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Reflecting on the impacts on undergraduate economic and management science students of a Freirean-inspired module in sustainability education

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Abstract

I reflect on impacts of a Freirean-inspired module designed to conscientise and implicate economic and management science students in socio-economic and environmental challenges. A conceptual framework proposed by Hopwood, et al. (2005) was used to compare student positions in relation to these challenges based on their pre- and post-module opinions. In terms of socio-economic concerns, the results indicated a reformist central tendency, with an aversion for anything radically transformative. Participating in the module had no significant effect on this. In terms of environmental concerns, students separated into two groups: those who clustered around wanting to maintain the status quo, and a noticeable minority who expressed transformative views. Participating in the module shifted student opinions towards greater environmental concern. Based on this, I reflect critically on humility, the paradox of respecting student subjectivity vs activism, Freirean 'unfinishedness', and the importance of small victories.

Keywords: Common sense, critical pedagogy, Freire, sustainability education, unfinishedness

Introduction

This paper presents a critical reflection on impacts of a Freirean-inspired module delivered to undergraduate economic and management sciences students. The intention of the module is to conscientise and implicate these students in major socio-economic and environmental challenges confronting humanity. It is posited here (and argued more concretely later) that this module sits at the nexus between sustainability education and Freirean critical pedagogy.

However, this is not the starting point of the paper. The starting point is a 2005 paper written by Hopwood, Mellor and O'Brian in which they proposed a mapping of different approaches to sustainable development.[1] The centrepiece in this was a simple two-dimensional

[1] Sustainable development is most commonly defined with reference to the Brundlant Report definition as development that meet the needs of the present generation without compromising the ability of future generations to meet their own needs. Hopwood, et al. (2005: 40) define the boundaries of this as 'attempts to combine concerns with the environment and socio-economic issues'.

conceptual space comprising 'increasing environmental concerns' on the x-axis and 'increasing socio-economic wellbeing & equality concerns' on the y-axis (Hopwood, et al., 2005: 41). Having set up this conceptual space, Hopwood, et al. (2005) proceeded to populate it with various sustainable development approaches or movements. They then proposed the partitioning of their sustainable development conceptual space, along with the mapped sustainable development approaches, into three broad categories: those that involved maintaining the *status quo*; those that involved some *reform* of existing political economic systems, but not an overthrowing of them; and finally, those that were altogether more revolutionary and would involve fundamental *transformation* of political economic regimes.

Over the years, this paper has been cited many times.[2] By far its most common use has been as a source of authority for its basic argument that a large array of definitions and activities have been appended to the concept of sustainable development (e.g., Bibri & Krogstie, 2017; De Neve, et al., 2020; Martínez-Allier, et al. 2010; Milne & Gray, 2013; and many more). That Hopwood, et al. (2005) noted potential contradictions inherent in some of the underlying environmental and socio-economic currents has also been referenced by some (e.g., Berardi, 2013; Stevis & Felli 2020). Beyond this, some have cited it as authority for a general definition of sustainable development (e.g., Wang & Lo, 2021; Witjes & Luzano, 2016), although the whole point of the paper was that the sustainable development discourse is littered with definitions. Dempsey, et al. (2011) used the paper as authority for the suggestion that sustainable development is an explicitly anthropocentric movement, and a few years later used it as authority for the idea that sustainable development is a matter of social justice (Dempsey, et al., 2012). One or two authors have simply acknowledged Hopwood, et al.'s (2005) conceptualisation of sustainable development *en route* to their own conceptualisations (e.g., Scoones, et al., 2015). And a few have latched onto their proposed partitioning of sustainable development approaches into the status quo, reform and transform categories (e.g., Hueskes, et al., 2017; Visseren-Hammakers, et al., 2021). To the best of my knowledge, no one seems to have used Hopwood, et al.'s (2005) proposal for any sort of actual empirical mapping.

In this paper, however, I do precisely this. Specifically, I use their framework to map the socio-economic and environmental attitudes of a large sample of students participating in the module considered here before they started the module and after having completed it. The aim in doing this, is to give some expression in this particular context to Corres, et al.'s (2020; 2) assertion that 'it is interesting to explore to which extent [sustainability education] provokes transformative changes towards the current unsustainable reality through developing emancipatory qualities'. The paper proceeds as follows. Following on from this introduction, I locate the module in relation to the sustainability education and critical pedagogy discourses. I then present a description of the methods used, followed by results and discussion, and finally I present some sort of conclusion.

[2] 3482 on 25 February 2025 according to Google Scholar.

Locating the module

As already noted in the opening paragraph, I suggest that the module sits at a nexus between sustainability education and critical pedagogy. However, it is not sufficient to simply declare this, even though this sort of declaration seems to be quite common practice. It is necessary to try and demonstrate it. Or better still, given the diversity of activities that fall within these two discourses, to reflect on where exactly within them this module sits.

