
Article

Our Health: exploring interdisciplinarity and community-based participatory research in a higher education science shop

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Submission date: 29 June 2021; Acceptance date: 20 June 2022; Publication date: 31 August 2022

How to cite

Gilchrist, L., Willis, A. and Szoor-McElhinney, H. (2022) 'Our Health: exploring interdisciplinarity and community-based participatory research in a higher education science shop'. *Research for All*, 6 (1), 18. DOI: <https://doi.org/10.14324/RFA.06.1.18>.

Peer review

This article has been peer-reviewed through the journal's standard double-anonymous peer review, where both the reviewers and authors are anonymised during review.

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Open access

Research for All is a peer-reviewed open-access journal.

Abstract

This paper presents a qualitative case study of the experiences of student and community partners involved in collaborative health research in the context of an extra-curricular higher education science shop: Our Health. Our Health community partners set research questions around health and well-being, and conduct research with interdisciplinary groups of students using a community-based participatory research model. Our case study explores the benefits and challenges that this approach raises for students and community partners as they navigate the complexities of stepping beyond disciplinary boundaries and relationships to develop new research insights and methodologies. This qualitative case study draws on: grounded theory to analyse online focus groups with participating undergraduate students and community partners; semi-structured interviews with graduate students and key university staff members; and online project meetings. For the latter, we used non-participant observation to observe community members and students at work in online meetings, co-creating evolving knowledge around the lived experiences of health issues. Through these methods, we developed a deeper understanding of the relational modes of community–student collaboration in community-based participatory research. Our findings demonstrate the key role played by interdisciplinarity in the

context of a community-based participatory research approach in enabling students and community partners to develop their intrapersonal skills, health research skills and knowledge integration skills, while strengthening connections between the academy and wider communities.

Keywords interdisciplinary; community-based participatory research; undergraduate students; health; responsible research and innovation

Key messages

- Taking an interdisciplinary approach can enrich community-based participatory research for higher education and community partners.
- Working in student teams across disciplines and levels of study, while enriching learning, can create challenges, including around timetabling, student turnover, project ownership and community partners' desire for continuity.
- Community-based participatory research that includes undergraduate students on health-related topics provides many benefits to all participants, including improvements to health research skills and knowledge integration skills.

Background

This paper reports on research into the experiences of participants on the Engineering and Physical Sciences Research Council (EPSRC) Our Health (OH) programme, based at the University of Edinburgh, which operates as a small-scale (~40 students per year), process-based science shop (Urias et al., 2020) integrating responsible research innovation (RRI) and community-based participatory research (CBPR) principles. OH operates at the interface of interdisciplinary health research and society to ensure that the needs of citizens who will use and benefit from it are met. It specifically aims to reduce health inequalities by improving health research skills and knowledge within socio-economically disadvantaged communities.

Using an RRI/CBPR approach, OH creates extra-curricular projects which co-develop complex health-related research questions with community partners on topics that lack a substantive body of evidence or consensus. OH staff facilitate the formation of interdisciplinary research teams comprised of volunteers from community partner organisations and from undergraduate and postgraduate students. They are supported by a small (five) network of academics with expertise in health-related CBPR, and experience of working with colleagues from a range of disciplines.

CBPR is most commonly used in public health (Israel et al., 1998; Roussos and Fawcett, 2000), while patient and public involvement and engagement (PPIE, also known as PPI) is now required by most granting agencies funding biomedical and health service research (Shippee et al., 2013; Forsythe et al., 2018; Sheppard et al., 2021). Using elements of both approaches, OH facilitates collaborative research between the university and community-living vulnerable people with chronic and often complex health issues. The OH science shop model translates principles of RRI (Gresle et al., 2021) and CBPR into practice, democratising and enhancing research. The case studies presented here explore OH projects in which the following research questions were co-developed by students and two community partner organisations:

- How does the communication and interaction between patient and consultant, during the diagnosis process, affect long-term self-management of lived lung conditions? (CP1)
- How do the breathing techniques we use in our (community partner) singing practice impact our lung physiology and affect our symptoms of chronic obstructive pulmonary lung disease? (CP2)

Both projects have completed two of the four research phases: (1) development; and (2) conceptualisation. They are currently in the implementation phase (3), aiming towards the fourth and final stage, (4) translation (Gehlert and Browne, 2013).

