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What impact does teaching in outreach activities have on medical students' own learning and teaching skills? A pilot study

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Abstract Widening Participation outreach activities in United Kingdom medical schools aim to build aspirations and support progression to medicine for those from under-represented groups. Medical student ambassadors (SAs) deliver much of the outreach work, but there is a paucity of literature to show evidence that it benefits their own studies. This quick glance, mixed methods questionnaire study aimed to elicit the perceived benefits for SAs in terms of improving knowledge, skills and attitudes in their course. 14 SAs in two medical schools completed the anonymised online questionnaire. They reported that the work improved their own learning, with increased knowledge in different subject areas, as well as improved their teaching skills and self-confidence. The authors plan to follow up these findings with a mixed method, multi-centre study to look for objective improvement in assessments for SAs.

Key words Widening Participation; outreach; medicine; access; student ambassadors; student development

Introduction

Widening Participation (WP) outreach activities in universities in the United Kingdom aim to build aspirations and support progression to university. This is to redress inequalities and familiarise students from a wide variety of under-represented social groups with higher education. The most under-represented groups include looked-after children, people from families with no experience of higher education, and those from working-class backgrounds or low-participation neighbourhoods.

Both Hull York Medical School (HYMS) and University of Manchester Medical School (UoM) organise a variety of WP activities to support pupils from schools in their respective regions to get into medical school. These pupils range in age from 10 to

17. The WP portfolio of activities align to the pedagogical practices at HYMS, utilising an integrated approach closely linked to the curriculum. Activities follow a case-based or problem-based learning approach, with opportunities for physiology and clinical skills related activities. Outreach activities vary, ranging from SAs teaching use of Electrocardiographs and spirometry, as well as clinical skills, such as reflexes and taking blood pressure. Other workshops cover problem-based learning (PBL) cases on clinical topics to give students insight into learning in medical school. SAs deliver different activities to pupils from Year 7 to Year 12, and so their individual experiences vary. UoM also has an integrated medical programme but their WP activities do not directly align to the medical curriculum. Activities tend to be all day events, comprising of inspiring talks and workshops, which all students get to experience. Workshops include those covering communication skills and ethics discussions, as well as practical skills in checking blood pressure, listening to the chest, and performing urine dipstick testing. UoM SAs deliver different activities to different age groups, and so their experiences are different as well.

Medical student ambassadors (SAs) facilitate WP programmes. Ylonen (2010) looked at student motivation to becoming an SA. They identified the experience of being a mentor, financial rewards and the chance to develop their CV, as motivators. In a subsequent study, students mentioned altruism and the chance to improve self-confidence, communication skills and their teaching ability (Ylonen, 2012). In a report for the Higher Education Academy, Sanders and Higham (2012) reviewed the current literature on the role of higher education students in widening access, retention and success. Some benefits highlighted by students included the acquisition of transferrable skills from undertaking WP work.

HYMS and UoM regularly recruit and remunerate medical students from all years of the programme to act as SAs to deliver their WP activities. HYMS allocate their SAs to pre-planned outreach activities that cover the curriculum themes. UoM has a less structured approach, with activities created by staff and students independent of the curriculum. This links closer to Altermann et al. (2016), where the students in their study designed and delivered their own outreach activities.

Aims and objectives

There is a paucity of literature on the impact on learning for medical students undertaking teaching in outreach activities. Anecdotal conversations with SAs had highlighted benefits to their own knowledge, understanding and skills. This quick glance two-centre study aimed to clarify these perceived benefits and discover how widespread they are.

Methods

This study used a mixed methods approach for which both contributing institutions received ethical approval. A questionnaire developed from that used by Altermann et al. (2016) and based on the principles of questionnaire design defined by Artino et al. (2014). This looked at student perceptions of the impact of their participation as SAs on their knowledge, skills and understanding of the applied life sciences, psychosocial medicine, clinical skills and teaching skills. All SAs in role between 2015 and 2017 received email invitations to participate in the study. Consenting participants received a link to complete the online questionnaire.

The questionnaire contained two open and six closed items (Appendix 1). The closed questions were a mixture of Yes/No and Likert scores. The final two questions required a free text response. The Qualtrics software automatically captured and collated the data for HYMS, with the select survey software collating for UoM. The authors collated the quantitative data and thematically analysed the free text comments.

Results

13 out of 130 HYMS SAs participated in this study and one out of 15 UoM SAs. The results show the findings for each of the questions in the questionnaire.

