

SEPnet Placement Report

SEPnet Summer Placements 2017

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SEPnet Summer Placements

Summary

Since 2009 the number of placements has increased from 38 to 91 in 2017. Approximately 20% of the total eligible cohort applied for SEPnet placements in 2017 and more students are pursuing their own placements and signing up to other schemes each year. 42% of placements were successfully secured by female students in 2017 reflecting SEPnet's commitment to gender diversity.

Feedback from students indicated that most rated the nature of the work as the most important criterion for selecting a placement followed by relevance to their skills and knowledge. Students rated programming as the most relevant element of their course followed by report writing, data analysis skills and how to research information. The organisations receiving the most applications were Institute for Cosmology and Gravitation (ICG), University of Sussex, Royal Marsden Hospital, AWE and eOsphere. Projects around space and satellite technology are becoming increasingly popular.

In feedback from employers, many commented that CVs were well-presented and structured but students needed to make covering letters more relevant and some still did not do enough research about the organisation beforehand. Performance at interview was important in securing a placement but enthusiasm was considered as equally important. Interviews with employers during the placements indicated they rated students' top 3 skills as self-management, problem solving and communication – the same skills that students felt they improved most.

In terms of career plans, 87% of placement students felt the placement had helped improve their employability. 32% of students stated that the placement confirmed their commitment to pursue a PhD. However, many expected to pursue a career in industry afterwards. Just over 31% were still unsure about what they wanted to do next.

Employer engagement of physics students is still relatively low (just under 50%) and evidence shows students from under-represented backgrounds engage less with career activities. The Teaching Excellence Framework (TEF) will require universities to measure progress of all students in terms of learning gain, retention and participation and employment and will be a driver for a greater focus on embedding employability skills to benefit all students.

Background

The SEPnet Summer Placement Scheme was set up in 2009 to create dedicated work experience opportunities for physics 2nd and 3rd (non-final) year students in order to:

- raise awareness of career opportunities
- develop students' employability skills
- encourage graduates to pursue physics-related careers
- persuade employers of the benefits of recruiting physics graduates.

Since 2009 the number of placements has increased from 38 to 91 in 2017. The number of students registering for placements in 2017 was 302. This represents approximately 20% of the total eligible cohort (numbers are approximate since the Open University does not have a defined physics degree cohort). While the number of students registering for placements has not increased in the last 2 years, more students are now pursuing their own placements and signing up to other schemes. The number of total known summer placements was 157 compared with 119 in 2016.

This report provides a summary of the 2017 SEPnet placements including information and feedback gathered from students and employers during placement site visits and a follow up student survey.

About the placements

112 projects were submitted by employers/research institutions from which 91 were selected based on funding provision. Organisations providing placements were sourced from areas including defence, IT, energy, engineering, space, knowledge exchange and research institutions. 17 new employers submitted projects and 28 SMEs. Projects comprised programming, software development, data analysis, modelling, product testing, science communication, market research. More organisations offered data analysis and IT roles than in 2016 and programming knowledge and skills are increasingly important requirements for placement roles.

The top professional level destinations for physics graduates in 2016 were business and finance professionals (21%), IT (18.7%), engineering (7.8%) and education (7.6%). An increase in IT related roles reflects the demand for physics graduates in this area and the number of physics graduates going into IT. We continue to offer engineering roles and support teaching placements through the Millais scheme. A steady increase each year in the number of business and finance related roles indicates awareness amongst employers of the desire to reach physics students.

See breakdown of the general nature of the placements in Graph 1 below. Examples of the diverse range of projects is shown in Table 1.

57% of placements were funded by employers, through the Santander SME Internship Scheme or through university widening participation budgets (up from 44% in 2016). The remainder were funded through SEPnet partner (physics department) funding. More employers took advantage of the offer that SEPnet partners would fund a 2nd placement (32 up from 15 in 2016). Increased funding from employers and other sources is an encouraging sign for the sustainability of the placement programme.

