Student Research Teams (SeRTs): inspiring and enabling student-led extra-curricular and co-curricular research partnerships with academics and professional practitioners

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Abstract

The core aspiration of all Higher Education Institutions (HEIs) is to create opportunities that energise and focus engagement and so empower their students to enjoy learning and to become their future professional selves. Here we describe one vehicle, Student Research Teams (SeRTs) that combines these two elements by inspiring students, staff and professional practitioners to collaborate in mutually beneficial, extra-curricular student-led research partnerships. We compared the effectiveness of SeRTs with that of other active learning vehicles and found SeRTs to be significantly better at fostering student engagement and enhancing their perceived development of employability skills and personal attribute strengths. These strengths were also highlighted by a SWOT (Strengths, Weaknesses, Opportunities & Threats) analysis across a range of SeRTs and by detailed qualitative survey of students on one SeRT case study. The greatest challenges associated with SeRTs were time and funding constraints. We discuss how these and other challenges may be met and suggest some solutions.

Introduction

One of the most fundamentally inspiring ways in which students and staff can engage and learn together is as partners in co-creating new research knowledge and understanding. Such partnerships have long been acknowledged to aid student retention by drawing staff and student together into engagement with the core academic mission of HEIs (Hippel et al., 1998). They also offer opportunities for learning to occur in a way that moves away from transmission learning (Nygaard et al., 2011) towards self-empowered active learning and threshold concept inquiry (Myer & Land, 2005; Cousin, 2006; 2010). Employers increasingly value students being able to demonstrate skills and personal strengths honed through these routes and partnerships in subject based enquiry and research are consequently considered as a core component of student-staff learning partnerships in Higher Education (Healey, 2005, 2014). Such partnerships may also provide more fundamental personal development gains by being an arena in which students can explore future possible selves (Stevenson & Clegg, 2011) and develop self-authorship (Baxter Magolda, 2007).

In this paper we present and evaluate a novel student-staff research partnership platform, Student Research Teams (SeRTs) where the partnership consists of a small team of students (usually 3-10 students) who manage a short research project with support from academic staff mentors. SeRT research projects arise from suggestions by staff, students or professional practioners and vary in their subject matter and length from a day to several weeks. Due to the ecology-nature of the department in which they arose and the research background of the person who developed the SeRT platform (A Diaz) most of the 30 SeRTs that have run to date have been ecology-focused. However, a few have been in archaeology and physical geography for which SeRTs also work well
because the research is benefited by being carried out by a small team rather than one individual (or
a large team). SeRTs could be similarly useful in a wide range of other disciplines. Many of the SeRTs
we have carried out have occurred in field sites close to the campus but a third have occurred
abroad, sometimes in physically challenging environments such rain forests and high mountains. All
SeRTs are either extra-curricular or are co-curricular (i.e. students can choose to undertake them as
(non credit bearing) placements). As well as a choice of subject matter, SeRTs afford students the
flexibility to engage either as participants or as student managers. The latter undertake to lead the
execution of the project and its write up with support from academic mentors.

In this paper we address the following questions:

1) How do SeRTs compare with other active learning opportunities in terms of their efficacy in
engaging students and enhancing their perceived employability skills and strengths?

2) What are the key strengths, weaknesses, opportunities and threats relating to SeRTs as perceived
by student and staff partners?

3) Is there evidence that SeRTs foster the development of self-authorship in student team members?

Methods

We used a combination of quantitative and qualitative questions to survey the views of staff and
undergraduate students in ecology, geography, environmental science and archaeology who have
been involved as partners in SeRTs. The size and nature of the pool of people surveyed differed for
each question as follows.

For question 1 we surveyed all students who had been involved in SeRTS and received replies from
38 students who had been involved in SeRTS as participants and 12 as managers. We asked each
student to respond questions either via Survey Monkey or by writing their responses on paper
copies of the survey. Each student was first asked to score out of ten how much they had been
engaged by each of the following active learning activities they had experienced over the last year: a
SeRT project as a manager; a SeRT project as a participant; within-curricular field work; extra-
curricular student society. Each student was then asked to score out of 10 how much they felt the
activity had increased a range of subject specific skills and personal strengths (Table 1). The mean
score was calculated for skills and for strengths for each student. Differences in significance across
activities were tested using One Way ANOVA tests with Tukey tests used to explore where the
differences lay.
Table 1. Subject specific skills and personal strengths the students were asked to self-assess to measure their gain in employability.

