

Waves of evidence: A novel approach to the collaborative enquiry of equity in higher education

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This paper introduces diffractive collaborative enquiry, a methodological innovation that addresses urgent practical challenges in higher education research and evaluation. By enabling real-time collaboration across heterogeneous research projects *in medias res*, our approach overcomes traditional barriers of misaligned timelines and incompatible methodologies for joint analysis that typically delay university responses to student needs. Bringing together three distinct ongoing research projects at the University of Oxford—academic skills development, diversity of student experience, and mental health—we demonstrate how diffractive reading practices can generate actionable insights within the complexities of a collegiate system without extensive prior planning or waiting for evidence to emerge from completed projects. Our approach also examines how different datasets interact, illuminating connections between academic preparedness and institutional belonging. By maintaining productive tension between different data sources and perspectives rather than seeking consensus, our framework creates pathways for a more holistic understanding that supports responsive, equitable systems capable of interrupting the reproduction of institutional inequities. This work offers a transferable model for complex organisations seeking to leverage diverse ongoing research, evaluation and reporting for timely decision-making that promotes educational justice by addressing systemic barriers and centring the needs of underrepresented students.

Keywords: diffractive analysis, higher education, university, collaboration, mixed methods, inequality, academic skills, mental health

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Introduction

Higher education continues to face significant challenges in ensuring equitable outcomes for disadvantaged students (Mountford-Zimdars et al. 2015; Burke & Lumb 2024), especially in collegiate systems like the University of Oxford, where support services and academic initiatives are fragmented across administrative layers (Palfreyman & Tapper 2014). The University of Oxford's (2025a) Access and Participation Plan (APP)¹ provides a strategic roadmap for addressing persistent gaps in access, participation, retention, and degree attainment for students from underrepresented groups. Of note are disparities in attainment between Black and White students, students with and without a disability, and students from different socioeconomic backgrounds. Although the University of Oxford's awarding gaps are smaller than the sector average, the institution has set ambitious targets to increase attainment for underrepresented undergraduate students to 94% by 2028/29 (see APP). It is important to note that the University chose to explicitly state a position that aspires to the objective of genuinely improving outcomes for disadvantaged students rather than just statistically reducing disparities: 'We do not want to close gaps without improving outcomes, as it is the absolute improvement that we really want to achieve. We therefore decided it was most appropriate to set targets for absolute improvements.' (APP paragraphs 24 to 26).

Focusing only on the APP, however, limits a more complete understanding of student experience. Indeed, the University of Oxford (2025b) recognises the necessity of a holistic perspective, acknowledging 'strong links between a student's educational opportunities, feeling part of social groups ... and ongoing positive mental wellbeing' (para. 1), and its initiatives frequently highlight the importance of addressing diversity gaps during and after entry. While gender-related challenges are not in the APP, they are targeted by individual researchers and programmes within the institution (Advance HE 2022). Similarly, despite falling outside the APP's scope (domestic "home" undergraduate students' risks to equality of opportunities),² international students comprise 46% of the student body at the University of Oxford (2023) and research demonstrates that international students experience significant exclusion from equity, diversity and inclusion frameworks, suggesting they would benefit from comprehensive appraisal in access and participation initiatives (Tavares 2021).

¹ Access and Participation Plans (APPs) are regulatory documents required by the Office for Students for all English universities charging higher tuition fees. These legally binding plans set out how institutions will improve equality of opportunity for underrepresented student groups across the student lifecycle—from pre-entry outreach through to graduate outcomes. Each APP includes specific numerical targets for reducing gaps in access rates, retention, attainment, and progression to employment or further study between underrepresented groups and their peers. Universities must detail evidence-based interventions, investment commitments, and evaluation strategies to achieve these targets, with progress monitored annually.

² <https://www.officeforstudents.org.uk/for-providers/equality-of-opportunity/equality-of-opportunity-risk-register/>

The UK Higher Education Context

In the UK context, the contemporary landscape of widening participation in higher education was shaped significantly by Tony Blair's 1999 government target to increase young adult participation to 50% , which led to considerable diversification of the student profile across cultural and social backgrounds (Loddick & Coulson 2020). This policy shift necessitated universities to adapt their support structures and develop new roles focused on student learning and academic skills development (Hilsdon 2011; Universities UK 2017).

The UK higher education sector has witnessed a significant shift in its approach to evaluating access and participation work over the past decade. Prior to 2018, widening participation was overseen by the Office for Fair Access (OFFA), which required institutions to produce Access Agreements focused primarily on outreach activities and financial support packages. The creation of the Office for Students (OfS) as the new regulatory body for higher education in England marked a fundamental change in regulatory philosophy. The OfS introduced statutory Access and Participation Plans (APPs) that require institutions not only to set ambitious targets for improving equality of opportunity but, crucially, to evaluate their interventions using increasingly rigorous methodologies.

The OfS established the Transforming Access and Student Outcomes in Higher Education (TASO) in 2019 as part of this new regulatory infrastructure, tasked with supporting the sector to build robust evidence about "what works" in widening participation. However, the regulatory approach has faced critique from within the sector, with concerns raised through strong sector networks about the tension between standardised evaluation requirements and the contextualised, relational nature of widening participation work (Biesta 2007). In response, the OfS has increasingly emphasised regular dialogue with institutions and sector bodies, marking a shift towards more collaborative regulatory engagement that seeks to balance accountability with the recognition that effective practice emerges through ongoing conversation rather than compliance alone.

