Creating an engaging psychology-themed university placement for school students

Aamir Sohail[1,2*†], Anne C. Saulin[1], Kübra Fethiye Karataş[1], Rong Zhang[4], Lei Zhang[1,2,3†]

[1]Centre for Human Brain Health, School of Psychology, University of Birmingham
[2]Institute for Mental Health, School of Psychology, University of Birmingham
[3]Centre for Developmental Science, School of Psychology, University of Birmingham
[4]School of Psychology, South China Normal University, Guangzhou, China

Correspondence should be addressed to:
Aamir Sohail: axs2210@bham.ac.uk
Lei Zhang: l.zhang.13@bham.ac.uk
Centre for Human Brain Health, School of Psychology, University of Birmingham

*Lead author
[†]Corresponding authors

[This article has been accepted for publication in *Psychology Teaching Review* published by the British Psychological Society. Journal website: https://explore.bps.org.uk/content/bpsptr]

Abstract

University placements provide valuable hands-on research experience for students, whilst allowing labs to engage in meaningful outreach. However, building and structuring these placements for college students (ages 16-18) may present challenges. Firstly, many hosts lack teaching experience towards this specific group, which differ significantly from university students in their subject knowledge and research skills. Additionally, hosts must balance creating engaging content while ensuring students develop meaningful practical skills and knowledge. Drawing from our collective experience, we provide practical guidelines in structuring placements in the fields of psychology and cognitive neuroscience. We discuss the importance of advance planning, tailoring content to student interests, incorporating practical elements, and promoting interdisciplinary engagement. In doing so, we aim to encourage more labs to host student placements, subsequently widening access for psychology and neuroscience research.

Keywords: student placements, psychology education, neuroscience education, research experience, teaching resources, widening participation; outreach and engagement

Introduction

Many research institutions offer structured placement opportunities for secondary school students, with established programmes like SATRO[1], in2Science[2] and STEMPoint[3] connecting students to hands-on research experiences each year. College and sixth-form students (aged 16-18, hereafter referred to 'school students') seek to complete a university placement for several reasons. Doing so both strengthens their university application by gaining practical experience and can help them in feeling more prepared for higher education (STEM Learning, 2022, in2scienceUK, 2023). Indeed, school students, after completing a university placement, report improved confidence for their university applications, feel less alienated from stereotypes, and are four times more likely to receive an offer from a top university (In2scienceUK, 2023; The Sutton Trust, 2024). University placements are particularly important for students from traditionally underrepresented and/or disadvantaged backgrounds, who are less likely to consider applying to university (Atherton, 2024), and in particular to higher tariff job providers (UCAS, 2016). This discrepancy is influenced by the lack of knowledge about certain criteria (e.g., entry requirements), and of relevant outreach and engagement initiatives from the university (Bolton & Lewis, 2024). Demonstrating their importance, students report being more aware of where to seek support and advice on applying to university after completing a placement (in2science, 2024), a key approach for helping those from underrepresented backgrounds get into higher education (Torgerson et al., 2014).

For universities and research institutions, organising placements for school students can also be an incredibly rewarding experience, one which also enhances the lab's individual and the departmental reputation at the university (Gentile et al., 2017). Running placements also provides practical experience in course planning and teaching, particularly useful for master's and doctoral students. However, doing so requires specific knowledge, teaching and organisational skills in how to create and structure the placement. For example, teaching school students may be challenging – even for those with prior teaching experience - as school students typically do not

[1] https://www.satro.org.uk/satro-research-work-placements
[2] https://in2scienceuk.org/
[3] https://www.stempoint.org.uk/en-gb/home

have the statistical or research experience of university students. Concepts, terms and theories that may be taken for granted as prior knowledge at an undergraduate level will certainly need to be explained, with students requiring step-by-step guidance and close supervision when engaging with STEM (Science, Technology, Engineering and Medicine) subjects (Banks & Barlex, 2020). In addition, structuring the placement to facilitate learning, whilst also being fun and engaging, can also present its own difficulties.

