

University–Industry Collaboration: Preparing Doctoral Students Through Co-Created Project Based Learning

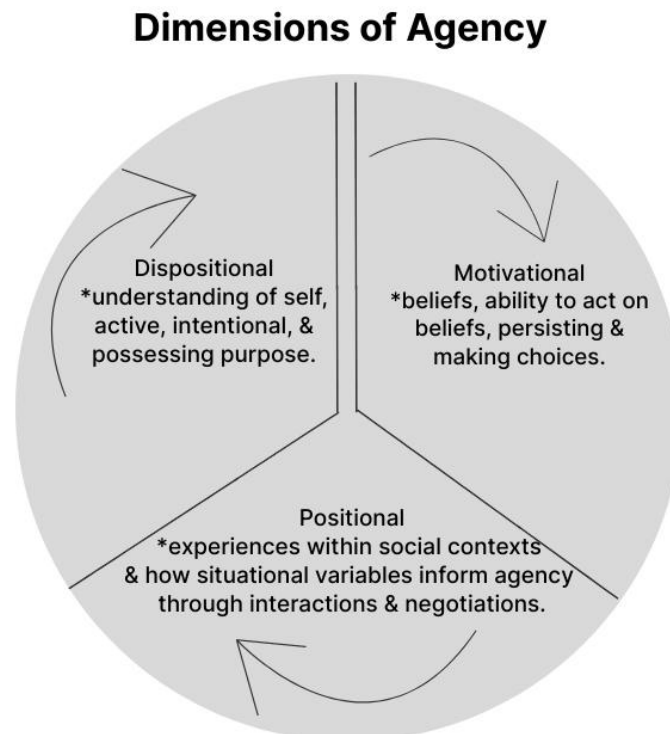
Laura Blackburn (Glasgow Caledonian University), Dr Valerie Blair (NHS Education for Scotland) and Dr Sivaramkumar Shanmugam (Glasgow Caledonian University)

1.0 Introduction

Student engagement has become an important issue in higher education (HE) and drives initiatives promoting student inclusivity and diversity, as well as improving the quality of teaching and learning. With widened access, methods supporting transitions into HE call for careful consideration to ensure the needs of a diverse student population are met (Healey and Healey, 2019). Diversity includes ‘non-traditional’ students who face inequality in cultural capital and increased challenges to academic achievement. Student success requires an active engagement in learning. Although still an evolving construct, student engagement generally describes behaviours related to satisfaction and achievement. Engagement levels depend on many variables. One influence includes the teaching methods of the HE institution and the students’ perceived control over their learning, otherwise known as agency.

Agency can be understood as the ability to act purposefully and autonomously (Emirbayer and Mische, 1998). Learner agency places students as agents of change and active participants in their education. Students with enhanced agency participate at a higher level on the ladder of student participation in curriculum design (Bovill and Bulley, 2011), taking ownership and responsibility over their education. Agency hinges on student motivation, disposition, and position (see figure 1). Poverty, first language, educational background, age, gender, ethnicity, disabilities, self-efficacy, part-time status, available support for transition into HE, and HE pedagogy can also interact to impact learner agency.

Figure 1. Dimensions of Agency Adapted from a Model of Student Agency by Vaughn (2020)



One way to enhance learner agency is through a student-staff partnership. Partnerships aim to empower, engage and revise student roles from passive to active participants, overcoming power hierarchies which stem from traditional student and staff portrayals. Student-staff partnerships occur at different levels, such as learning, teaching, assessment, research, scholarship projects, curriculum, and pedagogy design. Students and staff bring different yet complementary expertise to a partnership, with the potential to enhance the learning experience. Partnerships occur in a wide range of contexts outside of HEI settings, including practice education, industry environments, governing institutions, trade unions, and other networks. To facilitate a student-staff partnership, there must be trust, inclusivity, reciprocity, shared power, honesty, a sense of belonging, and ownership.

