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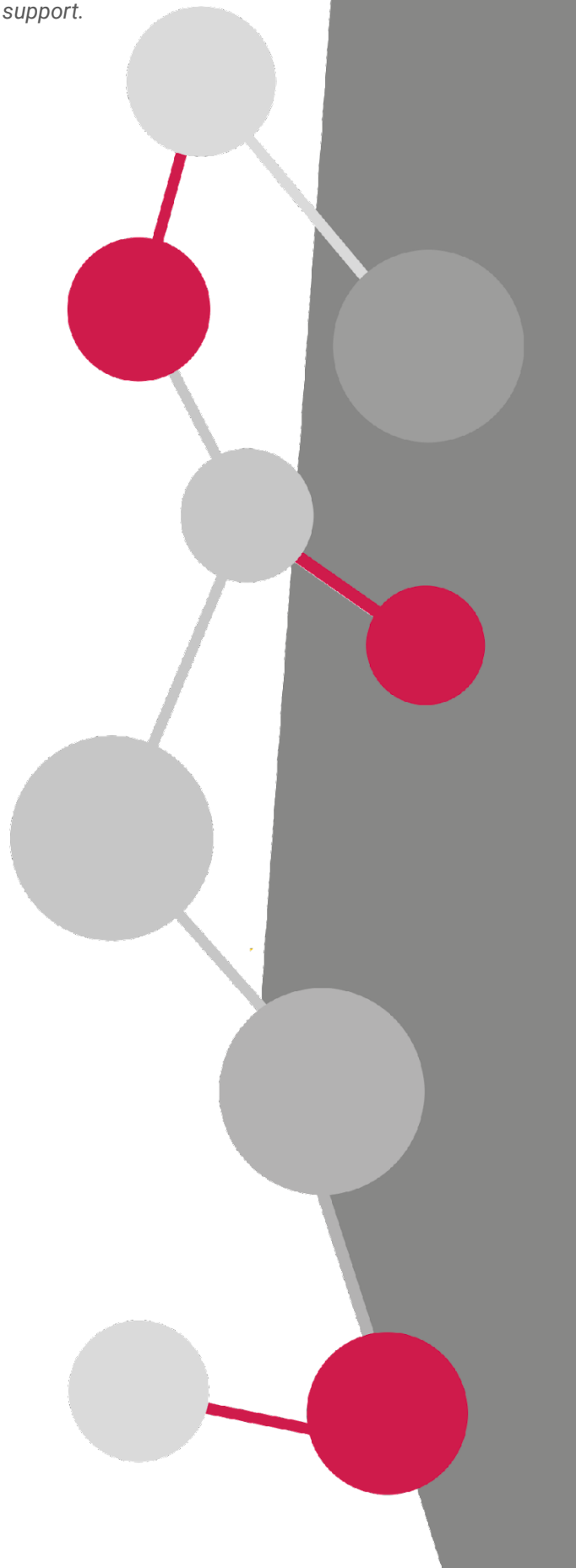


Evaluation of the 2020/21 Nuffield Research Placements cycle

Contents

Executive Summary

For over 25 years, Nuffield Research Placements has supported students from across the UK to develop a wide range of skills through an engaging, real-world placement experience, funded by the Nuffield Foundation with support from UK Research and Innovation. Today, the programme provides an opportunity for year 12 (or equivalent) students from disadvantaged backgrounds to take part in real STEM and STEM-related research, gaining a unique experience through their participation. Evaluation of the 2020/21 cycle revealed highly positive feedback from students, teachers, and providers alike:

- **Overall satisfaction with the scheme is high:** 94% of students were satisfied with their placement experience.
- **A real research opportunity:** Nuffield Research Placements are intended to be authentic STEM placements, and 93% of students agreed that this was the case.
- **Enhancing university and job applications:** At the end of year 13, 98% of the 2020 alumni found that their applications had been supported by the NRP experience.
- **Teachers recommend the experience:** All teachers surveyed agreed that they would recommend Nuffield Research Placements to future students.
- **Students are empowered:** Over 90% of teachers found that returning students had greater self confidence and motivation.
- **Providers recommend the experience:** When asked if they would recommend Nuffield Research Placements to others, 95% of providers said they would.
- **Improved research skills:** 91% of providers observed that their students' skills in interpreting and reporting research findings had developed.
- **Making a difference:** for 79% of providers, hosting a student fulfilled their workplace's public engagement, widening participation, or social responsibility goals.
- **Personal development for providers:** 82% of providers found that the placement had developed their coaching, mentoring and management skills.

1. Introduction

With funding by the Nuffield Foundation and support from UK Research and Innovation, Nuffield Research Placements provide students with the opportunity to take part in real research. STEM Learning has delivered the programme since October 2020, and 1001 students were supported to start a placement hosted by 190 organisations in 2020/21. Currently, the programme supports high-achieving students from disadvantaged backgrounds: living in a low-income household, being the first in their family to access higher education, or having spent time in local authority care.

Taking place in the summer holiday following year 12 (or equivalent), the 4-6 week long experience comprises some online preparatory study, followed by a 2-3 week supervised placement in a STEM or STEM-related field, and finally a range of optional webinars on topics such as university admissions and future study options.

During their placement, students collaborate with an expert on their 'live' research question, working independently or with other students. The placement culminates in a written report and poster summarising the research findings. A wide range of locations are available, from offices to laboratories to fieldwork locations. Disruption caused by COVID-19 caused most 2021 placements to be moved to a predominantly online model, while in 2020 the wholly-online Nuffield Future Researchers programme was deployed as an alternative.

Throughout the 2020/21 Nuffield Research Placements (NRP) cycle, STEM Learning's Monitoring and Evaluation team surveyed students, providers, and teachers to gain insights into their experiences and perceived impacts of the programme. We surveyed the following stakeholders:

- **Applicants:** following their application to NRP, students had the option to complete a baseline post-application survey. This survey examined their attitudes towards STEM and recorded other STEM enrichment activities they are involved with.
- **Participating students:** after they completed their placement and/or BeFutureReady skills modules, we asked students to fill in a follow-up survey. This aimed to capture their experiences and personal development brought on by participating in NRP.
- **Placement providers:** providers received a survey shortly after placements concluded, to collect feedback about their placement experience and information on how their students had progressed.
- **Teachers:** teachers who provided references for students who undertook a placement completed a short survey at the start of the new academic year detailing the impact of the placement.

The post-application student survey received 1,435 responses, with 857 students completing the follow-up survey. For the teacher and provider surveys, we included results received up to the 31st October 2021, comprising 131 provider responses and 121 teacher responses. For all surveys, we only analysed complete responses.

Survey results from the previous year's alumni, who had taken part in the online Nuffield Future Researchers programme in the summer of 2020, were also analysed. The survey was released after the students had received their A level (or equivalent) results and captured the impacts of their experience on their imminent future destinations. 145 complete responses were captured between the 17th of August and the 7th of September 2021.

