social sciences

MDPI

Article

Towards an Education *Through* and *For* Social Justice: Humanizing a Life Sciences Curriculum Through Co-Creation, Critical Thinking and Anti-Racist Pedagogy

Amy Maclatchy [1], Lan Nguyen [2], Olorunlogbon Olulanke [2], Lara Pownall [2] and Moonisah Usman [1,*]

[1] Centre for Education and Teaching Innovation, University of Westminster, London W1B 2HW, UK; a.maclatchy@westminster.ac.uk
[2] School of Life Sciences, University of Westminster, London W1W 6UW, UK; w1838536@my.westminster.ac.uk (L.P.)
* Correspondence: usmanm@westminster.ac.uk

Abstract: Degree awarding gaps highlight the inequitable outcomes of higher education (HE) for racially minoritized students in the UK. This ongoing issue has been described as a "wicked problem", directly related to structural racism, or policies and practices that continually disadvantage racialized students. Movements to decolonize the curriculum bring hope and the tools to rebuild more socially-just institutions and societies. However, it is sometimes questioned whether the field of science, with its guise of objectivity, needs decolonizing, or what that process involves. We argue that student partnerships are central to building decolonized science curricula that are critical, anti-racist and will evoke social change. In this study, conducted with life sciences students in a UK HE institution, we share critical reflections captured through a mixed methods approach to address how we create an education that is through and for social justice. Education *through* social justice aims to create equitable learning environments by addressing how structures and curricula invite, engage and support racially minoritized students to be partners in the learning journey. Whereas education *for* social justice is about co-creating curricula, teaching practices and principles that lead to change makers and fostering more socially-just societies. Our research indicates that an education that is both through and for social justice requires co-creation where traditional power hierarchies are dismantled, and mattering is emphasized. Partnerships and curricula must be centered in anti-racist practices, with a structured and intentional approach to developing critical thinking skills for continual reflection, self-development and actions to promote inclusion and equity in life sciences and society.

Keywords: student–staff partnership; co-creation; anti-racism; social justice; life sciences; decolonizing higher education; decolonizing science; foundation; critical thinking; mattering

Academic Editor: Alison Cook-Sather

Received: 30 January 2025
Revised: 19 February 2025
Accepted: 19 February 2025
Published: 24 February 2025

Citation: Maclatchy, Amy, Lan Nguyen, Olorunlogbon Olulanke, Lara Pownall, and Moonisah Usman. 2025. Towards an Education *Through* and *For* Social Justice: Humanizing a Life Sciences Curriculum Through Co-Creation, Critical Thinking and Anti-Racist Pedagogy. *Social Sciences* 14: 136. https://doi.org/10.3390/socsci14030136

1. Introduction

Degree awarding gaps highlight inequitable outcomes for racially minoritized students (Universities UK International 2022). This ongoing issue is described as a "wicked problem", rooted in structural racism, making it clear that "it is the system and not the student that is the root of the problem" (Ugiagbe-Green and Ernsting 2018). In a similar vein, structural racism reinforces racial health inequalities in society (Raleigh 2023). The COVID-19 pandemic highlighted the disproportionate impact on Black and South Asian communities (Bailey and West 2020). Again, the problem is not with Brown or Black bodies but with the system. Both issues encourage us to reimagine how we support racially

minoritized students and equip them to make social change. As Tuck and Yang (2018) state, "Social justice is the ghost in the machine of the educational apparatus. It is the only part that makes any part of the field of education matter".

Education *through* social justice is about making educational spaces, learning and teaching practices equitable and socially just. To us, this means we must address how structures, classrooms and curricula invite, engage and support racially minoritized students. Education *for* social justice is how the curriculum and teaching practices work towards creating a more socially-just society. We are reminded that "pedagogy must be meaningful and connected to social change by engaging students with the world so they can transform it" (Giroux, as cited by del Carmen Salazar 2013). Our curricular and educational spaces must tend to issues of social justice, power and privilege. Forming democratic and relational student–staff partnerships allows us to collectively reimagine a decolonizing education (Fraser 2021). We dream of university spaces where stories are shared, relationships are valued, and compassion is practiced. In such an education, students explore topics that spark their curiosity and drive their commitment to learning. They play an active role in shaping their experiences and futures and develop critical skills to explore real-world problems, so they may impact the future of others.

Student–staff partnerships are a popular method for inviting students to take an active role in shaping their higher education experience. Such partnerships can take many forms. One widely used definition describes student–staff partnerships as "a collaborative, reciprocal process through which all participants have the opportunity to contribute equally, although not necessarily in the same ways, to curricular or pedagogical conceptualization, decision making, implementation, investigation, or analysis." (Cook-Sather et al. 2014). Student–staff partnerships engage our emotions (Healey and France 2024), centering them as humanizing experiences and therefore making them potential vehicles for decolonial and anti-racist work. We cannot make social change or begin anti-racist work without engaging first with decoloniality, as the knowledge generated and disseminated within the framework of westernized universities is inherently linked to racism, stemming from an unequal global power dynamic established through colonization (Le Grange 2023). In our context, decoloniality refers to " [. . .] to efforts at rehumanizing the world, to breaking hierarchies of difference that dehumanize subjects and communities and that destroy nature, and to the production of counter-discourses, counter-knowledges, counter-creative acts, and counter-practices that seek to dismantle coloniality and to open up multiple other forms of being in the world" (Maldonado-Torres 2016). Student–staff partnerships can allow for the co-creation of decolonial and anti-racist atmospheres where students and staff can bring their emotions, lived experiences and knowledges to collectively critique how knowledge is created, disseminated and valued (Fraser 2021). Institutional change and social justice also require "politicized compassion", a term coined by Gibson and Cook-Sather (2020) as "an action-oriented, critical, and collective response of solidarity to the status quo of neoliberalism, exclusion, and micro and macro forms of inequality as and where they exist". Student–staff partnerships play a crucial role in fostering politicized compassion and, therefore, are a powerful catalyst for institutional change and social justice.