Collaborative Barriers in Higher Education Research

Despite its importance, collaborative research and evaluation faces significant barriers in higher education. Individual colleges, departments, and research labs typically develop and implement projects independently, leading to a fragmented understanding of effective practices across the institution. Projects are often initiated at different times, making *a priori* collaboration difficult. Once started, incompatible responsibilities, objectives, theories, standards, schedules, and methodologies can lead to irreconcilable differences that impede cross-project collaboration.

When similar projects are implemented across departments and colleges, differences in local context and assessment methods can still make it challenging to meaningfully synthesise findings. Data governance requirements can also create barriers by restricting sharing of personal data, particularly when collaboration has not been stated in participant-facing materials beforehand. These barriers can be sidestepped by adhering strictly to secondary analyses that aggregate findings across multiple completed studies (e.g. meta-analysis). However, this creates considerable lag between identifying areas for enhancement and implementation that can span years, preventing timely interventions for critical issues.

Traditional top-down approaches to research and evaluation, meanwhile, often focus narrowly on identifying straightforward, generalisable interventions that can be implemented across all contexts—an approach which can overlook nuanced, context-dependent differences in educational practice, and may fail to capture how power dynamics shape student experience, instead reinforcing deficit narratives that locate problems within students rather than institutional structures (Boliver 2017; Burke & Lumb 2018). There is thus a need for finding novel approaches to quickly integrate findings from multiple, concurrently active projects with diverse aims and methodologies, while preserving the complexity of student experiences. Here we introduce diffractive collaborative enquiry as a methodological innovation that demonstrates how evidence from varied projects can be read through one another using diffractive co-analysis to generate unique and multifaceted insights.

Theoretical Framework for *Diffractive Collaborative Enquiry*

Representative Co-analysis

Co-analysis has emerged as a vital tool within participatory research, enhancing the established collaborative practices of co-design and co-creation. This approach is grounded in fundamental principles where knowledge is co-constructed through interactions between researchers and those with lived expertise that integrate ‘theoretical and methodological expertise with ... real-world knowledge and experiences into a mutually reinforcing partnership’ (Cargo & Mercer, as cited in Vaughn & Jacquez 2020 p. 2). As Vaughn and Jacquez (2020) emphasise, co-analysis must enable ‘genuine and meaningful participation’ where stakeholders have ‘the ability to speak up, to participate, to experience oneself and be experienced as a person with the right to ... have the expression valued by others’ (2020 p. 5).

Here we build upon this and other participatory methods employed at the University of Oxford, including iterative student review of research outputs and theory of change workshops (Centre for Teaching and Learning 2024, 2025), as well as co-analysis listening circles where policy partners, education professionals, academics, and students collaboratively analyse primary data (Department of Education 2024).³ By appointing a circle of project representatives and considering them as both experts and co-analysts, we leverage participatory methods and adapt them to a collaborative process where real-time evidence is used, for instance, to guide policy decisions, namely scientific panels (e.g. Ruckert et al. 2025). Rather than apply a traditional consensus-based model, however, we suggest representatives engage in diffractive co-analysis.

Diffractive Enquiry

In physics, diffraction describes how waves bend and spread to form complex interference patterns. Drawing on Haraway (1997) and Barad's (2007) conceptualisation of this phenomenon, and Mazzei's (2014) application of diffraction as a metaphor for analysis in educational research, we illustrate how diffractive analysis can reveal previously obscured patterns in student experience. As Mazzei argues, diffraction moves us beyond ‘a reduction of data using a series of concepts’ toward something more rhizomatic that ‘keeps analysis and

³ <https://www.education.ox.ac.uk/project/what-matters-to-students-embedding-student-voices-in-evaluations-to-improve-student-outcomes/>

knowledge production on the move' (2014 p. 743). In lieu of coding data into themes, analysts process narratives by 'plugging in,' which describes reading data, theory, participatory input, and personal experience through each other to produce 'a different relationship among texts' that 'create something new' (2014 p. 743).

This diffractive approach is particularly useful when traditional coding might miss important patterns, when seeking to understand how practices produce outcomes rather than just describing them, and when material conditions matter as much as meaning. While reflection implies mirroring and sameness, diffraction highlights patterns of difference. Bohr's complementarity principle is crucial here, as seemingly contradictory findings become necessary for a more insightful understanding of complex phenomena (Barad 2007). Thus, in the context of co-analysis, we view diffraction as a form of discussion and enquiry, where the aim is not to synthesise different perspectives into a unified whole, but to embrace productive tensions that emerge when diverse datasets and points of view interact, creating 'interference patterns' that enable 'thinking in the round'.

Aims

By rejecting the notion of evaluation as apolitical or objective, and instead recognising the deeply embedded ethical, political, and epistemological dimensions of evaluative practices, our diffractive collaborative enquiry approach aligns with calls for justice-oriented evaluation that foreground marginalised experiences and voices (Gordon et al. 2022). While we focus on disparities among undergraduates in the University of Oxford's collegiate system as a proof-of-concept to complement the Access and Participation Plan (APP), the framework we propose has broader implications for understanding and enhancing support across different student populations, including among graduate and international students. Our primary aim is to contribute both methodological insights and practical policy recommendations for improving student experience by developing a process for placing research in dialogue in complex higher education environments—not only to advance theoretical understanding, but also to inform institutional practice, contributing to the UNESCO (2021) Sustainable Development Goal 4 vision for inclusive and equitable quality education.

