CASE STUDY

Facing Challenges in Remote Mathematics Education and Support by building a Community of Practice around Student-Staff Partnership

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Abstract

Our active community of practice, developed from a weekly book club, formed through a shared interest in student-centred learning. Inspired by the book *The Power of Partnership*, this interdisciplinary group fostered and nurtured two practical mathematical applications through a partnership approach. In Munster Technological University academic support, including Mathematics and Statistics support, is offered to students through the Academic Learning Centre (ALC). Project 1 explored, through student-staff partnership, how best to promote the ALC. The project challenged our assumptions of how students would like to interact with the service. Project 2 focused on teaching mathematical analysis to a large cohort of year two students at the University of Southampton during the Covid-19 pandemic, elaborating on how small study groups, facilitated by student partners, were utilised to maintain a sense of connection and belonging, when possibilities for in-person teaching were extremely reduced. This paper discusses how a dispersed community of practice collaborated to enhance learning and teaching of mathematics.

Keywords: Partnership, Engagement, Inclusivity, Student centred learning, community of practice.

1. Introduction

This paper discusses two partnership projects that emerged from and were supported by weekly book club discussions. In Munster Technological University academic support, including Mathematics and Statistics support, is offered to students through the Academic Learning Centre (ALC). Project 1 explored, through student-staff partnership, how best to promote the ALC. The project challenged our assumptions of how students would like to interact with the service. Project 2 involved teaching mathematical analysis to a large cohort of year two students at University of Southampton. Reduced in-person contact time presented additional pressures to maintain a sense of connection and belonging. The design and implementation of these projects were guided and supported by weekly conversations with the book club community.

In April 2020, amid the turmoil of emergency remote teaching and learning, a book club formed to discuss student-staff partnership. The book club discussions centred around *The Power of Partnership* (Mercer-Mapstone & Abbot, 2020), a text comprising individual case studies about partnerships developed across varied educational settings. These discussions were enriched by the diversity of book club participants - two from lecturing (mathematics, engineering), one from mathematics support,

and two from central learning and teaching functions with a focus on student engagement and academic/educational development. Personal experiences fed into discussions of the chapters, sometimes leading us in unexpected and serendipitous directions. This book club developed into a community of practice (Wenger, et al., 2002) which has continued to meet weekly throughout three lockdowns, periods of remote and hybrid teaching and gradual return to campuses. The community of practice discussions grew into concrete plans. There was reciprocal benefit between the book club conversations and the evolution of the projects described in this paper to inform our understanding of partnership and to inform project development. Figure 1 shows how the timeline of the book club and the projects ran in parallel.
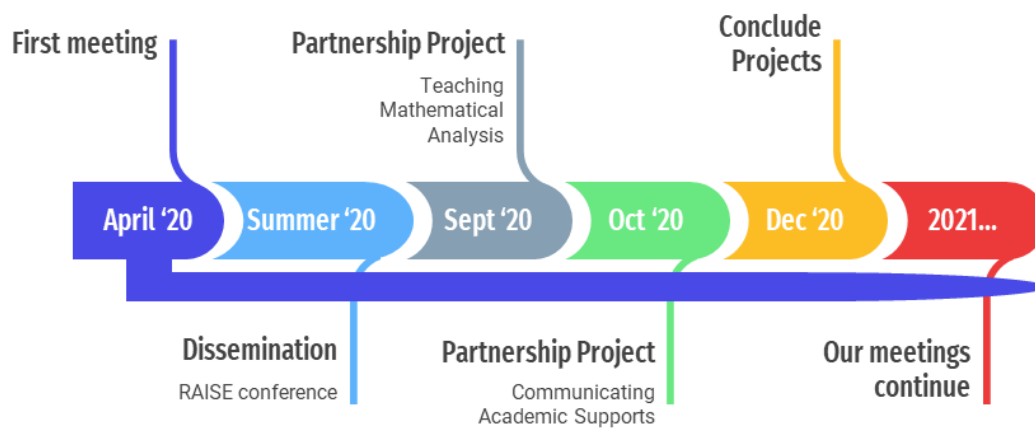

Figure 1: Timeline showing how the projects and the book club ran in parallel

The remainder of this paper is organised as follows. The next section discusses the literature in relation to student staff partnership and applications of student voice work in mathematics. Next, two parallel case studies are presented where student-staff partnership was applied to two Mathematics-related contexts. The final section discusses the implications of the work to date and plans to deepen and broaden the work of our community of practice.