Table 1 suggests that the activities benefited the SAs in their overall learning (93%). The majority of students (79%) agreed that facilitating the sessions had helped to improve their life science knowledge. However, only half agreed that their understanding of psychosocial medicine had improved.

Table 1: Table to show the results from the closed True/False questions.

	Yes (%)	No (%)
Question 1: Considering the outreach activities you have participated in overall; do you consider it to have benefitted your own learning?	92.85	7.15
Question 2: Did you think that the outreach activities you participated in improved your knowledge and understanding of the applied life sciences?	78.5	21.5
Question 3: Did you think that the outreach activities you participated in improved your knowledge and understanding of psychosocial medicine?	50	50

Figure 1 shows that 14% of the respondents found the outreach activities were very useful, with 57% moderately useful and 28% reporting it was slightly useful for developing their clinical reasoning and clinical skills.

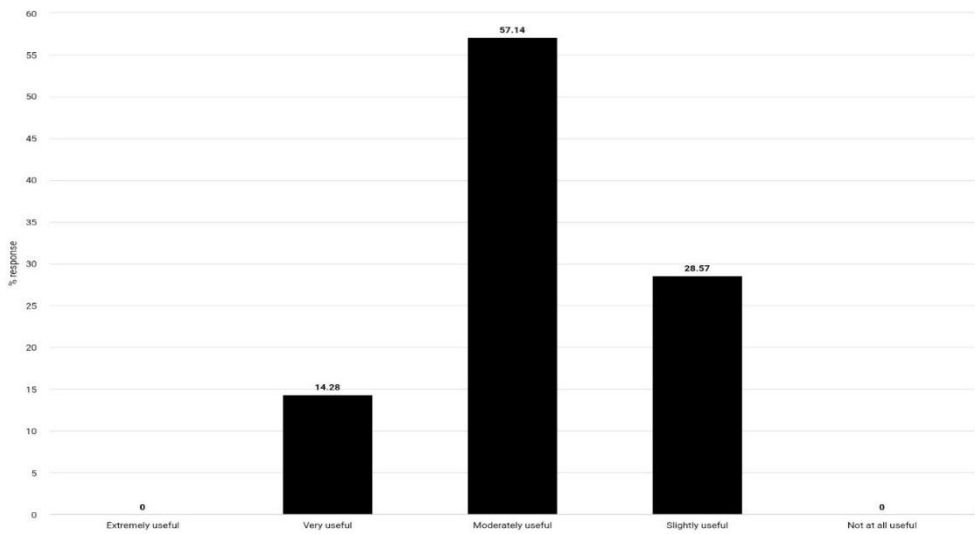


Figure 1: The students’ perception of the impact of outreach activities on developing clinical reasoning and clinical skills.

Figure 2 shows that all SAs found the experience helped improve their teaching skills, with approximately 86% finding the experience extremely or very useful.

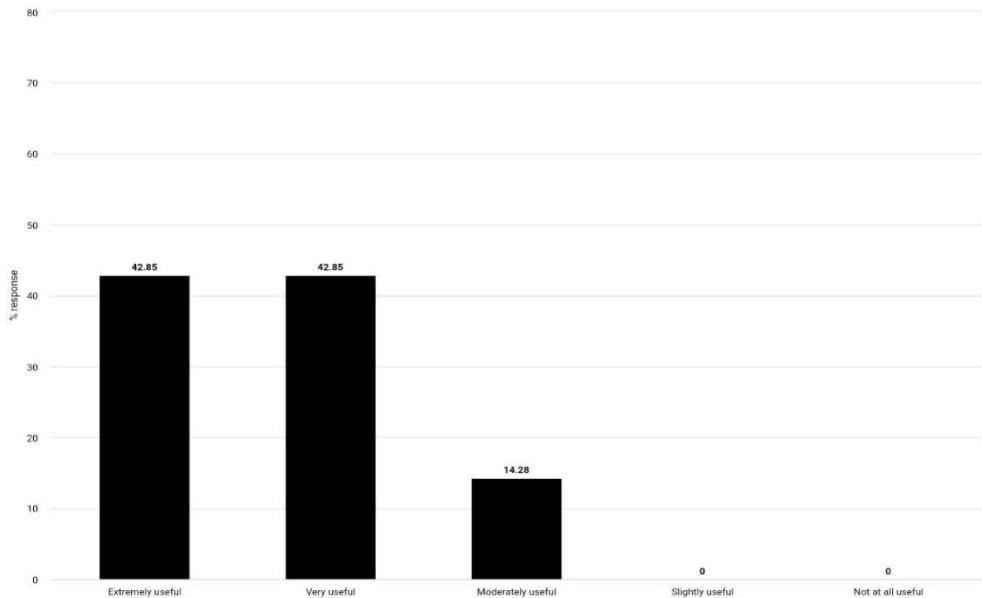


Figure 2: The students’ perception of the impact of outreach activities on developing teaching skills.