Graph 1. General nature of placement

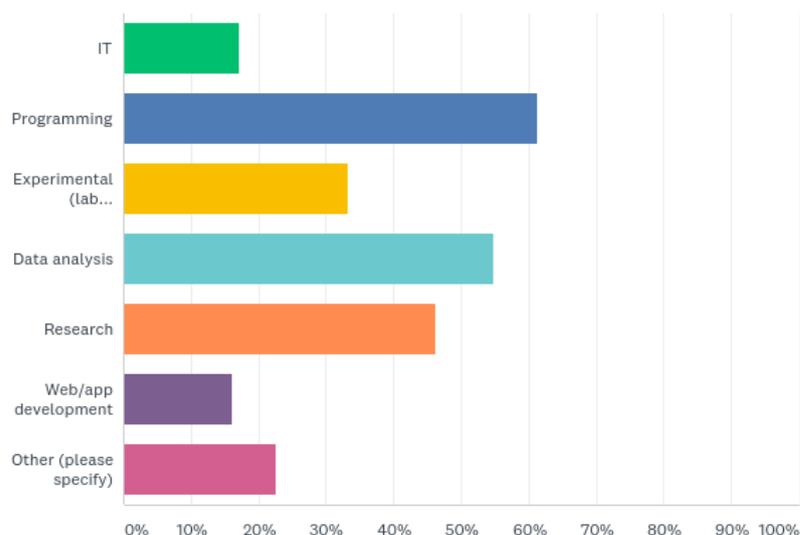


Table 1. Example of projects

Company	Project
Algorithmic Laboratories Ltd	An investigation into how to manage financial risk ahead of economic news releases
Colour Holographic	Optical measurements of holographic optics for Augmented Reality systems
Dobell	At which times are online shoppers most likely to buy?
eOsphere Ltd	Measuring rainfall in Malaysia using satellite data
Fourth State Medicine	Exploring applications of cold atmospheric plasma
National Physical Laboratory	Measuring the size and density of advanced nanomaterials
Rank Group	Detecting Advantage Play Within Blackjack

Students applied directly to organisations who each received between 1 and 27 applications. The organisations receiving the most applications were Institute for Cosmology and Gravitation (ICG), University of Sussex, Royal Marsden Hospital, AWE and eOsphere. Most students when asked 'what criteria did you use when selecting placements?' rated nature of the work as most important followed by relevance to their skills and knowledge. Students, not surprisingly, often prefer less risky and more physics-related projects in a research environment. AWE's placements took place at University of Surrey and this may have attracted more students as a result. However, it is also worth noting that projects around space and satellite technology are becoming increasingly popular (eg eOsphere's project).

About the students

302 students registered for SEPnet placements from the 9 partner universities. 28% of registrants were female down from 31% in 2016. Although the average percentage of female physics students across SEPnet partners and nationally remains at 20%, 42% of

placements were successfully secured by female students compared with 34% in 2016. Positive action is taken to ensure that under-represented groups, including females, are encouraged to apply. Students who meet the universities' widening participation criteria (eg first generation, BME, socio economic background) are tracked and university WP funding increases the number of placements that can be offered as well as supporting under-represented students to carry out placements. 10k of WP funding for placements was offered in 2017 compared with 2k in 2016.

Feedback from the employers

Applications, CVs and interviews

Employers were asked for their feedback on applications and interviews via student application tracking forms.

CVs

Many employers commented that they were well-presented and structured. The feedback was generally very positive and more favourable than in previous years suggesting that students see the importance of getting help with preparing them and taking advice.

'O presented a very good CV and very structured approach to his study and ambitious free-time life. He did not present exactly the skills asked for in the job description, but had experience in a related programming skill that he honed in his free time.' SME

Covering Letters

These were mostly good, but there were a number of comments that students needed to do more to make them relevant and less generic.

'The biggest 'problem' is overly generic cover letters - with so many applicants I was looking for them to indicate that they were interested in what we do, and that they'd done some research into it. Some were so generic as to presumably be identical for every placement they'd applied for.' Research Organisation

Interviews

While some applicants prepared well, a number of employers mentioned that students did not do enough research about the organisation or project beforehand. Many interviewers ask technical questions and students are often unprepared for these:

'She knew my research and asked very good questions about the project and how it related to my research.' Research institution

'Unfortunately it appeared that he hadn't read the project details. His lack of detail in his answers gave the impression of bluffing which meant we became unconvinced he could do well at the placement.' SME

'By way of constructive criticism we suggest that you prepare more before an interview: reading about the company etc also try not to give up on a question as soon as you hit the difficult bit. Interview questions will always be aimed to make you think your way through and I'm sure you are well able to.' Large organisation.

Skills Knowledge and Attributes

Employers were asked to rate their students' performance during the placement. 96.25% rated students as good or very good in 2016 - down to 86.66% in 2017. This is to be expected as the number and diversity of students on placements increases to include those who may be less well prepared.