2. Literature Review

2.1 Partnership

Student partnerships, student-staff partnerships and a range of interrelated, yet distinct, terms (student involvement, student engagement, student voice) have gained increasing attention over the last 20 years, particularly in the UK, Australia, USA, and Scandinavia (Klemencic, 2011; Bovill & Bulley, 2011; Healey, et al., 2014; Ashwin & McVitty, 2015). Indeed, partnership was identified by the (Higher Education Academy, 2015) as core to the vision for its future as a process to enhance learning and teaching practices through meaningful and shared dialogue with all members of the academic community.

Healey, Flint and Harrington (2014) define partnership as a process rather than a product, one that supports student engagement, whilst recognising there are many other potential opportunities to engage students. Their definition is that partnership "represents a sophisticated and effective approach to student engagement...the potential for a more authentic engagement with the nature of learning itself and the possibility for genuinely transformative learning experiences for all" (Healey, et al., 2014, p. 55). Partnership extends traditional views of feedback from students about their learning experiences, defined by Cook-Sather et al. (2014, pp. 6-7) as:

"a collaborative, reciprocal process through which all participants have the opportunity to contribute equally, although not necessarily in the same ways, to curricular or pedagogical conceptualization, decision-making, implementation, investigation, or analysis".

Importantly, a series of values underpin partnership practices including trust, authenticity, reciprocity, inclusivity, empowerment, challenge, respect, and community (Higher Education Academy, 2015).

Partnership is a commitment to open, constructive and continuous dialogue and can often challenge preconceptions of how students and staff can work together by "navigating the difficult terrain of power hierarchies" (Verwood & Smith, 2020, pp. 30-31). It challenges the "consumerist relationship presenting a constructive alternative in which opportunities arise to foster positive behaviours, and to develop communities within and between students and staff" (Ody & Carey, 2016, p. 33). By challenging the traditional roles - staff as holders/givers of knowledge/decision and students as recipients of such - and encouraging greater active participation from students to engage in decision making, staff relinquish some of the power and control to make space for the process of partnership to take place (Bovill & Bulley, 2011). This is however a process and exploring shared goals and objectives is a key in achieving shared equity of power.

However, adopting a new way of working can be uncomfortable and unsettling. These roles often have blurred boundaries and no clear expectations. Through accepting this process, students and staff are stepping into a new, neutral and brave space (Cook-Sather, 2016) which may feel disorientating and risk-filled. Cook-Sather argues that using the terminology *brave space* as opposed to *safe space* sets the tone and mode for this type of engagement. Being brave requires active engagement, stepping out of your comfort zone and therefore, potentially risky. By choosing to be vulnerable, and open to entering a new, open, and risky environment is where the potential of a transformational learning experience may occur (Healey, et al., 2014).

2.2. Rhizomatic Pedagogy

Partnership can be a slow and challenging process, with its outcomes not always clearly seen. Consequently, rhizomatic pedagogy (Deleuze & Guattari, 1987) and rhizomatic growth (Mathrani & Cook-Sather, 2020) have been used as an analogy for partnership, given a rhizomes limited upward growing shoots do not convey the significant amount of activity beneath the surface, defined as nodal relationship and barriers/branching. This analogy also resonated with the book club members in the development of the two projects. Although the projects had outputs, it was the experiences beneath the surface where the projects were developing and adapting where much of the growth happened.

2.3. Partnerships in Mathematics

Whilst partnership in institutional Learning and Teaching (L&T) activity has been well documented (Healey, et al., 2014; Cook-Sather, et al., 2014; Ody & Carey, 2016), the disciplinary perceptions of students as active or passive participants in learning is varied. Students in STEM were likely to self-identify as passive learners (Bunce, et al., 2016), which will impact the scope and nature of students as partners-type activity (Matthew, et al., 2017). Using the view of partnership noted earlier, there is little evidence of well-developed partnership activity in mathematics, yet innovations in learning and teaching, and student engagement practices are wide ranging including flipped classroom (Lo & Hew, 2021), tilted classroom (Alcock, 2018) and peer-learning programmes (Duah, et al., 2014; Malm, et al., 2021), but not explicitly partnership activities (Duah & Croft, 2011). Therefore, whilst examples of specific partnership activity are low, the hallmarks of partnership in other areas of mathematical pedagogy exist. The book club projects seek to add to the mathematics partnership literature describing new practice for those engaged in innovative, mathematical learning and teaching activity.

