

Science and scientific literacy as an educational challenge

Study

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Objectives of the study

Context

- Spread of misinformation: importance of scientific literacy in the public debate on science-related issues (e.g. health, energy, climate)

Objectives

- Propose a framework definition of scientific literacy
- Overview the level of scientific literacy among EU population
- Identify effective education policy approaches to support scientific literacy
- Provide recommendations to the CULT Committee

The concept of scientific literacy

Challenges

- Multiple definitions and ‘visions’ of scientific literacy in terms of knowledge, competences, attitudes

Findings

- Importance of a broader framework for scientific literacy: considering fundamental literacy, scientific knowledge and competences, contextual understanding, critical thinking and civic engagement
- Relevance of scientific literacy in relation to media literacy, active citizenship, global competence

Recommendations

- Address science and scientific literacy in a comprehensive way, taking into account various contexts, broader competences
- Develop guidelines to support the implementation of the European Framework of Key Competences

The role of scientific literacy in the 'misinformation age'

Challenges

- Potential consequences of science-related misinformation on the general public (e.g. public health)

Findings

- Role of cognitive, social and technological biases: confirmation bias, false consensus, echo chambers, algorithms
- Impact of disinformation campaigns on scientific debates: examples of the 'debate' on vaccines and climate change

Recommendations

- Complement fact-checking initiatives with 'inoculation' approaches
- Promote research on impact of misinformation and effectiveness of counter-measures

Scientific literacy in Europe

Challenges

- Limits to the comprehensive assessment of scientific literacy

Findings

- PISA 2015 shows differences in achievement in science across the EU and low engagement in science-related activities
- Eurobarometer data show generally positive view on science- and technology-related issues in Europe

Recommendations

- Use funding programmes to develop assessment instruments to better measure scientific literacy and update the PISA framework
- Use Eurobarometer to identify and analyse factors that shape scientific thinking

Educational policies and practices to foster scientific literacy

Challenges

- Promote a comprehensive approach to scientific literacy at EU level

Findings

- Gap observed in several EU countries between the aims of science education and the expected learning outcomes
- Contrasting results about the effectiveness of various science teaching practices on students' achievement
- Non-formal and informal learning environments can promote scientific literacy by raising the interest of the general public in science

Recommendations

- Encourage Erasmus+ projects aimed at the design, piloting and exchange of innovative teaching practices for scientific literacy
- Provide professional development opportunities for the promotion of innovative science teaching practices