The CP1 team draws on social science approaches and methodologies (surveys, focus groups, participant observation and journalling) to study the use of an assessment tool by health-care practitioners and outpatients at a respiratory clinic. It aims to better understand the relationship between diagnosis and newly formed patient identities, to improve long-term self-management of lung conditions.

The CP2 team works with bioengineering to design a novel handheld device to measure lung function parameters, and with cognitive psychology to measure changes in perceptions of symptoms in response to singing and involvement in CBPR. The methodologies include biosensor design and testing, experience-based design and storytelling.

Both projects rely on the subject knowledge and CBPR skills of OH academics to meet students and community partners 'where they are' in their knowledge and skillsets. OH staff assess any gaps and, with consent, recruit postgraduates or postdoctoral researchers to work with teams and take on any research activities that require knowledge and skills outside the capacities of the original teams.

OH is relatively unique in recruiting through a volunteering rather than a curricular route, which it does via the university's careers service, and in enabling students from all levels and any discipline to join extra-curricular CBPR projects. This approach to engagement is resource intensive, which is one of the main factors restricting OH's reach to approximately forty students per year. Strachan et al. (2019) outline the only programme discussed in the literature that is similar to the OH interdisciplinary approach. They also involve students across levels of study in 'research-based education'. However, they do not appear to involve community partners as active researchers.

University–community research approaches such as OH have been gaining traction since the turn of the century in response to the perception that the 'university' had separated itself from the community and become insensitive to the lived experience of people who live and work around it (Strand, 2003). Authors in CBPR (Israel et al., 1998; Roussos and Fawcett, 2000), PPIE (Forsythe et al., 2018; Shippee et al., 2013; Brett et al., 2014) and related engaged approaches such as Citizen Science (Laut et al., 2015) have demonstrated that working with community partners benefits the people and communities participating, while improving research, its dissemination and its impact. In relation to student benefits, authors have shown that experiential learning with the community complements and inspires students' core learning, as well as equipping them with the skills and knowledge required for a more active role in society, post-university (Southby, 2017; Khobzi and Flicker, 2010).

Approaches to democratising research such as the OH science shop are tasked with building and maintaining meaningful relationships with community groups outside the university, while simultaneously offering students relevant experiential learning opportunities. As our paper demonstrates, the decision to encourage students across the university, and from any disciplinary background, to engage with the OH science shop, and to work in mixed teams, has added to both the benefits and the challenges that participants face.

Context

In 2013, the EPSRC funded (£11 million) a large Interdisciplinary Research Collaboration (IRC), to design and develop novel medical technologies for improving health. The OH science shop was designed and piloted as part of the IRC's Public Engagement with Research strategy, using dedicated IRC funding. It has two part-time staff. It is located within the IRC, in a specific university faculty, and, as such, its operations are influenced by and highly dependent upon that particular context.

Similarly to the experiences of other science shops (Gresle et al., 2021), sustainability of OH has been a challenge. The IRC funding model is finite, limiting OH's capacity and expansion, and it is not sustainable long term. OH funds constantly need 'topping up', which is time consuming and deflects from the complex work of creating high-quality CBPR. The University of Edinburgh is a competitive, research-intensive institution with a strong track record of commercialisation and enterprise. It fosters an institutional environment and culture, similar to many high-profile universities operating across Europe (Fokkink and

Mulder, 2004), which has not always prioritised the democratisation of research. However, in recent years, there has been a shift towards balancing its commercial activity with its social responsibility and sustainability agenda. The University of Edinburgh also has invested significant resources in strengthening interdisciplinarity. Undergraduates are offered interdisciplinary courses and training in interdisciplinary research skills. As a result, OH has benefited from a renewed interest from senior management teams in how its interdisciplinary CBPR processes and outputs may benefit the overarching strategy of the institution, rather than just a single faculty.

