

“I'm not alone”: Outcomes of a faculty-wide initiative for co-creating inclusive science curricula through student-staff partnership

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Abstract

We explored the experiences of and outcomes for students and staff working in partnership on an academic development project aiming to enhance the inclusivity of science curricula across a faculty. Quantitative survey data revealed changes in student and staff perceptions including increases in sense of belonging for both, perceptions of fairness in decision-making for students, and increased adoption of inclusive teaching practices for staff. Open responses articulated benefits and challenges of the project. Implications from this research will be relevant to academic developers working in similar spaces such as decolonising the curriculum or engaging students as partners in development work. (100 words)

Keywords:

Student-staff partnership, inclusive curriculum, sense of belonging, science education

Word count: 6049

Introduction

The Australian higher education sector has been grappling with issues of diversity for decades. Higher education institutions are increasingly being required to implement systems for evidence-based improvements to support minoritised student cohorts to achieve specific measurable participation and attainment outcomes and to create cultures that embrace diversity rather than exclusion (TEQSA, 2017). This raises the question: How do we achieve such equitable outcomes? One solution focuses on curricula as the core space where all students interact with institutions. As the diversity of cohorts increases (NCSEHE, 2016), approaches to pedagogy, curriculum design and content should also evolve. Academic developers, with a remit for and influence to drive curriculum enhancement, play a critical role in achieving change (Huijser et al., 2020; Stensaker, 2018). Developers are ideally positioned to facilitate change given their roles require navigation within and between power-laden institutional cultures (Little & Green, 2012).

One reason cited for educational inequalities is the normative nature of curricula. Curricula often reflect an overrepresentation of staff from non-minoritised backgrounds who make decisions about syllabi (Jester, 2018). For students, seeing the omission of their histories and identities from mainstream curricula can lead to feelings of isolation, alienation, and marginalisation; higher attrition rates; and attainment gaps (Abou El Magd, 2016; Seidman, 2012; Strayhorn, 2012). Criticisms of this top-down model of curriculum design have resulted in student push back, birthing international movements like *Why is my curriculum white?* and *Rhodes Must Fall* advocating for decolonisation of curricula. A contributing factor to non-inclusive curricula could be the lack of active student contributions to curriculum design.

A promising approach to infusing curricula with diverse identities and knowledges representative of diverse student cohorts is to engage students as partners in the curriculum enhancement processes (de Bie et al., 2019). Trent University (Canada), for example, undertook a student-staff collaboration, 'Queering the Academy', to "dismantle cisgenderism/heterosexism, trans/homophobia, and discrimination", by inviting staff to "consider how they can 'Queer' their lectures, course materials, and content" (Trent University, 2018). Academic developers have a critical role to play in such efforts as key agents to create processes that bridge academic and student domains (Bryson, 2016). The student staff partnership model offers a pedagogical approach that provides students with opportunities to actively shape teaching and curricula in partnership with staff (Werder et al., 2012). Calls are increasingly being made for academic developers to partner with students (Bovill et al., 2011), such that students become actors in, rather than subjects of, their learning experiences (Felten et al., 2019). The partnership model has shown to improve students' sense of empowerment and belonging, arguably critical for all students but particularly for those from minoritised backgrounds (Cook-Sather, 2020; Mercer-Mapstone et al., 2017). Academic developers can support such partnership processes to be relationship-focussed and in realising "the potential of partnership to make institutions more equitable and empowering spaces" (Matthews et al., 2018, p. 246).

The Faculty of Science at our university began an academic development project, the Developing Inclusive Science Curriculum (DISC), in 2019 to develop and implement targeted initiatives to improve inclusivity in the science curricula and Faculty culture. A partnership approach was chosen as it has been shown to benefit students and staff from minority backgrounds (Cook-Sather, 2018). The project engaged staff (including academic staff who teach, academic developers, and professional staff who support teaching) and undergraduate

students in partnership to develop inclusive science curricula. We evaluated the approach guided by the following research questions:

- (1) What are the benefits and barriers for students and staff working in partnership on a Faculty-wide inclusive science curriculum project?
- (2) How does working in student-staff partnership on a Faculty-wide inclusive science curriculum project change the perceptions of students and staff within that project?