Method: Case Study Across Three Projects

As a case study for the application of diffractive collaborative enquiry, our work brings together representatives from three research projects at the University of Oxford. Each project has its own methodologies, data boundaries, and institutional milieu, and through co-analysis we aim to show how different projects, perspectives, and practices interact to create new patterns of understanding that would remain invisible to single-project analysis. Our approach also recognises an inherent tension in higher education support. While institutions must help students adjust to academic expectations, this process can inadvertently amplify disadvantage when it positions some students as perpetually 'catching up.' Well-intended policies designed to support underrepresented students may paradoxically reinforce deficit narratives by marking certain students as needing remediation. This process of categorisation, even when undertaken with equity goals, can reproduce the very marginalisation it seeks to address by positioning certain students as lacking or deficient rather than recognizing how institutional structures create barriers. As Alejandro (2018) demonstrates in her analysis of how efforts to address Western dominance in academic disciplines can

inadvertently reproduce the Eurocentrism they seek to challenge, well-intentioned initiatives risk essentialising difference and reinforcing hierarchies they aim to dismantle. A diffractive enquiry, then, is poised to reveal how this tension manifests differently across student populations, allowing us to identify pathways for support that enable growth without stigmatisation.

Summary of Projects

The *Academic Skills Development Project* (Centre for Teaching and Learning 2025),⁴ examines how academic literacies development impacts student outcomes across the collegiate university. Using most significant change methodology⁵ and college-based evaluations, the project conceptualises academic skills as complex social practices embedded in power relations. Funded by the Access Fund,⁶ the project emphasises participatory approaches that address systemic barriers rather than reinforcing deficit narratives.

The *Diversity of Student Experience Research Project* (Centre for Teaching and Learning 2024),⁷ investigates learning experiences of students from diverse backgrounds through multiple complementary streams: staff-student inquiry, a feedback channel, student diaries, and participatory pedagogic action advisory groups implementing a grassroots theory of change approach. The project moved away from targeting individual ‘deficits’ to examine systemic barriers, adopting the principle of ‘nothing about us, without us.’ Student participants, including DPhil literature reviewers, received compensation through the Diversity Fund.⁸ Beyond financial recognition, the project embodied an ethics of care through protocols designed to support vulnerable students and provide responsive emotional support as part of its enhanced ethical framework.

The *Nurture-U Project*⁹ is a multi-centre research effort that aims to find better ways to support the mental health and wellbeing of university students. Guided by a stepped-care, whole-university framework, the project emphasises individual need and institutional circumstances. At the University of Oxford, student outcomes are tracked and evaluated quantitatively via a university-wide survey (Marshall et al., 2025) and qualitatively in focus groups with staff and students. This project is supported by a UK Research and Innovation and UK Medical Research Council grant (MR/W002442/1).

Research Ethics Committee approval was granted at University of Oxford for the Academic Skills Project (St Peter’s College: R85055/RE006; Trinity College: R94025/RE001.01), Diversity of Student Experience Project (R85055) and Nurture-U Project (R60998).

⁴ <https://www.ctl.ox.ac.uk/academic-skills-development-project>

⁵ For an overview of this method in Higher Education, see https://cdn.taso.org.uk/wp-content/uploads/TASO_Most-significant-change-briefing.pdf

⁶ <https://governance.admin.ox.ac.uk/legislation/council-regulations-1-of-2020>

⁷ <https://www.ctl.ox.ac.uk/diversity-of-student-experience-project>

⁸ <https://edu.admin.ox.ac.uk/the-diversity-fund>

⁹ <https://www.nurtureuniversity.co.uk>

Conversations Across Data: Building Our Collaborative Method

After inviting project representatives, informal conversations began on September 11th, 2024, through emails that revealed shared interests despite distinct perspectives. Hau Ming Tse joined Elizabeth Rahman, in representing the Diversity of Student Experience Project, Joris de Henau spoke about the Academic Skills Project, and Kevin Matlock spoke to the Nurture-U Project. While de Henau contributed literature on academic skills, Rahman proposed a working definition of educational inequality that included wellbeing to refine scope drawn from Matlock's and de Henau's work. Our first roundtable sparked recognition of unexpected dataset overlaps, though we grappled with how these might productively produce insight. Matlock proposed an 'active meta-synthesis', acknowledging the complexity of bringing together quantitative and qualitative approaches.

By November 4th, we had discussed what it means to 'stand in someone else's shoes' when examining others' data. Tse questioned whether secondary analysis might be 'too labour intensive' while Matlock expressed concerns about time constraints. These tensions shaped our methodology, pushing us to balance rigor with manageability. December meetings revealed tensions between project aims and publication aspirations, as well as a concentric circles model accommodating differences and convergence points whereby aspects of student experience rippled outward through our distinct methodological approaches. Throughout this process, we maintained what Matlock called 'conversational flow' rather than seeking consensus. Our different datasets, from Rahman's qualitative observations to Matlock's large-scale quantitative data, created opportunities for what de Henau described as 'counterpoints' that reveal hidden patterns.

Academic skills development was deemed the ideal starting point for demonstrating the value of diffractive collaborative enquiry because the collegiate structure offers unique opportunities for personalised academic support, though it also requires thoughtful coordination to ensure consistent resource access. Acknowledging that working-class students face challenges beyond enrolment—including cultural exclusion and negative stereotyping within elite institutions that persist well after admission (Reay 2021)—de Henau (2025) noted that targeted academic support at the college level has been shown to enhance students' performance, confidence, and sense of belonging. Rahman, building on Evans et al. (2015), then suggested diffraction might reveal how support systems function as complex social practices embedded in power relations that disproportionately impact students from marginalised backgrounds.