2. Student feedback on BeFutureReady content

2.1 BeFutureReady modules

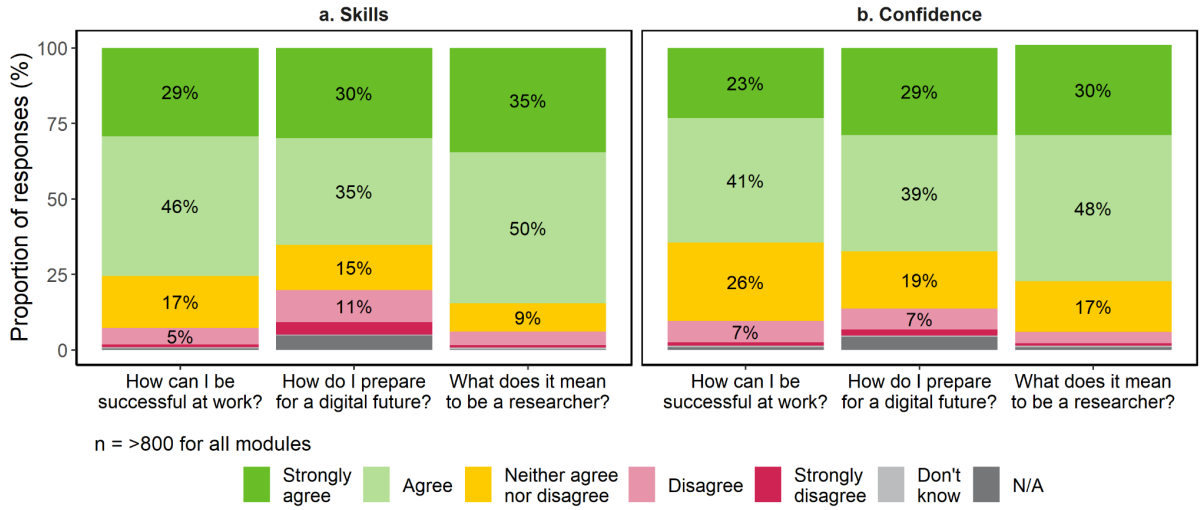
Students undertook three BeFutureReady (BFR) modules: *'How can I be successful at work?'*, *'How do I prepare for a digital future?'*, and '*What does it mean to be a researcher?'*. Over 90% of students completed each module in 6 hours or less; the total amount of time was often an accumulation of many short sessions. The results below represent the feedback from students who completed the live placement collaboration.

Students responded to the statements *"The activities helped me to develop the skills I needed for my placement with my placement provider"* and *"I felt confident going into my placement because I had completed these activities"* to assess the effectiveness of the preparatory BFR modules (Figure 1).

A majority of students agreed that each module had helped them develop skills necessary for their placement (Figure 1a), and that the modules made them feel confident going into their placement (Figure 1b). For both statements, the *'Research skills'* module garnered the highest proportion of overall agreement (85% for skills and 78% for confidence), although a similar percentage of students strongly agreed that the *'Research skills'* and *'Digital future'* modules had made them feel confident.

Focus groups for the BeFutureReady modules were carried out, providing additional insight into the feedback given for these modules. Most students felt that the *'Successful at work'* module was generally useful, but often mentioned that the tasks were 'fairly simple, already known, or self-explanatory'. For many students, the *'Digital future'* module was not relevant to their placement and many felt they would not retain the knowledge to use in future. However, some found it to be advantageous for their placement, while a few found it useful for college work. These findings could explain the more mixed results of the two modules. Meanwhile, the *'Research skills'* module received the most positive survey feedback, which was reinforced by the focus group findings; most students considered it the most relevant module to their placement, with skills such as peer reviewing and referencing covering new ground for many.

Figure 1. Feedback for BeFutureReady modules



2.2 BeFutureReady webinars

37% of students took part in at least one BFR webinar. These webinars were designed to improve student awareness of the labour market and pathways to higher education, training and employment. The results in this section represent feedback from students who engaged with the BFR content only, as well as from those who both engaged with BFR and completed the live placement collaboration. Since the webinars were piloted during the 2020/21 cycle, cohort sizes were quite small but this is anticipated to increase in future.

For each webinar, we asked students whether it was well organised, and whether it contained relevant and useful information. For the three webinars *'Job applications: how to present yourself', 'What do university admissions teams look for?',* and *'Exploring apprenticeships: Earn while you learn',* we asked students whether attending had increased their understanding of the topic covered. Students taking the *'What can I do if I study…'* webinars were asked whether they were helpful for making informed choices about their next steps after leaving further education.

For all webinars except *'Exploring apprenticeships: Earn while you learn',* over 90% of respondents agreed that they were well-organised and contained relevant and useful content[1].

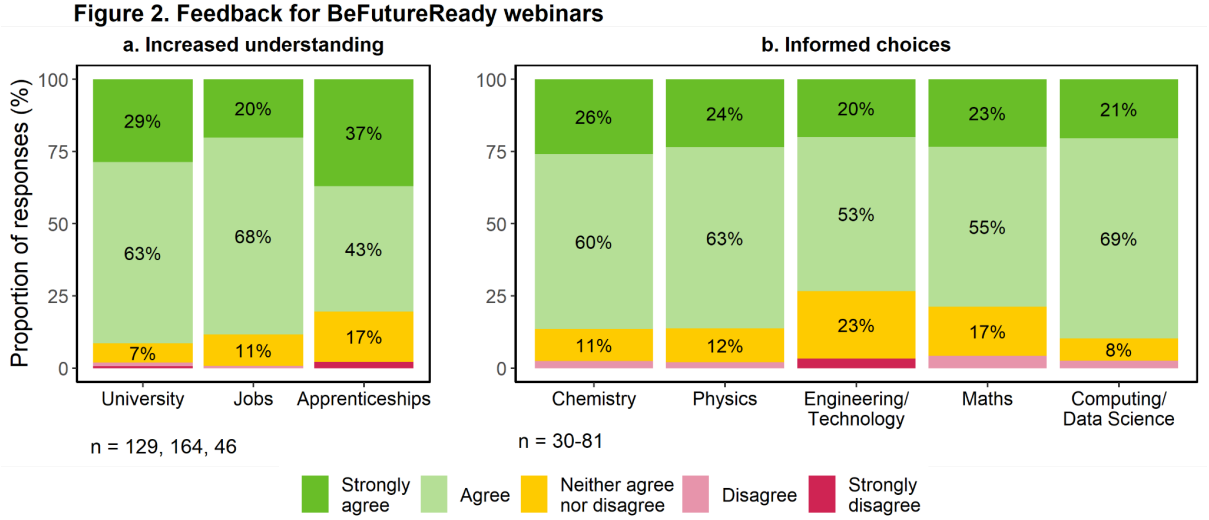
As shown by Figure 2a, a large majority of students who attended the '*Job applications', 'University admissions'* or *'Exploring apprenticeships'* webinars agreed that they had increased their understanding of these topics. Interestingly, although the *'Exploring apprenticeships'* module had the lowest level of overall agreement out of the three (80%), it also had the highest level of strong agreement (37%). Therefore, while

[1] For the '*Exploring apprenticeships'* webinar, 78% agreed that it was well-organised and 87% agreed that the content was relevant and useful.

the webinar did not increase understanding for every student, those who did benefit from increased understanding saw it to a greater degree compared to the university and jobs webinars. This could be due to the fact that young people often have less knowledge about apprenticeships.

For the *'What can I do if I study…'* webinars (Figure 2b), an average of 83% of attendees agreed that the webinar they attended was helpful for making informed choices. Computing/Data Science had the highest agreement at 90%, and Engineering/Technology had the lowest agreement at 74%.