The current paper examines student-staff partnership through a unique case study of university-industry partnerships in a pre-qualifying Physiotherapy doctoral programme. A vignette of a student service evaluation illustrates and provides context for the innovative

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nature of partnership. A student-staff partnership formed the authorship approach, with a doctoral student co-writing with academic and industrial staff. The paper begins by summarising the organisational and historical context of the Doctor of Physiotherapy (DPT) programme at Glasgow Caledonian University (GCU) and gives an understanding of what a university-industry partnership involves. Following this, professional development module project specifics to the partnership are provided and complemented by an example of a student quality improvement (QI) project. The paper concludes with a discussion on relevant pedagogy, practice and lessons learned.

2.0 Partnership Context

Clinical, research, education, and leadership are integral cogs in the wheel that is physiotherapy. The DPT programme at GCU aims to develop a new type of Physiotherapy graduate with the skills, behaviours, and knowledge to meet the current demands of the profession. Pre-registration modules comprise the first year of the programme, followed by doctoral education in research and professional development, and the accumulation of practice-based learning. Unlike in other Physiotherapy programmes in the United Kingdom, DPT students come from diverse educational and enterprise backgrounds, bringing original insights and abilities to the profession, while also developing unique skillsets in research, project management, leadership, and entrepreneurship on the programme.

The Professional Development 2 (PD2) module delivers a student-staff partnership experience, with students leading a quality improvement project in partnership with university and industry staff. University-industry partnership offers opportunities for creating, exchanging, and applying knowledge in environments other than academia, such as industrial or clinical. Partnerships between university and industry facilitate Research and Development (R&D), shortening the time between enquiry and practical application. Partners reap benefits from engaging in R&D partnerships. Industry partners gain from the expertise and knowledge provided by the university, while academic partners gain increased opportunities for funding, idea generation, and other resources. Student partners, on the other hand, encounter

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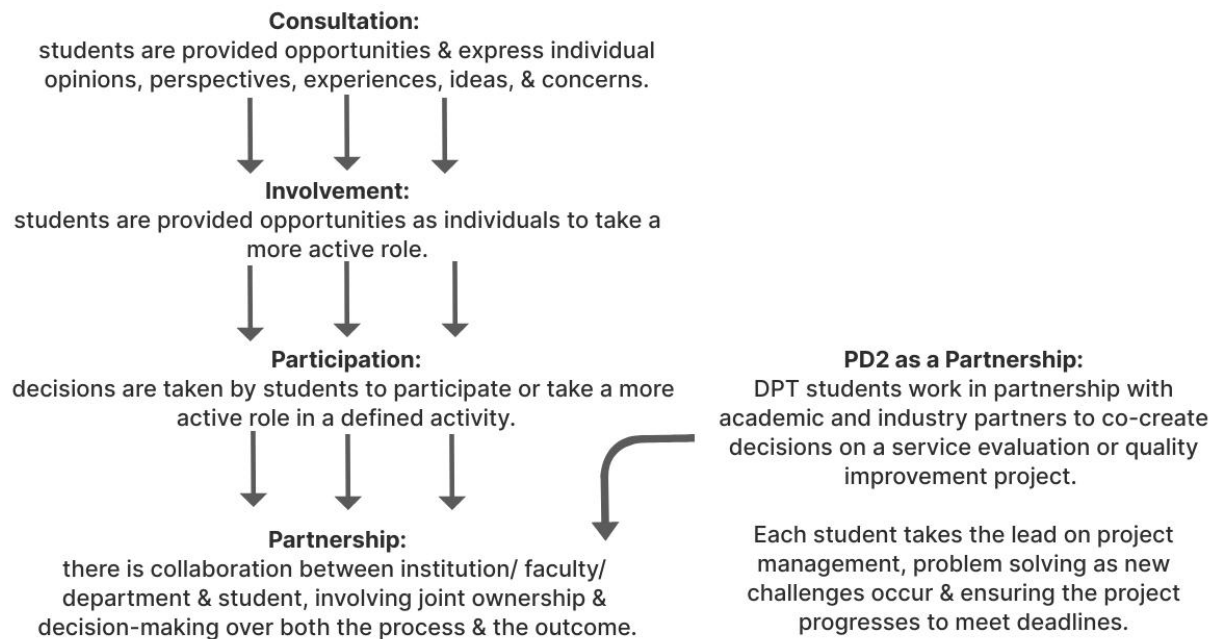
opportunities to express creativity and leadership, as well as enhancing employment prospects. Engaging in R&D projects for QI equips students with diverse and innovative skills within and outside of academia. The partnership reaps benefits from the varying backgrounds of students, bringing original insights into the projects with real potential to positively impact on service users.