Our student–staff partnership is in the University of Westminster (UoW). UoW is in the center of London and has a diverse student body with students from 165 countries. Our work is situated in the module 'Critical Thinking for Academic and Professional Development', core for foundation students. Foundation programmes are specifically designed to widen access and participation in higher education for underrepresented students. They provide students with crucial skills and experiences for a successful transition into their degree. The Critical Thinking module is covered across the foundation provision at UoW and tailored to the subject-specific needs of students. Here, we share our work on the

iteration for students in the School of Life Sciences. These students pursue the following degree pathways: biochemistry, biological sciences, pharmacology and physiology, human nutrition, and biomedical science. For these students, the module focuses on understanding how critical thinking is linked to the discipline's practices and values. Students are encouraged to use their disciplinary knowledge to dissect health inequalities, developing their understanding of social justice and practice as agents of change.

Critical thinking skills are fundamental to our development as learners and for us to critique the limits of our disciplinary knowledge, recognize inequalities and challenge injustice. As hooks (2013) describes, "Critical thinking is about having the language and frames of reference to examine one's life in-depth, as well as the world around us, so we can ask questions about the things we take for granted". There is an expectation of higher education students to develop as critical thinkers and apply these skills to their professional and personal lives. It is undisputed that students develop critical thinking skills more effectively when they are taught explicitly (Behar-Horenstein and Niu 2011). Hence, critical thinking is a life-long skill that should be taught with intention, especially in the context of anti-racism and social justice. As the Black Lives Matter movement gained momentum in 2020, our university launched a 10-point commitment plan, which inspired us to specifically focus on creating an anti-racist curriculum that encourages students to develop into change makers. Over the last five years, we have engaged in several student–staff partnership projects to center humanity and social justice at the heart of the module, involving small projects with former and current foundation students as well as whole class co-creation. In this paper, we share the findings from our pilot research project evaluating the student experience on the Critical Thinking module, specifically drawing upon the effectiveness of our co-creation, curriculum and teaching practices in fostering education *through* and *for* social justice amongst life sciences students.

2. Materials and Methods

First, we describe the partnership methods used in the module, followed by our methods to evaluate our practice and capture the students' experience.

2.1. Partnerships Methods

2.1.1. Co-Creation of the Seminar Space

On a weekly basis, the module incorporates a one-hour lecture followed by a two-hour seminar, with a maximum of 25 students per seminar class. We start co-creation by 'rehumanizing' the classroom through building relationships using weekly 'icebreakers' in the seminars. This practice starts in the first term, even before we begin teaching the Critical Thinking module in the second term. We ask students to share their expectations for their learning journey to build a collective understanding of what brings us together. We encourage conversation about our culture, background and interests that shape us and inspire us to be in higher education and to do science. We hope to build a sense of community through these conversations to create an openness and a "shared commitment and a common good that binds us" (hooks 1994), a process that takes time and space.

To fully engage with issues of social justice, we need to first be grounded in principles of social justice in our classrooms. We do this by co-creating the space democratically. Students consider what values are important to them for working together and use these to identify core classroom principles. We are inspired by the Building an Anti-Racist Classroom (BARC) collective and share their principles with students and staff. We specifically draw attention to "believe people's accounts of their experiences of marginalization, and honor people's vulnerability by not disputing their lived experience. . ." (Brewis et al. 2020).

By developing a principled space that centers humanity, we allow ourselves to engage with our vulnerabilities.

2.1.2. Co-Enquiry for Anti-Racism

We see anti-racism as an active, ongoing process that shapes our academic journeys and personal lives. For us, being anti-racist involves a critical reflection of our understanding of race and unlearning, shifting away from Eurocentric epistemology. As Kishimoto explains, "...anti-racist pedagogy is not a ready-made product that professors can simply apply to their courses, but rather is a process that begins with faculty as individuals, and continues as they apply the anti-racist analysis into the course content, pedagogy, and their activities and interactions beyond the classroom... informed by critical race theory focuses more in-depth on the analysis of structural racism, power relations, and social justice...even in courses where race is not the subject matter" (Kishimoto 2018).

To facilitate this process, we structure our curriculum for science students to understand race, ethnicity and their intersection with the discipline. We teach them to address structural racism and challenge and avoid racist biases in their own research. In our classroom we begin with defining race and explicitly address that race has no biological basis and "there are no characteristics, no traits, not even one gene that turns up in all members of one so-called race yet is absent from others" (Adelman 2003). We acknowledge that race is not a biological reality, but that it does significantly impact the lives of the global majority. Next, we discuss definitions of racism at individual, institutional and internalized levels. Kishimoto (2018) reminds us that "while it is necessary to analyze institutional forms of racism to break away from understanding racism as individual acts, focusing only on systemic forms of racism makes it easy for individuals to evade responsibility for oppression". We ask students to complete a social identity wheel and share their context with the classroom, to reflect on their privileges, understand their positionality and appreciate other points of view.

Together, we explore case studies highlighting the impact of systemic racial inequalities and microaggressions on the lives of racially minoritized people. For example, the disproportionate impact of COVID-19 on Black and Bangladeshi communities (Bailey and West 2020). We also explore the increased rate of maternal mortality substantially affecting Black women (Draper et al. 2022). To facilitate development of critical thinking skills and engagement with counter-practices and counter-discourse, we use a 'tool-kit' approach. Our critical thinking tool-kit consists of five key tools: asking meaningful questions, analyzing for logic and reasoning, analyzing assumptions and bias, evaluating evidence, and considering multiple perspectives. Each week, the module is dedicated to applying one of the tools to a case study that explores social injustice. To explore this dialogically, we adapt problem-based learning (PBL) so that students lead the enquiry through research but also their lived experiences. They discuss their answers with the teacher, creating a dialogue and exchange of knowledge which is not restricted to a finite set of questions or answers. This is important because anti-racist pedagogy is more than about what is taught and extends to how the curriculum invites students to contribute actively.

