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WHAT DOES IT MEAN TO DECOLONISE COMPUTING AND IT - ANOTHER DUMB BUZZWORD OR RE-ENVISAGING ALL CULTURES AND KNOWLEDGE SYSTEMS FOR HOW THE WORLD IS FRAMED?

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Abstract

In this paper we describe the approach we have been taking at the Open University (OU), UK in the School of Computing and Communications (C&C), as we consider new ways of knowing in our decolonial transformation and consider what it means to decolonise a technical subject such as Computing and Information Technology education.

As a scholarship project we aimed to set out a vision and a roadmap for what computing could and arguably should mean for computing educators at the OU, once decolonised. We aim to critically interrogate both content and pedagogy informed by Critical Race Theory and decolonial thought, with the overarching focus being to re-orient the teaching of the subject at module, curriculum and programme level.

Decolonisation is therefore a complex challenge for HE change and there are many ways of framing, imaging and enacting the decolonisation of higher education within the discipline of computing and IT. Yet as a contested term, what does it mean to decolonise? This article will consider our practical experiences of the research project undertaken as we strive to commit to decolonial ethics and politics.

Keywords: Decolonisation, decolonising computing, decolonial, power, privilege.

1 INTRODUCTION

There is widespread discussion in higher education (HE) of 'decolonising' the university and curricula, which arguably grew from the 2015 Rhodes Must Fall movement firstly at the University of Cape Town, South Africa [1] and then to Oxford University, UK, with the demand by students to remove the statue of Cecil Rhodes, a white supremacist. Further protests and direct action by Black Lives Matter following the killing of George Floyd in the US and the toppling of the statue of Edward Colton in Bristol, UK in 2020, situated the injustices of colonialism and its long-lasting legacy.

This direct action against institutional racism has its roots in the humanities and social sciences and some UK universities such as Keele [2] and Kent [3] are already producing staff guides on how to decolonise the curriculum. As decolonising must be contextual to the discipline there is now a growing interest in how to undertake decolonisation in science and technology as seen at the University of York [4], who have taken steps to decolonise their Chemistry curriculum. However there is frustration that the decolonising wave is tokenistic, and if, some universities claim, they are decolonising themselves, what transformation actually looks like [5]. Guidance can be found from the QAA Subject Benchmark Statement: Computing (2022) suggesting that courses and providers could consider "acknowledging and addressing how divisions and hierarchies of colonial value are replicated and reinforced within the computing subject" [6].

Computing is arguably one of the trickiest areas for such work for several reasons. Firstly, we argue that computing needs to be viewed as a sociotechnical field as this helps to bring into focus issues tied up with social relations, political and economic. Secondly, our starting point is that as university educators we consciously or unconsciously adopt a Eurocentric/West-centric perspective in the production of knowledge and teaching content. We are also complicit because through our educational institutions we perpetuate Western dominance, racialised neoliberal capitalism, and the exclusion of the marginalised. Thirdly, decolonial change should not be mistaken solely as an Equality, Diversity and Inclusion initiative, as decolonisation goes further and deeper in challenging the Europe/USA centred colonial lens [7].

Acknowledging the power and privilege of the white majority in Europe and North America, requires reflection on identity, to think about values and to question and ultimately transform what we think and know. As educators, we have a particular role and responsibility in influencing future computing practices. Our students will go on to design, build and maintain the devices, artefacts, and infrastructures

of the future. It is imperative that educators are equipped and supported to recognise and challenge colonial legacies and neo-colonial tendencies in what we teach and how we teach it.

2 METHODOLOGY

Participatory design was adopted as the approach for this small-scale project as it involves active participation of several people, namely researchers and end users (tutors, academics, and students). A participatory approach relates to the project team values of togetherness, inclusion and social justice. The goal of this approach is co-creation or co-design, with the primary argument being that the stakeholders should be able to participate in the design of the products that they will be using. Participatory research is often referred to as participatory action research reflecting the concern with social equity and a rationale to generate knowledge for action. Influenced by the theory of research for learning by reflection and then action, the aim is to affect change by empowering stakeholders to gain an understanding of colonialism within computing and IT, in order to develop resources for setting out a vision and roadmap for what computing could mean for computing educators at the Open University. The project activity has so far consisted of creating documents, staff and student workshops and an online student survey.