Figure 2. Feedback for BeFutureReady webinars



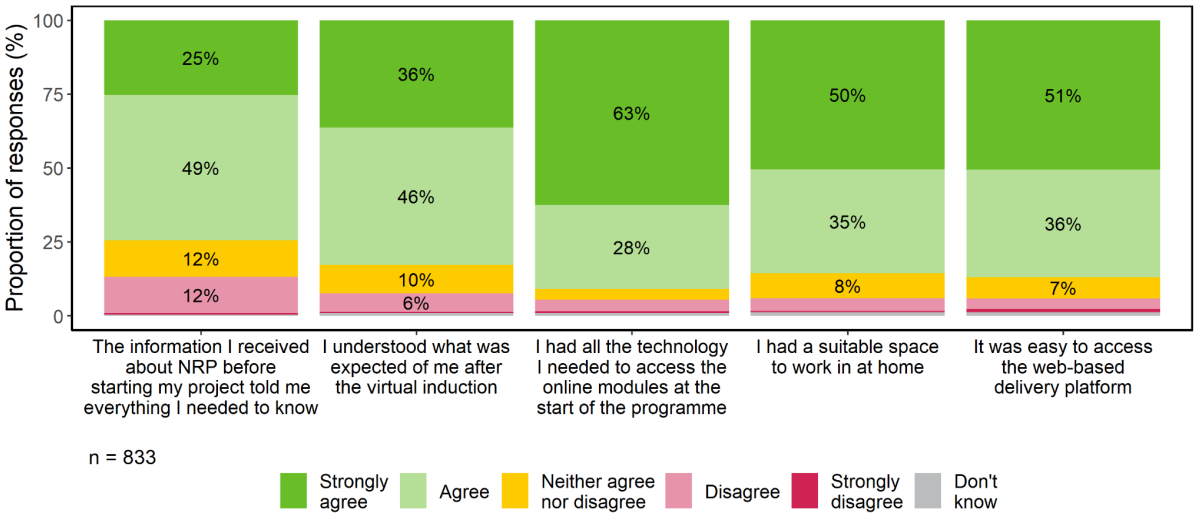
Students suggested a wide range of possible future topics for the webinars. Many students cited new subjects to cover, including psychology, medicine/healthcare (one student suggested *'A day in the life of a medical student or doctor'*), dentistry, pharmacology, and geography. Preparation for university (regarding both academics and finances) was mentioned frequently. Potential future webinars addressing CV writing, interviews, and career pathways were also mentioned. Several students were interested in content covering how to speak about their NRP experience in applications and interviews.

3. Student and provider feedback on placements

3.1 Student induction

Overall, students found the NRP induction experience to be useful: all but one statement concerning this received over 80% agreement (Figure 3). While the majority of students agreed or strongly agreed (74%) that they were told everything they needed to know, a comparatively larger proportion of students (13%) disagreed or strongly disagreed and a further 12% neither agreed nor disagreed.

Figure 3. Feedback for the Nuffield induction process



3.2 Time spent on placement

87% of students worked on their project for more than 40 hours in total, while 92% of students spent more than 10 hours creating their final report and poster.

On average[2], providers spent:

- 8 hours in meetings or calls with students (maximum 50 hours reported)
- 5 hours preparing tasks and activities (maximum 75 hours reported)
- 4 hours supporting students to develop their research skills and complete their research project (maximum 40 hours reported)
- 3 hours providing specialised training (maximum 40 hours reported)
- 3 hours reviewing student work (maximum 50 hours reported)

[2] Median values were calculated excluding blank or '0' responses.

It must be noted that several providers pointed out that some of the above categories overlapped due to the nature of their placement.

3.3 Student evaluation

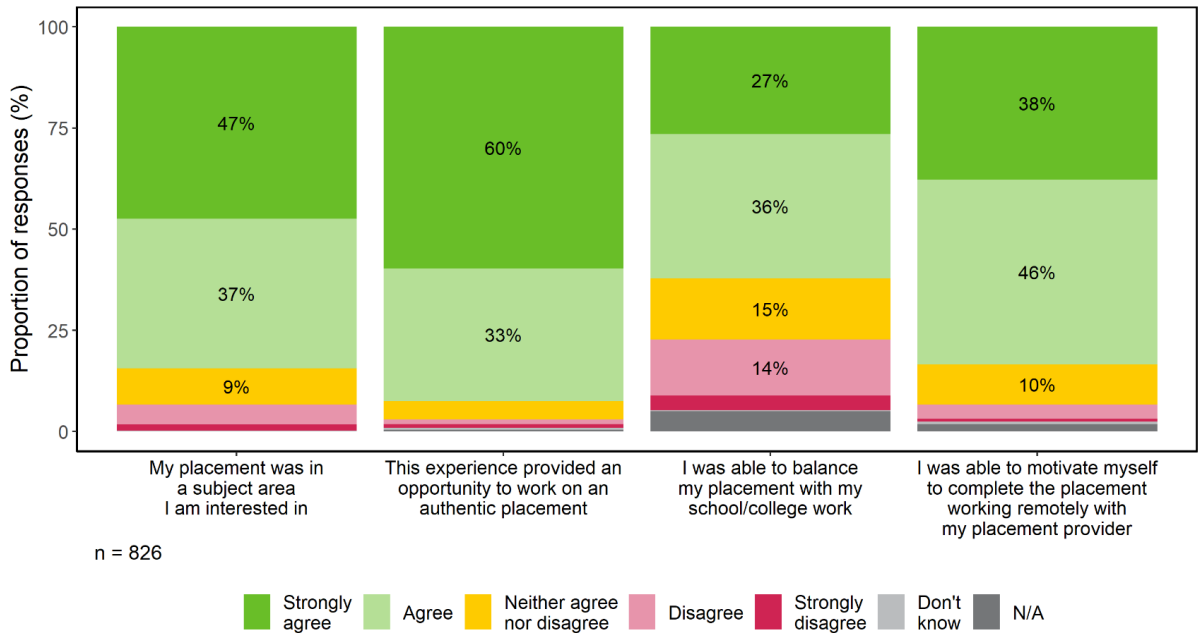
The follow-up survey presented students with a range of statements regarding their placement experience and asked to what extent they agreed. As shown in Figure 4a[3], 93% of students agreed that their placement had provided an authentic opportunity in STEM, and 83% agreed that they were able to motivate themselves to complete the placement. Students enthused about the experience in STEM they had gained:

"It was great to have the opportunity to work in a professional environment on a research topic."

"The experience of collecting primary data on human participants was very useful as it taught me how to be ethical."

"I really enjoyed using scientific instruments that I had never used before and getting to do the experiments that I had only heard about in school."

Figure 4a. Students' evaluation of their placement experience



Students perceived high levels of support from their providers (Figure 4b), with a large majority (all reporting 84% or higher) agreeing that their placement provider was knowledgeable, supportive,