3. Project 1: Communicating with students around Academic Subject Support, Munster Technological University

3.1. Context

This section discusses a project with a partnership team involving academic support staff, academic teaching staff, undergraduate and postgraduate students. Academic support, including Mathematics and Statistics support, is offered to students through the Academic Learning Centre (ALC). The ALC Coordinator wondered if students in remote emergency teaching mode were aware of the service. The project was conceived to ask the question – How can we communicate our message to students to improve student uptake of the service? Informed by the partnership book club it was decided that the logical step was to ask students, engage them in partnership discussions and work together to figure this out. The project looked at the communications methods used to engage students with subject support through the Academic Learning Centre.

The project team was recruited by sending an email to all students and inviting applications through a Microsoft form. The final team was composed of six students from first year to third year undergraduates, along with one postgraduate, one Academic Learning Centre member of staff, one Academic Success Coach, and two library staff. The student partners were drawn from all the Cork campuses and from a spread of disciplines. The project was supported by the Student-Staff Partnership Project Officer (AnSEO - The Student Engagement Office, 2021) who chaired the first meeting and gave some background into what partnership was as well as being available for on-going support of the project. The team committed to two hours per week for six weeks. There would be a one-hour meeting plus an expectation of one hour of independent work per week between meetings.

3.2 How was this partnership? What did partnership look like in this project?

From the outset the project aimed to be as democratic as possible. The initial project brief was not prescriptive about how the partnership team would reach its conclusions and how these would be gathered or reported. Following discussions about how to communicate with students, the team decided to survey the student body. The co-created survey garnered over 300 responses. These responses were discussed in subsequent team meetings which further deepened our understanding of the students' perspectives. The final 'product' of the project was a Padlet with recommendations for future communications with students. However, the real product was the increased understanding of each other's perspectives.

3.3 Outcomes, lessons learned and future work

As well as the final 'product' we learned a lot through these discussions. Some things we learned from the students included the following.

Many students hate emails and feel a sense of email overload. Many students learn to skim their inbox and only open emails that appear directly relevant to them. Even when an email is opened it is often skimmed for important information. For this reason, we realised that emails should be short and snappy. We need to make the 'What is in it for me!' (WIIFM), very relevant as soon as a student opens their email.

Messages about the ALC were not reaching other campuses in the way that we expected. Students from those campuses may feel that ALC is not relevant to them and therefore not pay attention to the information.

The main source of university information for students on social media was Instagram. Despite the emphasis on social media and electronic communications, it is the recommendations from Academics that really matter to students. Students fed back that they listened to recommendations made from real people that they already interact with, and hopefully trust. Academics are the main source of contact and information about the university. This is where students take their news from, and the source that they trust.

As well as lessons directly related to the project mission, we also learned a lot about partnership work through this first partnership project. We realised that students are a huge untapped resource. The students have lots of expertise to bring. Not just their experience of being a student but also unique individual skills from other life experiences and from their studies. The project challenged our assumptions of how students view the service and how they would like to interact with it. This has informed our thinking around promoting the service to students and has been especially valuable in the current climate of remote teaching and learning.

In future if we are wondering what students think we will just discuss it with some students.

4. Project 2: Students as Partners in building learning community through study groups, Mathematical Sciences, University of Southampton.

4.1. Context

To teach a compulsory second year Analysis module to a large cohort is always a challenging task. Achieving this during the global pandemic added extra layers of difficulty. There are always students who do not appreciate the mathematical rigour and abstraction of the module, and therefore, may struggle and disengage. Pre-Covid module design allowed for constructive dialogue with students, reviewing their performance and potentially identifying a need for additional individual help. It was not clear how to mimic this provision in the pandemic. The Analysis module, with one-hour face to face teaching per week, was the only second year module with an in-person teaching component, aiming to maintain a sense of connection and belonging to the University community.

