Undergraduate Research in Medicine

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Introduction

Undergraduate research is gaining recognition as a way of enhancing medical students' skills and attitudes necessary for future professional practice[1]. By partaking in this student-centered method of education, students learn to critically evaluate information, communicate and disseminate their results, and practice evidence-based medicine. In addition, at a time when investigators report a decrease in physicians' engagement in research[2], medical school research experience is strongly associated with postgraduate research involvement[3].

To support students in developing these life-long learning skills, and to cultivate a new generation of physician researchers, undergraduate research is increasingly promoted in medical schools internationally. NUI Galway School of Medicine runs an active undergraduate research programme in which students voluntarily undertake research projects on an extracurricular basis during the summer. Projects are typically eight weeks in length and may be laboratory-based or clinical in nature.

Aim

The aims of this project were twofold: to investigate the impact the programme has on students and to determine how to optimise the programme for future students.

Methods

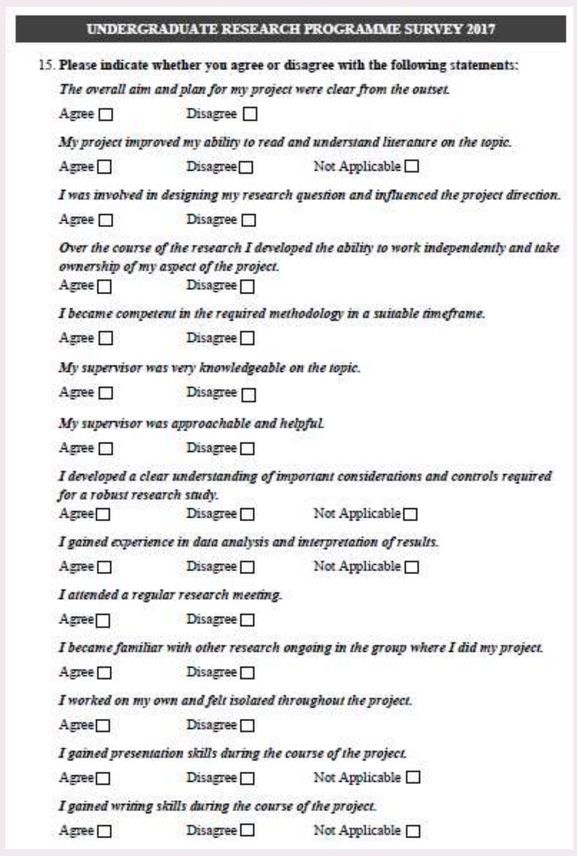
Two methods were used to generate feedback from undergraduate research programme student participants (n = 71).

Survey

A survey was developed and handed out at several scheduled programme workshops. The survey was also sent by email to students who conducted their research project in the academies or were otherwise unable to attend the workshops. The survey questions *(fig. 1)* were generated based on a review of relevant literature and asked students about:

- Demographics
- Funding
- How they learned about the programme
- Motivations for applying
- Past research experience
- Skills gained
- Positive and negative experiences throughout the programme
- Suggestions to improve the programme

The data were analysed in Excel.



UNDERGRADUATE RESEARCH PROGRAMME SURVEY 2017

15. Please indicate whether you agree or disagree with the following statements:

The overall aim and plan for my project were clear from the outset.
Agree ☐ Disagree ☐

My project improved my ability to read and understand literature on the topic.
Agree ☐ Disagree ☐ Not Applicable ☐

I was involved in designing my research question and influenced the project direction.
Agree ☐ Disagree ☐

Over the course of the research I developed the ability to work independently and take ownership of my aspect of the project.
Agree ☐ Disagree ☐

I became competent in the required methodology in a suitable timeframe.
Agree ☐ Disagree ☐

My supervisor was very knowledgeable on the topic.
Agree ☐ Disagree ☐

My supervisor was approachable and helpful.
Agree ☐ Disagree ☐

I developed a clear understanding of important considerations and controls required for a robust research study.
Agree ☐ Disagree ☐ Not Applicable ☐

I gained experience in data analysis and interpretation of results.
Agree ☐ Disagree ☐ Not Applicable ☐

I attended a regular research meeting.
Agree ☐ Disagree ☐

I became familiar with other research ongoing in the group where I did my project.
Agree ☐ Disagree ☐

I worked on my own and felt isolated throughout the project.
Agree ☐ Disagree ☐

I gained presentation skills during the course of the project.
Agree ☐ Disagree ☐ Not Applicable ☐

I gained writing skills during the course of the project.
Agree ☐ Disagree ☐ Not Applicable ☐

Fig. 1. Sample of the survey questions

Group Interviews

Students were recruited for group interviews through email and by announcements at the workshops. Similar issues to those investigated in the survey were discussed, but in greater depth. Transcripts of the interviews were produced based on note-taking by the interviewer and a colleague. A content analysis approach was used to identify recurring themes in the transcripts.

Student participation in both the survey and the group interviews was voluntary and all information received was treated in a confidential manner.

Results

Demographics

38 students completed the survey, representing a 54% response rate. 23 students (61%) were female and 20 (53%) were entering their third year of study. 21 students (55%) undertook a clinical project, while the remaining 17 (45%) performed a laboratory-based project.