Collating our experience of successfully hosting school students with previous guides offering practical advice for running school student placements (Lescak et al., 2019), this article describes how hosts can develop their own psychology or neuroscience themed placement. In doing so, we list key considerations including planning, student engagement, practical demonstrations, and teaching resources, providing guidance for creating engaging placements that benefit both parties (**Figure 1**). We present these tips, mainly keeping in mind single student or small group placements of commonly 1-3 weeks (e.g., in2Science, SATRO) who are based in one hosting lab. However, most tips can be adapted and upscaled to longer placements or placements in multiple working groups.

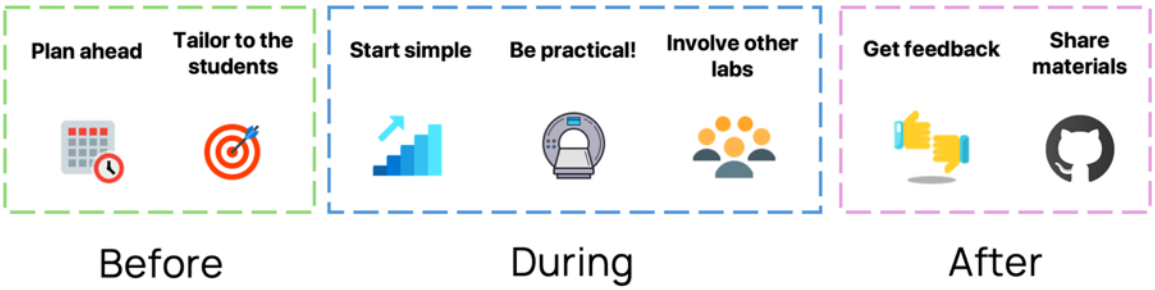

Figure 1. Tips for creating and running a successful psychology placement for school students. We broadly separate our considerations into three sections: those to be done before, during and after the placement. However, we note that some can span multiple categories. For example, tailoring the placement can occur both before and during the placement, whilst getting feedback from the students can be done both during and after. Icons by Icons8.com.

Plan ahead

It is important to plan what skills and topics will be covered during the placement. Initially, this may simply include the type of session (e.g., data analysis workshop, participating in an experiment) and topic that will be covered. Initial planning may begin a few months prior, with the specific structure developed closer to the placement. However, the extent to which this is possible depends on the how the placement is organised. Broadly speaking, placements are organised through one of two routes: either directly via the university, or through a third-party organization. In the latter, hosts may not be assigned their students until a few weeks prior, ruling out the possibility in finding out specific interests beforehand. On-the-other-hand, organising placements directly with the students offers more flexibility to when the placements' content and roles within the lab are organised. In any case, as students' expectancy of success is a predictor of persistence in work placements (Ogbaekirigwe et al., 2025), it is important that the students know what they are expected to do and learn ahead of time.

If multiple individuals are involved in hosting, it may be useful for each to focus on a different skill and topic, to diversify learning and avoid repetition. For example, one member may choose to run a workshop on data analysis, whilst another gives a presentation covering the psychological theories of behaviour. This reflects the wide variety of experiences that placement students report, which include attending a lecture, giving a presentation, participating in an experiment, writing a report and reading a scientific paper (in2science, 2024). Placements should therefore aim to strike a balance between skill-based sessions, practical demonstrations, and informal discussions, which are recommended approaches for teaching STEM subjects (Felder & Brent, 2024). Doing so will also maintain interest and a persistent work ethic, particularly for longer placements. The share of responsibilities also creates a collaborative work culture of the lab, which will reduce the burden when everything is run by a single person. Nevertheless, it is often helpful to appoint one lab member who is the main coordinator for one student (or small group of students) who ensures smooth transitioning from one placement phase to the next and that everyone involved is on the same page.

In the planning phase, additional administrative aspects should be considered. For example, some institutions require placement students to be officially registered, and students may need a badge to be allowed into the lab and office spaces. Others may additionally impose specific restrictions regarding minors in the buildings and thus require specific safeguarding precautions which need to be addressed in advance, e.g., lone working, named person responsible. In the case of a privately organized placement, more thorough screening procedures for the placement student, e.g., DBS checks, may also be required. Ultimately, it is the responsibility of the host to co-ordinate the paperwork required by the different institutions e.g., school, third-party organisation and university. These forms should be stored in password-protected files with restricted access. Efficiently organising forms in folders using an appropriate naming system makes the process more manageable and consistent. It also aids with facilitating information required by multiple bodies. However, only relevant forms should be sent to the students with clear instructions on which information is required, ensuring a simple process. We advise addressing these aspects clearly ahead of time, greatly contributing to a smooth and positive placement experience.