A mixed methods approach was adopted, and we share the outcomes and lessons learnt in the hopes these may encourage and inform future similar initiatives. In addition to contextual novelty, our study is particularly timely in taking action within our university culture to push back against concerning shifts in the current socio-political climate of increased nationalism and open discrimination in Australia and elsewhere.

Pedagogical Model and Process

Model

The DISC project aimed to develop, implement, and evaluate initiatives to enhance curricula and culture in the Faculty of Science to be inclusive and representative of diverse people, resources, approaches, and knowledges. A pedagogical model proposed by Curry-Stevens (2007) termed ‘pedagogy for the privileged’ that is novel to the academic development and science education contexts was adopted. With roots in social justice education, this model frames participants learning of equity through a transformational process situated within acknowledgement of individual privilege. The model proposes two learning processes of confidence shaking and confidence building. Confidence shaking occurs across six steps: awareness of oppression;

oppression as structural and thus enduring and pervasive; locating oneself as oppressed, locating oneself as privileged; understanding the benefits of privilege; and understanding oneself as implicated in the oppression of others. Confidence building can then be fostered, whereby learners develop confidence and skills around becoming active allies.

For this to occur, we believed that project members should gain an understanding of their own identities in relation to the institutional and societal context. This decision was also a response to calls that academic development work has a role “to play in responding to radical cultural shifts in the global landscape” (p. 97) where Huang Hoon and colleagues (2019) argue for the centring of a multiplicity of identity, voices, and stories.

The theory of change which framed our project was that of Rogers’ (1962) Diffusion of Innovations, which explains the spread and adoption of an innovation through a population. Innovation is said to move temporally across a normal distribution curve through five categories of ‘adopters’: from innovators through to laggards. We reframed the theory’s original business-focussed orientation to focus on engendering a cultural shift in our faculty. Our context was: Australian higher education, which has a history of claiming ‘apolitical’ status; the sciences, an arena which continues to adopt predominantly traditional teaching approaches and perpetuate arguments that the ‘objectivity’ of science means issues like racism are not relevant; and a Faculty of Science where ‘inclusive curriculum’ was a term new to most. We started by recruiting other innovators and early adopters by developing and circulating a project brief to all Faculty of Science students and staff inviting involvement, allowing those who were likely already interested to opt in. In total, 32 undergraduate students and 25 staff (professional/staff and academic/faculty) responded to the invitation. This group become our champions. By using

the project to set the example, our expectation and focus was that participants would influence and spread the ‘innovation’ of cultural change through the faculty, as per Rogers’ model.

The project ran for six months in 2019. The DISC ‘project group’ undertook the academic development journey framed by Curry-Steven’s pedagogy for the privileged and were the focus of this study’s evaluation. The project adopted a student-staff partnership approach from the outset with principles, shared definitions, goals, and focus areas of the project being co-created by the project group members. One example was our co-created understanding of what constituted an inclusive science curriculum. While there are many different theorisations of what inclusive curricula comprise which could have been presented as a definition to the group, we co-created our own definition through a participatory process (Appendix 1).

Process

Project group members undertook a monthly development program encompassing various activities designed to: a) provide them with opportunities to learn about theories, models, and practices around inclusive curricula such as, intersectionality, the social model of disability, cultural awareness, and process of social exclusion; and b) activities through which they learned to understand and bring their own lived experiences and identities to bear on their work as part of the project. These activities involved practices such as structured written individual and dialogic reflection, silent dialogues, ‘Check Your Privilege’ bingo, and world café events. An additional purpose served by these meetings was to build a community of practice.

To allow members to focus on areas of most importance to them, the group collaboratively identified six areas of focus for the project including anti-racism, gender and sexuality, accessibility, internationalisation, socioeconomic barriers, and a holistic approach (described in Appendix 1).

Project group members self-selected to join one or more subgroups focussed on one topic and met monthly, separately to the whole-group meetings. A model of distributed leadership was adopted with each subgroup defining their own goals, activities, and outputs. Subgroups received scaffolded support including mentoring, resources such as project management templates, and networking connections to relevant people and places within the institution.

All student members received a small stipend as financial recognition for their contributions to the project and four students also elected to complete an internship for academic credit for their work on the project. These students took on leadership roles within each of their subgroups as the internship meant they had significantly more time to contribute as part of their study load.