From here, we built upon each other's analyses in waves by focusing first on the local college environment and working outward toward the institutional and psychosocial environments. To allow more opportunities for discussion, this process was later conducted in reverse from broad to narrow. In each wave, a different project representative took the narrative lead, and the next followed up with a dialogic response and counterpoint. Throughout this process, we considered examining multiple disparities outside the Access and Participation Plan's (APP) scope, but ultimately focused our analysis on academic skills, support needs, and resources. This decision reflected practical constraints and our commitment to demonstrating how different analytical approaches could illuminate even seemingly straightforward topics in unexpected ways. The tension between our institutional roles, internal project needs, external perspectives and methodological approaches became productive forces shaping our collaboration, ultimately leading to the development of our diffractive collaborative enquiry model (Figure 1).

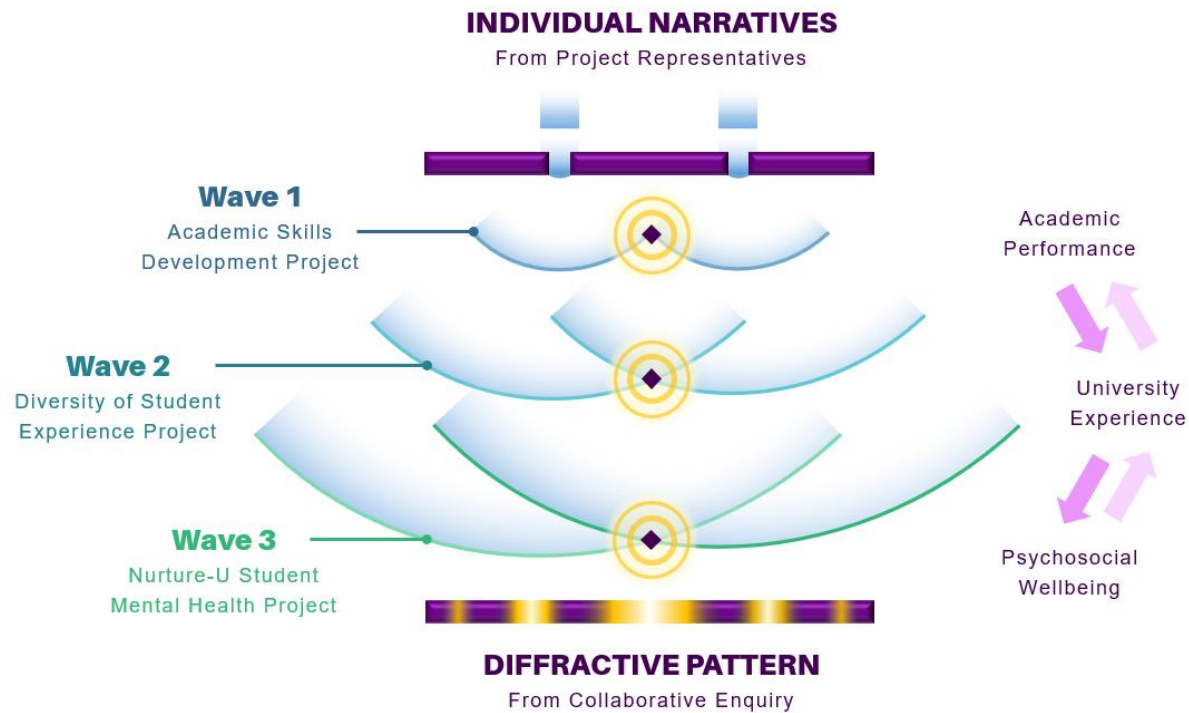


Figure 1. *Diffractive Patterns in Cross-Project Enquiry: Understanding Student Experience*

Inspired by the physics of wave diffraction, this figure visualises our method of diffraction collaborative enquiry, illustrating how student experiences can be understood through cross-project analysis. At the top, distinct narratives from project representatives diffract into concentric waves that represent progressive levels of student experience: Academic Performance (first wave), University Experience (second wave), and Psychosocial Wellbeing (third wave). Intersections (diamonds) and interference patterns (yellow circles) represent how insights from different projects interact and ripple across levels to produce a distinctly new pattern of understanding (bottom).

Results

Wave 1a – Academic Skills

We begin by examining academic skills development at the college level, focusing on how structured support impacts students' academic confidence and sense of belonging. The 3-day intensive academic writing course provided at St Peter's College represents an established approach to developing writing skills within a collegiate system, combining group instruction with individualised mentoring. Through the Academic Skills Development Project, researchers examined how such support impacts students transitioning from uncertainty to confidence. A key student narrative reveals how academic inequities manifest as interlinked challenges of skill development, confidence, and institutional belonging. Their reflection that 'if I had been in [a] better school I would not have started from [an] underperforming position' crystallises how educational disadvantage creates compounded barriers and illuminates the double-bind of academic support; while necessary for success, accessing such support can reinforce students' sense of non-belonging (i.e. identifying as someone needing support becomes another barrier to

overcome). The student articulated connections between technical ability and psychological wellbeing, noting frustration about their ‘lack of confidence, not only ... in ability but in output.’ This emerged in early writing where they found themselves ‘regurgitating what I had read’ rather than developing their own voice.

As the student gained technical proficiency through structured support, they developed confidence to ‘put my own spin [on the argument],’ though concerns about ‘marking being subjective’ persisted, suggesting institutional structures create uncertainty even as individual skills improve. This pattern of interconnected academic, psychological, and belonging challenges among students from disadvantaged educational backgrounds has been extensively documented across elite university contexts, with research demonstrating that initial cultural mismatch and confidence deficits often intensify rather than resolve throughout students’ university careers (Phillips et al. 2020; Jack & Black 2024; Sutton Trust 2018). This interplay between academic ability, confidence, and systemic disadvantage reflects how ‘academic literacies are not merely neutral skills but are deeply embedded in the values, epistemologies and cultural practices of academic disciplines’ (de Henau 2024 p. 9).