Another approach we take is to critique evidence-based research and draw upon examples of racism outside of academic literature with diverse media. We discuss microaggressions including touching hair without permission and the intentions and problems that surround 'where do you come from?'; a common question for people who are racialized as being other than white. This is facilitated by studying the infamous exchange between Hussey and Fulani (Peat 2022) and Ahmed's poem 'Where you from' (Ahmed 2020).

2.1.3. Co-Creation of Assessment for Social Justice

The module has three summative assessments, all have had the assessment criteria and marking rubrics co-created with former foundation students. The first assessment in the term takes the shape of recording a 10 min podcast episode for the Pedagogies for Social Justice Podcast. Students engage with a member of the public to reflect on their positionality in relation to the seminar case study and discuss their research findings to identify the causes and possible solutions for the social issue. In this way, students take the learning from the classroom outside the module and into the world. Second, to further strengthen the partnership on the module and students' critical thinking skills, students are invited to submit topics for the second assessment, which is a critical essay. Students are encouraged to consider which 'real-world' scientific problems or 'big ideas' they are interested in. The most popular topics are then selected, and the teaching team establishes a set of lectures and essay questions to support the students. The final assessment encourages students to consider how they will continue developing their critical thinking skills beyond the module. To do this, they are required to identify an activity, such as a grant opportunity, workshop, conference or work placement.

2.2. Evaluation of Practice

Our team of two academics and three former students of the module engaged in a series of reflective sessions over a period of eight weeks to identify core areas of module delivery and content for evaluation in a pilot study. The project was situated in the Students as Co-Creators programme, Curriculum Design Collaboration strand—a university-wide student and staff partnership initiative. Ethical approval for the project was obtained from the Centre for Education and Innovation, University of Westminster Research Ethics committee (CETI-CDC-2324-14).

We designed the survey in partnership to evaluate the effectiveness of curriculum and the teaching approach across five core themes:

1. The effectiveness of the 'critical thinking tool-kit' in encouraging critical thought and analysis of science and racism.
2. The effectiveness of the case study in facilitating the understanding of racial health gaps.
3. The effectiveness of the seminar space in allowing for conversation and reflection on lived experiences.
4. The effectiveness of the assessment in facilitating anti-racist discussion outside of the classroom.
5. The extent to which students feel like partners in their learning experience on this module.

The pilot survey consisted of twenty questions, a combination of Likert scale and open-ended questions. To facilitate students' understanding of the survey questions related to student partnership, they were provided with a definition of student partnership from the University of Westminster Student Partnership Framework: "To us, this means a commitment to building ethical relationships in which we share responsibility and leadership, commit to accountability and to working towards transformation, learn and unlearn together and from one another, center minoritized voices and knowledges, develop community, and open space for care and sustenance." (Araneta et al. 2022).

The survey was created in Microsoft Forms and distributed via announcements on the university Virtual Learning Environment (Blackboard), emails, lectures and seminars. All students studying on the Life Sciences pathway of the Westminster Foundation Programme were invited to participate (n = 206). Participants were incentivized through a random selection of ten participants to receive GBP 25 vouchers upon completion of the survey.

A descriptive analysis of response frequencies was conducted to identify key trends in the survey data. This was followed by a thematic analysis of the open-ended responses, aimed at uncovering underlying themes, nuanced perspectives and actionable insights to inform future practices on the module.

3. Results

Our aim was to understand students' experiences of the module, focusing first on whether our partnership practices successfully fostered a sense of inclusion, mattering, and active contribution. Specifically, we assessed whether students felt their lived experiences were valued and whether they could shape the module's learning and teaching processes, aligning with our commitment to education rooted in social justice. Second, we aimed to evaluate the impact of the anti-racist curriculum in deepening students' understanding of racism and social injustices within the life sciences, as well as its effectiveness in equipping them to apply this knowledge beyond the classroom to promote social justice. In total, 20 students participated in the study by responding to the questionnaire. Overall, we found evidence of the module being effective in holding a democratic approach and in facilitating thinking and action about social justice. Here, we have structured the results into two parts: The effectiveness of our approach to education through social justice and the effectiveness of our approach to education for social justice.

3.1. Education Through Social Justice—Do Students Feel a Sense of Partnership, Inclusion and Mattering?

The majority of students indicated that they felt like partners in one or more areas of the module. However, as expected, there were diverse views about students' experiences of feeling included as partners, of mattering and of how they experienced the seminar space (Table 1).

Table 1. Students' perceptions of partnership, mattering and the role of the seminars: Likert scale responses (%).

Theme	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Student partnership felt in:					
Seminar space	50	40	10	-	-
Developing module content	40	35	20	5	-
Assessment process	45	25	20	5	5
Extent to which:					
Traditional power dynamics disrupted	40	25	15	20	-
Ice breakers built relationships with staff	60	35	5	-	-
Ice breakers built relationships with students	60	30	10	-	-
Students mattered in the classroom	50	40	10	-	-
Roles of seminars:					
Feeling included	80	15	5	-	-
Feeling safe to share views	70	15	10	-	5
Feeling views were respected	70	20	5	-	5
Encouraged to share lived experiences	75	10	5	5	5
Encouraged to share feelings	60	25	5	5	5

3.1.1. Partnership and Mattering

Students were asked about the extent to which they felt partners across three areas: in the seminar space, in developing the module content, and in the assessment process. The majority of students (90%, n = 18) agreed with feeling like partners in the seminar

space, except two students that were neutral. A total of 75% of students (n = 15) felt like partners in developing the module content, whilst 20% (n = 4) were neutral and 5% (n = 1) disagreed. Similarly, most students (70%, n = 14) agreed about feeling like partners in the assessment process; however, 20% (n = 4) were neutral, 5% (n = 1) disagreed and 5% (n = 1) strongly disagreed.

When asked about the extent to which students felt like partners in their learning experience overall through an open question, there was a positive outlook with key themes from students' responses include building of ethical relationships, particularly between students and seminar tutors, where students reported being heard and having felt that they contributed equally in the classroom;

"We were able to build ethical relationships,"

"Felt comfortable asking questions and sharing my thoughts,"

"Collaboration with other students, sharing thoughts and ideas fostered collective learning."