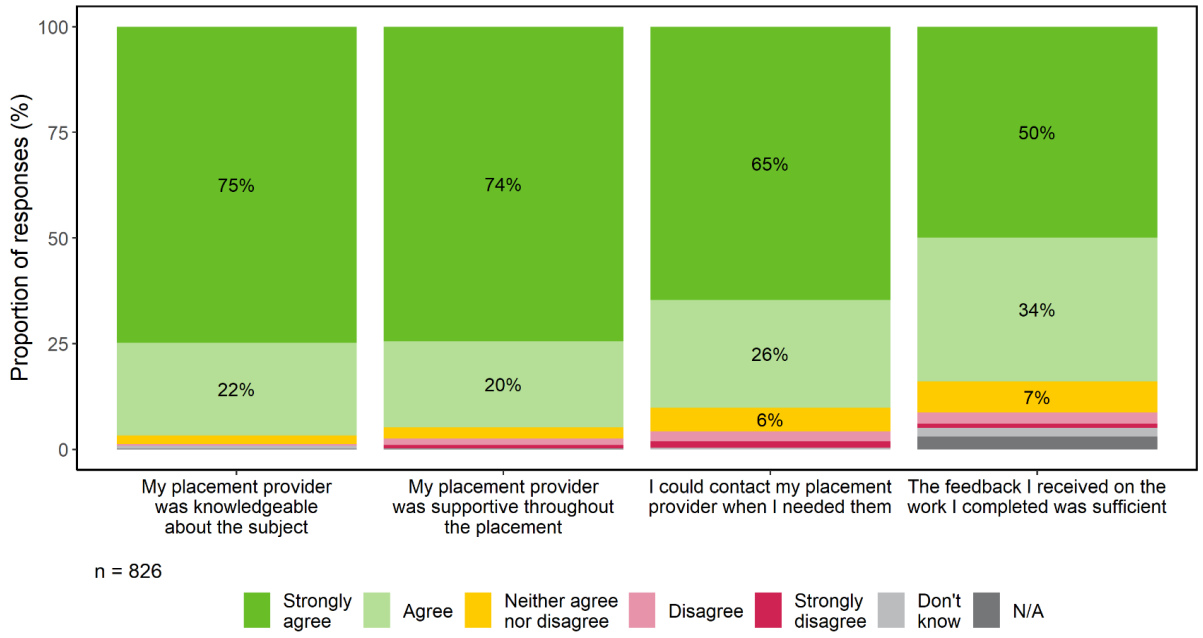
[3] The full statement concerning an authentic placement experience, as truncated in Figure 4a, was: '*This experience provided an opportunity to work on an authentic science, technology, engineering, maths, computing or social science placement.*'

contactable when needed, and provided sufficient feedback. There was greater variation in the proportion of students strongly agreeing with these statements. *'My placement provider was knowledgeable about the subject'* and *'My placement provider was supportive throughout the placement'* received the highest proportion of strong agreement, at 75% and 74% respectively. A lower proportion of students - 65% - strongly agreed that they could contact their placement provider when needed, while 50% strongly agreed that the feedback that they had received was sufficient. Many students told us about the positive experiences of working with their placement providers:

"The chance to network with industry professionals was great; I got to meet some amazing people and they provided good information about the research and helped along the project."

"I was able to work with academics who shared their passion for biology with me."

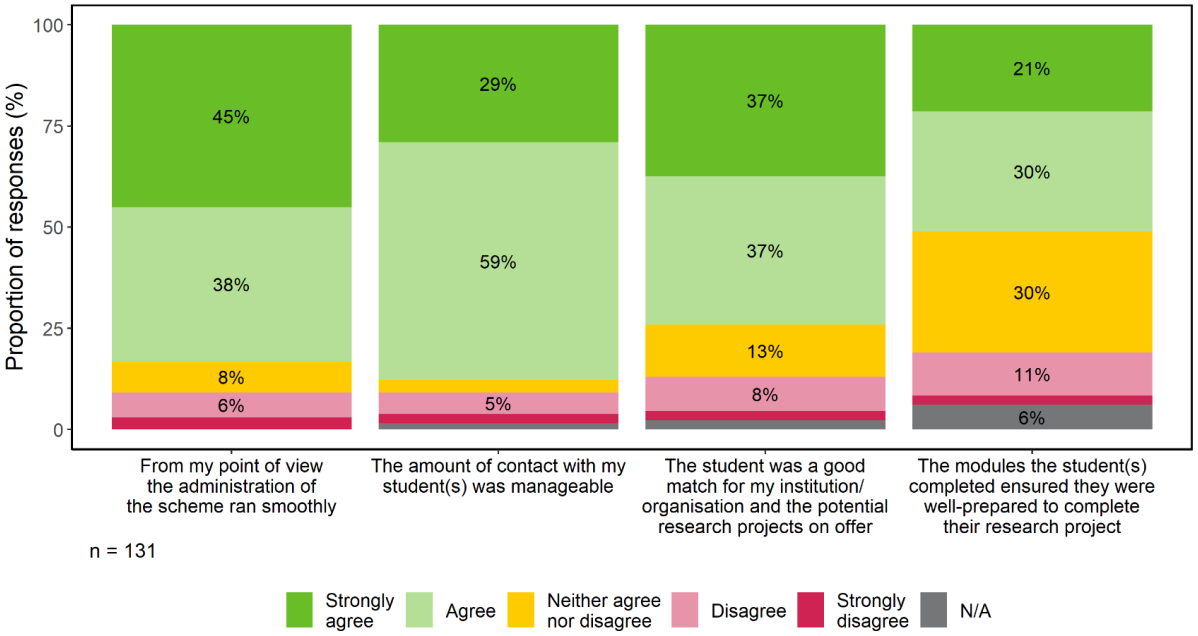
Figure 4b. Students' evaluation of their placement experience



3.4 Provider evaluation

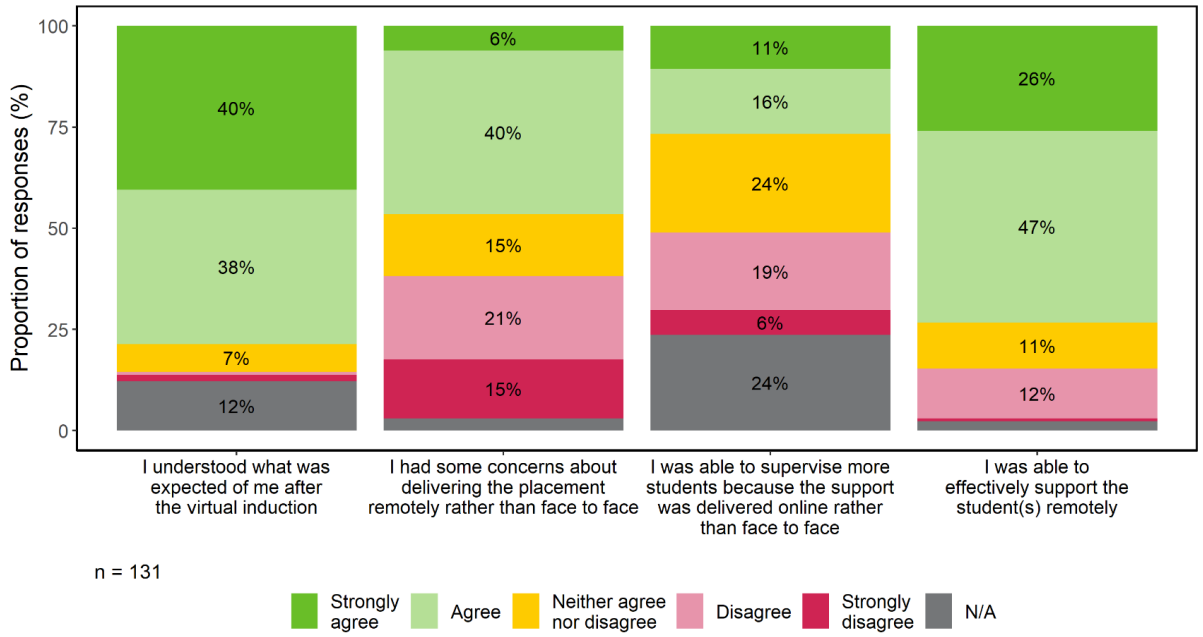
Most providers (Figure 5a) felt that the administration of the scheme had run smoothly, with 83% of respondents in agreement. 88% of providers felt that the amount of contact they had with their student(s) was manageable. Almost three-quarters agreed that their student(s) had been a good match for their institution/organisation and associated research projects, half of which strongly agreed with the statement. A lesser percentage - 51% - agreed that the BeFutureReady modules had prepared the students well for completing the research project, which may be due to a lack of awareness of the content of these modules.