18 students (50%) learned about the programme from classmates/friends, with School of Medicine emails being the second most common (32%) source of information.

Motivating factors

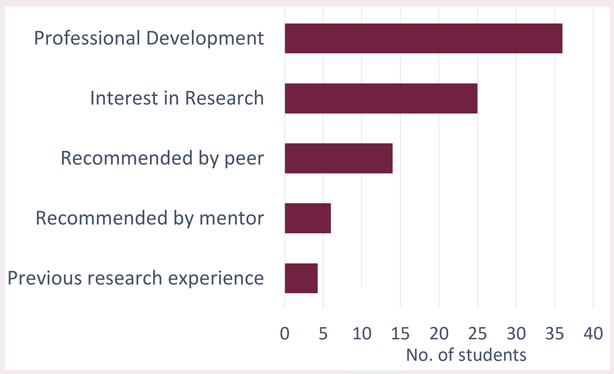


Fig. 2. Student response when asked "What motivated you to apply for a research project?"

36 students (95%) cited professional development as motivation for applying to the programme *(fig. 2)*, with interest in research being the second most common motivating factor (25 students, 66%).

Funding

32 students (87%) applied externally for funding. 36 students reported their ultimate source of funding, with 12 (33%) projects funded by Wellcome Trust and 4 (11%) funded by the HRB *(fig. 3)*. The School of Medicine funded 13 projects, while five of the remaining students received no funding.

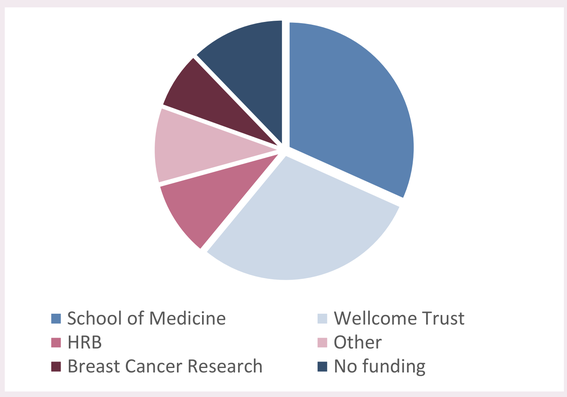


Fig. 3. Funding sources for students' projects

Skills gained

36 students (95%) agreed that they developed the ability to work independently, and 35 (92%) improved their ability to read scientific literature . Fewer students reported gaining writing skills (61%) and presentation skills (41%).

Positive and negative experiences

A large majority of students reported multiple positive aspects to their research experience. 34 (89%) students agreed with each of the statements that they learned about research processes, gained skills specific to their research area, and developed a relationship with their team *(fig. 4)*. A smaller number of students reported negative aspects to their research experience, with the most common negative aspect, lack of supervision, selected by 11 students (29%). 37 students (97%) agreed that they would recommend a research project to their peers.

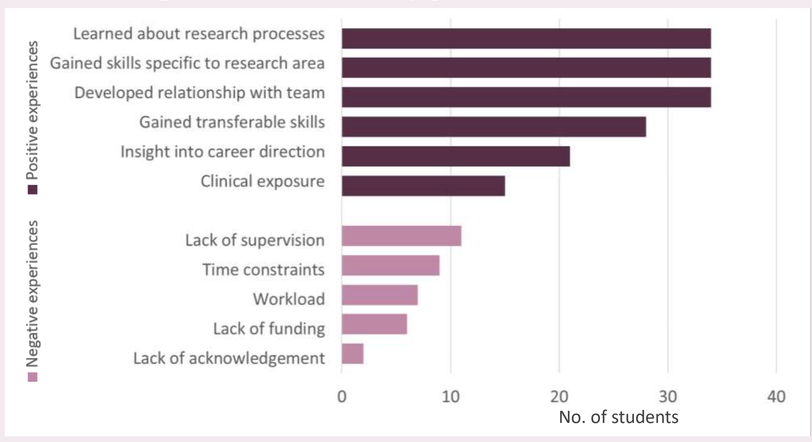


Fig. 4. Positive and negative aspects of students' research experiences

A subgroup of 14 students participated in the group interviews across two interview sessions. Suggestions to improve the programme that were common to both sessions included the setting up of social media groups and biweekly meetings for all students participating in the programme, to reduce the isolation experienced by some.

Conclusion

Overall, the data obtained from the survey and interviews are very positive. It was particularly encouraging to see that 97% of students would recommend research to their peers. Furthermore, incremental changes made to the programme over the past number of years were noted to have been positively received. Students play an important role in shaping the undergraduate research programme and will continue to do so as changes based on this work are implemented.

There were a number of limitations to this study. While the response rate of 54% is comparable to similar studies, results may not be representative of the entire undergraduate research programme population, with students who carried out their projects in the academies particularly underrepresented. As participation was voluntary, students with a positive experience may have been more likely to respond. In addition, the nature of this type of study based on self-reporting of experiences introduces the possibility of bias based on students' own perceptions.

As few students had past research experience, and at the time of the study students had not yet completed their projects, data relating to research outcomes was very limited. Further study is ongoing to interview past participants of the programme to better understand the longer-term impact of undergraduate research.

References

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