Students also commented that the co-enquiry was useful and that there were opportunities to learn new skills and enhance existing strengths. Only two students stated they were unsure, and one student suggested that they felt like partners in reading the case study but less in other areas. However, one student responded that they were "not much of a partner," but did not explain why.

To further understand students' feelings about partnership in the module, they were specifically asked about power dynamics, relationships and mattering. The responses to disruption of traditional power dynamics were more diverse than other areas; 40% (n = 8) strongly agreed and 25% (n = 5) agreed that traditional power dynamics were disrupted in the classroom, 15% (n = 3) were neutral and 20% (n = 4) disagreed. We also found that the majority of students agreed that the icebreakers built relationships with staff and between students. Three students felt neutral about these aspects.

With respect to mattering, 95% of students (n = 19) agreed that they mattered in the classroom whilst one student felt neutral about this. The most prevalent theme was that students felt included and that their opinions were heard. Examples include that students were "able to share my opinions and hear others in a safe space," their "feelings felt validated," they were "always included," and the "seminar space is a safe place to share my personal experiences without being or feeling judged."

When asked about the ways in which students felt they could contribute as partners to the module, seven students responded to this question. Their responses to this question fell into two broad themes: those who wanted to share more around the topic of racism (e.g., "be involved in having conversations talking about the subject"), and those who felt changing aspects of the seminar would allow them to contribute more as partners. Suggestions for the latter include

"allowing [students] to do a week where they take over the seminar,"

"Come up with more case studies showing the Racial Health Gap in the NHS,"

"Shuffling up the class to give people opportunities to work with people they haven't met before."

Interestingly, four students felt that the module supported them to make connections with others at university. For example, one respondent stated that the module led to a "more welcoming environment" and another stated that the activities "allowed a deeper discussion and bond."

3.1.2. Role of the Seminars

The majority of students (95%, $n = 19$) felt the seminars were a space they felt included, safe to share their views and that their views were respected; the remaining student felt neutral. All but two students felt they were encouraged to share their lived experience and feelings. We linked the two students who disagreed to their responses to the open questions to further understand their experience. The student that 'strongly disagreed' suggested that there should be more debates during the seminar. The student that 'disagreed' answered that they wanted surveys to be added as an activity in future seminars. One student that did not feel encouraged to share their feelings suggested more discussions about racism should take place in future seminars.

Students commented that they enjoyed the space created in the seminar, that it was the "best", "welcoming", and "perfect" and that it was "really good for sharing", but would like the physical space to be larger, particularly when preparing for debates. One student recommended "more ted talks/discussions about topics in depth". Another student commented that they "found the group discussions to be a bit slow paced and hard to navigate especially when one side is defending something that is false". This was also echoed by another student: "It's easy to get lost in group work and lose sight of what is the focus, so maybe alternative with debates, quizzes etc.".

Overall, the findings indicate that the module successfully fostered a sense of partnership, inclusion, and mattering among most students, with many highlighting the value of ethical relationships and collaborative learning. While students generally felt heard, respected, and supported, suggestions for improvement included diversifying seminar activities, enhancing engagement, and addressing group dynamics. The module created a welcoming and inclusive environment, with opportunities to further deepen dialogue and active participation.

3.2. Education for Social Justice—Does the Curriculum and Pedagogical Practice Encourage Students to Understand Racism and Equip Them to Apply This Knowledge Beyond the Classroom?

It was found that most students agreed that the critical thinking tool-kit, case study and seminar activities developed their understanding of racism and the assessment further cemented this by providing opportunities to put anti-racism into practice (Table 2).

Table 2. Students' perceptions of the critical thinking tool-kit, case study and assessments: Likert scale responses (%).

Theme	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Effectiveness of the critical thinking tool-kit:					
Thinking critically about science	65	35	-	-	-
Problem solving	55	40	5	-	-
Anti-racist thinking	50	45	5	-	-
Learning in other modules	50	40	10	-	-
Extent to which case study facilitated:					
Understanding of racial health gap	70	30	-	-	-
Conversation about racial health gap	60	40	-	-	-
Conversation about racism	55	35	10	-	-
Extent to which assessments facilitated:					
Reflection on lived experiences	55	35	10	-	-
Critical thinking about life sciences	65	35	-	-	-
Understanding of racism	60	40	-	-	-
Discussions about racism outside the module	65	20	15	-	-

3.2.1. Effectiveness of the Critical Thinking Toolkit and Case Study

Overall, the majority of participants (> 90%, n = 18) agreed or strongly agreed that the tool-kit was effective at thinking critically about science, developing problem solving skills, promoting anti-racist thinking, and supporting their learning in other modules. All participants agreed or strongly agreed that the case study facilitated their understanding of the racial health gap and conversation about the racial health gap. Whilst most participants agreed that the case study facilitated conversations about racism, 10% (n = 2) felt neutral.

The open questions indicated that students felt the critical thinking tool-kit improved their critical thinking skills and aided the research process. They described it as "complete", "well thought out", and "amazing." Additionally, one student discussed that they found the critical thinking toolkit "useful in helping students engage in meaningful conversations" about racism, further identifying how this could be an issue in the local context of the university given our diverse student cohort. Students also indicated that the critical thinking toolkit would be useful in broader contexts, with one student stating that it is "helpful for (their) future career" and another highlighting that the tool-kit could be applied to "different topics" that are more adapted to "students' personal preferences as students may not be comfortable speaking about certain topics." Another student referred to the tool-kit as useful for "self improvements".

