The impact of IRIS projects: student experiences of investigative research projects

2020-21 Evaluation
UCL Executive summary

IRIS PROJECTS

IRIS The Institute for Research in Schools

Background

To get an external perspective, IRIS commissioned the UCL Institute of Education to evaluate the impact of our projects on the students who participated in them. Despite the disruption of Covid restrictions, more than 300 students in 20 secondary schools took part in our evaluation, 112 of whom were participating in IRIS projects. The 188 who did not participate acted as a control group for the study. All the students completed surveys both before and after the period of participation in the projects, and 32 took part in interviews.

The surveys gathered data about many aspects of the students' aims and aspirations, as well as factors such as their attitudes to science, encouragement to study science and interest outside school. In-depth analysis was carried out to explore the data on various levels.

This relatively small-scale study gave us some useful indicators about the breadth of our impact and some important pointers for the future of our evaluation work. It also gave us plenty of food for thought in terms of how our work fits in the broader STEM landscape and what factors might help to maximise the positive impact of our work.

Findings

Students who had taken part in an IRIS project had more positive views around:

- the value of science to society
- the nature of science

This can be compared to students who did not undertake IRIS projects, who's responses were similar in the surveys taken before and those completed after the participation period.

Extensive analysis, exploring changes over time, revealed that students who took part in IRIS projects also gave more positive responses for:

- engaging with science outside the school curriculum (such as science media, programmes, visits and other activities)
- being encouraged to study science at A-Level or equivalent qualifications
- having aspirations to study, or actual studying of, science at A-Level or equivalent qualifications

Students who undertook IRIS projects also reported that they had benefitted from working as a team, understanding more about science, having fun, and contributing to scientific research.

IRIS students said they appreciated the chance to gain new knowledge and to experience being a researcher or scientist. The students highlighted that these opportunities were interesting and enjoyable, and that they valued working with their peers. Students liked how the projects gave them the chance to present their findings at conferences in front of their peers and scientists.

Evidence from the students who did IRIS projects indicated that their project:

- helped them feel more connected with science
- helped them know more about science and scientific research and developments
- increased their awareness of particular practices and skills
- promoted greater awareness of the wider field of science
- broadened their awareness around the relevance and applications of science

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Implications of the research

The UCL team stated that the findings from this work broadly show that young people's experiences of research can help them to feel like scientists, gain greater awareness of working scientifically and appreciate the wider relevance, value, and applications of science. These factors reflect young people's perception of themselves as scientists - their 'science identity' - that is, their sense of being able to see that they could be a scientist, or apply scientific practices in their future work. However, the UCL team stresses that wider benefits from these experiences may depend on whether and how these are valued and recognised within science education. Increasing accessibility and inclusion are continuing concerns for science and science education, so the benefits also depend on students being able to access them.

Implications for IRIS

This evaluation shows that participating in IRIS projects helps to develop young people's understanding of the processes involved in carrying out scientific research; it helps them to understand how to go about research, the stages involved, problems encountered and how science is important in solving real-world problems. What's more, it shows students that research is a collaborative and enjoyable process and enables them to see scientific careers as a realistic aspiration for them. Beyond extending their scientific knowledge, IRIS students develop wider skills, such as communication, problem solving, team working and leadership, all of which are transferrable and applicable to other aspects of their learning and lives.

IRIS will build on UCL's reflections and recommendations within its own evaluation activities. Over the next year, we are conducting a large-scale evaluation of the IRIS Research and Innovation Framework to explore the longer-term impact of the schools' involvement with the framework and changes in the students' views over time. We are reviewing our evaluation practices to ensure that we are robustly measuring impact and that we understand how our projects can help contribute to improving social mobility for disadvantaged young people. In addition, we are exploring how we can track our students to measure any longer-term impacts, such as subject choices and/or university or career progression.

As well as seeking to understand the impact of our work on young people's science capital and science identity, we are keen to contribute to the wider field of science education through working to understand the facilitators and barriers to schools' participation in research.

Further reading

Reiss, M. J., Sheldrake, R., & Lodge, W. (2023). Investigative Research Projects for Students in Science: The State of the Field and a Research Agenda. Canadian Journal of Science, Mathematics and Technology Education, 1-16.

Lodge, W., Reiss, M.J. & Sheldrake, R. (under review). Students' Experiences of Investigative School Science Research Projects

Acknowledgement

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