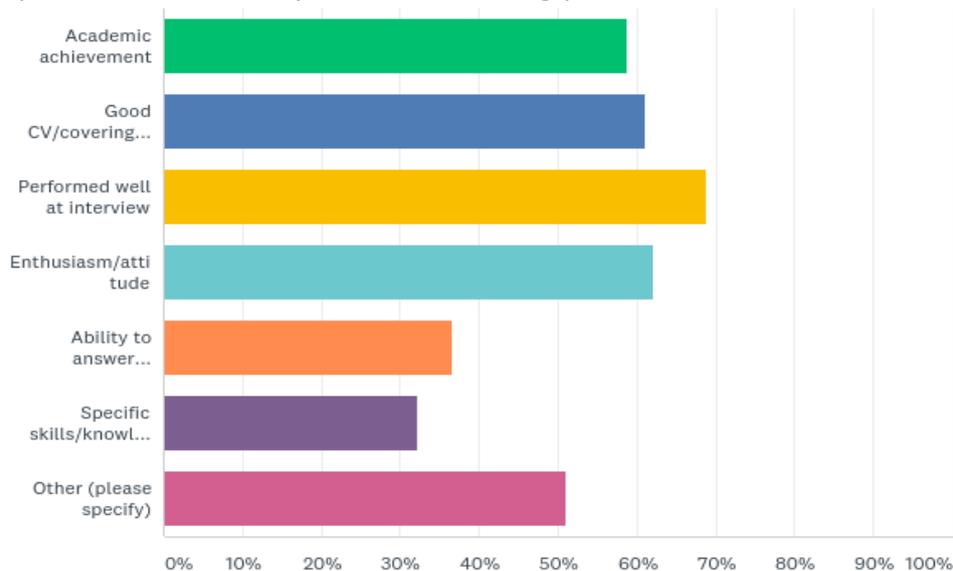
Table 2. How would you rate the student's performance to date?

	1 (VERY POOR)	2 (POOR)	3 (SATISFACTORY)	4 (GOOD)	5 (EXCELLENT)	TOTAL	WEIGHTED AVERAGE
(no label)	0.00% 0	2.22% 2	11.11% 10	44.44% 40	42.22% 38	90	4.27

Employers were also asked what influenced them when selecting students. Performance at interview was clearly important but enthusiasm and attitude were considered almost as valuable (see table below). This feedback and the comments below suggest students can compensate for lower academic achievement with a good CV and interview:

- We placed emphasis on candidates able to do the job more than focusing on their existing skills set
- We did not ask technical questions and had no expectations. The selected students had done their research
- Specifically important was an interest in the project rather than the company name and whether we felt the student would be a good fit with the team. Extra-curricular activities were also considered important

Graph 2. What influenced you when shortlisting your student/s?



In terms of transferable skills, the highest rated were self-management, problem solving and communication. The same skills were rated highest in 2016. Students also rated these 3 skills highest overall in terms of development/improvement

'The student is very self-motivated and happy to talk to anyone on the team to get the job done. We are lucky to have her.' Research organisation.

Table 3. How would you rate the student on the following skills/strengths?

	1 (VERY POOR)	2 (POOR)	3 (SATISFACTORY)	4 (GOOD)	5 (EXCELLENT)	N/A	TOTAL
Communication	0.00% 0	4.44% 4	23.33% 21	47.78% 43	23.33% 21	1.11% 1	90
Teamwork	1.11% 1	4.44% 4	13.33% 12	36.67% 33	30.00% 27	14.44% 13	90
Practical/lab	0.00% 0	1.14% 1	7.95% 7	27.27% 24	20.45% 18	43.18% 38	88
Resilience	0.00% 0	1.14% 1	15.91% 14	34.09% 30	23.86% 21	25.00% 22	88
Problem solving	0.00% 0	1.12% 1	17.98% 16	48.31% 43	25.84% 23	6.74% 6	89
Self-management	0.00% 0	3.33% 3	8.89% 8	44.44% 40	40.00% 36	3.33% 3	90
Commercial awareness	1.14% 1	7.95% 7	20.45% 18	23.86% 21	3.41% 3	43.18% 38	88

Employers were asked what technical skills they valued. Physics students are particularly valued for their mathematical and analytical abilities as well as their ability to pick up programming languages.