Methods

This study explored the experiences of and outcomes for students and staff working in student-staff partnership on a faculty-wide project that aimed to enhance inclusiveness in science curricula. An academic development framework using the model of 'pedagogy for the privileged' (Curry-Stevens, 2007) was applied. Our novelty was derived from the application of existing ideas, and concepts in new configurations to address the stated problems, outlined with messy nuances (as described by Schön et al., 1995 p.28). That is, the introduction of partnership and inclusive curriculum in our context and the use of the 'pedagogy for the privileged', to frame and evaluate an academic development project is a novel research approach. Quantitative and qualitative data on the perspectives of students and staff were collected using a questionnaire administered before and after the project to examine how this pedagogical model impacted participants in our context.

Institutional Context, Survey Design, and Sample

This study occurred within a large, young university ranked within the top ten universities in Australia. The university enrolls ~39000 students. The disciplinary context of the project was a Faculty of Science which has two schools (Life Sciences, and Mathematical and Physical Sciences), enrolling ~4000 students.

An online questionnaire was distributed to project members prior to the commencement and following the completion of the DISC project. Separate questionnaires were distributed to students and staff. Demographic information was collected including Gender, Age, Discipline, Minority status, First in family (students only), International Enrolment Status (student only), and Contract Type (professional/academic, staff only). Teaching staff completed items regarding their teaching practices and those who did not teach answered items regarding their perceptions of others' teaching practices in science. This study was approved by the UTS Human Ethics Research Committee approval number ETH19-4211.

Scales

Full surveys are detailed in Appendix 2 (students) and 3 (staff). Open response questions and Likert scale questions regarding participants' understanding and valuing of inclusivity in science teaching and learning were included, as were the inclusion of self in science curricula (students only). The scale for sense of belonging was adapted from Hausmann et al. (2009) and Trujillo and Tanner (2014). The in-group ties scale was adapted from Cameron (2004). The student-only scale on student voice was adapted from Tyler (2000).

The staff-only scales of educator's inclusive mindset and educator's learning expectation were both adapted from Sosu et al (2010) who explored the impact of teacher preparation on

student teachers' attitudes towards educational inclusion. Specifically, the items those authors use to assess 'Inclusive Mindset' and 'Learning Expectation' were translated from abstract statements such as "Reasonable for teachers to have lower classroom expectation for children with additional support needs" to personal statements to make them easier for responders to relate to, such as "I have lower academic expectations for students with additional support needs in my subject". Reverse scored items as in this example, were retained as reverse scored as per the original scale from Sosu et al. (2010).

Adoption of inclusive approaches within curricula was measured using a scale adapted from Nelson Laird (2011) who used a list of inclusivity items to measure the diversity of college courses. For example, Laird's item "Students gain an understanding of how to connect their learning to societal problems or issues" became "In my teaching, students gain an understanding of how to connect their learning to societal issues".

Analysis

Open response questions underwent thematic analysis according to Braun and Clarke's (2006) six-phase approach involving iterative cycles of reading, coding, defining, and summarising data into themes and subthemes. An inductive data-driven approach was adopted, meaning that the themes and subthemes were based on what existed in these data rather than applying a predefined coding framework. Coding for the pre- and post-questionnaires was conducted in pairs with each researcher coding individually and then cross-checking with their partner. Quantitative data were analysed using R (R Core Team, 2020, version 3.6.1678).

Results

Survey

The baseline questionnaire was sent to 57 participants: 32 students and 25 staff. Seventeen students and 13 staff responded. The follow up post-questionnaire was sent to 47 participants including 24 students and 23 staff, following the withdrawal of 8 students and 2 staff from the project. Fifteen students and 10 staff responded. Table 1 summarises participant demographics.

Table 1 near here

Quantitative results

Selected results are discussed in text and presented in accompanying figures. For full results, please see Appendix 4 and 5.