The IRC has a team of 30 health-related interdisciplinary researchers (principal investigators, postdoctoral researchers and PhD students) with extensive research, industrial and societal networks, which OH accesses to enhance its CBPR. OH enriches its training and supervision of interdisciplinary student teams and community partners by supporting a small group (six) of experienced IRC postdoctoral researchers and PhD students to deliver workshops that explore the conceptual and practical application of interdisciplinary research and interactional practice. The student teams also complete 200 hours of training in research, knowledge and mindsets, including interdisciplinary research skills. The OH staff (including academic leads) have expertise in CBPR and deliver three CBPR workshops per year for students and community partners. These workshops support participants to improve their CBPR skills, but it is the 'learning while doing', the supported experiential learning aspect of the OH projects, which consolidates the principles and practice of CBPR.

OH takes an active role in the identification of health-related social issues, and uses IRC PPIE activities to select potential community partners with specific health-related interests for collaborative research. Initially, OH and prospective community partners enter into a research development phase where specific health issues and perspectives are shared, and research interests and needs are identified. This provides the starting point for potential research questions to emerge.

During the conceptualisation phase, OH, community partners, students and the network of CBPR academics and IRC researchers explore the emergent research questions and invite a multi-stakeholder group to assess the questions' validity, originality, interdisciplinarity and wider long-term impact. Once the research question has been developed, a research design that integrates interdisciplinary knowledge and methodologies is agreed, and then the execution of the planned research can begin (implementation phase).

By 2020, OH had been in operation for four years, and had worked with six different community groups: four local, and two recently developed partnerships in India. Desiring a clearer understanding of the challenges and benefits of this form of collaborative research, we sought funding to enable us (AW and HS-M) to explore the experiences of students and community partners. We were particularly interested to explore the interdisciplinary context.

Brush et al. (2019) suggest that flexible research processes are important in CBPR so that methodologies can be tailored to the research purpose, skills and interests of the community. The formation of interdisciplinary teams to enable flexibility was suggested over twenty years ago as good practice in CBPR by Israel et al. (1998). They observed that working with community partners involves complex methodologies, diverse skills and knowledge. Interdisciplinarity is important, because answering questions raised by community partners often transcends disciplines or local knowledge. An interdisciplinary approach allows for the sharing and integration of all available knowledge sets, and facilitates innovative and creative research. Strand (2003), in her overview of individual postgraduate research students' use of CBPR, suggests that it is important for students to step outside their disciplinary boundaries when working with community partners. While these and other authors advocate for interdisciplinarity, it is usually limited to within the social sciences, and does not embrace academics from significantly different disciplines. Science shops have also advocated for interdisciplinarity (Gresle et al., 2021); however, this tends to be limited to the sciences. In this paper, we focus on the dynamics of CBPR when working in an engaged way with community partners and mixed-level, interdisciplinary teams of students, including those from social science, medicine, biology and engineering backgrounds.

Methods

This case study is based on research carried out by the first author (LG), who was not involved in OH prior to taking on this project. Ethics approval was obtained from the Research Ethics Committee to which the second author (AW), who is the social sciences lead for OH, is affiliated at the University of Edinburgh. We followed university-approved practices for conducting research, obtaining informed consent from, and providing confidentiality to, all participants. The participants and the community group names are anonymised. Informed consent was obtained through recorded verbal agreement to a consent form at the beginning of participation. Participants obtained access to this form and an information sheet two weeks before joining the research. These documents were discussed at the beginning of involvement, and participants were given the opportunity to ask questions or opt out before confirming agreement.