'S has excellent mathematical skills.' SME

'His programming skills were less advanced than desired at the start but he impressed us immediately with his data analysis skills.' SME

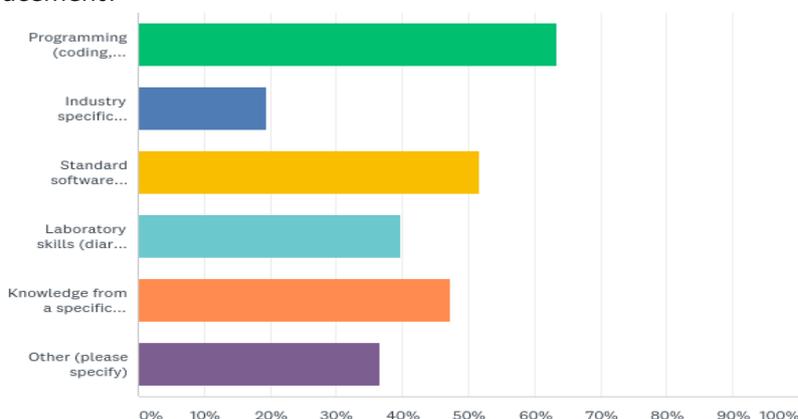
Feedback from students

When asked how many roles they applied for, the majority only applied for between 1 and 3. Students are always encouraged to apply for a number of placements to increase their chances. However many will only apply for projects that strongly interest them. 2nd year students can apply again in their 3rd year and those who did not secure their preferred placement in their 2nd year, or were unsuccessful in getting a placement, report learning from this experience.

Skills and knowledge gained

Students were asked what elements of their physics degree were particularly relevant in their placement. Programming was rated the most important, as for 2016, and shown to be even more relevant in 2017 - especially Python. See below.

Graph 3. What elements of what you have learned in your physics degree have you used in your placement?



Students also identified the following as important:

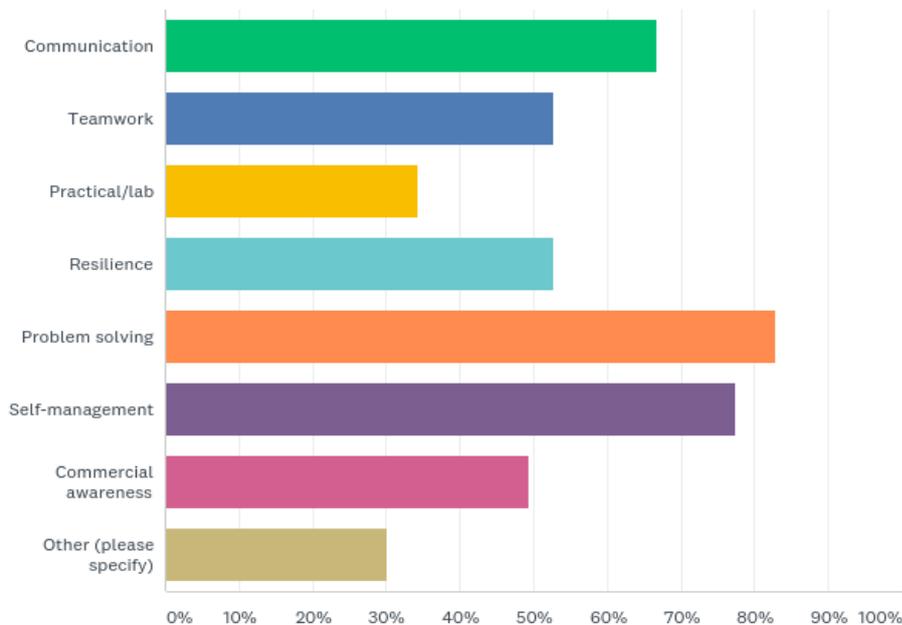
- Report Writing
- Data analysis skills, language processing
- How to research info and interrogate research papers

'Despite having only learnt MATLAB at university, I am now more determined to develop my knowledge of other languages, including Java and Python, which have been the key languages used throughout my internship.'

'This internship has greatly benefited me as it has accelerated my programming skills to the point where I feel I can pursue other work in this field, using a variety of coding languages.'

The highest rated skills that students felt they improved were problem-solving, self-management, communication (the same as for 2016). Students also identified other skills eg when to ask for help and working within a team and to be independent.

Graph 4. What skills/strengths do you think you have improved on this placement?



'I have acquired new skills, extended my knowledge and experienced what it's like to work in a research environment.'

'Living in Didcot was also my first time living away from my parents so I also learned to look after myself as an independent adult.'

Careers advice and plans

54% of students said they had visited their careers service (a small increase from last year). When students who hadn't were asked why not, replies showed that many students prefer to do their own research or ask parents for advice:

'There are millions of sets of information online.'

'I prefer to do my own research using websites.'