All students responded to the question regarding suggestions to improve their understanding of the racial health gap and racism in science. A theme that emerged frequently was a desire to learn more about the historical and social contexts of racism. Comments included "more statistics and real-life examples", "real life case studies", and "engaging with communities affected by racial health disparities to understand their needs and the problem better", as "talking about it sharing and educating is powerful, helping students understand from first-hand experiences". Further suggestions included "perspective[s] from multiple people" and voices, as well as including those from other backgrounds and disciplines, to demonstrate the widespread impact. Thus, demonstrating "that racism can be against everyone despite their role in an institution, the victim can be anyone with a higher or lower position than their abuser." A further suggestion was to gauge a better understanding of the correlation of influences such as "upbringing" and response to treatment to those affected by the racial health gap.

One student linked their understanding of the racial health gap to their assessment: "I think during the lectures and the seminars, it was evident the gap and it also helped to create the podcast where we had to research information about it".

3.2.2. Effectiveness of the Seminar Activities

Most students agreed or strongly agreed that all the listed activities encouraged conversation in the seminar (Table 3). Interestingly, one student disagreed and another strongly disagreed that debates encouraged conversation. The student that strongly disagreed with debates also highlighted that whilst they did not enjoy them, they felt they were useful for encouraging anti-racist discussions, alongside the TED Talks. The student that disagreed with debates also suggested that the "type of debates" did not work well. However, when asked what did work well, they suggested that "everyone was respectful" of opinions. They also suggested more TED Talks and class discussions about topics in depth. Another student responded that, "Due to them not experiencing racism, it was hard to understand the personal experience of others."

Table 3. Students' perceptions about activities that encouraged conversation in the seminar: Likert scale responses (%).

Activity	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Brainstorming questions about the case study	55	35	10	-	-
Identifying logical fallacies	55	30	15	-	-
Analysing bias in research papers	65	25	10	-	-
Debates	65	15	10	5	5
Videos	60	15	25	-	-
Sharing positionality	55	25	20	-	-

When students were asked which activities they would like to see in the future, some students mentioned more of the "same" or "similar" activities they had experienced in the module. It was also suggested that there should be more student-led activities, including debates and discussion, more focus on real problems including racism, and more research activities.

When asked what worked well to encourage anti-racist discussion across the module, students mentioned "freedom of speech" and having a "supportive environment" allowed sharing of authentic experiences and created a sense of safety. Students added that the diversity of the classroom facilitated different points of view to be heard and learnt about. There were also comments that the module aided self-reflection, views were respected and were well balanced in the classroom. Again, the module case study, videos and debates were referred to as successful ways of facilitating anti-racist discussion.

When asked what did not work well to encourage anti-racist discussion, students suggested that the structure of debates could be improved and that there were "too many tangents". They also suggested that lack of participation from others increased the burden to contribute. One student mentioned that the topics are seen as taboo in some cultures which made it difficult for everyone to participate openly. Another student expressed that there were challenges in discussing points that might be perceived as offensive, which limited their willingness to engage fully. Another response noted that because most students were from mixed backgrounds, there was not a direct relation to actions about racism. Overall, most students (n = 13) either commented that everything was well covered or that they could not identify improvements.

3.2.3. Effectiveness of Assessment for Social Justice

When asked about assessment, all students agreed that the assessments facilitated their critical thinking about life sciences and understanding of racism. The majority also agreed that the assessments facilitated reflection on their lived experiences and discussions about racism outside the module. Two students felt neutral about the assessment facilitating their reflection and three students felt neutral about the assessment facilitating discussions outside the module.

Feedback regarding recommendations of how the assessment could facilitate further discussions about racism included investigating "different types of racism", history of racism, and other examples from other racialized groups. One student commented on their experience and thoughts of their podcast assessment, stating that it "was great to get people outside of the university to share their experiences and having the opportunity to have that conversation." One student stated that "the assessments make me do more research on different topics that linking them to the Racial Health Gap (RHG). This way

improving my understanding on the RHG and how to think of ways to reduce it." Overall, students indicated that more formative assessments would support the students' learning and facilitation of critical thinking, whereas others indicated that the assessments already did this.

4. Discussion

Student partnership is an invaluable way to work with students and shift traditional power dynamics in the classroom. In our classroom, we strive to create a culture of partnership that actively shapes the learning environment and continues with each cohort of students. This allows us to learn from students and continually improve the curriculum and our practice. Our first, pilot evaluation of our partnership and anti-racist practices on the 'Critical Thinking for Academic and Professional Development' foundation module has identified several lessons for practitioners like us who are working towards an education that is through socially just practices and encourages students to be change makers in the field of science.

Bovill (2020) highlights that higher education needs both small-scale and whole-class partnerships and that the latter are underutilized, despite having the potential to be more inclusive. These partnerships can lead to enhanced relationships and an increased sense of belonging amongst students. Through our blend of small-scale and whole-class co-creation practices, we found an emphasis on *mattering* to be key for co-creating democratic spaces that foster meaningful discussions about social justice and anti-racism in the whole classroom. Mattering is distinct from belonging, which has traditionally been the focus of student engagement initiatives, primarily assessing how well students fit into the university (Cook-Sather et al. 2023b). It has been evidenced that student–staff partnerships which facilitate mattering over belonging can be more affirming particularly for minoritised students (Cook-Sather et al. 2023b). Mattering is about creating space for all people, their emotions, knowledges and lived experiences to be recognized. As Love (2019) describes, "we who are dark want to matter and live, not just to survive but to thrive. Matter not for recognition or acknowledgement but to create new systems and structures for educational, political, economic and community freedom". Mattering is the starting point for decolonial and anti-racist work in our classrooms. It is not about individual achievement, but rather about our collective goals and actions. It needs us to question our spaces and curriculum about who really matters, especially in spaces that are rich with diverse groups of students who may be minoritized within or outside the university.

In our study, most students agree with feeling partners on the module; however, more students agree that they *mattered*. Students reporting feelings of safety and validation highlight the importance of fostering democratic and principled spaces in anti-racist work. Students also emphasize that they can share their feelings, drawing upon the disruption of traditional power dynamics in the classroom and supportive relationships between students and staff developed through regular 'ice breaker' activities. These activities are set up weekly to draw upon our identity and culture, to engage with our social and political realities and to share the emotions that surround these contexts. The practice of sharing affect is central to rehumanizing the curriculum and classroom, and as Bell describes, to creating "decolonial atmospheres". Emotions are used to process our social realities and to actively struggle to change them (Bell 2018).