Tailor the placement to the students' interests

Students may have specific skills or interests that they want to learn during their placement. For example, if the student plans to study clinical psychology, but also has a keen interest in neuroscience, they may want to understand how neuroimaging can be used to understand different mental health disorders (Sohail & Zhang, 2024). Tailoring the placement to these interests makes it more meaningful for the student, and more beneficial for their university application (in2science, 2024). Persistence in completing placement tasks is also influenced by task values, including their intrinsic value and utility (Ogbaekirigwe et al., 2025), so students are more likely to work harder and gain skills if personally motivated. Students' interests and needs can be indicated by a short questionnaire or discussion with the host where the students list their strengths, interests, and goals for the placement. Based on the answers, the placement could be tailored accordingly. Creating an informal discussion space on messaging boards (e.g. Discord) can be useful in doing so, but permission from the organizing body should firstly be acquired. Communicating proactively with the

students that their preferences are taken into consideration when developing the placement may further contribute to the student's engagement with the lab.

Start simple

School students have a (relatively) basic education in the sciences, and are often not taught about statistics, nor have any practical experience with practical research skills e.g., data analysis, programming. Thus, they cannot be expected to tackle tasks that the lab may typically entrust a university student with. It is therefore important to keep things extremely simple at the beginning of the placement, but the materials and content can become more advanced as the placement progresses. This reflects a ‘bottom-up’ approach to learning, where knowledge and understanding is gradually built from basic foundations and concepts (Anderson & Crawford, 1995). Demonstrating this, our practical workshop on data analysis (see *Sharing materials*), features a simple dataset with older adults’ performance in an episodic memory task. Students firstly learn about the data and study, and are then taught how to perform simple operations (selecting a column/row, calculating mean values) with software (such as RStudio), before finally plotting the data (e.g., bar plots, scatter plots). In doing so, they also develop – and subsequently test - scientific hypotheses, learning important skills associated with independent enquiry referenceable in their university application. In this structure, each section naturally builds upon the last whilst developing in complexity, creating a challenging, yet engaging exercise. Importantly, we assume no prior subject-specific knowledge whatsoever. Despite this, students have struggled with certain parts of the material. It is therefore important to actively encourage the students to ask questions and to openly share whenever they feel stuck or uncertain.

Be practical

Students are likely to find placements overwhelming and disengaging if they consist solely of lectures and workshops. This is particularly the case for STEM-based subjects, which school students often report as boring, irrelevant and difficult to understand (Martinez-Borreguero et al., 2019; Wegner et al., 2014). Subsequently, incorporating practical elements (i.e., a lab visit, or study observation) can provide an engaging change from these more demanding sessions (Felder & Brent, 2024) and demonstrate how scientific research is conducted at universities. Furthermore, integrating theoretical and practical elements also improves subject knowledge and positivity among students (Núñez et al., 2023). Hosts can design these sessions can be complementary to one another. For example, one may choose to run a practical session where the students observe a brain scan following a workshop where the students learn about neuroanatomy and neuropsychology. Students can therefore see how the information learned in lectures at university are practically implemented in their course, making it more appealing and exciting for them to pursue higher education. Most placement students do not have prior experience participating in research or a science experiment outside of school (in2science, 2024). Practical sessions are therefore often a highlight of the placement for students, and provide hands-on experience with scientific research.

Reflecting the specific fields of experimental psychology and cognitive neuroscience, our placements collectively feature several workshops where students analyse data, create a behavioural experiment, and learn human neuroanatomy. In addition to these projects, we complementarily run practical sessions where the students observe magnetic resonance imaging and electroencephalography (MRI/EEG) studies. However, with practical sessions, it is vital for the host lab to complete the appropriate administrative forms e.g., Health and Safety, Insurance, as well as any specific additional screening with the students beforehand. For example, to observe an MRI study, students must firstly complete an access screening form deeming them safe to enter the MRI Control Room. Hosts, if unsure whether their students can participate in a practical session, should always consult their Principal Investigator (PI) as well as the health and safety or lab representative at the department.