The PD2 comprises a 40-credit mandatory module and involves three main summative components, running over the full academic year. For the first task, DPT students produce a report on a QI project completed in a three-way partnership with academic staff and an industry partner from the NHS or third sector. Students face few creative restrictions in how they choose to present their report, with the use of videos, images, and other artistic methods often encouraged by academic staff. Industry partners are consulted for feedback on drafts of the report to ensure the resources meet stakeholder requirements. DPT students participate at the fourth stage of engagement (see Figure 2), taking responsibility and leadership of the R&D projects. Students drive the project forward, managing timelines, meetings, data, and report writing. The second and third components of PD2 include completion of a reflective essay focusing on a critical incident in the partnership, and a viva.

All projects stemmed from a practice-based problem identified by industrial staff. Although academic and industry staff identified the topic and selected the student for each project, the subsequent stages placed the reins into the hands of each student to facilitate co-creation of methodology, analysis and report. Every project differed in objectives, industry and design. An example of one quality improvement project is provided in the next section. Academic staff facilitated student creativity by providing weekly resources through the trimester on co-production, behaviour change, creative data collection, project management, teaching and learning, reflection, and standards of conduct, ethics, and performance. Formative assessments involved such activities as creating bitesize videos.

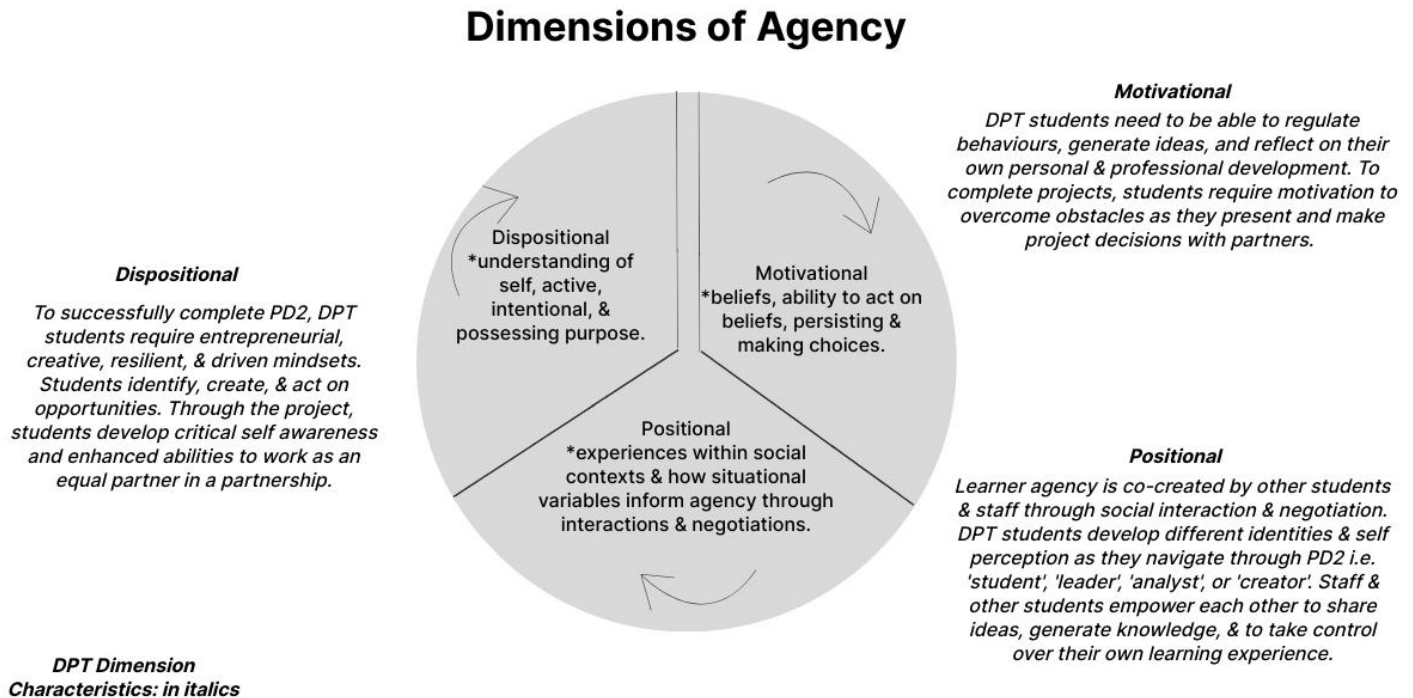
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Figure 2. PD2 placed within the Four Stages of Student Engagement adapted from Healey, Flint, and Harrington (2014).