2.1 Documenting the Project Scope

A set of documents to establish the scope and approach of the project were authored by the project team. The first document, an Initial Scoping Document (ISD) was based on desk research with the aim to clear the ground and set the stage for subsequent work. The ISD has addressed questions such as what do we mean by computing, in order to cement the project team's commitment to a fundamentally sociotechnical perspective on computing. Secondly, the ISD considered the distinct features of computing and IT which condition our ability to decolonise its teaching. These include the academic content, the teaching and learning system (including presentation of content, assessment and tutorials), student expectations and motivation, and the structure of the industry. Thirdly, the ISD answered what we mean by decolonisation in the context of computing, as we elaborated an understanding of decolonisation as well as its scope and limits in relation to computing and its relationship to teaching computing.

One output from the desk research literature review was the production of core and secondary readings. The decision was made that all current and new team members should at a minimum familiarise themselves with the core readings by Ali [7,8], Blanchette [9], Dennis [10] and Malazita and Resetar [11].

2.2 Teaching Resource 1 (TR1): Criterion and Methods

The first purposeful teaching resource, TR1, was a written document signposting criteria and associated methods with which to evaluate computing curriculum from a perspective informed by CRT and decolonial thought. TR1 was a combination of systemic evaluation and systems thinking, along with an adaptation of Dennis's 10 pedagogic approaches to decolonising [10]. TR1 included the traditional systems thinking approaches of evaluation methods, systems methodologies and system tools and characteristics of methods with four themes emerging: who belongs in the room, creating safer spaces, ways of knowing (epistemology) and diversity and pedagogy (method and practice of teaching).

The aim was to use TR1 as a basis of three critical review workshops each with a distinct stakeholder group: colleagues in the School of Computing and Communications, students (both Black and Minority Ethnic, BME, and non-BME), and external consultants from academia and industry. Through collaboration we hoped to maximise effectiveness and establish a shared understanding among participants with diverse perspectives on the issues involved. The overall aim was to produce criteria and associated methods which could themselves be used as critical participatory tools that enable colleagues to take ownership of the process.

Two of the three stakeholder workshops with staff and students have been delivered, and are discussed in this paper, and the third is currently in the planning and design stage with University of Leicester for delivery in summer 2023.

2.3 Tutor Workshops

Two workshops with representatives of the large cohort of part-time tutors that have direct student contact were delivered virtually during March 2022. This engagement with colleagues aimed to analyse existing examples of computing resources across the undergraduate programmes and industry. We decided not to introduce TR1 at this point given that tutors are neither experts in knowing what it means to decolonise computing, nor do they have a tried and tested approach from where to begin exploring what computing means in the context of the C&C school curriculum. TR1 was thus perhaps too theoretical.

Tutors were instead first introduced to the project via a talking pod cast from the project leader Mustafa Ali and asked to reflect on their positionality. Positionality was used as a way for tutors to consider who they are and where they are located when designing, building, researching or theorizing about computing and IT phenomena. External resources were shared to introduce the power that white people may subconsciously not be aware of via John Amaechi's 'White Privilege' article on BBC Bitesize [11] whilst Reni Eddo-Lodge's blog [12] 'Why I'm no longer talking to white people about race' aimed to open up the topic of structural racism. In addition, curriculum examples (see Table 1) were used to highlight the possible influences of coloniality on the module content. These resources were chosen because of their Western-centric focus and how the language presumes a particular profile and orientation. This is because the learning materials uses concepts, ideas and perspectives that centre or normalise constructions of 'Westernness' or 'whiteness' as basic reference points for human society.

