Biotechnology’s wheel of knowledge

CATHY BUNTING and ALISTER JONES describe the development of a biotechnology learning hub for New Zealand’s schools

The findings highlighted that biotechnology learning needs to be situated in real-life contexts that are relevant to the learners, but that units need to have realisable end-points that take into account the constraints of working with living systems.
Comments from the biotechnology industry

THE BIOTECHNOLOGY SECTOR was invited to contribute their views about school access to modern biotechnological knowledge and ways in which this could be facilitated. Three focus group meetings were held, involving representatives from six crown research institutes, five universities and 11 private biotechnology companies.

Participants held a range of views of biotechnology, framed by their own endowments, and felt that any definition of biotechnology needs to reflect the diversity of ways in which a biological system can be applied to produce a process or product. They also stressed the interplay between scientific and technological processes, and that the success of a project is dependent on the underpinning science as well as the creativity of the team and the marketing of the product/process. Skills in mathematics, computing, communication, business and entrepreneurship are also valuable, and because one person is unlikely to be highly skilled in all these areas, teamwork is essential.

Participants also felt that there was a common perception among the public that biotechnology is fundamentally a threat to New Zealand, rather than being a factor that underpins our long-term wellbeing. They suggested that this requires more of an effort from the biotechnology industry to interact with teachers and students so that future citizens will be able to make informed decisions about biotechnologies that are likely to be part of their everyday life. They indicated, however, that it was difficult for an organisation to build relationships with more than a few schools at a time.

The development of an online portal for biotechnology in schools

THE NEW ZEALAND Biotechnology Learning Hub (www.biotechlearn.org.nz) is an online portal that was developed as a result of the research findings. Its principal aim is to bring the biotechnology and education sectors together in a more sustainable and educationally meaningful way to enhance teaching and learning in New Zealand schools. The content is developed as a result of a research process both in terms of the biotechnology that is featured, and best practice of teaching, learning and assessment.

A key feature of the hub is the ‘focus stories’ – in-depth case studies of modern biotechnology in action. These have been developed in conjunction with the biotechnology industry and educators and provide authentic contexts in which classroom learning can be situated.

Information about the science and technology components is provided in the form of text, video clips, animations, and interactive stories, and can be used as teacher background and/or for student investigations.

In addition, unit plans include a range of suggested learning activities and have been designed to show how teachers can transform the biotechnology presented in the focus stories into relevant teaching and learning experiences.

An ‘in-the-lab’ section includes video and animated explanations of common molecular biology tools, as well as examples of the diverse range of contexts in which these tools are used.

In addition to being an online portal, the Biotechnology Learning Hub has personnel and physical resources to respond to the needs of teachers, students and the biotechnology sector. The hub is still developing and content for the website is expected to continue to grow in response to the needs of teachers, students, and the biotechnology sector.

A governance board with representatives from the science, innovation, and education sectors provides overall direction.

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What is the Biotechnology Learning Hub?

The Biotechnology Learning Hub brings together the worlds of biotechnology and education, and is rich in multimedia content that highlights current New Zealand research and makes it accessible to New Zealand school teachers and students, as well as the wider community. The hub is at www.biotechlearn.org.nz