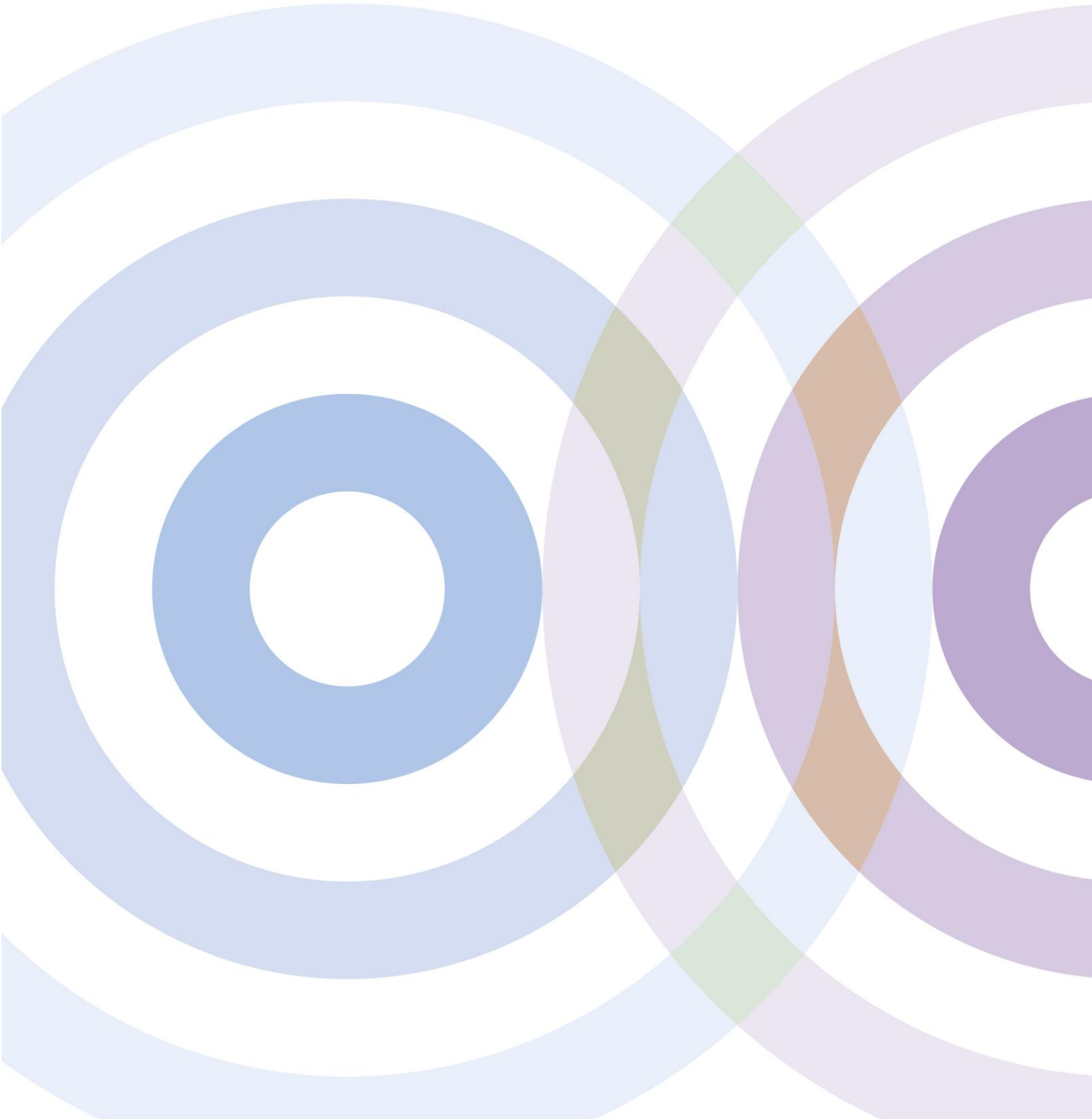
Ondata Research

Advanced Connections
Year 1 Interim Evaluation Report

Laura Thomas, February 2025



Introduction

Advanced Connections is a tutoring programme for learners taking A-level Physics in schools in Wales and is run by the Physics Mentoring Project based at Cardiff University. Mentees work with university mentors over multiple sessions to support the development of their confidence and knowledge of physics. The mentors also provide advice and guidance around university applications and life at university. The two content streams are split into physics-related sessions and those which are mentoring-related and link to university applications and related areas.