Classes and formative assessments empowered students with the skills and knowledge to successfully complete the project. As well as support from staff, for enhanced learner agency, students required motivation and confidence to take a leadership role in the university-industry partnership (see Figure 3). Some students flourished when faced with the challenge of leading a QI project, while others remained passive, requiring additional support and encouragement to complete the project. The complexity of each practice-based problem did not allow for student comparison of projects or peer support through the quality improvement journey. Student reactions when dealing with the complexity varied, while also juggling a research project for another module with a separate supervisory team. Although student engagement on the participation ladder fluctuated (Bovill and Bulley, 2011), all students identified critical incidents in the partnership for their learning and reflection. Students created action plans to illustrate their development needs as part of the summative components. The viva targeted insights from student essays and action plans, attempting to clarify or deepen reflection on aspects of self and philosophy.

Figure 3. DPT student characteristics under the framework of Vaughn's (2020) A Model of Agency.

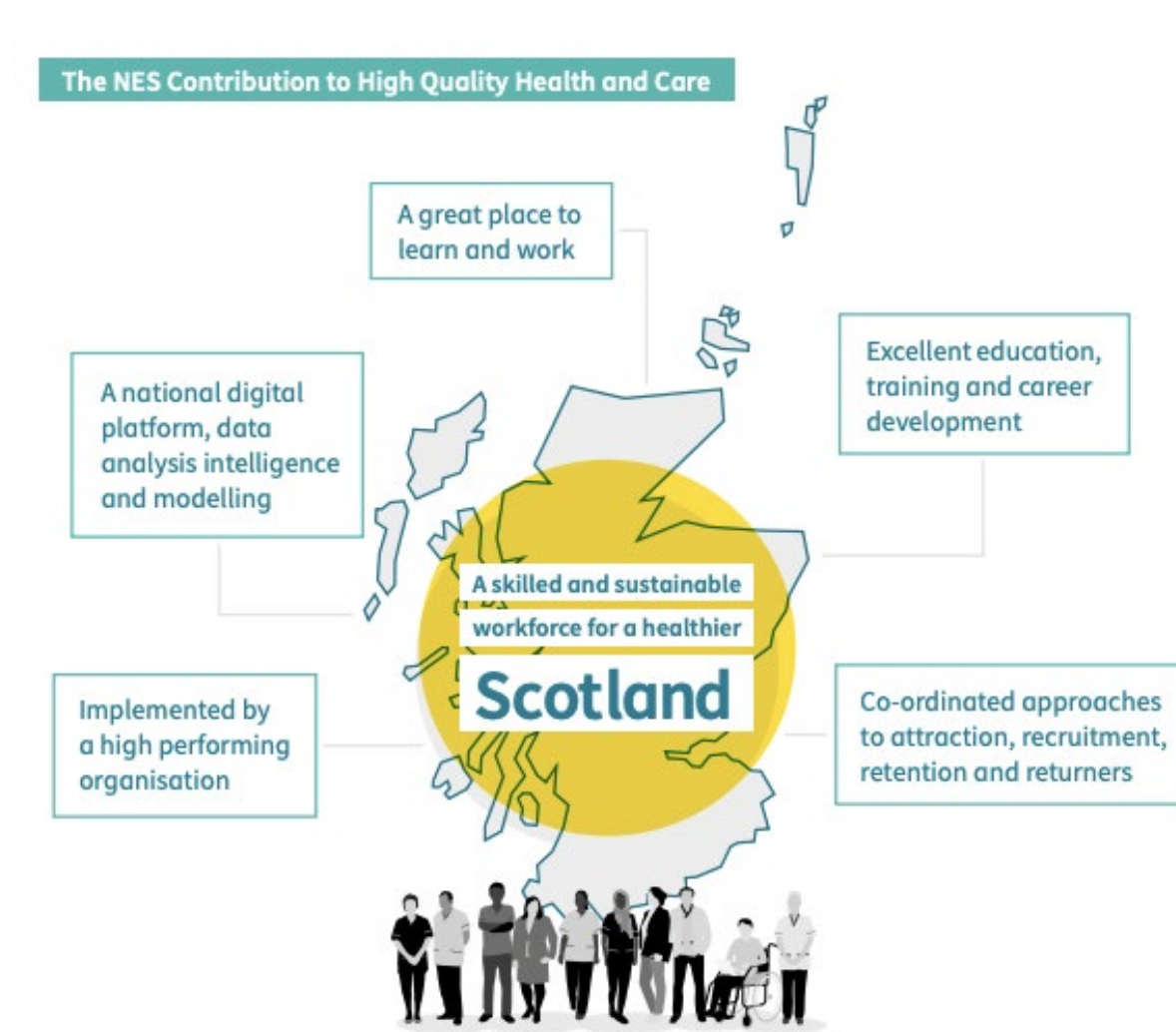


3.0 A Vignette of a Quality Improvement Project

NHS Education for Scotland (NES) is an educational and training body and a national health board within NHS Scotland, responsible for developing and delivering healthcare education and training for the NHS, health and social care sector and other public bodies. NES has a Scotland-wide role in undergraduate, postgraduate and continuing professional development (see Figure 4). Flying Start (FS) is one of the professional development programmes created by NES, aiming to support healthcare professionals in their first year of practice. The first six-months post-registration for the newly qualified practitioner (NQP) is considered a period of transition. Mentorship and preceptorship methods smooth this transition, aiming to develop 'work readiness', the extent to which a NQP has the knowledge and skills to work autonomously.

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Figure 4. The NES Contribution to High Quality Health and Care (National Education for Scotland, 2019).



FS is a web-based programme that provides support and early career development for newly qualified nurses, midwives, and allied health professionals across Scotland. NQPs take responsibility for programme completion while receiving support from FS Facilitators, who are experienced NHS members of staff. FS offers a valuable learning experience not only for NQPs, but also for the facilitators guiding them through the process as they develop competencies and capabilities for future career prospects. Although all NQPs are expected to complete FS in their first year of NHS employment, how each health board supports programme

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implementation at the local level varies. Some health boards choose to make the programme mandatory while others provide workshops, remote or face to face, with or without protected study time. The COVID-19 pandemic has since brought forth new challenges in FS engagement with increased pressures on NHS staff.