Figure 5a. Providers' evaluation of their placement experience



The survey also captured providers' perspectives on the remote aspect of the placement (see Figure 5b). The virtual induction proved successful, as 79% of providers reported that following the induction they understood what was expected of them. When it came to the placement itself, less than half had been concerned about delivering the placement online rather than face-to-face, and 73% agreed that they had been able to effectively support their student(s) remotely. However, the remote placement did not provide opportunities for most providers to supervise more students: only 27% agreed that this was the case, although for 24% this statement was not applicable.

Figure 5b. Providers' evaluation of their placement experience



3.5 Optimum delivery model

We asked providers for their opinions on what the optimum delivery model of NRP would be following COVID-19 restrictions being lifted. Combining online and face-to-face experiences proved popular: 53% of respondents felt that a blended approach with online preparatory modules and an in-person placement would be optimal, with a further 22% preferring a primarily online model with the student spending one or two days on site. Returning to a wholly in-person placement was less sought-after, with 13% of providers believing it to be the best delivery model. Meanwhile, only 3% felt that a wholly online placement was most suitable.

4. Student skills development

4.1 Student skills and confidence

In the follow-up survey, we asked students to what extent they agreed with statements about their transferable skills and attributes. We sought to determine to what extent the NRP experience influenced students' perceptions of their skills, giving insight into how participation in the scheme can aid in self-development. Several students spoke highly of the skills they had gained from participating in NRP:

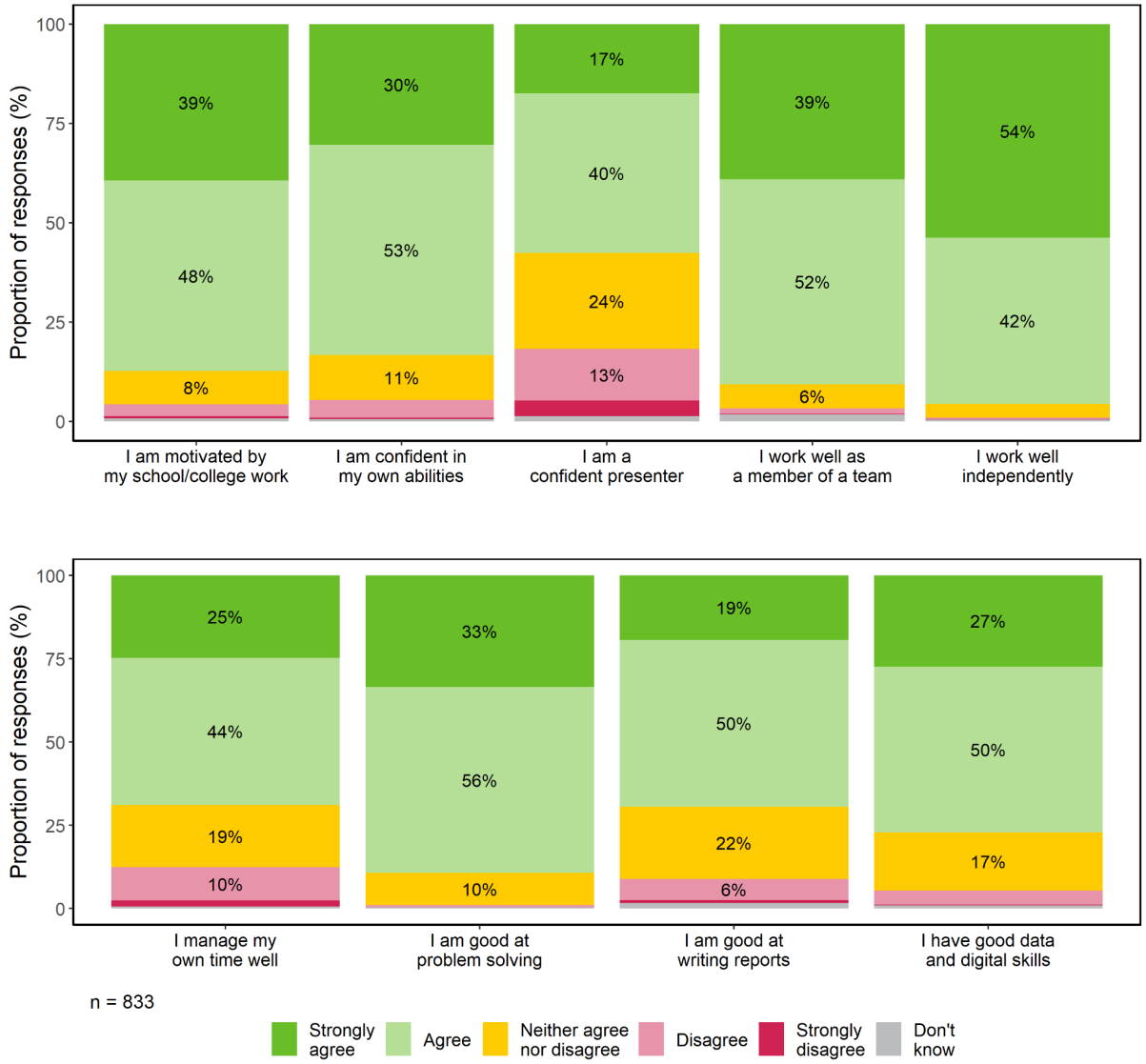
"I have been taught skills I have always thought I could never understand."

"Undertaking this project has inspired me to pursue a career in research, so I am sure that these skills that I have gained will be beneficial for me."

"The best thing for me was developing simple skills like computing that I didn't know before… those skills really came in handy during my research work as I had to analyse and solve large pieces of data for Biology."