Table 1: Examples of the influence of colonialism within module content

Cultural normalisation: Using the steps involved in making a cup of tea, as an illustration of task decomposition

Terminology: "let us state this again in rather black and white terms" and "master/slave"

Stereotypical assumptions: "Neutral versus emotional: In the former case, it is expected that the nature of our transactions would be objective and detached; in the latter, the showing of emotion is expected, or at least not deprecated. For example, you might expect British people to be 'neutral' in their transactions, but people from Latin American countries to be more emotional."

UK/US dominance in the narrative: many examples with a focus on the UK in the 1950's. Reference to the Industrial Revolution and the use of only US and UK data sources. For example, The Associated Press is American and Ofcom data in English.

To broaden out the focus from inside the University, examples were also taken from within the IT industry to illustrate the influence of colonialism beyond the curriculum. The examples selected are listed in Table 2.

Table 2: Examples of the influence of colonialism within industry

Global life cycle of computing devices such as laptops and/or smartphones involves neo-colonial flows from the core of the modern world system (demand, design) to the margins/periphery (supply, construction) back to the core (as the primary site of consumption) and then back to the periphery (disposal of e-waste) [13].

Coded bias in algorithms for predictive policing, criminal justice and social welfare system. For example, face recognition software used by UK passport photo checker – women with darker skin are more than twice as likely to be told their photos fail UK passport rules [14]. Beauty AI – the first ever beauty contest judged by robots picked 44 white skinned winners [15].

Sale of domain names in 2010, 10% of the Tuvalu government's income came from sale of its national domain '.tv' [16].

Racial homogeneity in the original emoji set for missing two "ethnic" characters; the people emoji featured in Unicode 7.0 were represented as White [17].

2.4 Student Survey

Following a full ethical approval by the Open University's Human Research Ethics Committee, an online survey invitation was sent to 3695 undergraduate students across 17 C&C modules. The target population was restricted to those modules whose chairs consented to the survey distribution, and further restricted according to whether a student had been invited to participate in a survey during the last month and/or had already participated in 4 surveys that year. All invited students were aged 18 years or above and currently registered on at least one undergraduate module.

Using the onlinesurveys.ac.uk tool provided by JISC, a mixed method survey ran from June 6th to July 1st, 2022. The survey consisted of 12 quantitative questions using a five-point Likert scale and 5 qualitative questions using a free text box, and are listed in Appendix A. The use of the 'Challenge Power' and 'Diversity Represented' constructs from Thomas and Quinlan's Culturally Sensitive Scales formed 9 of the 12 quantitative questions [18].

We were provided by the university with demographic characteristics for each participant as held on their student record, including gender, religion, ethnicity and disability (all of which are considered 'protected characteristics' within the Equality Act 2010 [19] and thus of particular importance), along with age and geographic area (Scotland, Wales, Northern Ireland or one of the English regions). Demographics are self-reported but selected from standard categories used across the UK Higher Education sector.

399 participants completed the survey, with 394 consenting to using their data for the purpose of the analysis. This resulted in a 10% response rate.

2.4.1 Survey Descriptive statistics

Over three quarters (78.7%) of the survey respondents identified as male, compared to 21.3% who identified as female. In terms of representation against the average C&C student this is broadly similar with the largest qualification in the School, the BSc Computing and IT degree (Q62), as 78.7% are male and 19.3% female. But it is different from the BSc in Computing and IT with a second subject (Q67), where there are less men (66.8%) and more woman (33.2%).

The majority (39%) of the participants were aged 30-39 years old, thus older than both Q62 and Q67 where the dominant age-group is 21-29 year olds, at 47% and 45% respectively. The ages of remaining survey participants were 40-49 years (26%), 21-29 years (23%), aged over 50 (10%), with the least number of participants (2%) aged 18-20 years.

Participants' registered home addresses were distributed amongst the four nations with just over three quarters of students living in England. The remaining participants were in Scotland 13%, Wales 6% and Northern Ireland 4%.