Traditionally, there is no room in a life sciences classroom for affect and for students to explore stories and their lived experiences. A review of the literature indicates that student–staff partnerships serve as a powerful means of recognizing and accessing each other's humanity in STEM education (Cook-Sather et al. 2023a). Initiatives that foster meaningful partnerships, such as 'Human in STEM,' can also be catalysts for driving activism into

institutional change (Bunnell et al. 2021). When implementing partnership practices in our classroom, we also discovered that making time and space to engage with affect and human context creates the setting for meaningful partnerships and anti-racist science education. Partnerships and building relationships are fundamental to appreciating that science should be democratic, serving the interests of the communities it impacts. Science is embedded in social, cultural and historical contexts (Lederman 2007). As scientists, we make choices about which topics are worthy to engage with and which methodologies and whom we include in our research journey. Engaging with our subjectivities allows us to analyze and critique them to do science that is more transparent. It allows us to build transdisciplinary connections and develop holistic understandings and solutions to scientific problems. In our classrooms, we acknowledge that the scientific method does not always lead to objective science (Cochran et al. 2021). We discuss how the scientific method works and how it was used to perpetuate racism and serve colonialism. The results from this study tell us that life sciences students want to learn more about the interconnection between science and racism.

Science curricula make connections between disease predisposition and race. However, rarely are the nuances of such biological connections explored in the context of inequity and discrimination, despite there being evidence to link racism with poorer long-term health (Forde et al. 2021). The students in our study have specifically expressed a desire to learn more about the historical and social contexts of racism, with real life examples of its impact on communities. This serves as an encouragement for practitioners who may be embarking on their own journey towards creating socially-just science curricula and classrooms. As Love reminds us, "education research is crowded with studies that acknowledge dark children's pain but never the source of their pain, the legacy that pain has left, or how that pain can be healed." (Love 2019). Students in our study also indicate that they want to learn about "real-life" examples, and with racism described as a "public health crisis" in The Lancet (Devakumar et al. 2020), there is no shortage of examples that we can bring to the classroom. Ella Adoo-Kissi-Debrah died at the age of 9—her death being recorded as the first in the UK to be caused directly by outdoor air pollution (Samarasekera 2024). Similarly, Awaab Ishaak died at the age of 2, and was recorded as the first death directly attributed to mold, an indoor air pollutant (eClinicalMedicine 2022). Underlying these examples is "environmental racism"—Black people in the UK are disproportionately exposed to environmental pollutants (McArdell 2021). To tackle these inequalities, we need to engage our students, the future change-makers, in anti-racist and critical discourse. By studying human experiences and posing problems about their relation to the world, we invoke critical consciousness (Freire 1970). The participants in our study also suggest that drawing upon real-life examples can deepen the understanding of racism, even for those who might have never experienced it.

Furthermore, our results demonstrate that a structured approach to teaching critical thinking is fundamental for students to embrace social justice topics, conduct research and develop their own stance. Students appreciate our critical thinking tool-kit, suggesting it significantly enhanced their understanding of racism, for addressing other topics at university, and also for applying critical thought to their career choices. We took a partnership approach to teaching critical thinking in the classroom—as bell hooks suggests—"critical thinking is an interactive process, one that demands participation on the part of the teacher and student alike". Fundamental to this approach is acknowledging that teachers are ongoing learners and that they share the learning and teaching journey with students. There are several examples in the literature of structured approaches to teaching critical thinking in STEM, but there are very few that engage with anti-racism (Bernal-Munera 2023) and even fewer that employ the benefits of co-creation in this process.

Finally, our work demonstrates that authentic assessment opportunities can further actively engage students with social justice by empowering them to undertake knowledge exchange beyond the classroom. Calls for assessment to be humanized and to serve as a gateway for learning are not new (Angelo 1999). Authentic assessments have traditionally been described as opportunities whereby students engage with 'real-world' tasks; however, a more recent proposition is for authentic assessments to be a "vehicle for transformative social change" (Bernal-Munera 2023). The results of our evaluation show that students found that the assessment on this module—particularly the creation of a podcast episode—facilitated reflection on their lived experiences, critical thinking about life sciences, understanding of racism and discussions about racism outside the module. In these episodes, students invited guests from outside the university and shared powerful examples of personal stories and vulnerabilities as well as their learning from in-class discussions and independent research about racism. In line with our commitment to education *for* social justice, one episode from each discipline is published with the Pedagogies for Social Justice Podcast for these discussions to reach a wide audience (Araneta and Usman 2025).

Student–staff partnerships for social justice and anti-racism are not free from challenges. Some students expressed discomfort in engaging with conversations about racism, describing it to be a "taboo" topic, which further strengthens our call for anti-racism to be embedded across all disciplines. Similar feelings of discomfort have been reported extensively in the literature in the context of teaching and learning about racism and other social inequalities (Ambikar et al. 2023). Discomfort with discussions about race are bound to the comfort that accompanies the illusion of race being an illegitimate concern. There is evidence of "white ignorance"—representing the "systemic erasure, denial, obfuscation, forgetting, and idealization" ingrained into the British education system at every level (Bain 2018). It is, therefore, our understanding that discomfort with dialogue about racism is inevitable, and taking a race-evasive approach to teaching and practicing in life sciences is not the solution. Active engagement with the lived realities of racism is important to facilitate reflection and deep learning, hence the space needs to be created for all emotions to unravel in the classroom. Another challenge that the students describe in our study is "fear of offending". We believe this stems from a commitment to maintaining the classroom as a welcoming and respectful space. However, this commitment should not be a barrier to asking questions which come from a place of curiosity and willingness to develop knowledge. DiAngelo and Sensoy (2014) provide "silence breakers" to navigate this challenge and allow for authentic engagement with anti-racist discussions. They also present three analogies to help people think about racism in the context of structures and patterns rather than individual acts. Whilst we deploy these silence breakers in our classrooms, we have not used the latter and will consider this in our future work to reduce the burden to contribute being placed on students familiar with racism. There was also an indication that actions to do with racism may be less relevant to study in a diverse classroom like ours. This was an interesting perspective that encourages us to consider two aspects: First, we must ensure we adequately introduce how internalized racism can perpetuate racial inequalities, and second, we need to consider more explicitly the actions against racism that can be undertaken by people of color.