Our task was to identify and introduce an intervention into the established module delivery practice that would make learning and teaching less isolating and create a caring atmosphere where everyone matters, is supported, and nobody feels abandoned. To achieve these goals a research-informed approach suggested utilising the collective strengths of students themselves, an underutilised resource (Biggs & Tang, 2011). Encouraged by support from academics and informed by pedagogical research, we decided to create study groups, to divide the cohort into groups of five who would work together on their homework submitting it as group work. In their groups, students marked each other's work, gave and received feedback, as well as reflecting on how receiving feedback helped to improve their own work. However, the implementation and overseeing of 36 groups was a huge task. Drawing on regular discussions with the book club, the situation gave rise to an opportunity to engage with student partnership pedagogies. We recruited volunteers from year three and year four student cohorts, who in partnership with the module Academic, would oversee and support the study groups. The concepts, study groups as well as student partnerships, represented a novelty to both groups of students and were carefully introduced and motivated. Both concepts emphasise process over product, learning over performance, time requirements and messiness, kindness to one another (Campbell & Bokhove, 2019). The third year and fourth year student volunteers were open to engaging with this new concept of pedagogical partnership, the role beyond their traditional student role.

4.2. Student Partnerships

The notion of 'student helpers' is well established within our institution. However, the notion of the student partnerships is less established and to build an authentic partnership beyond the declaration and good will, is a non-trivial task. Whereas in the 'student helpers' approach, students are told what to do, in a 'students as partners' approach, students are positioned differently. The partnership concept draws a different picture blurring the demarcation line between the student-staff sides. Our partnership evolved from having cameras off during the online meetings to lively discussions with cameras on towards the end of the project. The student partners were highly motivated and very conscious about their role, as one of them put it: *"Group work and discussion has played a huge role in my mathematical education, and I think it should always be encouraged especially now that it has become slightly more challenging to do so."*

To build and deepen our partnership we created a time and space for reflection. We held bi-weekly meetings that allowed us not only to discuss how to support the students in line with their needs, but also how to support each other.

4.3. Some outcomes and future work

Evaluating the intervention from the student learners' perspective, the project achieved its objectives to connect students and to enable them to support one another.

The feedback from students, learners and partners, was overwhelmingly positive. Groups reported increased self-confidence, improved organisation, time management, communication skills, leadership, and the experiences valued beyond job applications.

Despite our intentions, it is not completely clear whether this example represents a truly authentic partnership. It was difficult to overcome perceived power dynamics, replacing students' agreeable nodding, with more meaningful contributions when making decisions developed slowly.

In 2021/22, the project entered its second iteration with the 2020/21 group work participants, volunteering in the role of student partners.

With the support of book club, the project has a huge potential to continue supporting the development of students as reflective learners and educators.

5. Discussion

The creation of the book club was timely amid concerns of keeping the 'heart' in our interactions with students during the Covid-19 pandemic. Creating a shared experience of lockdown and, as we were almost strangers, a freedom in discussion around the impact partnership opportunities have had and could have on our own practice gradually emerged. Weekly focus on the book emboldened each member to develop stronger partnership mindsets (Peseta, et al., 2020) and stimulated implementation of the case study projects discussed above. Authenticity was a common thread as we wanted to work with the projects in a way that would resonate positively for ourselves and the project teams. The support each member received from the group was particularly critical and informed the group ethos in the ensuing partnership projects, each member mutually enabling based on individual prior experience.

Through our book club, and the projects discussed above, we experienced that student-staff partnerships have the potential to begin challenging the roles students and staff can play in the learning

environment, allowing some traditional hierarchies in higher education to be questioned with respect to power and how it is exercised, and identifying ways of working that build a more open student learning experience. It caused us to review our preconceptions of partnership and to reframe our own language. We began to view partnership as a way of operating rather than an outcome, Adopting the partnership mindset gave confidence to those undertaking the projects, otherwise processes and experiences would have remained static and continued unchallenged. We became attentive to our assumptions and those of our institutions, valuing process over product. Emboldened by the knowledge that we were not alone in these thoughts we grew braver in conversations outside the book club. We started to see the beginnings of a ripple effect (e.g. in the second iteration of Project 2) that encourages a sense of community, and its potential to impact student success and retention.

6. Conclusion

This paper discusses how two student-staff partnership projects grew out of an online book club during the Covid-19 pandemic. The book club members came from a diverse range of backgrounds within Higher Education Institutions across Ireland and England. The weekly discussions drew on the varied experiences of the participants to deepen our understanding of student-staff partnership. The first project looked at communicating with students about Mathematics support services while the second focused on creating community in online delivery of an Analysis module. Both projects had positive outcomes for staff and students. Experiences from these projects fed back into the book club discussions, which facilitated a space for reflection and synthesis. As the book club approaches its second anniversary it continues to enrich our understandings of student-staff partnership work and drive us forward to work more in this space. Our hope is that readers find inspiration to take a brave step to try a partnership activity of their own.

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