Sustainability education

Sustainability education, broadly defined (Corres, et al. 2020), began to emerge in earnest in the early 1990's. Sterling (2025), for instance, as one of the more prominent scholars in this field, describes referring to 'education for sustainability' in a conference presentation in 1991. From here, sustainability education has, to some extent, tracked movements in the broader sustainability discourse from a relatively small, quite radical fringe discussion to the point where today, it comprises a massive and diverse body of academic literature. In their bibliometric review of the literature spanning two decades from 1998 to 2018, Hallinger and Chatpinyakoop (2019) proposed that this might be usefully divided into three broad categories or schools of thought. The first of these was really not about sustainability education per se but rather focused on managing educational institutions in supposedly sustainable ways. This branch of work is unrelated to this study.

The same cannot be said of Hallinger, et al.'s (2019) second category. This is the body of work that has focused on the discussion of competencies. It has included reflections on both the competencies that teachers might need in order to deliver sustainability education, as well as those that students might need to acquire in order for them to become positive contributors towards sustainability. And since the focus in this category is very much on teaching and learning, inevitably, a significant amount of effort has been invested into aspects of curriculum and pedagogy in this category of work (Corres, et al., 2021; Evans, 2019).

Finally, the third category within the sustainability education literature that Hallinger et al.'s (2019) proposed, is equally germane to framing the work presented in this paper. This is the body of work that has focused on the implementation of sustainability education. Systems thinking has been a defining character of work in this category (Porter & Córdoba, 2009; Sterling, 2004, 2021, 2025; Sterling, et al., 2018).[3] From this systems perspective, it has been argued that for education to actually contribute to the pursuit of sustainability, nothing short of a complete overhaul of the entire education system will be required (Sterling, 2004). Notwithstanding the whole-system scope of this school of thought, aspects of curriculum and pedagogy, as central work in education, have inevitably also received attention here.

In regards pedagogies specifically, in both the competencies and implementations literatures, many approaches have been mooted, often all bound up together: holistic or

[3] This is perhaps unsurprising given the historical centrality of systems thinking in the broader sustainability discourse, following Meadows, et al.'s (1972) seminal book *The Limits to Growth* which was grounded in systems thinking.

interdisciplinary pedagogies; experiential, participatory or action pedagogies; collaborative pedagogies; problem based pedagogies; dialogic pedagogies; even 'wild pedagogies' (Corres, et al., 2020; Dutra, 2025; Sterling, et al., 2018; Welsh & Murray, 2003). Despite all of this diversity, however, common to almost every reflection on pedagogy that I have read in the sustainability education literature, was the use of the word 'transformation' or one of its derivatives 'transformational' or 'transformative'. In some instances, the use of these words has been very deliberate and precise, especially when used in relation to the formal application of transformative learning approaches inspired by the work of Jack Mezirow (e.g., Rodríguez Aboytes & Barth, 2020; Sterling, 2011; Thomas, 2009). In other instances (e.g., Abo-Khalil, 2024; Bakırlıoğlu & McMahon, 2021; Welsh, et al., 2003), these words seem to be rather empty signifiers dropped into narratives premised on the uncritical assumption that the minute one speaks about sustainability education, one must be contemplating transformation.

Of course, from Hopwood, et al. (2005), we know that not everything that carries the name sustainable development is transformational. And the same is very much true of sustainability education. Certainly, it seems reasonable to assume that any of the so-called 'real world' learning proposals (e.g., Brundiers, et al., 2010), or those substantively grounded in neoliberal ideology (e.g., Beynaghi, et al., 2016) really cannot be considered transformational. The 'real world' today is not sustainable, and neoliberalism is the defining ideology of this unsustainable 'real world'. This was alluded to by Corres, et al. (2020; 2) who drew distinction between 'hegemonic' and 'transformative' sustainability education efforts.

Interestingly, Corres, et al.'s (2020) identification of this distinction, and the contradictions that underpin it, was limited to the environmental dimension of sustainability. Specifically, they identified the contradiction between environmental sustainability and economic growth in the context of a finite planet. They made no reference to socio-economic contradictions, which have a much longer tradition of scholarly recognition dating back at least as far as Marx's analyses of capitalism in the late 19th Century.[4] This focus on environmental issues and the relative relegation of social issues to the background, seemed to me to be a somewhat general pattern in the sustainability education literature.

Assuming that this bias is in fact real, several explanations could no doubt be advanced. The dominance of literature from the global north (Corres, et al., 2021; Hallinger, et al., 2019) where socio-economic crises are perhaps less acute than the global south might be part of the reason. But beyond this, it is entertaining in the context of this paper to speculate on whether the pedagogical tail might be contributing to wagging the dog in this instance. As already noted, derivatives of Mezirow's transformative learning theory have served as a central inspiration for much of the sustainability education literature that has tended towards the more transformational end of its range (Rodriguez Aboytes, et al., 2020; Sterling, 2011; Thomas, 2009). The thing with Mezirow, however, is that while his work certainly emphasised social justice through education, the focus of his work was a) on individual transformation rather than on social transformation; b)

[4] For a comprehensive reflection on contradictions that confront us and threaten our sustainability as a species, see Harvey (2014).

strongly inspired by Dewey's pragmatism and thus anchored in 'the real world'; and as such c) never socialist in its orientation (Fleming, 2022).