'My father recruits people so was able to give me advice.'

Some simply did not feel the need and some felt that the advice would be too generic and viewed the advice of their SEPnet Employer Engagement Officer who is based in their department as more relevant:

'I didn't feel I needed them.'

'Not sure they can help. They are too generic. I prefer to do my own research and my Employer Engagement Officer is very helpful.'

The role of the department-based SEPnet Employer Engagement Officer (EEO) is acknowledged to be valuable and their advice is viewed as relevant to physics students. Where careers services work closely with physics departments and EEOs, they are seen to be more valuable and strong links need to continue to be reinforced.

Students are encouraged to reflect on the application process and what they've learned. The majority acknowledge that they have learned to prepare a better CV and covering letter and gained useful interview experience:

'I learnt the importance of preparation and to not be too stubborn to ask for help.'

'I learnt how important a good cover letter can be.'

'I now know to make sure to mention all UG modules that might be relevant.'

Some students gained confidence from the process:

'I learnt a lot from the application process, I have also improved my confidence when talking in groups as I am generally a shy and quiet person.'

And perhaps too much confidence in at least one case!

'Getting a job is not as difficult as expected.'

Every year we carry out a survey six months after the placements to find out what impact the placement has had on students' career plans. 36% of placement students responded to the survey and 87% stated they felt the placement had helped improve their employability. A significant number of students state that the placement confirms their commitment to pursue a PhD (see below). However, increasingly students are choosing to do a PhD with the expectation of pursuing a career in industry afterwards. This shows increased awareness that having a PhD can prepare you for a career in industry as well as academia.

However, just over 31% said they were still unsure about what they want to do next. This may reflect the wide range of opportunities still open to them which makes it harder for them to make decisions and delay finding suitable graduate roles and reinforces the importance of relevant and timely careers advice and information.

Table 4. How has this placement influenced your career plans?

ANSWER CHOICES	RESPONSES	
I now want to pursue a career in physics research (i.e. Masters/PhD)	32.26%	30
I now want to pursue a career using physics in industry/business	36.56%	34
I'm still unsure about what I want to do next	31.18%	29
TOTAL		93

In terms of career destinations, evidence of more tangible outcomes reinforces the importance of placements for clarifying students' career choices and improving their

employment prospects. Five students were offered extended placements or part-time work (with Accelogress, Gill Research, Oxta Energy, TalUpp, Thales) and seven students are known to have been offered graduate roles with their SEPnet placement employer (Fourth State Medicine, Gill R&D, Wood Plc, Tesla Engineering, Photonics Technologies, Leonardo, Rank).

Context and conclusion

Evidence of employment rates are increasingly used by prospective students as a way of selecting a university and degree course and, therefore, a priority for universities as they compete for the best students. The Teaching Excellence Framework (TEF) will become a key driver of universities' priorities and activities as it will require them to measure progress of students in terms of learning gain, retention and participation, and employment outcomes.

Placements have been shown to improve employability rates of graduates and many large employers state they will only recruit graduates with work experience (Associate of Graduate Recruiters). We therefore need to continue to focus on offering as many placement opportunities to students as possible in areas where physics graduates do well and can apply their skills and knowledge more broadly.

There continue to be skills shortages in business, IT, engineering and STEM teaching – all popular destinations for physics graduates. However, the unemployment rate of physics graduates for 2016 was higher after six months at 8% than for all disciplines at 5.3% (Graduate Prospects). Physics graduates may delay entering employment or further study while they weigh up the options available to them. Hopefully the introduction of the new Graduate Outcomes survey in December 2018 will demonstrate better outcomes for physics graduates as it will track destinations after 15 months.

While interest in placements grows, less than 50% of SEPnet physics students engage with employer engagement activities overall and more needs to be done to reach the wider cohort of students, in particular widening participation (WP) students, to ensure they build their skills and confidence. According to recent research in Graduate Prospects, WP students show lower participation in co-curricular activities and paid internships and struggle more with issues of confidence and career readiness and can be disadvantaged by recruitment practices. Low participation of WP students in career activities in their 1st year is mirrored in subsequent years. Early intervention by careers service could have a positive impact on this cohort and help level the playing field. Embedding skills in physics courses is therefore key to engaging with all students.

Employer engagement and placement officers can play a key role in helping departments improve and collate TEF metrics in relation to employment rates, student retention and learning gain through placements, embedding employability skills and raising career awareness to benefit all students. In this respect SEPnet physics partners should be in a strong position to demonstrate they are ahead of the game.

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