The ethnicity of the participants was dominated by those who identified as White (86.3%) and in terms of representation across the school this ethnic balance is broadly similar to Q62, which has 83.8% White students, and with Q67 which is 80.6% White. The remaining participants identified as Asian (4.3%), Black (3.6%), Prefer Not to Say (PNTS) (3.6%), Mixed (1.3%), Other (0.8%) and Arab (0.3%).

Most participants when asked about religion did not specify their religious affiliation as the majority choose 'None' 41.1% closely followed by 'PNTS' 35.3% and 'Other' 6.1%. Of those participants who did declare a religion, the most popular was Christian with 12.9% respondents, followed by Muslim 2.3%, Buddhist 1%, Spiritual 0.8%, Jewish 0.5%.

13.2% of participants declared a disability - this is less than on Q62 (18.9%) and Q67 (22.3%).

2.5 Student Workshops

Two student workshops entitled 'To critically discuss proposed themes for how to decolonise computing and IT', were held virtually during October 2022. Of those students who had completed the online questionnaire, 54 'opted in' to a follow-up workshop and consented to be contacted. All 54 were invited and subsequently 18 students expressed an interest in attending a workshop. A limited range of 4 workshops dates (13th or 19th October 2022) and times (5.30pm or 7.30pm) were offered. In the spirit of co-design the chosen dates and times were based on the likelihood of the most participants being able to attend due to them self-selecting their preferences. This led to Workshop 1, 13th October 2022 at 7.30pm (attendance = 7) and Workshop 2, 19th October at 7.30pm (attendance = 2). The relatively low number of participants in Workshop 2 questions the extent to which power inequalities within the

communities that are the subject of the research can influence the outcomes. The dates and times of the workshops were initially set by the research team based on our availability and questioning whether the participants always have the time and skills required to meaningfully engage is a challenge the project team continues to face.

Each student workshop mirrored the staff workshops in that participants began by anonymously self-assessing their level of understanding of decolonising via a poll. Next positionality was again the focus, but this time introduced through a definition, with participants invited to self-identify by completing an anonymous word cloud positionality statement. The three resources of Ali's podcast on Decolonising Computing, Amaechi [11] and Eddo-Lodge [12] were then discussed, having been sent to participants in advance of the workshop. The focus then moved to examples of coloniality from the C&C curriculum and externally within the wider computing industry. Finally students were asked to critique TR1 and specifically the four themes, the first occasion that the project teaching resources had been shared formally with any stakeholders.

Both staff and student workshops were recorded and a transcript was analysed for themes. Anonymised collective dialogues have been included in the presentation of these findings.

3 RESULTS

3.1 Positionality

According to Lazem [20], it is through reflection on identity that values may offer a divergent path to question and ultimately transform what we think and know. Therefore, as a catalyst for workshop discussion, participants were first asked to consider their positionality [21], given that at a minimum researchers and practitioners adopting a decolonial computing perspective must consider who they are and where they are located. Research that considers positionality of both the researcher and the researched can be transformative, according to Stacey and Thorne [22]. The resources by Amaechi [11] and Eddo-Lodge [12] were selected in order to get closer to the phenomenon being discussed, and to give voice to those that are often at the periphery.

For some tutors this focus on race, power and privilege highlighted the complex relationship that those striving to do decolonising work face when distinguishing it from work to make the curriculum more equal, diverse and inclusive (EDI). Rai and Campion [23] are blunter and call the relationship "awkward and confused". Yet Ali [7] is clear that decolonial change should not be mistaken as an EDI initiative, as decolonisation goes further and deeper in challenging the Europe/USA centred colonial lens.

One task therefore for this project is to support stakeholders in differentiating between race equity work and doing decolonising work. Both require acknowledgment of the power and privilege of the white majority in the West but undoing the impact of colonialism also requires reflection on identity, and where one is situated in the world.

The decision to allow student workshop participants to self-identify resulted in labels such as "Buddhist", "Lesbian", "Mother", "ADHD", "physically disabled". Yet as a research project team we have struggled to produce an individual positionality statement which we are comfortable to share, perhaps a reflection of an unconscious wish to conceal our own vulnerabilities. This does raise the question as to why as researchers we are unable to embrace an ethics of care to our research that includes a transparent acknowledgement of our lived experiences.