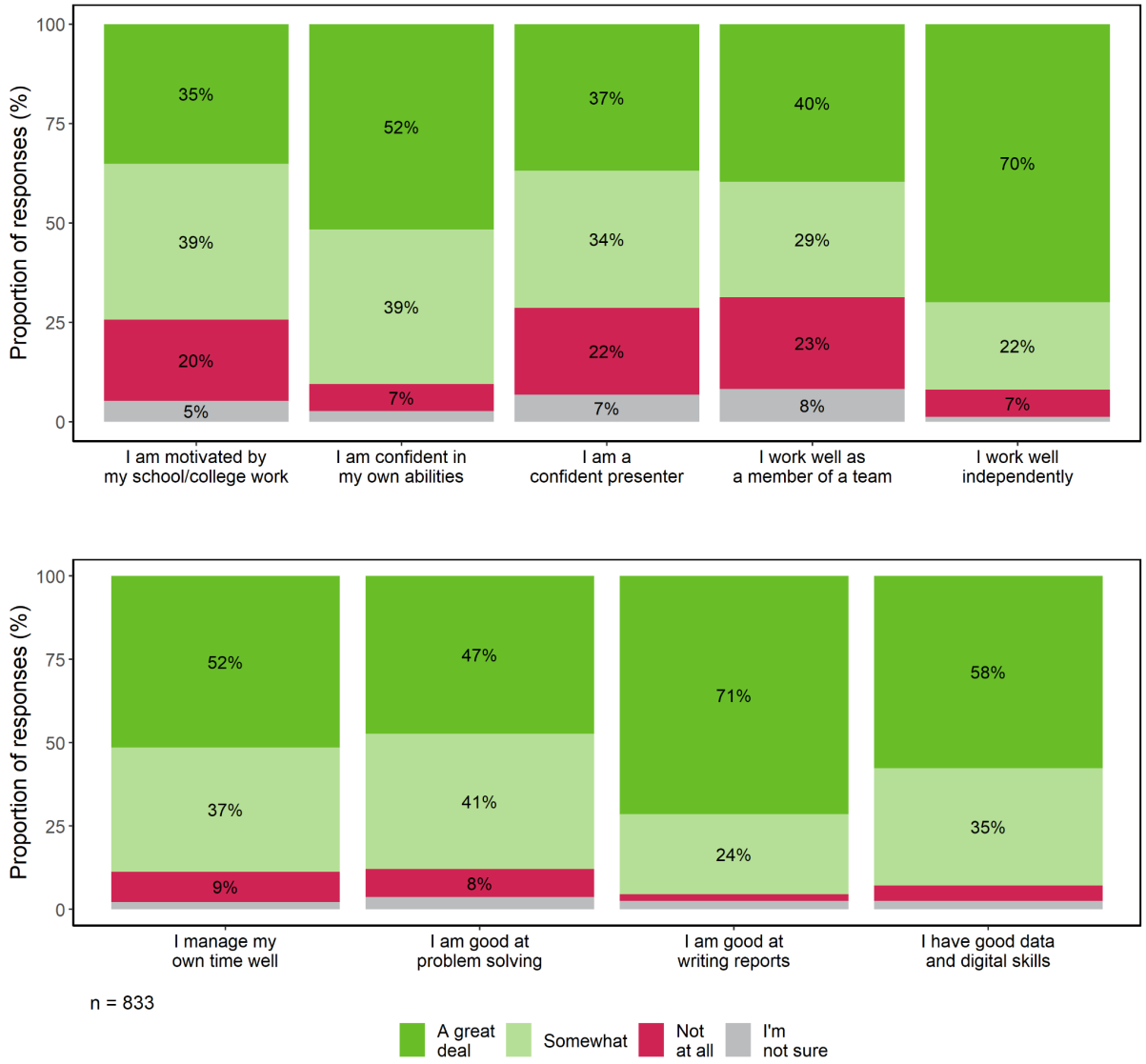
Students tended to rate their personal skills and attributes highly, with a majority of students agreeing or strongly agreeing with our statements. Notably, only 58% of students believed themselves to be a confident presenter, the lowest of all self-reported skills. Meanwhile, *'I work well independently'* had the highest level of agreement at 96%, with over half of the students strongly agreeing with the statement (Figure 6).

Figure 6. Self-reported student skills



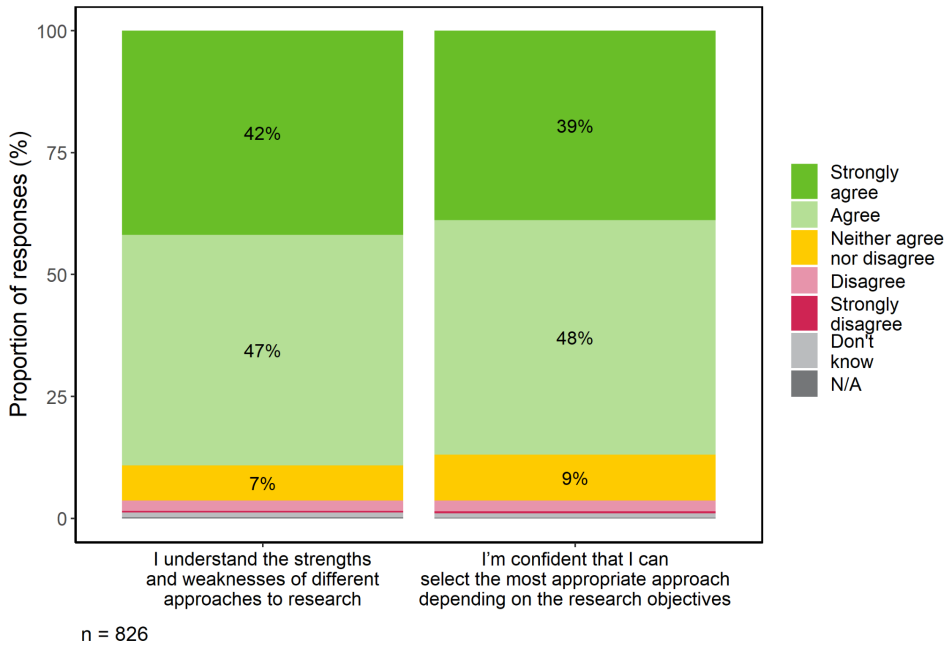
The NRP experience seems to have exerted a significant influence on students' skills and attributes (Figure 7). In all skills, a majority of students stated that the NRP had influenced them either 'a great deal' or 'somewhat'; on average, 85% of students responded this way. Report writing was the skill most influenced by the NRP. 96% of students felt their placement had influenced their report-writing skills at least somewhat, with 71% experiencing 'a great deal' of influence. Teamwork was the least influenced category overall, with 69% of responses being either 'a great deal' or 'somewhat'. However, in a separate question, a minority of students reported having the opportunity to work as part of a team with either NRP peers or colleagues at their placement provider (46% and 42% respectively).

Figure 7. Influence of NRP on self-reported student skills



Following their placement, we also asked students about their understanding of the strengths and weaknesses of different approaches to research, and their confidence in selecting the most appropriate approach depending on the research objectives (Figure 8). Students agreed with both statements at similar rates: 89% and 87% respectively.

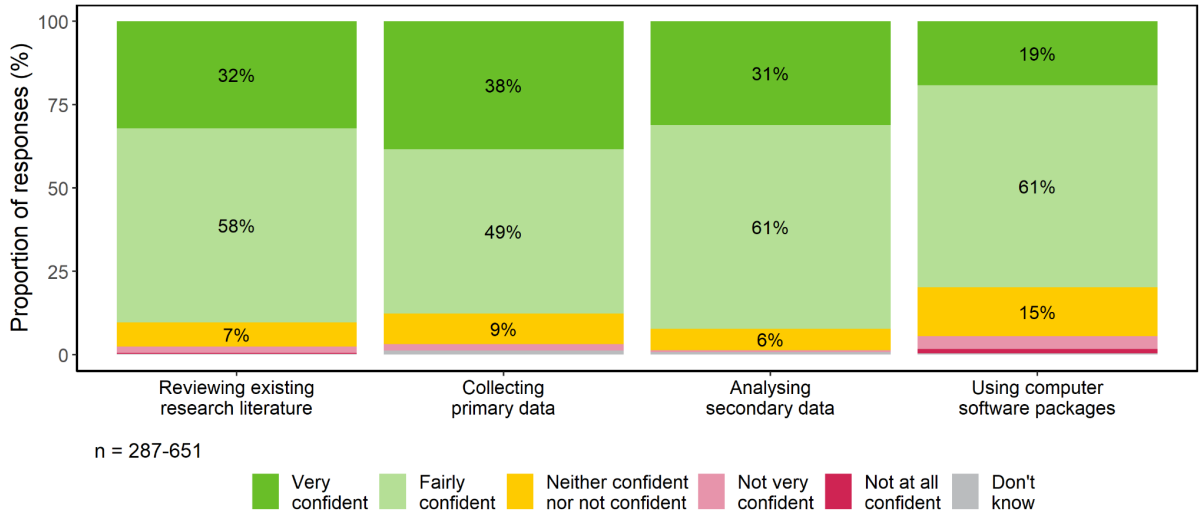
Figure 8. Self-reported student research skills



To examine students' confidence in technical skills used during their placement, we asked them to select which of four activities they had done. 35% learned how to use computer software packages (such as SPSS, R, or Python), 77% analysed secondary data, 79% reviewed existing research literature, and 38% collected primary data.