Overall the aims of the programme are to:

- Increase study of physical sciences at university.
- Increase confidence and resilience in mentees and mentors.
- Promote teaching careers to Higher Education students.
- Encourage gender equality in STEM.

The first cohort of mentees had their first session in June 2024 and will continue through until the end of March 2025. There have been around 60 mentees and 12 mentors involved in the sessions. Whilst the programme is based on established tutoring programmes around the UK, the content for Advanced Connections was developed in collaboration with Welsh teachers, the Physics Mentoring Project team and colleagues at Cardiff University. It did of course draw on existing content but was tailored to meet the needs of learners in Wales.

This short interim report looks at the feedback from mentees on the programme and teachers of those mentees. Mid-programme surveys were give to each group to get their impressions of how the sessions have gone so far.

Teacher feedback

There were seven responses to the teacher survey, each from a different school. In terms of the context of A-level provision in their schools, the numbers taking Physics ranged from 7 to 50 with the average being 24 learners. In order to be able to run Physics, schools reported that this number ranged between 5 and 15.

Teachers promoted the opportunity for the tutoring sessions to their learners and were motivated to encourage them to participate so that their learners were able to "improve their understanding of physics". One teacher commented that their learners were interested in pursuing physics at university and for another they were keen to provide their learners with the opportunity to improve their grades.

The scheme has been presented by teachers to their learners as something which would be of benefit to them but that it is up to the individual learners to maintain engagement. One teacher commented that they did not know what the programme involved. They knew that there had been a session for them to attend but they weren't available and they requested some written information outlining the contents of the programme. Another teacher said they would have benefited from having guidance from the team on how the content links with their work in class. Other comments from teachers relating to engagement levels from learners was to encourage the programme team to consider the length and frequency of the sessions. One teacher felt that 2 hours after school was too long and that their learners would have benefited from having shorter but more frequent sessions.

It seems as though some of the teachers have incorrect impressions about the sessions and their length. For example, the sessions themselves run for 1 hour. In terms of information provided to them, they had the chance to attend a kick-off meeting in April 2024 and there is written information and guidance available online[1] and handbooks were shared directly with teachers.

When asked about the impact of participating on their learners, the feedback from teachers seemed to depend on the level of engagement of their learners and unfortunately this is something which is largely outside of the control of teachers and the project. Whilst the programme is not aiming to improve performance in assessment and exams, teachers have noticed some improvements in these areas following participation. For one teacher whose learners positively engaged with the content, they noted that there was "Really positive feedback from the student enrolled on the course, & tangible improvements in a range of areas from general confidence, to performance in Physics". For another teacher who had two

[1] Information about the programme: https://sway.cloud.microsoft/fHE5NHKHbAIf5ZHC?ref=Link

learners participating, the one who was more engaged showed improved confidence in relation to physics and both had demonstrated improved understanding. However for the less engaged learner this had not necessarily translated into improved performance in assessments but they had shown increased knowledge of physics topics.

Teachers were asked to consider whether there had been improvements in their learners' problem solving, their confidence in relation to physics and how informed they felt about applying for university. The most positive responses were in relation to university advice and guidance, with one teacher commenting that "The university guidance alone was the main positive for the students and said it would be useful to future students."

When asked about whether they would recommend the course, there were mixed responses from teachers. One learner had an overwhelmingly positive experience and had already presented to the AS learners in their school recommending they apply for the next round. This school were also keen to have more places available and for this reason they did not want to recommend it other schools as it would lessen the chances of their learners' participation. For the majority of schools there were some hesitations linking to learner engagement, summed up by this comment from one teacher: "Yes and no - yes for those that really cared. No for those that didn't consider the extra hours involved - especially as it was their own time and after school".