3.2 White Fragility

Unsurprisingly there were defensive responses amongst staff and students. During the tutor workshop the push back was direct with questions such as "is there a real problem here?". Other participants expressed an outrage at Amaechi's and Eddo-Lodge's implication that they (as a White person) were racist when that was not their intention. The language of decolonising was a challenge for some participants as it was unfamiliar, whilst terms such as 'white privilege' were deemed by tutors as being "unfortunate" and provocative to those who identify as White, as they felt insulted at being considered privileged.

It was DiAngelo [24] coined the term White Fragility in 2011 and initial reactions from our students and to a lesser extent tutors (see Table 3), suggest widespread, though certainly not universal, scepticism through to defensive reactions when a white person is made to consider their own race as their worldview is challenged.

Table 3 Tutor and student responses to the idea of decolonising computing education

Tutor Responses	Student Responses
"Does the problem exist? What evidence is there?"	"I honestly don't know... I don't feel its particularly colonised"
"Computing is global, driven by economy and not race, gender etc."	"I think it is irrelevant"
"Computers don't have colour"	"this isn't an issue move on"
"waste of students' money"	"being ridiculously over the top"
	"another dumb buzzword used by the woke left"

This is perhaps not surprising as there is public hostility to decolonising the curriculum within the UK media, with publications such as The Daily Mail criticising universities who are decolonising courses with headlines such as 'Campus wokery on the march' [25]. Criticism is also strong within the political arena as voiced by the UK Universities Minister Robert Halfon, who recently suggested that decolonising is "nonsense" [26].

These defensive responses suggests that white fragility is very much present within our tutor and student community but as a project team we also reflected that our choice of resources by Amaechi and Reno-Lodge, did cite the problem as individual rather than structural. There is a stronger need to establish the structural nature of our concerns and perhaps we need to foreground the systemic/structural nature of the problem first, to help people to recognise the importance of positionality within this. In the tutor small group work this was illustrated by a discussion about racist intent, rather than racist outcomes of Artificial Intelligence, which we had assumed would be more straightforwardly understood than appears to be the case.

3.3 Colonial Terminology

Tutors were presented with examples of terminology (see Table 1) as evidence of how computing language reverts to what is colonial language in order to explain hierarchies. During the workshops it was posited that are other valid conventions such as "parent/child" and "main/secondary" address race equity, and that industry has already taking action to replace these colonial terms from its code – for example by Python in 2018, JP Morgan and Twitter in 2020 [27], and by GitHub, the world's biggest site for software developers [28]. Yet changing terminology falls prey to the accusation of wokeism or empty symbolism. This is seen in the debate over the decision by a Google vice-president to withdraw from the Black Hat virtual conference – defenders of the term claimed it refers to classic Western movies and good (white clothed) and bad (black clothed) cowboys [29]. The debate is far from over as developers are also pushing back, with one Black developer saying it 'creates confusion and unnecessary work' [30]; and the response by tutors illustrates this view (see Table 4).

Table 4 Tutor response to colonial computing terminology

"I feel like you're looking for something to criticise"
"more difficult to change"
"We would have to go through the whole bible"
"If we change the terminology, we are avoiding terms that are industry embedded and are not preparing students for the work environment."

In the tutor workshops the participants argued if we changed the terminology, we are not preparing students for the work environment. This view was further supported by emphasising that these terms have a technical meaning and so to implement change is more sensitive. For example, 'white-lists' and 'black-lists' are terms that are often used with respect to cyber security. There was a view that we could use 'allow' and 'deny' lists but that students may come across 'master-slave' in other computing contexts; so even if the Open University decides to stop using colonial language, these participants argued that students still need industry awareness.

3.4 Online Survey – Quantitative Analysis, Question No. 1-12 (Appendix A)

3.4.1 Data analysis

Analysis of the results were across the whole student population, and by three key demographic characteristics which were most relevant to decolonisation – gender, ethnicity and religion. Gender was a simple binary of Male/Female.