We then asked about students' confidence in the activities that they had done (Figure 9). Overall, students displayed high levels of confidence. Of those students who learned how to use software packages, 80% of students were very or fairly confident. This rose to 88% of students who collected primary data, 90% of students who reviewed existing research literature, and 92% of students who analysed secondary data.

Figure 9. Students' confidence in selected skills post-placement



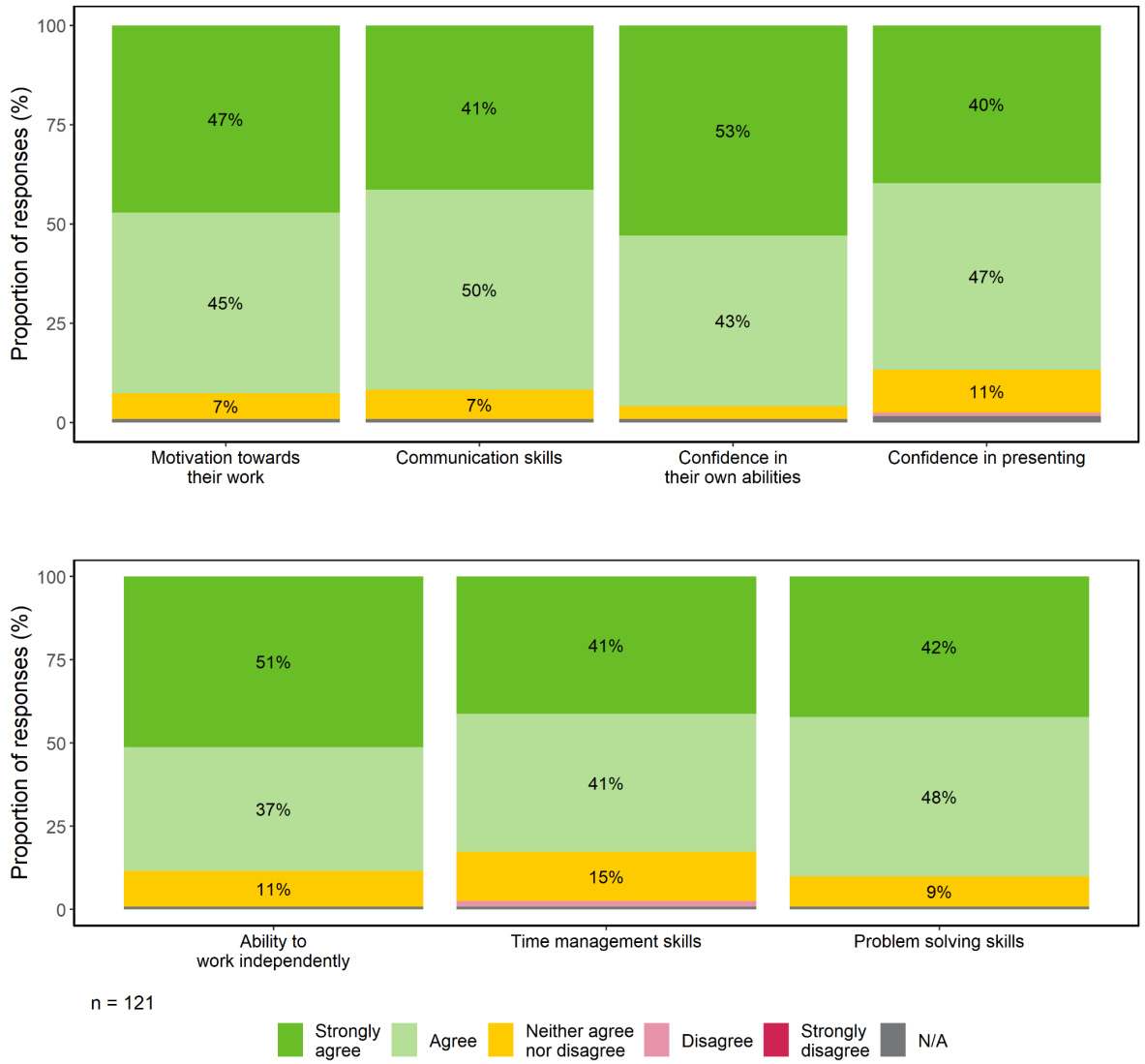
4.2 Student skills: teacher perspectives

In our teacher survey, we asked to what extent teachers agreed that their student(s) had improved in seven attributes and transferable skills following the completion of their placement. In every category, over 80% of teachers agreed or strongly agreed that their student(s) had improved. Improved self-confidence was a notable change: 96% of teachers noticed an improvement in this area and 53% strongly agreed, the highest proportion of all skills. Comments from the teacher survey reinforced the range of benefits experienced by students:

"…The students stand out amongst their peers for their sense of drive and enthusiasm. They have a greater sense of purpose. This is especially the case this year as many of our current cohort feel quite overwhelmed after their experience of school closures/ lockdown."

"All of the students return from their placements with a much greater amount of confidence in their abilities and that their chosen university route or career is valid. Women in particular gain a huge amount of confidence from the programme."

Figure 10. Teachers' perspective on changes in student skills



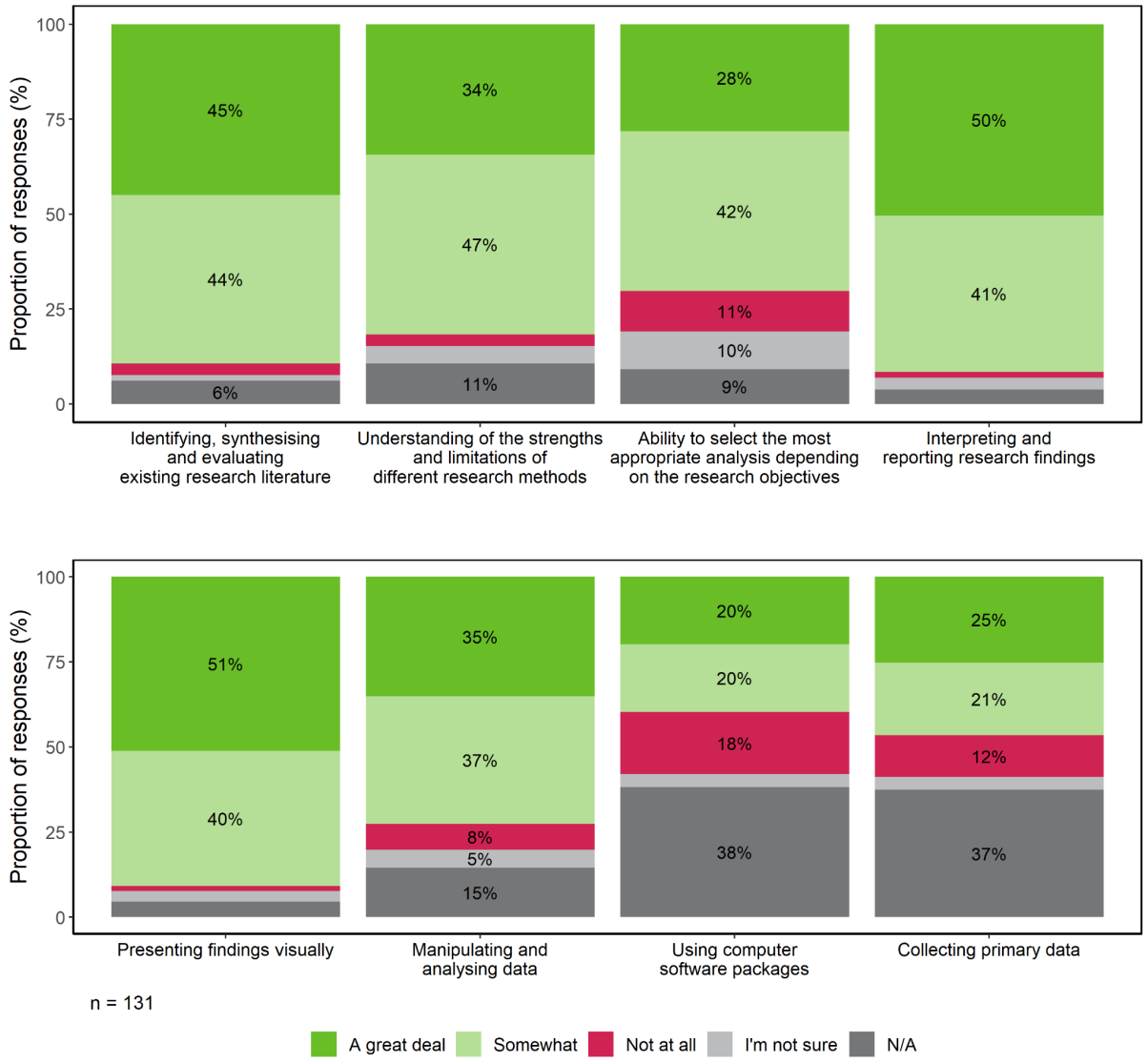
4.3 Student skills: provider perspectives