The following section summarises the feedback from the participating mentees.

Mentee feedback

In response to the call for feedback, the programme received 15 responses to the mentee survey. Questions asked about their reasons for participating in the tutoring and their future plans and motivations.

One of the first set of questions asked their likelihood of going into a range of routes which would progress into a physics-related career. This included FE, university and apprenticeships and Table 1 summarises the responses. In terms of the popularity of the options, university was the most likely outcome for the respondents whilst an apprenticeship was the least likely outcome.

I will consider…	physics-related study at FE	physics-related study at university	a physics-related apprenticeship
I definitely will	53%	80%	7%
I probably will	20%	7%	13%
I am unsure at this stage	0%	0%	7%
I probably won't	13%	13%	33%
I definitely won't	13%	0%	40%

Table 1. Mentees' study intentions

Mentees were asked to describe the subject(s) they intended to go onto with engineering-related and physics-related courses being equally represented (n=6, 40%) with the remainder indicating other science-related courses. When asked the likelihood of going into a science career, only 1 respondent was unsure with all others indicated they definitely will (60%) or probably will (33%). Almost half of the mentees said they knew what career they wanted to go into. Out of these, the most common was some form of engineering.

The reasoning for why the mentees joined the programme strongly aligned with the goals of Advanced Connections. This included wanting to be able to improve their performance at A-level: “To gain better knowledge and understanding of physics to enable me to obtain better results” with around half of the respondents agreeing with this as a motivation. The mentees already have an interest in physics and are motivated to learn more about the subject due to their own enjoyment of it. There were also those who were keen to find out more about what it would be like to study a physics-related degree at university. Other motivations were to be involved in extra-curricular activities and a longer term project.

Through participation in Advanced Connections, 80% or more of respondents said they strongly agreed or agreed that they felt:

- supported studying for A-Level Physics
- confident in my studies for A-level Physics
- more informed about how to apply for university and prepare for university life
- more confident solving physics-related problems

Over 70% indicated they strongly agreed or agreed that are enjoying studying A-Level Physics.

Mentees were also asked about their assessment of the benefits of the physics sessions. The most common theme was their improved understanding of physics concepts. An important element of this has been the chance to revisit and revise topics previously covered in class. One mentee also identified how they had also been able to start making connections between physics topics. One person commented that the experience had helped them to “think more like a physicist”.

For the content relating to university advice and guidance, the feedback from mentees was generally that this was very useful and provided insights and as a result they felt more confident about what to expect. These insights extended from UCAS applications through to student finance and university life. Two of the mentees specifically mentioned the benefits of being able to connect with university undergraduates and noted the importance of hearing this information from near peers. In terms of timings, some participants had already secured their university places so would have benefited from taking part in this programme earlier in their school journey.

Unsurprisingly, the most impactful aspect of the sessions for respondents was being able to access the physics content but the mentoring in relation to university applications and life was also strongly valued. Beyond that mentees enjoyed being introduced to new physics concepts not covered at A-level, the opportunity to revise topics and develop their problem-solving skills.

A common request from mentees for the sessions was to increase the level of physics in the sessions to be closer to university-level than A-level. Whilst there had been the opportunity to develop problem-solving skills, there were a couple of requests for the inclusion of more exam-style questions and support with approaching these.

Conclusion

It is clear that the Advanced Connections programme is meeting a need for schools in Wales who have learners interested in Physics at university. The programme is supporting the development of mentees' knowledge and understanding of physics, helping to improve their confidence and resilience. Teachers have been able to see this translate through into the participation of their learners in class.

There were also clear benefits to the interactions with the undergraduate mentors as they were able to provide advice and guidance about university life. It was important to mentees to be able to get this information from current students.

For the remainder of the sessions with this cohort there is the potential to monitor levels of engagement of the mentees and consider this as part of the selection process for future cohorts, especially given the observation by one teacher that they felt their more engaged learner got more out of the sessions. There are also ways in which the project team can continue to review barriers to engagement. The teachers also had some suggestions for length and frequency of the sessions which may promote improved engagement which should be considered.