Laura Blackburn (student partner) completed the current project in partnership with one academic partner and two industry partners. The project aimed to explore the experiences of newly qualified nurses, midwives, and allied health professionals as well as FS facilitators working over the course of the pandemic. Insight into the experiences of those participating in the programme provides programme designers with the tools necessary to tailor resources to meet the new needs brought about by the pandemic. The sections below present reflections on the student's and industry partners' experiences of the partnership.

3.1 Student Reflection

My educational college background and psychology degree reflected a traditional power relationship between students and staff. I did not know what to expect when entering the university-industry partnership in PD2. DPT staff matched those in my class with the most suitable industry partners based on experience and shared interests. My university-industry partnership comprised an academic partner, and two industry partners, including one of the Allied Health Professional Programme Directors and the Senior Educator responsible for the delivery of FS. After receiving my project topic, I researched the FS programme and planned an agenda for my first partner meeting. I had limited knowledge of NES and how the health board compared to, and interlinked with, other health boards in Scotland. I felt nervous stepping into a relationship without knowing the rules, expectations, and how partners from diverse backgrounds and workloads could work together to finish such a large project in only one academic year.

My partners shared their knowledge and experience of the problems faced by NQPs and FS Facilitators in NHS Scotland. The problem seemed relevant to my identity as an upcoming

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graduate in Physiotherapy, learning through the pandemic, often experiencing emotions related to isolation and uncertainty. I felt the project had a significant meaning for myself and my future, as well as that of my peers. After developing my understanding of the practice-based problem, I suggested data collection methods. I planned to use three methods: surveys for NQPs and FS Facilitators, a FS Leads focus group, and a NQPs focus group. My partners fed back the appropriateness of my methodology choices, providing reassurance and reducing my imposter syndrome.

Academic and industry partners reviewed my drafts of surveys and plans for focus group discussion, sharing knowledge and insight from all three unique backgrounds. I felt as though my partners listened to my opinions and appreciated my skills as a doctoral student. They encouraged my leadership in the project. I worried about my ability to collect enough survey responses and about the possibility that I might fail and let my partners down. Seeking NHS staff to participate in projects during the winter months, in a pandemic, was challenging. I met with my partners regularly for updates. They created a safe environment in which to ask questions and brainstorm different ways to increase engagement. Using my entrepreneurial skills, I turned to my business social media pages and network to promote the survey when it became apparent that internal NHS emails were not gaining enough traction. Social media posts propelled data collection and enabled me to return to my partners with a successful outcome.

My partners and I explored different ways to present data, outside of the typical research methods. I created animated videos, an infographic, and images to showcase the project outcomes. Through feedback, staff facilitated a feeling of validation. My ideas seemed to be worth something, even valued. I found myself less restricted by the label of 'student', able to speak, and feel as though my contribution mattered to all partners. They showed respect and treated me as an equal, something I feel does not often happen in academia. If you were to ask what I think, I would tell you all student-staff relationships should be based on an equal footing and respect. I think the experience of this partnership changed the way I think about some of my relationships as a student and sparked an interest in promoting student-staff partnerships.

3.2 Benefits of the Partnership

When creating the partnership, we did not review any pre-written guidance on how to make it work. Through negotiation and discussion, we decided on how the partnership would function to meet the needs of all partners. The main benefits from participating in the PD2 from a student perspective included enhanced confidence, skills, teamwork, leadership, creativity, adaptability, and resilience through a co-created partnership experience. For example, leadership skills are developed by the student taking responsibility for progress through the quality improvement stages, including creating conditions for change, understanding systems and opportunities for improvement, developing aims and change theory, testing changes, and implementation. Working with NES staff resulted in further partnership opportunities outside of the PD2 module. In partnership with staff, I completed a leadership four-week placement, co-created a poster presentation for an NHS Scotland conference, and co-wrote a paper on a topic of mutual interest.