Overall, the evaluation of our approach to co-creating a life sciences curriculum for social justice has been invaluable for allowing us to navigate this challenging process. Our research led to further ideas from students about their contribution as partners to the module. The students in our study expressed a desire to take a more active role by assuming responsibilities such as leading seminars and writing their own case studies. This encourages us to remain committed to co-evaluating our classroom partnership practices so that they evolve with the changing social and political realities of students and staff.

5. Conclusions

As we work towards realizing a more socially-just education and society, we find that education *through* social justice is connected to education *for* social justice. How we work with students and the problems we address together should reflect the kind of practices and change our students make in society. The results of our study indicate that through humanizing and creating spaces where we all matter, we make space for anti-racist and critical discourse, working in solidarity towards positive and lasting change. Second, engaging with the historical and social contexts of injustice, including racism, is important, even when discomfort is at play. This is especially important for us in life sciences, as we hold a commitment to creating a society where all individuals live healthily and contribute to maintaining a healthy planet.

Author Contributions: Conceptualization, M.U., A.M., O.O. and L.P.; methodology, M.U., A.M. and L.P.; formal analysis, M.U., A.M. and L.P.; investigation, M.U., A.M., L.N. and L.P.; writing—original draft preparation, M.U.; writing—review and editing, A.M, L.P. and M.U.; funding acquisition, M.U., A.M., L.N. and L.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Students as Co-Creators programme, Centre for Education and Teaching Innovation, University of Westminster grant number [CDC-2324-14].

Institutional Review Board Statement: The study was conducted in accordance with the Declartion of Helsinki, and approved by Centre for Education and Teaching Innovation Research Ethics Committee (CETI-CDC-2324-14, 27 March 2024).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The datasets presented in this article are not readily available because the data are part of an ongoing study. Requests to access the datasets should be directed to Dr. Moonisah Usman, usmanm@westminster.ac.uk.

Conflicts of Interest: The authors declare no conflicts of interest.

References

Adelman, Larry. 2003. *RACE—The Power of an Illusion, What Difference Makes a Difference?* San Francisco: California Newsreel.

Ahmed, Riz. 2020. Where You From. Youtube. Available online: https://youtu.be/1DmabQguml4?si=nIjBQGyBOGmnqS58 (accessed on 8 January 2025).

Ambikar, Rucha, Daniel Guentchev, and Dennis Lunt. 2023. A conversation on challenging and using comfort-zone racism in the classroom. In *Difficult Subjects: Insights and Strategies for Teaching about Race, Sexuality, and Gender*. New York: Routledge, pp. 19–34. [CrossRef]

Angelo, Thomas A. 1999. Doing Assessment as If Learning Matters Most. Available online: https://www.merritt.edu/slo/wp-content/uploads/sites/296/2014/02/angelo_learning-Matters.pdf (accessed on 5 January 2025).

Araneta, Kyra, and Moonisah Usman. 2025. 'We're Back with a Mini-Series!'. Pedagogies for Social Justice: Student Partnership. Podcast. Available online: https://open.spotify.com/episode/4CmiGoMxsOH2Xm9YxWvzlG (accessed on 18 January 2025).

Araneta, Kyra, Jennifer Fraser, and Fatima Maatwk. 2022. *University of Westminster Student Partnership Framework*. London: Centre for Education and Teaching Innovation. [CrossRef]

Bailey, Suzie, and Michael West. 2020. Ethnic Minority Deaths and COVID-19: What Are We to Do? *The Kings Fund*, April 30.

Bain, Zara. 2018. Is there such a thing as 'white ignorance' in British education? *Ethics and Education* 13: 4–21. [CrossRef]

Behar-Horenstein, Linda S., and Lian Niu. 2011. Teaching Critical Thinking Skills in Higher Education: A Review of the Literature. *Journal of College Teaching & Learning (TLC)* 8: 25–42. [CrossRef]

Bell, Deanne. 2018. A Pedagogical Response to Decoloniality: Decolonial Atmospheres and Rising Subjectivity. *American Journal of Community Psychology* 62: 250–60. [CrossRef] [PubMed]

Bernal-Munera, Marcela. 2023. A Freirean liberatory perspective of community colleges education: Critical consciousness and social justice science issues in the biology curriculum. *Cultural Studies of Science Education* 18: 41–55. [CrossRef] [PubMed]

Bovill, Catherine. 2020. Co-creation in learning and teaching: The case for a whole-class approach in higher education. *Higher Education* 79: 1023–37. [CrossRef]

Brewis, Deborah N., Sadhvi Dar, Helena Liu, Angela Martinez Dy, and Udeni Salmon. 2020. Building the Anti-Racist Classroom: How the collective makes the radical possible. In *Transforming the Ivory Tower*. Stoke-on-Trent: Trentham Books.

Bunnell, Sarah, Megan Lyster, Kristen Greenland, Gabrielle Mayer, Kristen Gardner, Tanya Leise, Thea Kristensen, Emma D. Ryan, Richmond Ampiah-Bonney, and Sheila S. Jaswal. 2021. From protest to progress through partnership with students: Being human in STEM (HSTEM). *International Journal for Students as Partners* 5: 26–56. [CrossRef]

Cochran, Geraldine L., Simone Hyater-Adams, Carolina Alvarado, Chanda Prescod-Weinstein, and Abigail R. Daane. 2021. Social justice and physics education. In *Teaching and Learning for Social Justice and Equity in Higher Education*. Cham: Springer International Publishing, pp. 125–47.