Figure 3 shows that almost all SAs (93%) perceived that their role in facilitating WP activities had been extremely or very useful in improving their self-confidence.

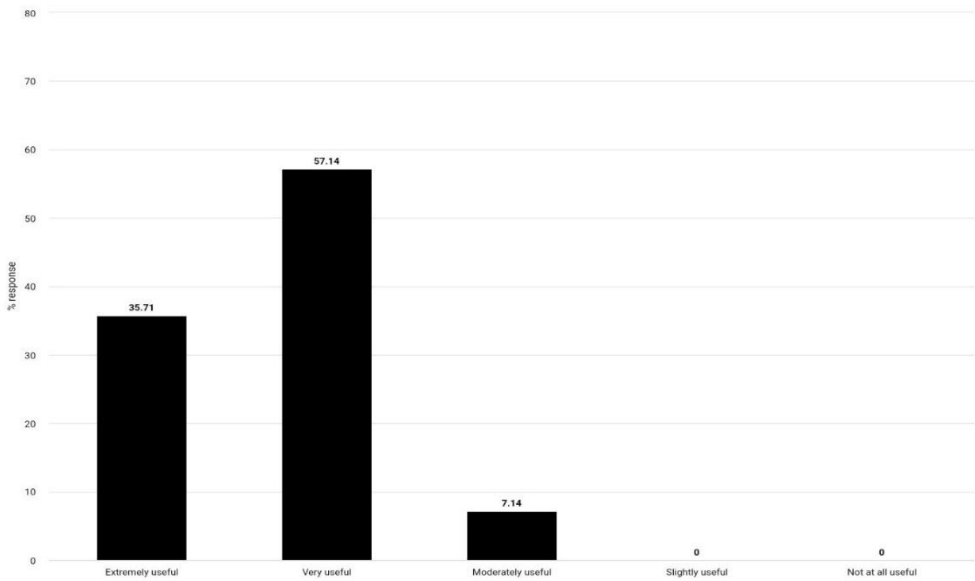


Figure 3: The students’ perception of the impact of outreach activities on increasing their own self-confidence

Thematic analysis of open questions

SAs answered open-ended survey questions related to the perceived impact of conducting outreach activities on their own learning, and the main reasons for becoming an SA. All qualitative comments came from HYMS SAs.

In terms of the perceived impact on learning, improved active learning and understanding emerged as dominant themes, exemplified in the following quote:

... Improves my ability to explain concepts of anatomy, physiology, pharmacology, pathology, and how this links to patient presentation. I find I can recall knowledge best when actively explaining concepts to peers or students. (SA, n=5)

In addition to improved academic knowledge, several students also referred to the positive effect on professional skills such as time management and leadership skills:

... Helped me time manage and also effectively get things across to a group. (SA)

... It helped with my Leadership skills. (SA)

In terms of motivation for outreach, common themes emerged of financial gain, enjoying the work, and inspiring and helping others. SAs responded with comments such as,

- ... The financial rewards (SA)
- ... The enjoyment of teaching (SA)
- ... Inspiring younger students to apply to medicine. (SA)

Interestingly, none of the respondents reported that they became SAs to improve their own learning, skills and confidence.

Discussion

The aim of this quick glance study was to gain an insight into whether the participation of medical students as SAs in outreach activities improved their own perceived learning. From the questionnaire, nearly all SAs felt that their participation did improve their own learning. The majority of students perceived that their knowledge of applied sciences had improved, and the activities were moderately useful for improving clinical skills and reasoning. Altermann et al. (2016) support this observation, finding that undergraduate students running outreach activities to secondary school pupils and the public report an improvement in their understanding and learning of physiology. Da Silva de Vargas et al. (2016) also found a similar picture, with undergraduate students involved in secondary school teaching becoming more comfortable with the subject matter that they were teaching. However, there was a split in opinion as to whether knowledge of psychosocial medicine improved because of the outreach work. These responses most likely reflected the nature of the outreach activities, mainly focused on biomedical topics rather than psychosocial ones. In addition, the positive responses of some of the students could reflect the stage of their undergraduate study. Those in later stages would have acquired more in-depth understanding of the psychosocial aspects of medicine in comparison to those at the beginning of their studies. The majority of students felt that the work was extremely or very useful for improving their teaching skills and self-confidence. This is in accordance with a number of studies (Khalid et al., 2018; Thompson et al., 2002).