Ethnicity covered several different groups, but because 86% of respondents were White the numbers of respondents in any other ethnic group was too small by itself to allow for statistical tests, so we grouped all non-White respondents into a single category. We excluded from this stage of the analysis the respondents (3.6%) who answered PNTS to ethnicity.

Religion required a different approach. This is of some interest as a category because of the crossover between ethnicity and religion (Muslims being a particular example of a group who have many ethnicities, but experience colonised discrimination as a religious community). As discussed above, 35.3% of students in our sample had selected PNTS, 41.1% had stated None as their religion, and just 23.6% had given any kind of religious affiliation. By contrast, in the 2021 census for England and Wales [31], where 94% of people gave an answer (i.e. just 6% were PNTS), 37.2% answered 'No religion' while the remaining 56.8% listed a religious affiliation. While we cannot assume that the religious makeup of our students is the same as the overall population of England and Wales (and we have an appreciable body of respondents in Scotland and Northern Ireland), the big difference in religious affiliation suggests that this data is partial at best and that at least some of our PNTS respondents are religious. However, we did notice a difference in responses between those who gave a religious affiliation and those who said no religion, so we chose to test the difference between these two groups and ignore PNTS respondents.

We took two approaches to analysing the Likert-scale questions. First, we obtained an overview of the questions about which respondents felt strongest, through a tallying method; second, we analysed whether question responses varied by demographic characteristics, using t-tests.

For the overview approach within our 5-point scale we grouped 'strongly agree' and 'agree' as one set of answers and ranked (see Table 5) and grouped 'strongly disagree' and 'disagree', leaving out neutral responses.

Table 5 Ranking of survey questions by agree/strongly agree responses

Survey Question No.	Question Wording	% of respondents 'agree' and 'strongly agree'
6	The curriculum features people from diverse backgrounds	52.1
4	The curriculum encourages students to connect learning to social, political or environmental concerns	50.5
7	People of diverse ethnicities are represented as researchers or professionals, not just as participants in research, clients, consumers, customers, etc	46.9
12	Does the module allow your lived experience to be drawn upon?	46.5
8	The curriculum respects that different cultures may have different understandings, skills and/or philosophies	46.4
10	Do you see yourself reflected in the module materials?	41.0
11	How well do the materials value/appreciate difference?	35.8
9	The curriculum addresses problems that are of concern to marginalized people/communities	29.5

1	The curriculum raises critical questions about power and/or privilege that are usually taken for granted	24.1
2	The curriculum encourages students to challenge existing power structures in society	20.5
5	The curriculum encourages students to take actions that fight inequity or promote equity	19.2
3	The curriculum encourages students to critique unearned privilege	17.2

3.4.2 Challenge Power

In reviewing the Challenge Power construct from the quantitative student responses, the first theme focuses on the curriculum's ability to provoke critical thought and challenge dominant ideologies. One could argue that currently we are failing our students, as 41% disagreed or strongly disagreed when asked whether the C&C curriculum encourages students to challenge existing power structures in society, as this was the highest scoring negative response. This perception of the inability of the curriculum to address power inequalities was again highlighted by the lowest number of students agreeing with the statement that "the curriculum encourages students to critique unearned privilege", as only 17% agreed or strongly agreed. This suggests that the curriculum is perceived as less culturally sensitive than it could be [32]. Yet the Challenge Power construct also included a question on how the curriculum "encourages students to connect learning to social, political and environmental concerns", and with 50% agreeing or strongly agreeing, this was also a high positive response. This suggests that this aspect of the C&C curriculum does display some cultural sensitivity.

Analysing these responses by demographics showed some important differences in the numbers of respondents finding particular questions important. For example, while question 6 (top-ranked in the above list) had 52.1% of all respondents agreeing or strongly agreeing, this was only true for 42.9% of female respondents, but was true for 59.6% of non-white respondents. Likewise, question 4 (second-ranked, with 50.5% agreement from all respondents), was top-ranked for female respondents (60.7%) and for non-white respondents (59.6%).