Wave 2a - Diversity of Experience

We extend our analysis to examine the intersection of academic preparedness, mental wellbeing, and institutional belonging across a range of student experiences, particularly those from underrepresented backgrounds. In the Diversity of Student Experience Project, a participant in the Staff-Student Enquiry stream articulates how support ‘comes at a high personal cost given power dynamics and fears of being seen as a bother’, which creates barriers to accessing help. The Diary stream captures this challenge temporally, revealing how student experiences fluctuate throughout the term in response to institutional interactions. This connects to findings from the Student Feedback Channel where students reported having to ‘teach themselves skills that others had already been given a chance to master’, a process that was both ‘humiliating’ and ‘exhausting.’

The Black Student Advisory stream illuminates how these challenges manifest uniquely for students with intersecting marginalised identities. One student describes having to ‘take extra classes, meaning [they] felt behind’ while simultaneously managing the ‘cognitive dissonance of being in an institution which has legacies of racism.’ A revealing pattern emerges around institutional support. One responder to the feedback channel notes: ‘A general lack of support for academic development ... was particularly acute for those students from socioeconomically disadvantaged backgrounds.’ This connects to a Black student’s observation that while they felt ‘prepared to apply’ through outreach activities, they were left feeling ‘as if [they] had no support in this new experience’ once enrolled.

Wave 3a – Nurture-U

We introduce here quantitative analyses of data from the Nurture-U project (Table 1), providing statistical patterns that both confirm and complicate the narratives emerging from the previous waves. Regarding academic preparedness, analyses of survey data from more than 1,100 students align with narratives from other projects. Using ANOVA to compare scores on the Satisfaction subscale of the College Student Subjective Wellbeing Questionnaire (CSSWQ; Renshaw 2018) shows that perceptions of performance and achievements at university differ quantitatively by

ethnicity ($p=.004$, $\eta^2_p=.012$). Tukey multiple comparison tests for this effect reveal that Black students are significantly less satisfied with their academic performance than White students ($p=.03$) and those from other ethnic backgrounds ($p=.047$), apart from Asian students who had a level of satisfaction comparable to that of Black students. Viewing ethnicity as a cultural construct, it's plausible this effect might differ by country of origin. Nonetheless, quantitative data do not support an interaction effect with domestic status. Rather, domestic students are less satisfied with their performance at university than international students regardless of ethnicity ($p<.001$, $\eta^2_p=.014$).

Conversely, parent education level (a useful proxy for socioeconomic status, particularly in an educational context; Crozier et al. 2008; Rindermann & Ceci 2018) shares no statistical relationship with university satisfaction. This diverges from student narratives in projects from other waves, suggesting unpreparedness may manifest in other ways. Indeed, when asked to rate the degree to which mental health interferes with academic performance in Nurture-U, negative impacts become visible ($p=.04$, $\eta^2_p=.006$); where both parents do not have undergraduate degrees (inferred socioeconomic disadvantage), students report greater interference than those where at least one parent has a postgraduate degree (inferred socioeconomic advantage; $p=.04$). Similar findings arise for domestic status, where interference is lower for international students, ($p=.002$, $\eta^2_p=.008$), but no main effects or interactions are detectable for ethnicity. Together, these patterns largely confirm narratives from other projects surrounding academic unpreparedness, but suggest root causes may be different for Black students than for socioeconomically disadvantaged and international students, with the former being related more closely to an awarding gap and the latter attributable to interference from mental health concerns.

A second dimension of institutional non-belonging is a lack of support. In contrast to comments on the Black Student Advisory stream about feeling unsupported, Nurture-U survey data on belongingness (feeling included and liked at university as assessed by the CSSWQ connectedness subscale) show no differences for ethnicity, domestic status, or parent education level. However, this measure's breadth, particularly its inclusion of peer social interaction, may obscure impacts, as extracts from Nurture-U focus groups paint a starkly contrasting picture.

When it comes to seeking mental health support, focus group students report they 'struggle a bit with Oxford [because] it all feels a bit disconnected ... particularly between the college and the department' and are hesitant to approach staff because 'that would be putting a big burden on them'. Staff confirm these worries, with one member of staff highlighting 'conflicting demands from all sides' as a barrier to providing support, noting the 'institution sort of sabotages itself by making everyone too busy'. Thus, narratives describing a lack of support for underrepresented students suggest it may be less a function of social activity or general belongingness (hence the lack of statistical differences in survey data), and more a consequence of students facing barriers to accessing institutional support, with narratives from participants in Nurture-U focus groups and interns at the Centre for Teaching and Learning (Grieve et al. 2023) describing difficulties navigating institutional complexities and concerns about staff burden. This dialogue between quantitative and qualitative results reflects complex negotiations of identity and expectations rather than simple gaps in performance and belonging.

Table 1. Significant Effects in Nurture-U Survey Data (n = 1179)

Outcome	Student Characteristic	F	df ₁	df ₂	p	η ² _p
Academic Satisfaction (CSSWQ)	Ethnicity	4.4	3	1124	.004	.012
	Domestic Status	16.4	1	1177	<.001	.014
	Gender	4.8	2	1168	.008	.006
	Gender x Domestic Status	4.8	2	1168	.003	.009
	Disability	10.3	1	359	.001	.028
Mental Health Academic Interference Rating (0 to 4)	Domestic Status	4.8	2	1168	.008	.006
	Parent Education	3.2	2	1145	.04	.006

Note: Rows reflect findings from one-way ANOVA, apart from interactions (e.g. gender x domestic status), where two main effects and an interaction term were entered into the same ANOVA model

Abbreviations: CSSWQ, College Student Subjective Wellbeing Questionnaire

Interlude: Evidence in Conversation

After propagating once through our diffractive method, we pause to reflect on the pattern of results across projects. When students describe their 'normalised struggle' whilst simultaneously experiencing ethnic differences in performance satisfaction, we see what Barad (2007) identifies as *material-discursive intra-actions*, where narrative and statistical evidence mutually inform our understanding of how disadvantage operates. Conversely, the apparent contradiction between an absence of statistical evidence alongside powerful narratives of disconnection evokes complementarity where seemingly opposing findings are each necessary for understanding student experience.