The first author (LG) conducted a series of semi-structured focus group discussions (five), semi-structured interviews (four) and recorded remote meetings as part of a non-participant observation process (three). Focus group and interview questions can be seen in Box 1. All current and previous students, community partners (CPs) and academics directly involved in OH were invited to participate. In line with standard approaches to sampling in qualitative research, we were looking to maximise the diversity and breadth of experience, rather than sampling for statistical representativeness.

Of the 47 people who had participated in the OH programme: 22 agreed to participate, with 18 joining focus groups and interviews, and 7 involved in the meetings, which were recorded and observed by LG. Table 1 describes the characteristics of participants. Table 2 indicates the disciplinary fields of students. Table 3 provides the length of involvement with OH for students. These demographics are representative of participant level of study and college affiliation in OH overall.

All interviews, focus groups and non-participant observation data were transcribed. Data were analysed by LG using NVivo 12 software in line with grounded theory, where data were collected and analysed in repeated steps leading to the generation of theory and subsequent literature review (Glaser and Strauss, 2017).

Box 1: Interview and focus group questions (Source: © Liam Gilchrist)

Research-based learning and health research skills:

- How has your time with the Our Health programme developed your understanding of research?
- What barriers have you faced working on your research projects?
- How has your project influenced (**ST: your**) (**CP: group members'**) understanding of health?
- **CP:** How has your understanding of conducting research changed during your time with Our Health?
- **CP:** How has working on your project influenced your members' understanding of their own health issues?

Interdisciplinary and community-based learning:

- How did the academic diversity of students influence your collaboration?
- **ST:** How has your collaboration with community partners helped your research?
- **ST:** What do you think community partners have learnt from you?
- **CP:** What did you learn from working with students during your research?

Student learning:

- **ST:** How has the Our Health programme impacted your wider learning within the university?
- **ST:** How has Our Health impacted your understanding of what you can do with your degree after university?
- **CP:** In what ways do you think your collaboration has impacted students' learning?

Our Health programme:

- Thinking of the Our Health programme overall, what went well?
- How could the Our Health programme be improved in the future?

(**ST = Student question only; CP = Community partner question only**)

Table 1: Characteristics of Our Health participants and research participants (Source: Authors, 2022)

Participant type	Number of invited OH participants	Number of research participants
Undergraduate student	25	10
Postgraduate student	3	2
Community partner	12	7
Academic partner	7	3
Total participants	47	22

Table 2: Descriptions of student college and degree title (Source: Authors, 2022)

College of student participant	Degree title	Number of students
College of Science and Engineering	Electrical and Mechanical Engineering (BSc)	1
College of Medicine and Veterinary Medicine	Medical Sciences (BSc), Biomedical Sciences (BSc), Neuroscience (BSc)	8
College of Arts and Humanities	LLB Law (BSc), Medical Anthropology (MSc), PhD	3

Table 3: Length of student involvement with Our Health (Source: Authors, 2022)

Length of involvement with OH	Number of students
Less than 1 year	2
1–2 years	6
2+ years	4

The research that informs this paper included the perspectives of all six OH projects, including seven CP participants from four OH projects. For the remaining two OH projects, which are relatively new and involve global partners who could not participate in this study because of challenges related to COVID-19, academic staff partners were interviewed.

While data were collected and analysed from all six community partner groups, this paper focuses primarily on the experiences of two groups, distinguished as CP1 and CP2 (four CP, six student participants). OH has the longest relationship with these CPs, which it started working with in 2018, when the programme was launched. Therefore, there are both more students and participants to involve in our study, and these have a greater breadth of experiences to share than other projects. Group members in CP1 and CP2 have participated in research activities across development, conceptualisation and implementation phases with OH through research priority-setting meetings and workshops (development) and methodology co-design activities and engagement during community hall meetings with OH students and academics (conceptualisation). CP1 participated in data collection through surveys, focus groups and observational research in a clinical setting (implementation). CP2 group members have taken part in co-design of biosensors (implementation). The wider community group membership receives regular progress updates from those who have directly participated in research activities, and from OH students and academics attending community meetings. These community groups have many similarities, making comparisons more meaningful. Both are examples of community-led, membership-based, patient support groups consisting of members with a wide range of lung conditions. Both groups have local branches in several regions across Scotland. OH students have established relationships both with group leaders and with the wider membership.