Critical pedagogy

Ironically, the one notable exception to this pattern of sustainability education focusing on environmental rather than socio-economic concerns seems to have been the ecopedagogy literature (Gadotti, 2010; Kahn, 2008). Here the general move has been to reconcile environmental and socio-economic contradictions by recognising environmental issues as a dimension of class struggle following eco-socialist and eco-Marxist logics (McLaren and Houston, 2004). The fact that this particular school of thought seems to have originated in the global south (Gadotti, 2010) might perhaps lend some weight to the speculation that the emphasis on environmental aspects of sustainability might be a global north bias. In any event, from a pedagogical perspective, the most prominent pedagogical inspiration here has not been Mezirow's transformative learning, but rather Freire's critical pedagogy. This is hardly surprising given the distinctly Marxian flavour of ecopedagogy. As Fleming (2022) noted, while Mezirow and Freire certainly shared some sources of inspiration, most notably Dewey, unlike Mezirow, Freire was also strongly influenced by Marxism drawing on the works of Marx himself, as well as the likes of Gramsci, Fanon and Che Guevara.

The ecopedagogy literature aside, in many ways the critical pedagogy literature might perhaps be accused of the inverse of the problem that the mainstream sustainability education suffers from. Whereas the mainstream sustainability education literature seems to have focused more on environmental issues, the critical pedagogy literature has perhaps more commonly focused on social issues. In terms of the application of critical pedagogy, however, just as is the case in the mainstream sustainability education literature, this has not always been applied in a particularly transformational manner (Corbett & Guilherme, 2021). For example, Welsh, et al. (2003) describe an initiative that they claim is grounded in critical pedagogy where students and their lecturers collaborate with 'corporate clients' to design supposedly environmentally friendly products. However, it is quite clear that this pedagogical experiment takes place entirely within the context of capitalism, and even the most cursory critical reflection on this reveals that it is not in any way transformational.

The module

Bringing these two streams of thought together then to locate the module considered here, I contend that this aspires to sit in the transformational nexus between socio-economic and environmental sustainability and as such in the nexus between sustainability education and critical pedagogy. This is a relatively uncrowded space, shared most prominently with the ecopedagogy movement (Gadotti, 2010). The module was developed as a compulsory module for first year economic and management sciences undergraduate students at a very large public distance education university in South Africa. Its explicit aim is to cultivate critical consciousness about, and implicate students in, pressing socio-economic and environmental problems through critical

reflection. The idea is that this might be achieved using a pedagogical approach significantly inspired in its conception by Freire's thoughts on critical pedagogy (Freire, 1970/1996; 1994; 1998). The module starts with students recording their "prior perspectives or worldviews" (Rodriguez Aboytes, et al., 2020: 1001) on an array of socio-economic and environmental issues by completing a set of multiple-choice questions. Each of these questions presents an issue (a problem or potentially controversial perspective), together with a range of possible opinions relating to this. The answers from this provide the basis for determining the pre-module socio-economic and environmental attitudes of students used in this study.

From this, students proceed on to the 'substance' of the module. In this, we do our best to balance the cultivation of the methodological rigour that Freire deemed necessary for the development of 'epistemological curiosity' (Freire, 1998: 22), with an honest respect for the subjectivities of all participants: teaching learners and learning teachers. Methodological rigour is cultivated through the introduction of a range of philosophical topics, including informal logic; moral philosophy traditions (deontology, consequentialism, virtue ethics and environmental ethics); and finally, some ideas on distributive justice. These theories are, however, never the focus of learning or assessment. Instead, they are presented to students to equip them with argumentative skills and philosophical frameworks useful for rigorous participation in dialogues and self-reflection on the sustainability problems that we confront them with.

These dialogues and self-reflections form the basis of a series of seven subsequent assessments. These assessments happen in two broad sections. The first deals with socio-economic issues and comprises four stages where students reflect in turn on: a) great wealth; b) miserable asphyxiating poverty,[5] c) the possibility that great wealth might be premised on asphyxiating poverty; and d) their own locations (current and aspirational) in relation to the socio-economic landscape that they have been debating. The assessments for the first three of these stages take the form of public dialogues in online discussion forums, while the fourth culminates in a more personal process of reflection. In this way, students are conscientised to contradictions in the first three assessments and implicated in the fourth.

The second broad section deals with environmental issues. This only comprises two stages which both culminate in discussion based assessments. In the first, students debate broad environmental issues in an abstract or personally remote sense. In the second, they calculate their own ecological footprints (Wackernagel & Rees, 1998). In this way they are once again implicated as they are confronted with the full extent of their own personal complicity in our environmental unsustainability. The final step in the module involves students revisiting the multiple choice questions that they did before starting their learning journey, and reflecting critically on how their choices at the end of the module compare to their choices at the beginning of the module. It is from these final multiple choice answers that I derive the post-module socio-economic and environmental attitude scores for students in this study.