In this case, belonging manifests differently across institutional spaces and measurement tools. The Diversity of Student Experience Project provides crucial evidence of how belongingness unfolds over time, revealing that even students who report academic confidence experience moments of profound non-belonging when confronting specific tasks. As one diarist documents: 'I genuinely cried in week one, purely because I kept reading and re-reading the same passage—and I couldn't understand it.'

The relationship between socioeconomic disadvantage and academic unpreparedness creates particularly complex patterns. While survey data from Nurture-U suggest that mental health interferes with academic performance more strongly for domestic students than for international students ($p=.002$, $\eta^2_p=.008$), similar levels of interference were found across ethnic groups regardless of country of origin. This pattern materialises differently, however, when read through wider research literature. For instance, compared to domestic students, international Black students tend to come from more privileged backgrounds and possess forms of cultural capital that align closely with elite institutional expectations (Webb 2022). The relationship between socioeconomic disadvantage and ethnicity (Li 2024) opens questions about how other forms of marginalisation might reveal similarly complex patterns. Consequently, following this interlude we work backward through the diffractive process, while reading established patterns alongside experiences of gender and disability to generate new possibilities for understanding institutional navigation and support needs.

Wave 3b - Nurture-U

Extending the quantitative analysis of Nurture-U survey data to other marginalised groups reveals additional complexity. Like ethnicity, satisfaction with performance at university differs by gender ($p=.008$, $\eta^2_p=.006$), but not domestic status. Yet, the emergence of a unique interaction not present for ethnicity ($p = .003$, $\eta^2_p= .010$) leads to a radically different interpretation for gender. Tukey tests show lower satisfaction among domestic women but only in comparison to international men ($p<.01$); women and men with matching domestic status are otherwise similar, suggesting country of origin plays an important role in understanding gender parity. The opposite pattern appears for gender diversity, however, where differences are purely non-domestic, with international gender-diverse persons feeling less satisfied than international women ($p<.03$) and men ($p<.01$).

Satisfaction with academic performance is also lower for those with a disability ($p=.001$, $\eta^2_p=.028$). Unfortunately, underrepresentation of international students with a disability in the sample makes interactions untestable. Although it is difficult to say for certain whether a more complex relationship exists, the relative absence of international students with a diagnosed disability is, perhaps, itself indicative of disproportionate disadvantage for this group. Like ethnicity and parent education, gender and disability show no differences as independent effects in the context of belongingness at university, nor is there an interaction between gender and domestic status.

Again, the breadth of the belongingness measure may conceal nuanced impacts, as Nurture-U focus group data suggest, at least for disability, some students face pronounced difficulties in university life. An extract from a student with lived experience highlights the structural barriers that contribute to academic dissatisfaction, noting an institutional 'reticence to provide adequate [disability] adjustments out of the fear of making Oxford too easy'. This same student also describes a multi-layered and unpredictable relational environment, where many 'department technical staff ... [and] my current PI are enormously supportive', but a few administrators and others tasked with providing accommodation 'have said some really offensive things about my disability'. While not readily apparent in quantitative trends, for this particular student, invalidating moments from a small number of staff have resulted in a pervasive disconnection, one that has led to 'avoiding my college like the plague'. These narratives further solidify the notion that feelings of not belonging are not general, but rather likely a specific consequence of being unable to access institutional support.

Wave 2b – Diversity of Experience

Narrations of day-to-day experiences captured in the Diary stream of the Diversity of Student Experience Project reveal oscillating patterns of belonging throughout the term. One humanities student documents periods of connection followed by isolation: 'I attended my tutorial which was very insightful ... when tutors are flexible and understanding it immediately takes the stress off, it humanises the (at times) very daunting Oxford system'. This temporality of belonging rarely appears in static measures but significantly impacts overall academic integration. Socioeconomic disadvantage materialises differently across contexts, including imposter syndrome: 'Seeing a 57 on my collection score affirmed in my head I do not deserve my place here'. This moment captures the risk of assessment

creating stigmatising identities.¹⁰ The challenge for institutions is how to provide meaningful feedback and support, without inadvertently confirming students' fears about their legitimacy.

The Student Feedback Channel reveals varied experiences among international students. Some note feeling excluded during discussions, with one postgraduate observing professors 'normally tend to select the same profile of people (white, native speaker, male).' Women in male-dominated subjects report unique challenges, with one undergraduate sharing: 'I have struggled with the lack of female tutors in my subject, and have noticed the material difference that having a female tutor in one of my subjects has made in how I feel more encouraged to engage with the subject.' Others highlight how small-group teaching helped overcome language barriers, where international students' experience varies substantially based on teaching context and representation. Students from historically marginalised nations note how diverse teaching content significantly impacts their sense of belonging: 'Expanding the curriculum to include more case studies and examples from various global contexts, especially from the Middle East and regions experiencing conflict, would be immensely valuable.' Perspectives from these projects enhance our understanding of how cultural background and historical context influence academic engagement beyond administrative domestic/international categorisations.