3.4.3 Diversity Represented

The second construct of Diversity Represented focuses on how people from diverse backgrounds are referenced within curriculum (33) and of those surveyed over half did feel represented, with 52% agreeing or strongly agreeing that the curriculum features people from diverse backgrounds. Further evidenced by 46% feeling that the curriculum respects how different cultures may have different understandings skills and all philosophies and 46% agreeing/strongly agreeing that the module allows lived experience to be drawn upon. This representation within the curriculum though must be considered when reminding ourselves the profile of the average participant who completed the survey, who was male, aged 30-39 years old, and identified as White British with no disability.

3.4.4 Statistical Tests for demographic differences

Using SPSS and converting the Likert scores into 1-5, with 1=strongly agree, so higher mean scores below show greater disagreement with the question, we analysed the statistical differences between mean scores on questions, using a two-tailed t-test. We found statistically significant differences in three questions for each of gender and ethnicity, and four questions for religion.

For **gender**, in each case Levene's test showed the need to use non-equal variances. With three of the questions, we found that female respondents had a statistically significant higher mean score at the 95% confidence interval, indicating a stronger level of disagreement with the question, on two questions which had high overall agreement levels:

- 6. The curriculum features people from diverse backgrounds ($t(114.269)=2.389$, $p=0.019$); Females ($M=2.71$, $SD=1.104$) disagreed more than Males ($M=2.40$, $SD=0.890$)

- 7. People of diverse ethnicities are represented as researchers or professionals, not just as participants in research, clients, consumers, customers, etc. ($t(119.732)=2.446$, $p=0.016$); Females ($M=2.76$, $SD=1.060$) disagreed more than Males ($M=2.45$, $SD=0.923$)
- 11. How well do the materials value/appreciate difference? ($t(123.744)=2.255$, $p=0.026$); Females ($M=2.86$, $SD=0.866$) disagreed more than Males ($M=2.67$, $SD=0.866$)

For **ethnicity**, in each case Levene's test showed the use of equal variances. Three questions showed a significant difference at the 95% confidence interval – in each case the agreement was higher by non-white than white respondents, on questions which it will be observed from the list above had the lowest levels of agreement overall:

- 1. The curriculum raises critical questions about power and/or privilege that are usually taken for granted ($t(374)=2.184$, $p=0.030$); non-white respondents ($M=2.87$, $SD=1.191$) agreed more than white respondents ($M=3.22$, $SD=1.001$)
- 3. The curriculum encourages students to critique unearned privilege ($t(374)=2.231$, $p=0.026$); non-white respondents ($M=3.02$, $SD=1.225$) agreed more than white respondents ($M=3.37$, $SD=0.980$)
- 5. The curriculum encourages students to take actions that fight inequity or promote equity ($t(374)=2.088$, $p=0.038$); non-white respondents ($M=2.98$, $SD=1.170$) agreed more than white respondents ($M=3.31$, $SD=0.994$)

For **religion**, in each case Levene's test showed the use of equal variances. Four questions showed a significant difference at the 95% confidence interval – in each case the agreement was higher by religious than non-religious respondents, with three of the questions (two also appearing in the ethnicity set of statistically significant differences) among those which had the lowest levels of agreement overall:

- 2. The curriculum encourages students to challenge existing power structures in society ($t(250)=-2.539$, $p=0.012$); religious respondents ($M=3.05$, $SD=1.047$) agreed more than non-religious ones ($M=3.39$, $SD=0.989$)
- 3. The curriculum encourages students to critique unearned privilege ($t(250)=-2.461$, $p=0.015$); religious respondents ($M=3.19$, $SD=0.999$) agreed more than non-religious ones ($M=3.50$, $SD=0.969$)
- 5. The curriculum encourages students to take actions that fight inequity or promote equity ($t(250)=-2.330$, $p=0.021$); religious respondents ($M=3.10$, $SD=0.989$) agreed more than non-religious ones ($M=3.40$, $SD=1.002$)
- 8. The curriculum respects that different cultures may have different understandings, skills and/or philosophies ($t(250)=-2.079$, $p=0.039$); religious respondents ($M=2.43$, $SD=0.979$) agreed more than non-religious ones ($M=2.69$, $SD=0.944$)

In summary: eight of the twelve questions showed significant statistical differences across one or more demographic characteristics, around levels of agreement with the Likert-scale questions.