Involve other labs

Whilst the students spend most of their time in their primary hosting laboratory, hosts can broaden the students' academic perspectives by encouraging engagement beyond their own. Extending student involvement across multiple labs in this way allows them to explore diverse research topics and methodologies, a common approach for maintaining interest in STEM subjects (Anderson & Li, 2020; Felder & Brent, 2024). Depending on the length of the placement, students can benefit from participating in lab meetings and conversations with academics from diverse fields, activities likely to help them improve their understanding of underlying theories and concepts (Linn et al., 2015). For instance, students could engage with a secondary lab with a focus on clinical psychology in a complementary field to the primary research focus of cognitive neuroscience. This illustrates the growing importance of interdisciplinary research, demonstrating the vast applications of scientific principles across domains.

Practically connecting research to its real-world applications is also crucial. The students may not have a specific focus on scientific research initially, often driven by curiosity or interest in exploring open-ended questions. However, during their lab experience, students can learn how research has practical applications that impact daily life, making the subject more relevant and interesting. Examples from our own experience include learning about studies which use MRI with Ecological Momentary Assessments (EMA) to understand adolescent behaviour and using EEG to understand the effect of specific foods/diets on brain activity. By illustrating these connections between the ‘real-world’ and scientific research, students are better able to appreciate the relevance of scientific inquiry beyond the academic setting.

Concluding a placement and getting feedback

It is commonplace for students to work on a project throughout their placement, to be presented to at its conclusion. This is commonly by delivering a presentation or writing a report (in2science, 2024). Whilst not strictly necessary, we strongly support doing so, as students learn important communication and writing skills required for higher education (Grangeat et al., 2021). However, the hosts should explicitly communicate that any presentation/assessment will be conducted in a relaxed environment, as students may be nervous presenting to postgraduate students and

senior faculty. Any feedback should be framed positively (“You presented really well, but to make it even better you could … “) to improve the student’s presentation and communication skills (Stuart, 2013).

At the placement’s conclusion, it is important to hold a debrief session with the students to review and celebrate what they have achieved. They are often surprised to see what they have been able to accomplish! Positive feedback also enhances students' sense of belonging and self-efficacy in the subject, leading to improved interest in STEM fields (Park et al., 2024). Equally, students can discuss whether they gained insight on career paths they want to pursue, and if they have increased confidence for their university applications. These represent key objectives and are commonly reported benefits of university placements from the students’ perspective (in2science, 2024). By providing feedback on key outcomes, and reflecting on what they enjoyed the most and the least, hosts can also make future placements more enjoyable and beneficial for the students.

Sharing materials

Hosts may not have the previous experience in teaching or organising placements and may find it difficult developing the required materials. Therefore, we advocate publicly sharing placement materials (e.g., GitHub or Zenodo), which allow for others less experienced to use directly if covering a similar topic, or as a template when creating their own materials. Sharing one’s materials also confers many rewards, building one’s portfolio and showcasing teaching and mentoring skills to potential employers. This reflects the ever-increasing practice of open science within (psychological) research (Open Science Collaboration, 2015), which psychology students may not be familiar with (Beaudry et al., 2024). It is therefore important to instil such practices for students involved with running the placement.

To this end, we share a key component of our placement materials, where students are tasked with analysing a simple dataset, creating plots in R and hosting the results on a webpage (https://github.com/sohaamir/placement_materials). These materials have been refined over the course of multiple placements, both to expand the content and skills learned, and in response to student feedback. We encourage

others to not only use these resources but also to contribute their own materials, fostering a growing repository of diverse content.

Conclusion

Hosting a school student placement is mutually valuable and beneficial for both researchers and students. The guidelines outlined in this article collectively emphasize the importance of careful planning, student-centred teaching approaches, and the value of practical demonstrations in making a placement accessible and engaging. Intended to reflect the personal opinions and practices of the authors, this article aims to encourage and facilitate hosting placement students, though it is more advisable to collect empirical data from the students' perspective when running future placements. We therefore advise others to flexibly integrate our suggestions with their own according to the specific circumstances and individual needs of the placement. We ultimately aim to subsequently encourage more universities and labs to host school students, emphasizing their importance, particularly for students from disadvantaged backgrounds. Doing so can ultimately provide opportunities for new perspectives on your lab, offer a valuable way of outreach to the public, and contribute to nurturing the next generation of scientists.