Where quantitative Nurture-U data show disability correlating with lower academic satisfaction, the feedback channel illuminates accessibility barriers: 'A lack of accessibility training and provisions throughout campus and my college has made me realise that, in the ways that I am not like a typical Oxford student, I am more of an inconvenience than an asset.' Both streams highlight institutional flexibility as critical. A diarist notes when a tutor was 'understanding with my disabilities,' it significantly improves engagement, while channel respondents emphasise how flexible practices make difference less salient. This suggests institutional responsiveness might moderate the relationship between demographic factors and satisfaction identified in the quantitative analysis.

Wave 1b – Academic Skills

We end with reflections from the Academic Skills Development Project, in particular an impact study on the introduction of an Academic Support and Development Lecturer (ASDL) by Trinity College. The ASDL provides one-to-one consultations, workshops, and drop-in sessions focused on developing academic writing, critical thinking, and study strategies complementing the tutorial teaching system. One Trinity student's narrative creates new interference patterns when read through a student narrative from St Peter's College (in the context of an intensive writing course, see 1a). While the latter highlights the perspective of a British state school student navigating academic transitions, the former, an international student, reveals how structured academic support transforms technical capabilities, academic identity and belonging.

Student narratives build on accounts from peer reviewers, demonstrating how academic skills support can bridge what a survey of 17% of the Trinity College student population reveals to be a 21-point gap between those reporting general academic confidence (88%) and those reporting task-specific capability (67%). Through dialogue with the ASDL, the Trinity student developed academic writing

¹⁰ This aligns with broader research examining how evaluation practices and institutional structures shape both academic outcomes and students' sense of belonging in higher education. See, for example, O'Shea et al. (2018) on first-generation students' experiences of belonging.

as an iterative process of critical thinking and argumentation, rather than following prescribed formulas: ‘The ASDL explained the questions I should ask myself; this changed the whole logic... I understand the model now; it is fine, [though it] takes a long time to incorporate.’ This co-constructed understanding reflects the ASDL’s academic literacies-based approach, creating a temporal dimension of academic development that mirrors oscillating experiences of connection and disconnection documented in the Diversity of Student Experience Project.

The explicit instruction in academic conventions that transformed the Trinity student’s writing diffracts through our findings about institutional belonging. While 75% of students at Trinity College report feeling part of their college community, this drops to 62% for university-wide belonging. The Trinity student’s experience suggests how college-based academic skills development—particularly one-to-one support—can bridge these spheres, making them ‘feel like part of a larger institution’.

The tension between structure and flexibility emerges as a key pattern when viewed through the lens of academic literacies as contested social practice (Lea & Street 1998). Reading student narratives through these multiple waves of evidence crystallises academic skills development as fundamentally intersectional, shaped by students’ multiple marginalised identities and their navigation of overlapping institutional structures. These stories reveal how domestic status, neurodiversity, and gender affect how students access support. For instance, in peer discussions, students highlight an international neurodivergent student who noted that college staff generally ‘don’t understand me and my brain,’ but found the ASDL ‘one of few staff who understand my disability.’ Gender and disciplinary context intersect this student’s description of how ASDL support helped her ‘translate mathematical understanding into clear written explanations’ in a male-dominated field, creating what peer reviewers called ‘a voice that you feel you can actually use.’

For international students, our research reveals complex navigation of both linguistic and cultural academic conventions, reflecting the gap between college belonging (75%) and university-wide belonging (62%). When diffracted through our broader findings about mental health, belonging, and accommodation, this final wave reveals how local responses to specific demographics must evolve towards recognising interlocking systems of marginalisation at the institutional level. These patterns point toward practices that support students’ complex identities while maintaining the strengths of college-based provision, a vision of academic skills development as both personally and institutionally transforming.

Discussion

Diffractive collaborative enquiry was developed as a novel method for enabling real-time co-analysis across projects and institutional boundaries. As a case study, we employed this approach to examine student experiences through multiple waves of evidence across three research projects—academic skills, diversity, and mental health—to identify persistent insights or ‘standing waves’ that emerge when different perspectives create interference patterns. Some areas, like differences for Black students and students experiencing socioeconomic disadvantage or disability, were selected to align with the University of Oxford’s (2025a) Access and Participation

Plan (APP), while others, like gender and country of origin, extended beyond the APP to support broader institutional equity goals. Below, we discuss specific findings for underrepresented university students and general recommendations.

Standing Waves: Persistent Patterns in Student Experience

Co-analysis in this cross-project case study suggested that when quantitative survey data indicate lower academic satisfaction among Black students and greater mental health interference with academic performance among socioeconomically disadvantaged students, and qualitative narratives describe students having to ‘teach themselves skills that others had already been given a chance to master,’ it reveals what critical race theory would recognise as institutional barriers masquerading as individual challenges; where disadvantage is not merely the result of individual prejudice but embedded within institutional structures and practices (Delgado, Stefancic & Harris, 2017). Moreover, patterns of difference in academic preparedness, and complex relationships between gender identity and country of origin, point to intersectionality as a key consideration.

Our enquiry further demonstrated that whilst survey data for international students as a whole indicated higher academic satisfaction overall, this pattern shifted notably in the narratives of students living in the United Kingdom from historically marginalised nations, where cultural differences emerged as primary challenges. This speaks to what postcolonial theory identifies as the hidden curriculum of elite institutions (Whitehead 2025). Similarly, the absence of statistical differences in belongingness for students with a disability juxtaposed with powerful narratives of disconnection demonstrate how traditional metrics can mask systemic inequities. A potential avenue for addressing these concerns arose in narrative evidence, where academic skills support was effective for increasing both academic skills and belonging, specifically feeling ‘part of a larger institution’ through engagement with staff.