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<tr>
<th>Subject Specific Skills</th>
<th>Personal Strengths</th>
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<tr>
<td>Practical data gathering skills</td>
<td>Team player</td>
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<tr>
<td>Report writing skills</td>
<td>Good communicator</td>
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<tr>
<td>IT and data handling skills</td>
<td>Reliable</td>
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<tr>
<td>Degree subject knowledge</td>
<td>Perspective and empathy</td>
</tr>
<tr>
<td>Problem solving skills</td>
<td>Able to lead/influence others</td>
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For question 2 we carried out individual informal focus groups within SeRTs to collate student views and also asked staff mentors for their own feedback. We then collected, themed and pooled responses from a total of 23 students and 5 academic staff into a simple list of responses (without quantitative measures due to the open, brain-storming nature of the data collection method).

For question 3 we interviewed separately each student member of one SeRT as a case study. For this we chose one of the longer running SeRTs, a 3 week project in the Peruvian Amazon studying the effect of ecotourism on the use of trails by large mammals. This SeRT consisted of 5 students and one academic mentor and all the students had management roles. The interviews were carried out by a student member of the team on return to university several months after the SeRT. Interviewees were asked to respond to the following two questions “What did you personally gain out of doing this particular SeRT project?” and “Based on your experience, what would you say to a student thinking of doing a SeRT project?” To avoid the possibility of leading responses, neither the interviewer nor the interviewees was exposed to the concept of self-authorship before the interview and the interviewer added no follow-up questions within the interview. Each interview lasted as long as the interviewee wished to speak for which was a few minutes in each case.

Results and Discussion

Question 1 - How do SeRTs compare with other active learning opportunities in terms of their efficacy in engaging students and enhancing their perceived employability skills and strengths?

Students reported significant differences (P<0.001) across active learning activities in both their level of engagement (Figure 1) and perceived employability skills and strengths gains (Figure 2). Engagement was reported as highest for SeRTs and lowest for student societies. Although scores for SeRTS were a little higher for managers than for participants, differences were not significant. This was surprising as managers were more physically engaged in design and reporting of the SeRT. This finding indicates that SeRTs can engage students more than other active learning opportunities even when the actual role played by the student is similar. Informal observation and discussion with students suggests that one important reason is that the small group sizes enabled students to feel a shared group identity. This agrees with Ratcliffe and Dimmock (2013) who report the importance of group identity in motivating their engagement in academic representation. Extra-curricular activities
scored surprisingly low; informal additional comments from students suggest that this may also relate to identity as several students reported feeling a disconnect with societies that they felt met too infrequently.

Figure 1. Comparison of the level of percent engagement that students reported feeling when participating in different, active learning, fieldwork based activities. The data shown are means with Standard Error bars.

Figure 2. Comparison of the levels of gain of subject specific skills (black bars) and of personal strengths (grey bars) that students reported feeling when participating in different, active learning, fieldwork based activities. The data shown are means with Standard Error bars.
SeRTs also scored highest for perceived gains in skills and strengths (Figure 2). In particular scores for personal strengths increased sharply when students were engaged in SeRTs, especially as managers. This reflects both the increased opportunity provided by SeRTS to hone these attributes and the awareness of students of their importance. For example, it is probable that student societies actually provide better opportunities for the development of personal strengths than students perceive but those conversations are not had within the activity. By contrast during SeRTs there is quite often informal discussion among the team of the importance to team function of members using and growing personal strengths. Consequently, students become aware of developing emotional intelligence and get a sense of the importance of this for employability (Pool and Sewell, 2007; Andrews and Higson, 2008; Crossman and Clarke, 2010) even though the discussions were not explicitly framed in those terms. Furthermore, SeRTs afford the opportunity for personal analysis and reflection within this context and for growth of self-authorship. In future SeRTs we will explore if it is beneficial to make this process more explicit in our discussions.

Question 2 - What are the key strengths, weaknesses, opportunities and threats relating to SeRTs as perceived by student and staff partners?