On the basis of the intent of the module and the subject matter covered, I have no doubt that the module fits within the broad sustainability education space. However, whether this

[5] In one of the discussions, a student described the poverty that they live in as follows: "I can hardly breathe."

module warrants the label of critical pedagogy is a little more open to debate. Having been inspired by Freire's work specifically, it has many of the elements outlined by Freire (1970/1996, 1994, 1998). It attempts to pay homage to the legitimate subjectivity of both students and academics. Notwithstanding this, the dialogic spaces that arise are grounded in the methodological rigour introduced through the philosophy topics that are presented. The debates which take place are structured around material lived problems, i.e. it is a problem-posing pedagogy. And the module is delivered with a distinct sense of joy arising from the simple act of debating our problems, and out of hope that the conscientisation and implication that this debate and reflection ought to generate might ultimately lead to progress towards solving these problems.

However, the module would almost certainly not pass the austere, almost bitterly exclusive formulation of critical pedagogy suggested by Valls-Carol, et al. (2022), which seems to insist that unless one is teaching the most oppressed in society, what one is doing is not critical pedagogy. While many of our students do indeed come from very poor backgrounds, many also do not. Furthermore, the mere fact that they are all university students means that they can no longer really be thought of as the ultimate downtrodden in society. They have tangibly progressed from rock bottom.

Beyond this, there is the slight issue that, as a compulsory module in the undergraduate curriculum, the module has become part of what Mayo (2015: 1124) referred to as 'official knowledge'. This criterion is of course a bit difficult. The ideal is surely that critical pedagogy does become part of 'official knowledge'. And where a teaching initiative such as this manages to achieve this status, either through struggle or because officialdom is ignorant of its radical intent, this should surely not preclude it from carrying the critical pedagogy label?

Finally, there is the issue of praxis, and the requirement that the impacts of any critical pedagogy must transcend beyond the classroom into tangible progress towards a better world. As Jeyaraj and Harland (2014: 2) put it: 'Critical pedagogy distinguishes itself from most other pedagogies because it enables students to act upon and use their knowledge for self and social transformation…'. However, they also note that: 'In fact, critical pedagogy is as much about cultivating the intellect as it is about social change' (Jeyaraj & Harland, 2014: 11). This latter position seems to align with Manning's (2023, 2025) contention that a Freirean inspired module she described represents an act of intellectual activism (as formulated by Contu, 2020) and is thus by definition an act of praxis.

Taken altogether, the module considered here is certainly not a perfect example of critical pedagogy. However, paradoxically, if it were perfect, it would not conform to Freire's (1998: 51) principle of 'unfinnishedness' and would thus not be perfect. On the basis of this then, I contend that it is not at all unreasonable to label it an example of critical pedagogy.

Methods

As noted above, the characterisation of the socio-economic and environmental attitudes of students necessary for mapping their locations onto Hopwood, et al.'s (2005) conceptual space

was based on their pre- and post-module multiple choice assignment answers. This was done for a sample of 1000 students from a single semester selected randomly.[6] Permission to use these assignments for this study was granted by both the research ethics committee of the economic and management sciences faculty and the university research permissions committee at the university where the module is taught. Both of these committees waived the requirement for informed consent based on a consequentialist argument that there was almost no possibility of any harm being done, and that the good that might arise out of this reflection could be significant.

The relevant multiple choice questions were divided into those probing socio-economic wellbeing and equality issues and those probing environmental issues (Appendix 1). From this, the options for each question were assigned an ordinal score between -1 and 2. In this allocation, a score of -1 was given to any option that was deemed reactionary or regressive, 0 represented a likely status quo position, 1 represented a reform position, and 2 represented a position tending towards being transformative. Not all questions had options representing all these positions. In a few of the multiple-choice options, a contradiction between environmental and social concerns was implied and scored as such.

It must be noted that this basic coding framework deviated slightly from Hopwood, et al.'s (2005) initial categorisation in that the regressive category was recognised. In my mind at least, the status quo is not a static space. A good illustration of this would be the fact that, for better or for worse[7], in 2005 when Hopwood, et al. published their framework, there was no 2030 Agenda for Sustainable Development with its 17 colourful SDGs. On the basis of this, it has always seemed to me that there ought to be space in our thinking about sustainable development for reactionary or regressive movements, movements that threaten to take society backwards from the present status quo. Trump's reference to 'Drill, baby, drill!' in his inaugural speech as the 47th president of the USA (Milman & Noor, 2025) would be a fine example of regression.