Ultimately, our *ad hoc* circle of representatives brought together professional services staff and academics to read different project datasets through one another in real time, producing what Mazzei (2014) calls ‘unpredictable and productive emergences’ (2014 p. 742) that highlight how institutional structures simultaneously support and constrain students in different, often difficult to measure, ways—a pattern of intersection and difference across research projects that emerges through this approach and unveils persistent barriers like nodes in a standing wave.

Broader Application: Equity-Based Higher Education

Navigating the Support Paradox

Diffractional collaborative enquiry identified patterns of difference between research projects that resonate with what Rahman and Cochrane (2023) describe as taking ‘a critical, post-colonially informed stance to knowledge production, asking how knowledge is produced and whose knowledges are validated.’ These findings surface a tension within higher education support structures; mechanisms designed to address inequity may, in certain cases, inadvertently reinforce the disparities they seek to ameliorate. Students navigate a complicated dynamic, benefiting from support while worrying about how accessing such support might affect their sense of belonging within the institution. Accordingly, we suggest several approaches that might help institutions navigate these tensions:

- *Normalise Support Structures.* Integrating academic development opportunities as a standard practice available to all students, rather than positioning them as interventions for specific groups, may reduce potential stigmatisation while maintaining effectiveness.¹¹
- *Recognise Diverse Strengths.* Acknowledging the varied perspectives, experiences, and capabilities that students from different backgrounds contribute could help reframe support from addressing deficits to building on existing strengths.
- *Embed Development Within Disciplines.* Incorporating skill development within disciplinary teaching and assessment practices, rather than as separate programmes, might allow for more contextualised and less isolated forms of support.¹²

Methodological Considerations for Future Practice

Our experience developing diffractive collaborative enquiry raises important questions about how higher education might approach multi-modal research and evaluation. The initial independence of our projects appeared to offer certain advantages, particularly in maintaining methodological diversity and avoiding premature convergence of findings. However, the deliberate effort to co-analyse these streams diffractively revealed patterns that would likely have remained hidden within individual projects. Therefore, by way of application, we suggest institutions consider:

- Supporting independent, methodologically diverse research initiatives while creating regular opportunities for teams to discuss and explore overlaps and contradictions across projects
- Establishing forums where productive tensions between data sources can be examined without pressure to resolve into unified findings
- Developing sustainable approaches to maintain both independent inquiry and collaborative analysis, particularly as project funding concludes
- Building institutional capacity through communities of practice to preserve and transmit co-analysis approaches as specific projects and personnel change

¹¹ Support as a standard practice, however, should not be conflated with a one-size-fits-all approach. Indeed, Dale et al. (2025) report that students at the University of Oxford encounter many distinct barriers to accessing university support, including attitudinal barriers like difficulty discussing problems, practical barriers like time constraints, and stigma-related social barriers, which must each be addressed as points of individual difference as they contribute differentially to preventing or delaying students in needs from seeking support.

¹² Burke (2012) argues that widening participation must challenge hegemonic utilitarian frameworks that position certain students as inherently lacking, advocating instead for institutional transformation that recognises diverse forms of knowledge and capability. Burke et al. (2018) document enabling pedagogies demonstrating how embedded, discipline-specific academic development values students' existing knowledge while providing epistemic access to powerful disciplinary concepts. Their participatory research emphasises that effective pedagogies recognise academic skills as socially situated practices within disciplinary contexts rather than generic competencies, requiring iterative reflexive approaches that engage with complex relational dynamics of teaching. This strengths-based framework conceptualises academic literacies as embedded within disciplinary practices, focusing on developing students as "genre analysts" capable of understanding and adapting to discipline-specific conventions.

- Adapting the diffractive and collaborative aspects of our framework, all or in part, at the institutional level to support ongoing research and evaluation work¹³

Conclusions and Implications

In this proof-of-concept, we demonstrate how diffractive collaborative enquiry can transform the insight process in higher education by rapidly drawing from multiple on-going research projects in real time to uncover justice-oriented approaches to understanding student experience; and pursuing new approaches and collaborative projects thereon. Relying on project representatives to read and interrogate different forms of evidence through one another can reveal complex patterns in how institutional structures create barriers for underrepresented students that may be overlooked by conventional approaches. For instance, in our case study, quantitative data showed that deficits in academic performance were primarily linked to gender and ethnicity, but when read alongside qualitative data from other projects, socioeconomically disadvantaged students simply experienced academic disadvantage in other ways (e.g. mental health interference).

Diffractive collaborative enquiry also has the potential to forward a sector agenda for transdisciplinary reflection, which argues for creating spaces where researchers and practitioners can critically examine standard definitions and measures, avoid deficit framing, and meaningfully involve students to address persistent inequalities through institutional change rather than mere regulatory compliance (Rahman & Schulte 2023). By embracing the multiplicity of perspectives for both students and research projects, our approach offers a rapid and nuanced means for developing more equitable, effective, and targeted approaches to support diverse student populations across heterogeneous higher education institutions.¹⁴

¹³ Creation of the Student Data Insights team within Education Policy Support, working alongside the Community of Practice for evaluators and analysts could, for instance, deploy these methodologies to examine how different evaluation streams interact, generating insights that might inform responsive adjustments to practice without waiting for formal evaluation cycles to conclude.

¹⁴ The potential value of establishing a Theory of Change for collaborative evaluation merits consideration. Such a framework could help universities develop systematic approaches to recognizing and working with the productive tensions that emerge when different forms of evidence create interference patterns, rather than seeking premature resolution or synthesis.

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