The main current strengths and future opportunities identified for SeRTs matched the results for question 1 in that they centred around the ability of SeRTs to provide opportunity for gains of both subject specific skills and personal strengths (Table 2). They also highlighted the benefits to staff and professional practice mentors and collaborators of being able to engage with students to co-create new knowledge and understanding. The most important identified weaknesses and future threats centred around time constraints for both student and staff partners. SeRTs that were open-ended in the time expectation were particularly problematical and all SeRTs were prone to delay creeping in between creation of the research results and them being turned into reported outcomes that can be communicated to others. The difficulties of finding time to write up findings for dissemination is common problem in undergraduate research creation (Walkington, 2008) but the short term nature of SeRTs make them especially prone to this. In future SeRTs we plan to include write up time formally within the SeRTs and to explore wikis as a way of speeding up the co-creation of output. One final issue which did not greatly affect the SeRTs in this study because they were internally funded but which was identified as a threat for future SeRTs was funding. Funding from professional practitioner partners has huge potential for win-win senarios if small amounts of funding can enable new research co-creation and learning but can be problematical to arrange in practice even if sums are small (for example simply to cover local travel).Legal considerations that should be explored early on in the process of setting up any SeRT with external funding include liability if a project is not completed on time for any reason and intellectual property rights if it is. There are also contractual issues of staff agreeing and managing appropriate expectations for data quality/quantity and of deadlines. Consequently we suggest that, in general, it is preferable to gain funding for SeRTs internally on the basis of their value for enhancing the engagement and experience of current students, attracting future students and supporting research output.
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<th>Strengths</th>
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<tr>
<td>• Engages students and staff – provides an enriching experience</td>
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<td>• Creates new research knowledge and understanding</td>
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<td>• Gives students good employability skills</td>
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<td>• Supports professional practice through collaborative projects</td>
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<th>Weaknesses</th>
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<tr>
<td>• Takes staff time to organise and students need to invest considerable time to gain from some SeRTS</td>
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<td>• Team dynamics may not work - then what?</td>
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<td>• Loss of momentum between data gathering and report writing may slow down outputs</td>
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<td>• Funding issues and conflicts of interest– comparisons made with consultancy projects</td>
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<th>Opportunities</th>
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<td>• Flexible - multiple entry levels for engagement for a wide range of students possible</td>
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<td>• Opportunities for many students on short projects</td>
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<td>• Students peers as role models</td>
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<td>• Can make a societal contribution while learning so contribute to outreach</td>
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<th>Threats</th>
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<td>• Need to demonstrate cost-benefit to academics and professional practitioners</td>
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<td>• Need to designing achievable projects</td>
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<td>• Need to define boundaries with research and consultancy activities</td>
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<td>• Need to manage expectations e.g. agree report content &amp; deadline</td>
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*Question 3 - Is there evidence that SeRTs foster the development of self-authorship in student team members?*

The interviews with students conveyed a strong overall appreciation among students of the value of their SeRT experience in their gaining subject specific skills and personal strengths. Moreover, there were some reflections that appeared to specifically identify growing self-authorship as defined in “the ability to collect, interpret, and analyze information and reflect on one’s own beliefs in order to form judgments” (Baxter Magolda, 1998) and “the internal capacity to define one’s belief system, identity and relationships” (Baxter Magolda, 2007). These include the following comments from three separate students: “it gave me a different view of ecology and made it easier to see the interconnections......you get out what you put into it and you could get something fantastic out if you put the effort in” (student 1, female age early 20s); “a valuable insight into what my future career might be........great experience working in a team, you feel a valued member of the team” (student 2, male age early 20s); “it gives a structured way of learning and a real feeling of whether this type of work is what I would like to do in the future....it is something to be proud of, what we have done, as students, as a team” (student 3, female age mid 20s).

*Conclusions to date*

Overall we have found that SeRTs offer a novel and effective way of engaging students in co-creating research and of working in research partnerships with academic staff. They enhance the university experience for both students and staff partners and appeal to potential students at Open Days. Their unique selling point of them being student-managed teams is a key facet in their success in terms of student engagement and perceived development of personal strengths that align with emotional intelligence. They also foster growth in self-authorship, even without this process being made explicit to students. We feel that the most important challenge to address to improve their success and enable their expansion is that of making the time investment value more apparent for both student and staff partners. We suggest that one way to help student partners is to embed SeRTs as short placements associated with degrees. For staff the time invested in these research partnerships could be considered as part of their professional development as educators and recognised as such as part of their application for HEA fellowships.

*Acknowledgements*

We thank Bournemouth University and Global Horizons for providing travel grants to support our highlighted 2013 SeRT in Peru. We also thank all the students and staff who have shared their time, thoughts and energy with us on this and other SeRTs.

*References*