We also asked providers to what extent their student(s) had developed eight research and data skills (Figure 11). For six of the eight skills, at least 70% of providers said that their student(s) had developed somewhat or a great deal. The remaining two skills, *'Using computer software packages'* and *'Collecting primary data'*, had the highest proportion of 'Not at all' responses, at 18% and 12% respectively, while also having the highest proportion of 'Not applicable' responses.

However, with over 60% of students stating that they had not learned how to use computer software or collected primary data during their placement, it is unclear whether the high proportion of 'not at all' responses here is due to students covering these topics but not developing their skills, or the topics not

being part of the placement at all. Although there was a 'not applicable' option for the provider student skills question, not every respondent may have selected this.

Figure 11. Providers' perspective on changes in student skills



5. Benefits for placement providers

Providers selected ways that being involved with NRP had benefited both their institution and themselves personally, with the choice to select and specify an 'other' option.

For their institution as a whole, providers reported a range of benefits:

- 79% of providers said that participating in NRP had fulfilled public engagement, widening participation, or corporate responsibility goals for their place of work.
- 37% cited potential future recruitment or diversification of the workforce as benefits.
- 26% indicated that the experience had lent them an 'extra pair of hands' on a project.
- Another 26% said that it had enabled them to forge strong links with local schools and colleges.
- Almost a quarter chose to specify an 'Other' option, with responses ranging from gaining a fresh perspective on research to providing development opportunities for colleagues.

On a more personal level, 82% of providers said that the experience had developed their coaching, mentoring and management skills. 55% had gained a better understanding of young people in the workforce, and 54% reported that participating had enabled them to communicate their subject area to the wider public. 10% of respondents selected 'Other', and several stated how much they had enjoyed working with the students.

"I find it useful to understand how someone new to the topic percieves [sic] *the research that we do- very useful to understand this from the perspective of a 'non-expert' stakeholder."*

"For me my number one motivation personally is to broaden access to HE... I was someone who was not as welcomed originally and had a lot of socioeconomic and prejudice barriers to pursuing my dream. Now that I've 'made it' somewhat, I like to do things to make it easier for others."

"It was a lot of fun - seeing the project through my student's eyes reminded me what it is I enjoy about physics and space research."

"The joy of working with bright young people; learning goes both ways and teachers should always learn from their students as well. I find it really fulfilling to see students enjoy these placements and to develop skills to set them up in their futures. I like to teach things that students often think they'll hate (statistics and software) and to get them to fall in love with the possibilities these tools give - it is enjoyable and fulfilling … it was a joy to see how much [they] benefitted and enjoyed everything at the end and how keen and interested they were throughout."

6. NRP students' future destinations

6.1 Future plans of the 2020/21 cohort

Both before and after the placement, the majority of students (over 80%) were planning to study for a degree in STEM. While only 2% of students changed their future plans as a result of their experience, over 80% of students found that it had an impact upon their aspirations. Just over half of the cohort found that participating in NRP had confirmed that they were happy with their plans. For 22%, their experience had helped them to decide between a number of options, while a further 7% had reconsidered their choices but ultimately did not change their minds.

6.2 Destinations of the 2020 alumni

Having reached the end of year 13, feedback from the 2020 alumni provides insight into the impact of NRP on students about to leave compulsory education. Over 80% of the 2019/20 cohort were planning to study a STEM degree in the 2021 academic year, a proportion similar to the destinations of the 2020/21 cohort. The NRP experience also influenced the future choices of this group: 38% of 2020 alumni felt that participating in Nuffield Future Researchers had significantly or greatly influenced their chosen pathway. Just over half of the cohort had been influenced somewhat or to a limited extent, while the choices of the remaining 11% were not influenced by the experience.

Alumni also benefited substantially when applying for jobs and further education courses. 98% of respondents found that the experience had supported their applications to at least some extent, with almost half reporting a 'significant' extent of support.

Several alumni detailed the benefits they had personally experienced from Nuffield Future Researchers:

"This experience was so useful to include for my personal statement and even CVs, because of how many skills I picked up during the programme."

"Nuffield strengthened my personal statement for University and helped me understood [sic] how to write up a scientific report within a deadline."

"If I didn't take part in Nuffield I wouldn't have a clue for what to do in university. Taking part in Nuffield allowed me to shape my future."

"Thank you so much for this opportunity, it helped me realise what I want from a medicine degree and helped me extend my networking opportunities significantly."

"The research done over the summer with the Nuffield foundation has influenced my ambition to become a researcher in physics. It showed me how much I enjoy research and was excellent experience prior to university."

7. Satisfaction among stakeholders

Satisfaction across all three stakeholder groups was very high:

- **94%** of students were satisfied or very satisfied with their experience, and **93%** would recommend Nuffield Research Placements to other students.
- **100%** of teachers would recommend Nuffield Research Placements to future students.
- **95%** of placement providers would recommend Nuffield Research Placements to others.

8. Conclusion

Despite the continued disruption of the COVID-19 pandemic, the 2020/21 Nuffield Research Placements cycle was very well-received by students, teachers, and placement providers alike.

The BeFutureReady modules were received favourably by the majority of students; the *'What does it mean to be a researcher?'* module garnered the most positive feedback, introducing students to skills not previously covered in their education.

As for the placement itself, the vast majority of students were satisfied with their experience and felt that they had experienced an authentic STEM placement. Students developed a range of skills, both technical and personal - several commented on how these skills would benefit their future endeavours.

Most students taking part in the optional webinars found that the information provided had increased their understanding of different post-18 options and helped them to make informed choices about future avenues of study. Many suggested future topics that could be covered, from specific degree subjects to preparing for university and future careers.

Although the vast majority of the 2020/21 cycle applicants were already set on pursuing a STEM degree, NRP still supported the students in their future choices: over 80% of students experienced some level of impact on their plans. Data from the previous year's alumni indicates that the experience is especially helpful when making applications for further education or jobs.

Students were not the only stakeholders to notice the programme's benefits. Teachers reported the positive changes they saw in returning students, with self-confidence standing out as the attribute which improved the most. Meanwhile, providers witnessed students develop a range of research and data skills over the course of their placements.

Overall, the feedback provided suggests that students have gained a rewarding, valuable experience by participating in the 2020/21 cycle of Nuffield Research Placements.