Student responses

Matching of baseline and follow-up responses could only be achieved for seven students, not a large enough number for statistical testing. Instead, a comparison of frequency of responses for items across the two surveys was performed. While the understanding and value attached to inclusivity were high in both surveys (see Figure 1), reports of felt inclusivity and belonging were higher in the post-questionnaire sample (see Figure 2). Some of the more notable findings include higher frequency of “Agree” and “Strongly agree” responses to the questions about belonging in the Faculty and in the discipline after the project, which is particularly important given the high percentage of minority students involved. After DISC, more students reported that

they had a lot in common with the typical science student. More students felt more strongly after the project that they had opportunities to participate in decisions about science teaching and learning, but there was no indication of the post-project cohort feeling that teachers in science listen and respect them more on issues about teaching and learning.

Figure 1 near here

Figure 2 near here

Staff responses

Eleven staff members completed the baseline questionnaire and 10 completed the follow-up questionnaire. Only two of the responses could be matched thus we compared only frequencies as above. Similar to students, staff also reported high levels of the understanding and value attached to inclusivity in both the baseline and the follow-up survey (see Figure 3). Figure 4 reveals interesting patterns about staff members' sense of belonging in science. Most staff members agreed or strongly agreed that they belong in the Faculty of Science, and this was true both before and after the project. The post-project sample did however, have a higher proportion of "Agree" responses indicating a positive shift in belonging. In the post-project sample, nearly everyone (90%) agreed about feeling like they belong in their chosen discipline. In the baseline sample, there was a wider variety of responses, with just over half of the sample either disagreeing or feeling neutral. The post-project sample also had a higher proportion of reporting that they had a lot in common with what they saw as a typical person in their discipline.

Figure 3 near here

Figure 4 near here

All staff including those who teach and those who do not, were asked items about educator's learning expectations and inclusive mind-set (Sosu et al., 2010). More of the staff who teach in the post-questionnaire disagreed with the negatively-worded statements 'I am not responsible for the learning of all students in my subject' and 'Inclusivity issues like race and gender are not relevant to my subject' (Figure 5). This result indicates more staff came to see that learning needs to be inclusive in science and that this is their responsibility. There was a decrease in "Strongly agree" for staff who teach for statements of 'all students can learn in my subject' and 'students learn from each other as well as from me in my subject' indicating that perhaps exposure to DISC led to a shaking of confidence around the extent of inclusivity in their teaching.

Figure 5 near here

In the inclusive mind-set scale, which indicates approaches to and beliefs about teaching which make an educator inclusive, agreement tended to decrease or become more polarised across most items after the project. This may indicate that, as above, teachers came to realise that perhaps what they thought was inclusive teaching prior to the project was perceived as less so as they came to more fully understand the scope of inclusive teaching. The adoption of inclusive approaches within curricula (Nelson Laird, 2011) generally increased after the project. This may indicate that teachers improved their teaching practices to be more inclusive because of the project.

Qualitative results

Table 2 shows quasi-qualitative summaries of student and staff responses to the open questions of the post-project questionnaire that underwent thematic analysis resulting in two main themes: benefits and barriers, each with multiple subthemes. The analysis showed quite distinct profiles of reflection from staff and students. Students expressed increased feelings of being valued and increased feelings of belonging in alignment with quantitative results. Staff were more removed, focussed on their learnings around understanding the principles of inclusivity and how that related to their teaching practices in alignment with Figures 4 and 5. The reflective comments portrayed that students were focussed on self-reflection and self-growth as outcomes of the project. Staff tended to have less focus on self-growth or reflection and more on application and practice. Student comments indicating reflection on belonging and inclusivity included *'I gained a greater awareness of the different issues regarding inclusivity and how working together as a team in... necessary changes for the benefit of everyone involved.'* The direct impact of the confidence building stage was highlighted by this student comment in the post project survey: *'I have enhanced my confidence and my ability to engage with people from diverse backgrounds from mine- rather than the traditional hierarchical dynamics'*. Staff remained focussed on curricula with only a few examples of reflection on self-development. Examples for the former and latter include: *'Realising that my content did not reflect inclusivity...'* and *'I am more aware of my biases'*.