Results

Overall benefits to community partners

Similarly to other projects engaging the public in research, OH community partners reported many benefits. Leaders from CP1 and CP2 reported that engaging in collaborative research through development, conceptualisation and implementation activities supported members in improving knowledge of their own health and wider health issues. Each noted improved understanding of research process and practice through participating in meetings and workshops supporting co-design of research methodologies, including survey and focus group design, development of an observational journaling tool (CP1) and co-design of a biosensor measuring lung capacity (CP2). Both felt research participation encouraged more active and independent involvement with participants' own health. This extended to group members who participated in data collection through focus groups and observational journaling with students in a clinical setting (CP1). Group leaders also perceived interest from members to further develop their understanding of health research over the course of the project.

The CP1 group leader observed that participation in research activities by members furthered engagement in their own health-care provision. During a community meeting with senior hospital staff, group members highlighted the impact of OH research involvement when raising concerns about the diagnostic process with senior clinicians, questioning perceived gatekeeping of health knowledge. These group members were involved in multiple OH research activities across project phases, including priority-setting meetings to support the development of a research question, methodology co-design activities and data collection. This group engagement with clinicians directly related to the CP1 OH research question.

Members of both groups who directly engaged with co-design of research methodologies, data collection and priority-setting meetings grew their confidence in sharing health and research knowledge with wider group members who had not directly participated. CBPR practice, including being empowered to set research questions, enabled them to engage in research that was seen as 'impactful', even to members of the wider group not present at the agenda-setting meetings.

Overall benefits to students

Students across all projects also reported benefits from engaging in collaborative research with community partners. OH enabled them to engage with communities not usually accessible to them. This provided students with an understanding of how their knowledge can be applied outside the university.

In focus groups and interviews, students and a CP member described students learning from community partners about health conditions and, importantly, about how community members experience health conditions.

Six physical/life science students differentiated between types of research, as working 'in a lab' and working 'with people'. All of these students valued the experience of researching with people, with several preferring it to lab work. Several students reported that they viewed experiential research with people as degree-relevant learning that was not covered by their programmes. Students felt that they gained employability skills, a better understanding of what they could do with their degree, further graduate opportunities and improved networking from OH participation. A graduate participant shared that OH research featured on their CV, and was asked about during a successful job interview.

Benefits related to interdisciplinarity

Across OH projects, students highlighted the interdisciplinary nature of their shared research with community partners. Several students from non-medical disciplines reported improvements to their understanding of health conditions, and explicitly viewed their learning through OH as interdisciplinary learning. Students reported sharing degree-specific and methodological knowledge across disciplines

in their groups. When describing scenarios which occurred during student research meetings, this interdisciplinarity was perceived to make important contributions to their learning by expanding their understanding and experience with different forms of research. Sharing their content knowledge, methodologies and 'outlooks' with other disciplines allowed students to consider solutions to research problems they otherwise may not have done. One student characterised the learning process as an iterative one, building knowledge of health and research from a range of disciplines, and then relating it back to their core discipline.

Students particularly appreciated learning about how the social sciences and life science approached problems, and gained an understanding of the differences within these broad categories. Their experience of working interdisciplinarily was so valued that some students asked for a greater range of disciplines in their group.

Challenges related to OH participation for community partners

Although there were many perceived benefits, which were consistently referred to across OH projects, interdisciplinary CBPR was also shown to be a challenging process. It is here that we turn explicitly to our two case studies: CP1 and CP2.