Cook-Sather, Alison, Catherine Bovill, and Peter Felten. 2014. *Engaging Students as Partners in Learning and Teaching: A Guide for Faculty*. San Francisco: Jossey-Bass.

Cook-Sather, Alison, Diana Salmeron, and Theodore Smith. 2023a. Humanizing STEM education through student-faculty pedagogical partnerships. *Frontiers in Education* 8: 1153087. [CrossRef]

Cook-Sather, Alison, Peter Felten, Kaylyn (Kayo) Piper Stewart, and Heidi Weston. 2023b. Reviving the construct of "mattering" in pursuit of equity and justice in higher education. In *Academic Belonging in Higher Education*. New York: Routledge, pp. 198–214. [CrossRef]

del Carmen Salazar, María. 2013. A Humanizing Pedagogy: Reinventing the Principles and Practice of Education as a Journey Toward Liberation. *Review of Research in Education* 37: 121–48. [CrossRef]

Devakumar, Delan, Sujitha Selvarajah, Geordan Shannon, Kui Muraya, Sarah Lasoye, Susanna Corona, Yin Paradies, Ibrahim Abubakar, and E Tendayi Achiume. 2020. Racism, the public health crisis we can no longer ignore. *The Lancet* 395: e112–13. [CrossRef] [PubMed]

DiAngelo, Robin, and Özlem Sensoy. 2014. Calling In: Strategies for Cultivating Humility and Critical Thinking in Antiracism Education. *The Official Journal of The White Privilege Conference and The Matrix Center for the Advancement of Social Equity and Inclusion* 4: 191–203.

Draper, Elizabeth S., Ian D. Gallimore, Lucy K. Smith, Ruth J. Matthews, Alan C. Fenton, Jennifer J. Kurinczuk, Peter W. Smith, and Bradley N. Manktelow. 2022. *MBRRACE-UK Perinatal Mortality Surveillance Report UK Perinatal Deaths for Births from January to December 2020*. Leicester: The Infant Mortality and Morbidity Studies, Department of Health Sciences, University of Leicester. Available online: https://www.npeu.ox.ac.uk/mbrrace-uk/reports (accessed on 5 December 2024).

eClinicalMedicine. 2022. Awaab Ishak and the politics of mould in the UK. *eClinicalMedicine* 54: 101801. [CrossRef] [PubMed]

Forde, Allana T., Tené T. Lewis, Kiarri N. Kershaw, Scarlett L. Bellamy, and Ana V. Diez Roux. 2021. Perceived Discrimination and Hypertension Risk Among Participants in the Multi-Ethnic Study of Atherosclerosis. *Journal of the American Heart Association* 10: e019541. [CrossRef] [PubMed]

Fraser, Jennifer. & Moonisah Usman. 2021. Dreaming to learn together: Lessons in decolonial and anti-racist partnership practices. *The Journal of Educational Innovation, Partnership and Change* 7, 1.

Freire, Paulo. 1970. *Pedagogy of the Oppressed*. Gaithersburg: Seabury Press.

Gibson, Suanne, and Alison Cook-Sather. 2020. Politicised compassion and pedagogical partnership: A discourse and practice for social justice in the inclusive academy. *International Journal for Students as Partners* 4: 16–33. [CrossRef]

Healey, Ruth L., and Derek France. 2024. 'Every partnership [. . . is] an emotional experience': Towards a model of partnership support for addressing the emotional challenges of student–staff partnerships. *Teaching in Higher Education* 29: 657–75. [CrossRef]

hooks, bell. 1994. *Teaching to transgress*. New York: Routledge.

hooks, bell. 2013. *Teaching Critical Thinking*. New York: Routledge. [CrossRef]

Kishimoto, Kyoko. 2018. Anti-racist pedagogy: From faculty's self-reflection to organizing within and beyond the classroom. *Race Ethnicity and Education* 21: 540–54. [CrossRef]

Le Grange, Lesley. 2023. Decolonisation and anti-racism: Challenges and opportunities for (teacher) education. *The Curriculum Journal* 34: 8–21. [CrossRef]

Lederman, Norman G. 2007. Nature of Science: Past, Present, and Future. In *Handbook of Research on Science Education*, 1st ed. New York: Routledge, pp. 831–80.

Love, Bettina. 2019. *We Want to Do More Than Survive: Abolitionist Teaching and the Pursuit of Educational Freedom*. Boston: Beacon Press.

Maldonado-Torres, Nelson. 2016. Outline of Ten Theses on Coloniality and Decoloniality. Available online: https://caribbeanstudiesassociation.org/docs/Maldonado-Torres_Outline_Ten_Theses-10.23.16.pdf (accessed on 2 January 2025).

McArdell, Georgia. 2021. Environmental racism in the UK is real: Anti-racism is the answer. *Alumni Blog: Perspectives, Provocations & Initiatives*, April 19.

Peat, Jack. 2022. Royal race row: The full exchange between Palace guest and Lady Susan Hussey. *The London Economic*. December 1. Available online: https://www.thelondoneconomic.com/news/royal-race-row-the-full-exchange-between-palace-guest-and-lady-susan-hussey-339758/ (accessed on 3 January 2025).

Raleigh, Veena. 2023. The health of people from ethnic minority groups in England. *The King's Fund*, May 17.

Samarasekera, Udani. 2024. Mixed news on air pollution and child lung health. *The Lancet. Respiratory Medicine* 12: e80. [CrossRef] [PubMed]

Tuck, Eve, and K. Wayne Yang. 2018. *Toward What Justice? Describing Diverse Dreams of Justice in Education*. New York: Routledge.

Ugiagbe-Green, Iwi, and Freya Ernsting. 2018. The wicked problem of B(A)ME degree award gaps and systemic racism in our universities. *Frontiers in Sociology* 7: 971923. [CrossRef]

Universities UK International. 2022. Annual Report 2020/21. UUKI Publications. Available online: https://www.universitiesuk.ac.uk/universities-uk-international/insights-and-publications/uuki-publications/annual-report-202021 (accessed on 3 January 2025).