

EXECUTIVE SUMMARY

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A literature review of research conducted on young people's attitudes to science education and biomedical science.

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Summary

1. A literature review of research conducted to date about young people's attitudes toward science education and biomedical science was conducted by a team from the Institute of Education. While there has been a large volume of research undertaken in the area of science education over the past four decades largely due to concern about the numbers of young people turning away from science, the review underlines a lack of research into young people's attitudes to biomedical science.
2. Classroom environment and perceived quality of teaching in the sciences are found to be influential in determining attitudes toward science education among young people. Perceptions of quality of science teaching decline as pupils move from primary school into secondary school. The report recommends that research is needed to identify the nature of quality teaching in science as perceived by young people aged 14 years and over. It is envisaged outcomes would support teachers in the development of practice and provide insight into possible reasons for a decline in perceptions of quality teaching in science as pupils move through secondary school.
3. There is lack of agreement among researchers about the strength of parental and peer influence on young people's attitudes toward science. This may be the result of ill-defined or inconsistent measures of influence, chiefly related to peer groups.
4. Evidence concerning the influence of culture and ethnicity on attitudes towards science is inconclusive though there is a history of lowered involvement in science among some ethnic groups, the reasons for which remain unclear. An in-depth exploration of cultural and ethnic influences on attitudes toward science is needed to inform science education policy.
5. Boys continue to express consistently more positive attitudes toward many aspects of science than do girls. However, girls express consistently more positive attitudes toward biology, particularly human biology, and areas of science that reward imagination and aesthetic appreciation. Girls tend to do slightly better than boys at GCSE level in biology and chemistry, though boys achieve higher scores in physics. In considering the influence of gender on attitudes, further research should investigate why girls have significantly more positive attitudes towards biology as this will help to inform subsequent steps to improving gender bias towards particular strands of science.
6. Evidence of a correlation between achievement and attitudes toward science is inconclusive. However, evidence of a correlation between achievement motivation and attitude emerged from one study. Work is needed to ascertain the extent to which a correlation exists in young people between motivation to learn science and attitudes towards science.
7. Although projects such as the International Longitudinal Relevance of Science Education (ROSE) project does not examine young people's opinion on issues related to biomedicine but to school science in general, they have important implications for the proposed Wellcome Monitor. Particularly in the development of quantitative research instruments for the measurement of attitudes that facilitate comparison between groups of young people of similar age.

8. The dearth of studies that explore attitudes of young people toward biomedical science suggests there is considerable scope for research in this area. Consideration needs to be given to the extent to which descriptive statements will be required to ensure that the young people interviewed have the required level of scientific knowledge and understanding sufficient to enable them to offer informed views.
9. Appropriate research methodology to support the aims and objectives of the proposed Wellcome Monitor should take account of the need to understand, not only the nature of young people's attitudes toward science and the biomedical science but also why they hold these attitudes. Such insight would help to inform future developments in science curricula.
10. The review concludes that the Wellcome Monitor's proposed rolling programme of research, utilising complementary research methods of triennial surveys and possible exploratory qualitative research has the potential to provide rich opportunities for in-depth exploration of factors influencing the attitudes of young people toward biomedical science. Although the emphasis of the proposed Wellcome Monitor is on biomedical science, the findings and outcomes of such research are likely to have broader implications for the science curriculum and teaching strategies in the short and longer term.