but are the result of overlapping identities and discriminations. An intersectional approach will help to consider the multiple inequalities that learners' experience and develop focused strategies to support equitable science education in response.

2.5.1 Recommendations

- Conduct holistic assessments into the barriers and challenges to engaging with science, using multiple methods to collect evidence from a range of populations.
- Support research studies which investigate equity in formal and informal science learning from an intersectional perspective.



- Promote the participation of informal science learning organisations in research studies alongside formal education bodies, to increase awareness of the extent and complexity of inequity, and the role of informal learning contexts within a learning ecosystem.

2.6 Cultivating equity in science education outside the classroom requires a systemic approach

Informal science learning happens in a huge variety of contexts and is mediated by a diversity of influences and channels. As such, SLOC can only be seen as a system. This makes it possible to spot which areas of the system are exclusive, which is the first step in identifying suitable interventions.

2.6.1 Recommendations

- Promote initiatives for mapping actors in informal science education to create networks of collaboration.
- Support research which investigates science learning ecologies and learning ecosystems, and which consider the whole science learning landscape, including out-of-school settings.

3 About SySTEM 2020

SySTEM 2020: Science Learning Outside the Classroom was coordinated by Science Gallery at Trinity College Dublin, and mapped science learning outside the classroom in 25 countries across Europe and the Middle East, assessing a number of transdisciplinary learning programmes to design best principles for educators in this field. The project researched aspects related to the science learning of children and teenagers in informal settings, and provided insights and tools to support educators, researchers and policymakers.

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4 Further reading

[Reshaping Science Learning: Findings and Recommendations from SySTEM 2020](#)

[White Paper on Equity-Focused Science Education Outside the Classroom](#)

[SySTEM 2020 Design Principles and Methods Toolkit for Supporting Science Learning Outside the Classroom](#)