Despite their similarities, each group had a different view of their relationship to OH research. These differences can be traced back in part to their perspectives on interdisciplinarity and on research. The leader of CP1 agreed that they participated in a research process, but disagreed with the term 'research project' being used. CP1 also conceptualised the group's role as 'patient involvement to help the students more than we'. This came as a surprise to the OH Programme Lead, who conceptualised the work being done with both CPs as research projects, and with mutual benefit to all partners:

CP1 leader (focus group): Ours wasn't really a project ... I mean, although we are sort of analysing it as to how everybody feels about it ... we don't have an end project really in mind for it.

The leader of CP2 appeared more confident in their role as research partner, highlighting OH as a 'very collaborative approach', and valuing the uniqueness of the interdisciplinary model. Members of CP2 were observed during meetings actively making research decisions and setting tasks for students.

Later, in a focus group, the CP1 leader elaborated on their perception that OH research was not a project in a response to an open question about their wider views of the OH programme. The CP1 leader conceptualised their OH relationship as constituting several individual involvements. The CP1 leader felt this way because of discontinuities in their participation and students' intermittent involvement:

CP1 leader (focus group): Although we've been involved sort of for four years, we've been in and out ... because ours isn't a project, we don't have the follow-on until the next stage ... We've had students periodically in and out of meetings ... I think each time we do it, it's sort of an individual thing, it's not a sort of continuation.

Students from both groups, and from other OH projects, highlighted the challenges of continuous involvement around coursework, and would temporarily disengage with their project and stop organising meetings around exam periods. This was highlighted in two of the meetings included in the non-participant observation. Students specifically brought up difference in exam schedules and coursework submission as a challenge for an interdisciplinary team. Scheduling was mentioned as less of an issue for groups from similar courses and years of study. Students organised project meetings during lunch breaks and in the evening to manage their OH research around university commitments:

CP2 leader (non-participant observation): Are your timetables similar?

Engineering undergraduate: Not at all, but I'll make it work. I've got coursework already due for tomorrow, I'll just make it work.

Student involvement was also impacted by students leaving OH or university. As OH projects increase in length, some student turnover becomes inevitable. Not only did new students join existing teams, but they also introduced new disciplinary insights and approaches to those teams from their core degree programmes. The experience and impact of this was contrasted by the two community groups. The CP1 leader highlighted that 'different students' joining OH had 'different approaches', which they viewed as a challenge. The CP2 leader, who did not highlight continuity or interdisciplinarity as challenges, perceived that new students 'pick[ed] up where the other group left off', and did not 'disrupt the dynamics of the group'.

We know from context that the changes to students in CP1 changed the disciplinary balance, with a social scientist postgraduate joining for one year then leaving. CP2 retained several students from the beginning of their collaboration with OH, and new students who joined were more disciplinarily similar to the previous student demographic.

Turnover in community group membership was also mentioned. The CP1 leader perceived changes in their own group's membership as another source of challenge to the collaborative process:

CP1 leader (focus group): But at the same time, it changes for us because we have new patients coming in through the group as well, and they have different questions and they have different views. So I think it will ever be changing.

Groups also differed in postgraduate and academic involvement. CP1 include a postgraduate student, while CP2 do not have any postgraduate students in their OH group. Postgraduates' research experience appeared to put them in informal leadership roles within groups. Postgraduates interviewed shared examples of teaching research skills to undergraduates. While they still highlighted learning from other students, they provided more examples of things they had taught. One postgraduate reported on the only example given of a student actively negotiating research parameters with their community partner:

CP1 Medical Anthropology postgraduate (interview): A lot of these students are still trying to understand the scientific method, how you actually conduct research and then also depending on the[ir] grade ... they were still fairly young into [research]. OK about ethics, I mean, how many students in biological sciences you know are concerned with the ethical portion of research until they start doing it?