It must be acknowledged, to borrow Hopwood, et al.'s (2005: 42) phrasing, that the scoring of the *question* options was 'inevitably a broad conceptual [suggestion] rather than a precise mapping and exact [scores] are open to challenge'. However, once this framework was defined, *students'* aggregate socio-economic and environmental scores were then calculated as the sum of the scores for each of the individual socio-economic and environmental multiple choice options they selected respectively. This scoring and aggregation process was done using an Excel macro. The pre- and post-module socio-economic and environmental scores were then compared statistically using two-tailed Wilcoxon Signed Rank tests. For the graphical representations, the scores were transformed in two ways. First, in order to spread the students out slightly, a random value between -0.5 and 0.5 was added to each student's aggregate scores. Although entirely arbitrary, this dramatically improved the visualisation of the densities of

[6] Because of the distance learning nature of the university offering this module, and the fact that the module is compulsory for all undergraduate economic and management science students, the student numbers are high ranging between 7 000 and 20 000 in any particular semester.

[7] See Eccles and van der Merwe (2020)

students in any particular region of the mappings without significantly relocating the students. Following this, these adjusted scores were then transformed to fit back onto the -1 to 2 scale we used for coding individual multiple choice question options. These two transformations were only done after the analyses and so had no impact on the statistical analyses performed.

Results

From the emphasis given in the introduction to the conceptual mapping of socio-economic and environmental concerns proposed by Hopwood, et al.'s (2005), it is these mappings in Figure 1 that form the centrepiece of the results in this study. In Figure 1a the pre-module scores for students are plotted, while in Figure 1b the post-module scores are plotted. In Hopwood, et al.'s (2005) conceptualisation of this space, curvilinear lines demarcating some approximation of the status quo, reform and transform areas were drawn. In the graphs presented here, I elected rather to use straight lines to demarcate these areas separately for the socio-economic and environmental dimensions (the dashed lines in Figures 1a and b). As already noted, in addition to these three categories imagined in Hopwood, et al.'s (2005) original conceptualisation, the representations here also allow for students to occupy reactionary or regressive positions where their scores for either socio-economic or environmental concerns are negative. Conceptually speaking, these students, attitudes lie squarely in the realms of regressing towards increasing unsustainability.

Having spread out the markers, and by making them semi-transparent in Figures 1a and b, zones of higher and lower density become apparent on these graphs. And these are confirmed on the accompanying pre- and post-module contour maps (Figures 1c and d, respectively). In the pre-module mappings (Figure 1a and c), there appears to be a dense zone in the area of the graph that has been characterised as the reform zone for both axes. In the post-module mapping (Figure 1b and d), the main change appears to be a new dense zone emerging in the more transformational environmental concern regions of the maps.

This trend of increasing environmental concern is even more evident when one considers the pre- and post-module frequency distributions for the socio-economic and environmental concern scores (Figure 2a and b respectively). In terms of the socio-economic wellbeing and equality concerns dimension (Figure 2a), the distribution of students appears to be more or less normal for most of the range, but with a very dramatic drop off towards the more radical transformational part of the curve. In terms of the pre- to post-module trend, visually it appears as though there might be a slight trend towards decreasing concern. In terms of the environmental concern dimension (Figure 2b), two features are worth noting. The first is the 'strange' spike of students who, at least in thought, seemed to fall into the more radical transformational regions of this area of concern, both before and after doing the module. The second is the apparent trend of increasing concern for environmental issues between the pre- and post-module scores.