4 CONCLUSIONS

Decolonising the curriculum should be one of the most important conversations in universities today as HE in the West is built on the power and privilege of the dominant white population and continues to be at the expense of ethnic minorities who remain on the periphery. Many universities were funded via money from colonial plunder and enslavement and universities continue to look at the world through a Western and Eurocentrist lens.

Doing decolonising work in HE is not without challenges. Firstly, there is frequent misunderstanding of the goal. It is naïve to assume that students and tutors know the position that universities seeking to decolonise are taking, and quite likely that the understanding of the topic is muddled. This was highlighted by a comment by one student:

“we need to identify what is meant by colonising in the computing and IT modules in the first place.”

As a starting point and therefore central to any work on decolonising within Computing and IT, we must clarify what we mean by Computing, *before* we explore what it means to decolonise. We argue that it must be seen as a sociotechnical practice, in which the social, material and computational are

inextricably linked in everyday work; and that we must additionally establish the structural nature of inequality within that practice.

The second challenge is a combination of white privilege and white fragility, with some rejecting the impact of colonial rule on education and regarding decolonising as a troubling ideology that has no place in education:

“There is always going to be some degree of political pushback from certain demographics of people, i.e. white conservative people.”

It is likely that decolonisation of education will be an unpleasant process for the oppressors as the process of revealing and dismantling colonist power in all its form will require us all to check our privileges and recognise the importance of positionality in this transformation.

Finally there is a challenge of striking a balance given the highly-politicised nature of these topics, and the risk of attack in the right-wing press; as captured by one student:

“Finding and sticking to the difficult path where the “woke” are satisfied, but the “middle ground” are not disillusioned, or the press do not ridicule the institution i.e. National Trust going too “woke” recently”

In looking to next steps then Bhambra, Nisancioglu and Gebrial [34] identify three distinct positions within UK universities in regard to decolonising activity. Firstly a market driven agenda, secondly an extension of ongoing diversification strategy and thirdly a radical framing involving a new orientation. All of these are present at our own university to some extent, especially driven by a new university strategy that includes Equity as a key pillar, and by the creation of an Access and Participation Plan [35] in response to UK government expectations that HEIs should address the awarding gaps between black and white students [36]. The research activity reported in this paper seeks to be part of Bhambra et al.’s third approach, reframing Computing and IT from a discipline which is inherently colonialist and techno-centric to one which is plural, sociotechnical and founded on justice for all.

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Appendix A: Online Survey Questions

Likert-scale questions (choice of five options, from 'strongly agree' to 'strongly disagree')

1. The curriculum raises critical questions about power and/or privilege that are usually take for granted
2. The curriculum encourages students to challenge existing power structures in society
3. The curriculum encourages students to critique unearned privilege
4. The curriculum encourages students to connect learning to social, political or environmental concerns
5. The curriculum encourages students to take actions that fight inequity or promote equity
6. The curriculum features people from diverse backgrounds
7. People of diverse ethnicities are represented as researchers or professionals not just as participants in research, clients, consumers, customers, etc.
8. The curriculum respects that different cultures may have different understandings, skills and/or philosophies

9. The curriculum addresses problems that are of concern to marginalized people/communities
10. Do you see yourself reflected in the module materials?
11. How well do the materials value/appreciate difference?
12. Does the module allow your lived experience to be drawn upon?

Free text questions

13. What does decolonising mean to you?
14. What do you think it means to decolonise the computing curriculum?
15. How do you think we can start to decolonise computing at the OU?
16. It is important to engage students as partners in decolonising activities – how best could this be done?
17. What challenges do you foresee?
18. Any other comments?