This CP1 postgraduate also highlighted not wishing to 'overpower' others in the project, due to only being with the project a short time compared with undergraduates. The student mentioned this in reference to a discussion about the role of postgraduate leadership within student teams:

CP1 Medical Anthropology postgraduate (interview): I tried to guide them, but I didn't want to overpower it ... it was kind of like, just be aware. Because I knew that I wasn't going to be there for multiple years. They are.

All OH CPs (including CP1 and CP2) have a direct relationship with the OH Programme Lead, in both an academic and administrative capacity. CP2 have an academic involved with their project who has a research relationship with both the community group and the student group. CP1 is the only long-term OH project without any direct academic research relationships or continuous postgraduate involvement. Considering that they were the only OH project to highlight both a lack of continuity and the challenges of student turnover, it shows the importance of both student and academic leadership in interdisciplinary CBPR.

As mentioned above, CP2 experienced the interdisciplinarity of the university group with which they were collaborating as contributing beneficially to the collaboration. In contrast, the CP1 leader perceived that they 'don't think [interdisciplinarity has] been highlighted so much that we've noticed it really'. The CP1 leader observed that they had noticed interdisciplinarity when visiting OH at the university, but did

not think this translated to their own student–community partnerships. The CP1 leader perceived their visit to the university as an important part of their research experience, mentioning it on two separate occasions, and emphasising that it helped them to experience interdisciplinarity in that context.

The CP2 leader mentioned that she thought that having some students on the project that are not medicine students was positive for their OH collaboration. However, she observed that the group still framed their research question as a ‘medical issue’, showing the challenges in removing disciplinary boundaries from health research.

Discussion

While we were interested in exploring the experiences of all participants in OH CBPR projects, our institutional location and funding meant that our main focus was on students. Knowing how OH differed from most other science shops in terms of its mixed-level, interdisciplinary student teams, we expected that novel findings about students’ learning journeys would emerge from our research.

Working in interdisciplinary teams of students from all levels of study on community-engaged research projects is experienced as empowering by students, particularly in relation to student confidence in themselves as researchers, leaders and collaborative partners.

Not only does the interdisciplinary aspect of the OH approach extend the reach of health research training and knowledge beyond biomedical and health-care fields, but it also provides key benefits to students in terms of learning a range of approaches and how to work across differences. Gehlert and Browne (2013) argue that educational opportunities that enable students to learn how to be part of transdisciplinary research are essential to producing graduates who can contribute to solving complex issues. It also provides a broad range of solutions to choose from, potentially improving the research. This connects with Israel et al.’s (1998) insistence that interdisciplinarity is key to providing the flexibility needed in CBPR projects, particularly ones in which the community partners set the question. Israel et al. (1998) were writing about academics; our paper demonstrates that this is equally, if not more, important in science shop contexts in which students are the main university research partners.

While our research provides evidence of benefits to community partners, higher education institutions (in the form of improved learning and employability skills) and students in engaging in the sort of science shop approach used in this case study, there are clearly challenges. Many challenges are shared with health CBPR that does not involve interdisciplinary student teams, as well as with research that engages patients directly, but others are unique to this context, as we highlight below.

Our findings suggest that undergraduates have a strong desire to build relationships with more experienced postgraduate students within student groups where peer-to-peer relationships sometimes revolve around leadership and mentoring. Undergraduates valued the experience of postgraduate students, and did not appear to be concerned if the postgraduate’s disciplinary background did not match their own. When groups lacked such relationships, students expressed concern that the research process and outputs might be hindered and compromised.

Time pressures from other commitments came up for community partners, similar to what is reported in the literature (Brett et al., 2014), also for the students, comparable with academic researchers (Hally et al., 2020). Pressures of time, and juggling of multiple responsibilities, can be exacerbated by working in an interdisciplinary context, from differences in student timetables through to needing to negotiate complexity and disagreements stemming from disciplinary differences within their partnerships. However, all participating students appeared open to, and excited by, novel disciplinary perspectives, particularly when they could be applied in a community context. They reported that their core degree programmes did not provide opportunities for either interdisciplinarity or community engagement. Benefits accrue when interdisciplinarity is balanced across teams and projects, but this balance must be constantly negotiated by students and community partners. This balance is based partly on perceptions of which disciplines are required for a particular research question and collaborative partnership.

