

ABSTRACT

Promoting school learners' understanding of genomics: Determining the basis for further research and curriculum development

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More than a decade after the completion of the Human Genome Project, school science faces a challenge: how to move beyond the traditional focus on the functions and inheritance of single genes to promote children's understanding of the science and importance of genomics. At the onset of this study there was no clear understanding in the UK curriculum development and informal science communities of pedagogical approaches to helping children understand genomics, of the availability of related teaching and learning resources, or of factors influencing their design and use.

This collaborative study, conducted by the Public Engagement Team at the Wellcome Genome Campus (WGC) and the University of York Science Education Group (UYSEG), comprised three main objectives:

- 1) to conduct and analyse a discussion amongst the UK biology education research community to gain their perspectives on key issues in genomics education;
- 2) to complete a landscape review of research regarding the teaching and learning of ideas related to genomics; and
- 3) to survey resources available to support teaching and learning of genomics-related biology.

Members of the Biology Education Research Group (BERG) of the Royal Society of Biology (RSB) were invited to contribute to a discussion, using methodology derived from the Delphi Technique. Four major issues emerged from the discussion: practice in schools, professional development for teachers, curriculum development and the place of Mendelian genetics. The landscape review of the literature on genomics education employed a simplified version of the systematic review methods developed by the Evidence, Policy and Practice Initiative (EPPI) Centre. 112 papers passed through the inclusion criteria, of which 29 have been identified for in-depth analysis (including cross-matching to the themes from the Delphi exercise). Data collection and analysis for the web survey of teaching and learning resources is underway, to develop a typology of resources and identify archetypes.

The outputs of this study can be used to inform further research as well as curriculum development. It is envisaged that genomics curriculum development would espouse the design and recommendations for use of pedagogically sound learning progressions, teaching and learning resources, and teacher professional development elements.

Keywords: Curriculum development, Genetics education, Genomics education, Pedagogy