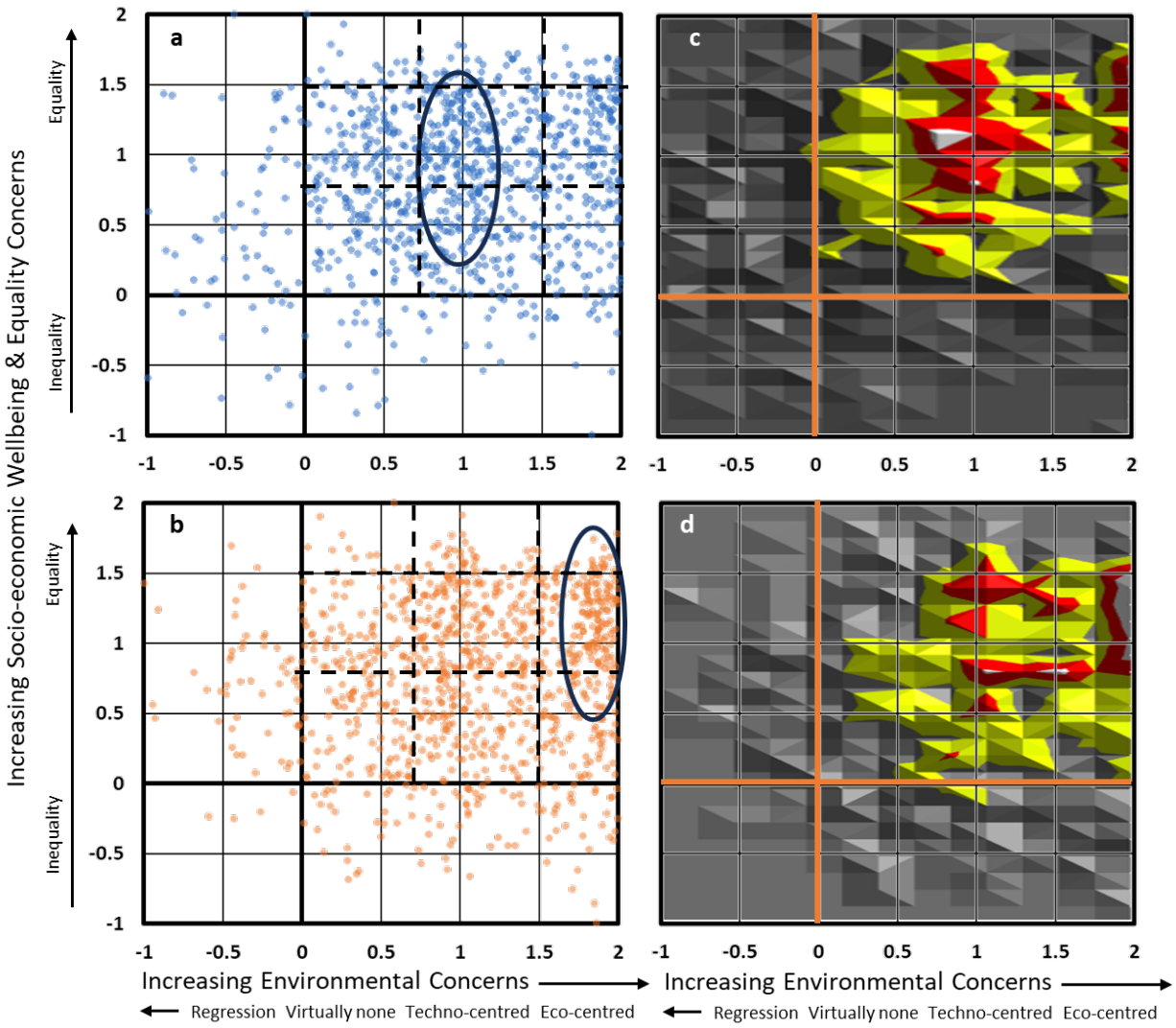

Figure 1: Graphical representations of student socio-economic and environmental concern profiles before (a and c) and after (b and d) participating in the module. The profiles are presented as both scatter plots (a and b) which show the general distribution of students and contour maps (c and d) which highlight areas of high and low student densities in Hopwood, et al.'s (2005) conceptual space. The dashed lines in a and b divide Hopwood, et al.'s (2005) space into status quo, reform and transform zones.