Related to this, but not discussed in the literature, is the issue of turnover, which was raised in relation to community group membership and to students. While OH has long-term relationships with community groups, these are maintained by the Programme Lead. Students are only at the university for the duration of their programme. A master's student is usually at the university for one year, while undergraduate and PhD students might attend for three to four years.

For students, working with interdisciplinarity has been experienced as wholly positive. However, it appears that community partners can find changes in approach disconcerting when students leave and are replaced by those from other disciplines. Managing community partner expectations, and increasing their understanding of research through offering additional training and induction, might help to manage challenges related to interdisciplinarity and shifting student group composition.

Strand (2003), in her work on individual research students, suggests that managing the multiplex role relations found in CBPR is best facilitated by the university establishing an administrative structure to help coordinate and support projects. A dedicated role with expertise in research–community relations and engagement can help hold partnerships together and support community-based research. Our findings show that such a role may be even more important when taking into account turnover in science shop-based CBPR, and in working with interdisciplinary student teams.

One of the best practices established through systematic reviews into health CBPR is that of recognising community identity (Israel et al., 1998). Our research demonstrates that identity within a community group may be complex, and may resist the identities used by science shops and students. The community groups with which OH works are bounded geographically, as is found in the CBPR literature. However, they are also in some sense patient groups (connecting to PPIE research); while members do not share a common diagnosis or health-care setting, they do share a set of symptoms and ongoing treatments.

Community groups that engage specifically with health-related issues can mirror the disciplinary differences seen within academia and health services. Some of the community groups with which OH has partnered are led by people with a clinical professional background, who bring their own disciplinary perspectives, experiences and language to the CBPR process. In our study, looking across focus groups, interviews and non-participant observations, we observed that different participants used different language, and that the language used reflected these disciplinary complexities. Students usually used the term 'community partner' when discussing community groups and their members, in keeping with the language used by OH. In contrast, community group leaders sometimes referred to people in their groups as 'patients' and sometimes as 'participants', and to themselves as 'conductors', thus using language from their own professional disciplinary backgrounds. Within health research, community groups themselves may need to be understood as groups that express their own interdisciplinarity.

Conclusion

Societies the world over face unprecedented and complex challenges that can only be addressed through working collaboratively and democratically across differences and across scales. Community-engaged research that brings mixed groups of students together to solve real-world problems is critical to building capacity to deal with complex, multi-sectoral problems. Being able to work across disciplines, and between universities and communities, will be key to moving forward in socially just and constructive ways.

Our experience with OH shows that involving students from a range of disciplines in CBPR increases its reach in terms of equipping students and community partners to bring about much-needed, place-based change. These kinds of approaches, emphasising the creative and collaborative power of interdisciplinarity, enable participants to critically engage structural roots of health inequalities, and use community–university partnerships to drive civic action forward towards a more sustainable and equitable future.

Acknowledgements

The authors would like to thank all OH participants for their involvement.

Funding

Thanks to our funders EPSRC IRC Proteus EP/R005257/1 and the University of Edinburgh (Principal's Teaching Award Scheme).

Declarations and conflicts of interest

Research ethics statement

The authors declare that research ethics approval for this article was provided by the University of Edinburgh, School of Health in Social Science Research Ethics, Integrity and Governance.

Consent for publication statement

The authors declare that research participants' informed consent to publication of findings – including photos, videos and any personal or identifiable information – was secured prior to publication.

Conflicts of interest statement

The authors declare no conflicts of interest with this work. All efforts to sufficiently anonymise the authors during peer review of this article have been made. The authors declare no further conflicts with this article.

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