There are now opportunities in medical programmes for students to undertake near-peer teaching and begin to develop their teaching skills. Bulte et al. (2007) found that an outdoor near-peer medical student tutor project provided developmental benefits to both tutors and learners. Studies also suggest that

students who engage in teaching activities may have a greater retention and understanding of the material they teach (Jackson and Evans, 2012; Nelson et al., 2013). The development of communication and interpersonal skills in teaching enables the SAs to achieve some of the requirements stated in the General Medical Council's Outcomes for Graduates (General Medical Council, 2018). This also highlights the need to apply biomedical and psychosocial principles, which the WP work enables SAs to do.

In many medical schools, the chances for students to undertake any teaching is still limited, and any prospects for students to deliver teaching is to be encouraged. Bugaj et al. (2019) reported that in a peer-assisted learning study, student tutors felt that their clinical skills as well as self-confidence had improved because of their role as tutors. Our results for both of these topics concur with this work. The free text responses of the students suggested that undertaking roles as an SA helped with their leadership skills, their enjoyment of teaching, and provided financial rewards. These findings are also reported by Ylonen (2010; 2012), Green (2018), and Sanders and Higham (2012). This 'quick glance' study suggests that undertaking outreach activities as an SA improves the students' perceived knowledge of key components of the medical curriculum, as well as indicating a professed improvement of both their teaching skills and self-confidence.

Limitations

A key limitation of the pilot study was that it focused on perceived improvements for the SAs. It would have been helpful to explore quantitative evidence of improvement through evaluation of SA exam scores before and after the outreach work to assess for significant improvement. Although the study was a scoping exercise, there was an uneven distribution in participation between the two centres, with a poorer response from the UoM cohort. It would be beneficial to repeat the study, improving number of respondents by contacting all students who have acted as SAs. A possible reason for the poor response rate was the timing of the distribution of the questionnaire, which occurred close to summative assessments, when SAs were revising. This study was an initial scoping exercise to gain an insight into the

students' perceived benefits of undertaking outreach activities. A larger, multi-centred, mixed methods study using assessment data and focus groups or one-to-one interviews will follow. This will confirm the benefits of leading outreach activities and provide richer data regarding how working as an SA influences academic and professional development. This larger study has the support of the National Medical Schools Widening Participation Forum, a collaborative organisation of 24 medical schools and other voluntary organisations. All three authors represent their respective institutions in this forum.

Conclusion

This 'quick glance' study looked at the impact of outreach work on medical studies, as perceived by student ambassadors. Students reported that it improved their own learning, with increased knowledge in different subject areas, as well as improving teaching and self-confidence. We are planning a larger multi-centred, mixed-methods study to determine whether a wider cohort of students report similar benefits of the work. We also aim to obtain richer qualitative data on the students' perceived personal development. Evidence of wider benefits could have implications for healthcare curricular development and incentivise student involvement in outreach and programme linked training.

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Appendix 1

Online questionnaire

	Possible answers
Question 1. Considering the outreach activities you have participated in, overall, do you consider them to have benefitted your own learning?	Yes/No
Question 2. Did you think that the outreach activities you participated in improved your knowledge and understanding of the applied life sciences?	Yes/No
Question 3. Did you think that the outreach activities you participated in improved your knowledge and understanding of psychosocial medicine?	Yes/No
Question 4. How useful do you consider participation in these outreach activities to have been to your own knowledge of clinical skills and reasoning?	1-5
Question 5. How useful do you consider participation in these outreach activities to have been to the development of your own teaching skills?	1-5
Question 6. How valuable has your participation as an outreach ambassador been to your own self-confidence?	1-5
Question 7. In what ways has your role as an ambassador impacted on your own learning?	Free text responses
Question 8. What are the main reasons for you agreeing to participate as an ambassador in outreach activities?	Free text responses