The emotional impact of the project was felt heavily by staff and students, with some feeling that the challenges to enhance inclusivity in the faculty were almost insurmountable, whereas others felt saddened by what they learned, but empowered that their contributions in the project were making a difference or joy at finding a community. Examples included this student

comment: *'I found it challenging to overcome my biases. It's really hard to unlearn, deconstruct and decolonise your mind-set. ...It took more emotional effort than I had expected'*; and a staff comment: *'It was emotionally quite draining'*. The emotional benefits of the partnership model were overwhelmingly consistent in the comments, such as this student: *'also got to relate to a lot of people out there which felt... I'm not alone'*.; and staff: *'I felt like I belonged with this group of people more than anywhere else in the university....'*. This emotional labour is unsurprising in light of the fact that both groups found they were faced with overcoming their own biases and many were from marginalised backgrounds making the focus of the project more personal.

Table 2 near here

Discussion

The purpose of our evaluation was to understand the experiences of students and staff engaging with the novel combination of two pedagogical approaches (student-staff partnership and pedagogy for the privileged) in a science context where both are relatively foreign, through an academic development project seeking to make science curricula more inclusive. Our findings speak to both benefits and challenges that we translate into recommendations for practitioners seeking to undertake similar initiatives.

Lessons learnt from applying a 'Pedagogy for the Privileged' to an academic development project

Our pedagogical model for transformational learning; confidence-shaking and confidence-building embedded within a students-as-partners model represents a novel framework for academic development. Akin to multiple stages in the first part of the model, changes in staff

perceptions during the project (Figure 4) showed more staff came to see that science learning needs to be inclusive and that such changes are their responsibility. Similarly, qualitative results showed both students and staff had become more aware of their own biases. Project results showed a decrease in “Strongly agree” responses for staff who teach for the statement ‘All students can learn my subject’ (Figure 4). Such a decrease perhaps indicates that exposure to DISC led to a shaking of confidence for staff who teach, around how inclusive they believed their teaching practices to be. This realisation was described in staff responses like ‘*Realising that my content did not reflect inclusivity*’ and ‘*I need to work on and own how my perceptions of people's identities who differ from my own may cause me to act in a way that is not inclusive*’. The latter stages of the confidence-shaking process were reached for certain participants, leaving project members less sure of their own practices and, as one student put it, ‘*...somewhat guilty of my privilege*’. This guilt is commonly associated with stage six of the model, whereby those with certain privileges understand themselves as implicated in the oppression of others.

Through this pedagogical lens, we have realised that, whilst much effort was put into supporting project members to understand and position themselves in the systems of privilege and oppression intersecting with classrooms and institutions, significantly less work was done around confidence building. Post-project results in Figure 4 do indicate, however, increases in responses for staff who teach across all items associated with the adoption of inclusive teaching approaches indicating some may have reached the action-taking stage. As one respondent wrote: ‘*a silent ally isn't a particularly good ally*’, showing awareness that actions lead to change. The shift in staff responses towards responsibility for student learning and inclusive curricula supports that there is an opportunity to build on this impetus by pairing ‘confidence building’ with specific academic development interventions. Therefore, for other developers undertaking

decolonisation efforts, we recommend adoption of the ‘pedagogy of the privileged’ with careful attention to supporting and scaffolding.

Enhancing opportunities and reducing barriers

The finding of an increased sense of belonging for both staff and students was a powerful benefit of this project (Figures 2 & 4). The value of belonging for student success and for organisational culture is well documented in the literature, particularly for students and staff from minoritised backgrounds (Cook-Sather, 2020; Islam et al., 2019). The DISC project, by intentionally being inclusive and promoting inclusivity, attracted a diverse group of students and staff: about half of the project members self-identified as belonging to a minority group. The value of such diversity became clear in the post-project questionnaire responses, as one student wrote: *‘that is one thing I truly loved and that made this project stand out from everything else. Its diversity’*. It was gratifying to see that students and staff described a project environment where diverse voices were heard *‘without judgment’*, and through DISC discussions they came to realise that they were *‘not alone’*. Given this importance of belonging in institutional narratives around student engagement, academic developers would be well positioned to use this evidence to strategically position their work as critical.