References

Anderson, J. R., & Crawford, J. (1995). Cognitive psychology and its implications.

Anderson, J., & Li, Y. (2020). Integrated approaches to STEM education. *An International Perspective, Springer Nature*.

Atherton, G. (2024). Universities not for everyone: levelling up and who is missing out on higher education in England. National Education Opportunities Network (NEON).

Banks, F., & Barlex, D. (2020). *Teaching STEM in the secondary school: Helping teachers meet the challenge*. Routledge.

Beaudry, J. L., Williams, M. N., Philipp, M. C., & Kothe, E. J. (2024). What do incoming university students believe about open science practices in psychology? Teaching of Psychology, 51(3), 269-276.

Bolton, P., & Lewis, J. (2024). Equality of access and outcomes in higher education in England (Research Briefing CBP-9195). House of Commons Library.

Felder, R. M., & Brent, R. (2024). *Teaching and learning STEM: A practical guide*. John Wiley & Sons.

Gentile, J., Brenner, K., & Stephens, A. (2017). Undergraduate Research Experiences for STEM Students: Successes. Challenges and Opportunities, 69-96.

Grangeat, M., Harrison, C., & Dolin, J. (2021). Exploring assessment in STEM inquiry learning classrooms. *International Journal of Science Education*, *43*(3), 345-361.

In2scienceUK. (2023). Summer Programme Impact Report 2023: Promoting Social Mobility and Diversity in STEM. In2scienceUK.

In2scienceUK. (2024). 2024 Programme Impact. In2scienceUK. Retrieved April 19, 2025, from https://in2scienceuk.org/wp-content/uploads/2024/12/In2STEM-2024-impact-data-report.pdf

Lescak, E. A., O'Neill, K. M., Collu, G. M., & Das, S. (2019). Ten simple rules for providing a meaningful research experience to high school students. PLOS Computational Biology, 15(4), e1006920.

Linn, M. C., Palmer, E., Baranger, A., Gerard, E., & Stone, E. (2015). Undergraduate research experiences: Impacts and opportunities. *Science*, *347*(6222), 1261757.

Martinez-Borreguero, G., Mateos-Nuñez, M., & Naranjo-Correa, F. L. (2019). Analysis of the emotions of secondary school students in stem areas. In *EDULEARN19 Proceedings* (pp. 724-733). IATED.

Núñez, M. M., & Borreguero, G. M. (2023). Design and Implementation of Practical Workshops for Teaching STEM Content: Analysis of Cognitive and Emotional Variables. In *Handbook of Research on Interdisciplinarity Between Science and Mathematics in Education* (pp. 131-148). IGI Global.

Ogbaekirigwe, C. O., Ubah, I. M., Azubuike, A. S., Igwe, U. A., & Okolie, U. C. (2025). Understanding the motivational predictors of students' persistence in work placement learning tasks. *Education+ Training*, *67*(1), 37-55.

Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science*, *349*(6251), aac4716.

Park, L. E., Ward, D. E., Moore-Russo, D., Rickard, B., Vessels, V., & Hundley, J. (2024). Positive Feedback as a Lever to Boost Students' STEM Outcomes. *Personality and Social Psychology Bulletin*, 01461672241265954.

Sohail, A., & Zhang, L. (2024). Informing the treatment of social anxiety disorder with computational and neuroimaging data. Psychoradiology, kkae010.

STEM Learning. Evaluation of the 2021/22 Nuffield Research Placements cycle. (2022).

Stuart, A. E. (2013). Engaging the audience: developing presentation skills in science students. *Journal of Undergraduate Neuroscience Education*, *12*(1), A4.

The Sutton Trust. (2024). Our Impact. Retrieved January 20, 2024, from https://summerschools.suttontrust.com/our-impact/

Torgerson, C., Gascoine, L., Heaps, C., Menzies, V., & Younger, K. (2014). Higher Education access: Evidence of effectiveness of university access strategies and approaches. Durham University.

UCAS. (2016). Through the lens of students: how perceptions of higher education influence applicants' choices. UCAS.

Wegner, C., Strehlke, F., & Weber, P. (2014). Investigating the differences between girls and boys regarding the factors of frustration, boredom and insecurity they experience during science lessons. *Themes in science and technology education*, *7*(1), 35-45.