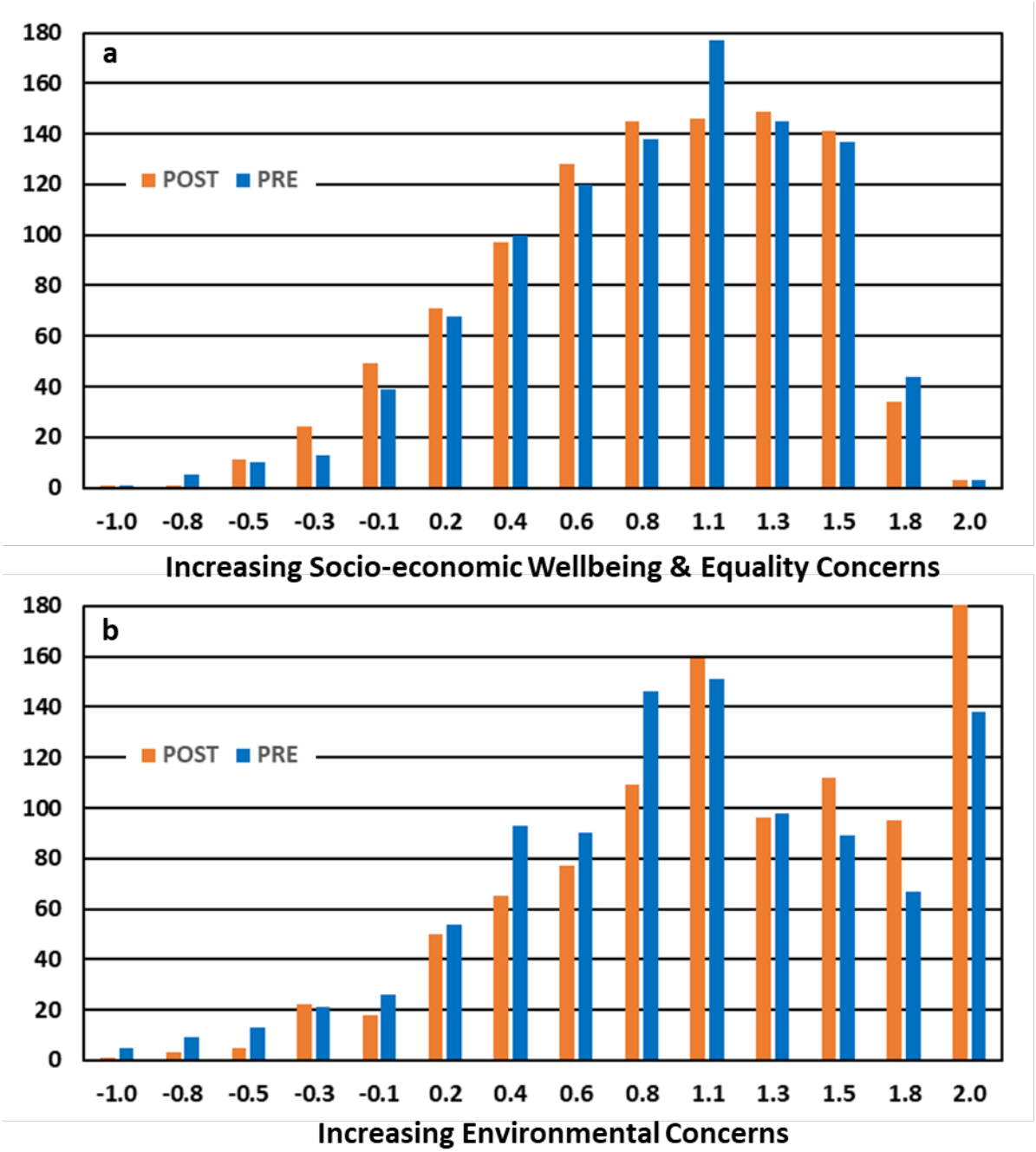

Figure 2: Frequency distributions of student a) socio-economic and b) environmental concern scores both before (blue bars) and after (orange bars) doing the module.

Finally, looking at the statistical comparisons between the pre- and post-module scores, the Wilcoxon Signed Rank Z-statistic for the socio-economic wellbeing and equality concern scores was 1.778, indicating that the scores before and after the module were not significantly different at the 5% level. In contrast, the Z-statistic for the environmental concern scores was 7.048, suggesting a significant difference between pre- and post-module scores at the 1% level.

Discussion

The primary focus of this paper is on the impacts of participating in the module described here on the socio-economic and environmental attitudes of students as illustrated by any changes in the distributions of these attitudes pre- and post-module. In order to discuss this, however, the first logical step is to reflect on the pre-module attitudes in their own right.

Pre-module attitudes

Having read Hopwood, et al.'s (2005) paper with its mapping of a set of very discrete sustainable development approaches across their proposed conceptual space, one might easily have been tempted to anticipate that the mapping of students undertaken in this study would also resolve distinct clusters. The likelihood of a distinctly bimodal socio-economic distribution of participating students based on the so called 'missing middle' (Garrod & Wildschut, 2021) would only reinforce this temptation.

In terms of the socio-economic dimension of our mapping, however, the empirical results did not bear out such a pattern at all. No interesting heterogeneous clustering resolved. Instead, the distribution of students was, as already noted, altogether normal for the most part, but with a rather sudden truncation towards the more radical transformational end of the spectrum (Figure 2a). In effect this suggests that, irrespective of diverse socio-economic backgrounds that these students might come from, in terms of their perspectives on socio-economic wellbeing and equality, they represent a reasonably normal population with a central tendency somewhere in what would probably constitute Hopwood, et al.'s (2005) reform space. In this space there is a recognition of problems associated with socio-economic wellbeing and equality. And, in a country such as South Africa, which is one of the most economically unequal societies in the world (Tregenna & Tsela, 2012), it would be strange if such a recognition of problems was not the case. However, there seems to be a prevailing majority view that fixing these problems can be achieved through reforms of the existing political economy, rather than through any sort of radical transformation.

In reality, this actual finding is not at all surprising. After all, the module is fundamentally premised precisely on the likelihood of an ideological 'common sense' (Chomsky & Waterstone, 2020) being present among economic and management science students, and the view that we might all benefit from this common sense being shaken up a little through conscientisation and implication. This premise was not some whimsical fantasy. It was grounded in a vast literature reflecting on the existence of an overwhelming political economic common sense, its character, its construction, and, of course, its merits and its demerits. In terms of the prevailing political economic common sense, Fisher's (2009) notion of 'capitalist realism' highlights how, in contemporary society in general, 'it is easier to imagine the end of the world than the end of capitalism' (Fisher, 2009: 1). Mechanisms for the construction and perpetuation of such a capitalist realism have been discussed since at least the 19th Century but took a quantum step forward in the 1920's and 30's with the Italian Marxist Antonio Gramsci's work on the cultural hegemony

(Bates, 1975; Borg, et al., 2002; Mayo, 2015). Updated renditions of this have been popularly advanced by the likes of Harvey (2005) and Chomsky and Waterstone (2020).