Industry partners also acknowledged the benefits of the university-industry partnership, including the unique skillset brought by the DPT student, compared to other students and NQPs. DPT student participation brought enhanced critical evaluation skills and a better understanding of how to measure and demonstrate impact. The university-industry partnership facilitated a greater understanding of DPT student skills as well as NES's role, its strategy, and workplan. Working in partnership allowed a student-led independent evaluation to be undertaken and the data used to enhance support for NQPs participating in FS. The positive experience of the industry partner has opened doors for future student-led QI projects.

4.0 Project-Based Learning as a Pedagogy

The DP2 module applied the pedagogy of Project-Based Learning (PjBL) (Guo et al., 2020), with the aim of developing both hard and soft skills to aid student professional growth. PjBL provides an opportunity for students to engage with practice-based problems and develop problem

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solving skills and facilitate change. For PjBL to be successful, students must engage with the project and for this to occur, the correct environment and motivations must be in place. Students need to feel comfortable to engage at this high level and feel as though they have agency over their learning.

DPT staff provided motivation for students to engage by identifying problems aligned to each student's clinical and research interest. Academic staff worked in a three-way partnership with students and industry partners to facilitate a 'safe' environment for students to engage. Each industry culture varied, and for some partners, the culture may not have been compatible with partnership working. Creating conditions and expectations of the partnership helped to overcome differences and bridge academic and industry worlds. One of these conditions involved shared decision making, where partners scaffold advice and support for students to learn and find the answer. It is through this process that the project and learner agency are co-created by all partners. Partners provide feedback on the final project reports and resources as well as the overall partnership experience. Feedback signals areas for future development and celebration to students.

As part of the curriculum of PD2, students attended weekly classes to upskill their knowledge of project management. Resources presented to students included demonstrations of QI and project management tools. Students completed formative tasks, such as creating bitesize videos on philosophies, and provided peer feedback on content. Students shared their project updates during each class and raised any concerns to academic staff and other students. Through these discussions, students provided peer support and advice, not only on project management but also on topics related to managing mental health and well-being. The classroom gave students an additional 'safe' space to seek support and share their experiences without the fear of corroding partner relationships.

Students reflected on their personal and professional development, interactions, negotiations, and critical incidents in the partnership in both the essay and viva. Reflecting on moments of creativity, entrepreneurship, and resilience, demonstrates growth of mind and enhances learner dispositional agency. Academic partners played a key role in facilitating reflection and

engagement by acting as guides through the learner liminal passage. The time and energy required by staff to ensure all students' epistemological progression can cause cognitive fatigue, as staff mentor many students across the programme. However, the additional support from staff can make the difference in student engagement and outcomes.

5.0 Lessons Learned

This paper presented a case study of a university-industry partnership in a doctoral programme. Below are three recommendations based on the experiences of all three authors who engaged in a PD2 partnership with the DPT programme at GCU.

5.1 Lesson 1: Use Project-Based Learning

The pedagogy of PjBL provides opportunities for students to engage in real work problem-solving. Discussion and negotiation with students enhance student voice and the decision-making power of their learning. Students drive their learning forward, seizing and making opportunities, with support and guidance from partners. PjBL offers a useful tool for students' professional and personal development by placing the student in control.

5.2 Lesson 2: Safe Partnership Environment

Creating a 'safe' space for student engagement is critical to PjBL. Students must feel able to express opinions and ideas, and to raise any concerns along the way. If students do not feel in control, their enjoyment and learning potential can diminish. This outcome is not desirable for all involved as it may result in a project failing to meet the needs of the practice-based problem. In the initial stages of PjBL, partnership conditions, expectations, and scope of the quality improvement project should be agreed by all. Quality improvement/project management tools can facilitate effective partnership working.

5.3 Lesson 3: Enhance Learner Agency

All attempts should be made to enhance learner agency and encourage student voice, effective co-creation, and student engagement with their education. Increasing learner agency can positively impact the learning experience, student success, and achievement.

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