The student-staff partnership model likely was a crucial component of the project that fostered this enhanced sense of belonging. This is consistent with previous work in this area, where such interactions resulted in a sense of belonging for minoritised students (Meeuwisse et al., 2010). This, along with other benefits such as students’ ability to make their voices heard, contribute to decision-making, and self-empowerment, were likely a result of the partnership approach intersecting with the project’s focus on inclusive curriculum. This explanation aligns with increasing evidence that “partnerships can facilitate epistemological forms of equity and

inclusion by (1) creating more equitable conceptions of knowing and knowledge that open possibilities for (2) fostering students' confidence in their knowledge and willingness to share it' and are a "powerful way to recognize underrepresented and underserved students as holders and creators of knowledge" (Delgado-Bernal, 2002, p. 106) and "bring about greater epistemic justice in higher education". (de Bie et al., 2019, p. 35)

There were barriers reported by both staff and students, either emotional or institutional/structural barriers. Primary emotional barriers included a fear of not getting inclusivity 'right' or inadvertently excluding others. The emotional labour of working both on equity and diversity initiatives and in student-staff partnership (e.g. Felten, 2017; Zembylas, 2012 respectively) is documented, but little is suggested as solutions other than raising awareness among participants. When academic developers are designing future projects of this nature, they would benefit from including explicit support such as workshops to give individuals a coping toolkit, including those outlined by Cook-Sather et al. (2019) and Ntem and Cook-Sather (2018).

Regarding institutional and structural barriers, students and staff primarily reported not having enough time to engage with the work. It is recommended that future projects specifically embed approaches to facilitate engagement, which may be through workload allowances or teaching buyouts for staff. Ten students left the project primarily for reasons of being time poor and others identified that time was challenging even with the credit for a subject and/or stipends. Such challenges are found elsewhere in the partnership literature, highlighting the criticality of academic developers implementing support and recognition mechanisms, many of which are detailed by Mercer-Mapstone & Marie (2019).

Staff and students also identified, through their struggles, that they would have benefited from support to develop professional skills, particularly project management, time management,

and collaborating with a diverse team. It is likely that the participation in this project created opportunities for some development of these skills (we, as authors, can speak to this), but we did not include any explicit professional development in the project. Thus, our overarching recommendation is that developers considering similar projects might implement an explicit learning and growth framework that attends to the aforementioned emotional support alongside professional development activities structured around the stages of the pedagogy of the privileged. We believe such a framework would maximise the potential for transformative and professional learning as a meaningful way to give back to those who contribute so much to collaborative academic development work.

Recommendations

Through discussion of our findings, we have developed five key recommendations for academic developers who support student-staff partnerships to make curricula more inclusive:

1. Adoption of the 'pedagogy of the privileged' (Curry-Stevens, 2007) is relevant to both process and focus of such work, with careful attention to developing *both* stages of the pedagogical process *evenly* across confidence-shaking and confidence-building.
2. Tailored and content-specific support (such as trauma-informed practice) must be given to partners to cope with the deep emotional labour that is required where partners are advocating for change based on their own lived experiences of oppression.
3. Partnership work should embed approaches to recognise engagement, such as workload allowances or teaching buyouts for staff and course credits or stipends for students, to adequately incentivise and reward partners from minoritised backgrounds for whom

barriers to engaging in such work are disproportionately high.

4. Partnership projects should be supported by a learning and development framework that attends to the aforementioned emotional support alongside professional development activities structured around the stages of the pedagogy of the privileged.
5. The outcomes achieved from this evaluation paint a convincing picture of the value of partnership work. Such evaluation should be undertaken not only for the sake of research but to convince financial decision-makers in higher education that partnership work is worth sustaining through ongoing funding commitments, rather than through small, ad-hoc grants.

Conclusion

We have no concrete conclusions, only “openings” (Glesne, 1997) where we invite fellow academic developers to consider the recommendations for development work we have made here, such that as a community we can move towards creating equitable processes whereby students and staff can collaboratively work on inclusive curricula. As a result of this project working in partnership to enhance the inclusivity of science curricula, students and staff were left with an increased sense of belonging and empowerment, strategies to make curricula more inclusive, and a deeply felt tension of the emotionally laborious struggle to push back against the systems of oppression which play out in our classrooms and institutions. As our results build on a growing body of evidence around the transformational power of engaging students-as-partners in liberatory academic development work, we leave readers with the question: *are we at a tipping point where we must see it as a responsibility for academic developers to engage in partnership with students because, put simply, not to do so would be unethical?*

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Data availability Statement

The data that support the findings of this study are available on request from the corresponding author (WMH). The data are not publicly available due to their containing information that could compromise the privacy of research participants.

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