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Call to boost 'dual use' science education

Every life scientist should be educated about potential misuse of science, NRC says



CDC scientist working in Biosafety Level-4 laboratory.

Image credit: CDC

Governments and science organisations should play a more active role in supporting efforts to educate students about the risks of science misuse, said the National Research Council (NRC) in a report released this week.

It called for sustained funding to create online resources and integrate education on these issues into existing courses taken by science students, particularly graduate students and post-doctoral fellows.

"An introduction to dual use issues should be part of the education of every life scientist," writes the NRC Committee on Education on Dual Use Issues in the Life Sciences. "This education should be incorporated within broader coursework and training rather than carried out via stand-alone courses."

Advances in the life sciences have raised concerns that along with the benefits comes a risk that scientific research will be used for malicious purposes. To deal with the potential for this 'dual use' of science, as well as fears that heavy-handed regulation could stifle scientific research, countries and the international community are adopting a mix of legal measures and efforts to create a **culture of responsibility** among scientists — a so-called "web of prevention".

Self-governance is seen as an important part of implementing this approach, but most scientists are still unconcerned with issues around the dual use of science, according to the report. "This has led to an increasing focus on education as an essential foundation for effective development and implementation of a web of prevention."

Countries and international organisations should build on existing efforts to include issues around science misuse into advanced education, said the NRC Committee. It highlighted the 7th Review Conference of the Biological and Toxin Weapons Convention, due to take place in 2011, as an "obvious opportunity" to take steps in that direction.

The report was based on a workshop that took place in November 2009 in Warsaw, Poland. Sixty participants from nearly 30 countries were convened to discuss how scientists are being educated about the responsible conduct of research with dual-use potential, and what can be done to improve this. They also considered insights from research into how people learn at different stages of their lives and careers.

They concluded that introduction of dual use issues in formal education has been "very limited", with signs of a rise restricted to isolated projects.

To reach the most diverse group of scientists possible, dual-use education should now be integrated into programmes that already deal with issues around responsible conduct of science, according to the report. "Appropriate channels include biosafety, bioethics and research ethics... as well as inclusion of examples of research with dual use potential in general life sciences courses."

Noting a lack of online resources designed for active learning, the Committee calls for the production of educational resources targeting various audiences. This should take the form of an "international open access repository of materials that can be tailored to and adapted for the local context", writes the NRC.

It also recommends promoting online collaborations to create and share lessons learned about teaching strategies, improve the quality of materials, and assess learning outcomes.

But implementing these measures will take "sustained funding" by private institutions, and support by governments as well as scientific organisations, according to the report. The Committee singled out the WHO and UNESCO as key contributors to this effort — the former on improving biosafety and the latter on **bioethics**.

Reference and link

1. NRC Committee on Education on Dual Use Issues in the Life Sciences. Challenges and opportunities for education about dual use issues in the life sciences. National Academies Press 2010. **Report**

US National Institutes of Health information on dual use research

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