Education's role in the construction and perpetuation of this capitalist realism has also been considered extensively in the literature. This has looked at education at a variety of educational levels (da Costa & Saraiva, 2012; Morgan, 2020), and has considered it both from an affirmatory perspective (e.g. Boldureanu et al., 2020; Jones and English, 2004; Lourenço et al., 2013; Pittaway & Cope, 2017) as well as from a critical perspective (Brown, 2015; Morgan, 2020; Snir, 2018). Morgan's (2020) dissertation is particularly relevant in terms of the interpretation of the findings here in that his work considered economic and management science education in the South African school curriculum, the feeder system for the vast majority of students considered in this study. His findings suggested capitalist realism as a central belief regime in this context. In short, based on all of this, the normal curve, truncated as the prospect of the 'end of capitalism' begins to come into view, is precisely what ought to have been anticipated.

In contrast, in terms of the environmental concern dimension, the empirical results did seem to bear out the anticipation of some distinct clustering of students emerging. While most of the students in the sample formed a normal distribution along the environmental concern axis with a central tendency at the top end of what would probably comprise Hopwood, et al.'s (2005) status quo region, there was a very distinct spike of students whose choices in the multiple-choice questions indicated a consistent high concern for environmental issues (Figure 2b). It is noteworthy that these students did not exhibit any particularly striking socio-economic wellbeing concern features as is evident in Figure 1. In terms of explaining this, there is a significant and well-established literature on the subject of environmental concern (e.g. Diekmann & Franzen, 2019; Fransson & Gärling, 1999). Within this, there are a number of common hypotheses regarding likely correlates of environmental concern, including socio-economic status, or social class as Fransson and Gärling (1999) put it. And if there is any general merit in this, the likely bimodal socio-economic (or class) distribution of students participating in this module already noted might result in distinct categories emerging.

Beyond this, there are other features specific to the South African context that might reinforce any social class based distinctions. Contemporary environmentalism in South Africa is intimately intertwined with histories (and contemporaries) of race and racism. As Green (2014: 2) put it: 'voices raised in the protection of nature have an uneasy time escaping the scripts of race and racism'. These 'scripts of race and racism' have been central to the emergence or construction of a highly polarised popular discourse around environmental issues. Most recently, this has been particularly noticeable in relation to the transition from fossil fuel based energy sources (especially coal) to renewable energy ones such as wind and solar. Here, the environmental movement to reduce carbon emissions is framed as contradictory to the socio-economic wellbeing of working class communities which are dependent on fossil fuel supply chains for their livelihoods (Slater, 2023). Labour unions in particular have been very vocal critics of the transition

from fossil fuels to green energy options (NUM, 2023). Ironically, this is extremely helpful to capital as represented by organisations such as Futurecoal.[8]

Module impact?

Turning then to the impact of the module in terms of the student senses (common or otherwise), in framing this discussion, it is necessary to note up front that what is presented in this paper is an extremely personal reflection on the over a decade of hard work. For this reason, a reflective voice blends very closely, perhaps even uncomfortably so, with the more analytical content. With this framing established, the results here are, at least on the surface, a little humiliating. Freire (1998: 71) notes that: 'Education never was, is not, and never can be neutral or indifferent in regard to the reproduction of the dominant ideology or the interrogation of it.' From this premise, and 'succumbing' to my own subjectivity, complete success in this module would have had a particular pattern for me. Namely, it would have been characterised by a general movement of student positions into transformational areas of Hopwood, et al.'s (2005) conceptual space in terms of *both* socio-economic and environmental concerns. In this regard, it is clear that my own subjectivities lie 'towards a red and green political economy' developed by Marxian ecological economists such as Burkett (2009) and Foster (2000), and the ecopedagogies of Gadotti (2010). What the results show, however, is that statistically speaking there was no significant increase in student concerns about socio-economic wellbeing and equality. In terms of environmental issues, there was a significant increase in student concern.

A superficial interpretation of these two results might go as follows. Where socio-economic wellbeing and equality issue are concerned, one might again acknowledge the deeply entrenched character of Fisher's (2009) capitalist realism, a phenomenon noted in the educational space specifically by Warwick, et al. (2018). One might then resign oneself to the conclusion that the attempts in this module to conscientise and implicate these particular students in real injustices arising out of neoliberal capitalist common senses are simply not up to competing against the overwhelming burden of the neoliberal capitalist hegemony. Perhaps neoliberalism is simply too shrewd in its biopolitics, or too clever in its capacity to counter the reality of its injustices with its dreamwork (Appadurai, 2015). Indeed, when one considers the enormous amount of effort (both intentional and unintentional) sustaining this hegemony (Chomsky, et al., 2020; Harvey, 2005), and the fact that these students' participation in the study of economic and management sciences is a strong indication that they have bought into the common senses inherent in this hegemony, one might even ask: 'What were you thinking to even dream that this little semester module could make a difference?' Pollard (2019) attributed a similar sense of disappointment with critical pedagogy outcomes to a similar root cause. She turned to Bordieu's notion of 'doxa' which is very similar to Gramscian notions of common sense as follows: 'So internalized are the assumptions …, that people simply "forget" that these assumptions are manufactured by other people …' (Pollard, 2019: 91).

[8] https://www.futurecoal.org/

In terms of the statistically significant strengthening of environmental concerns observed, here one might conclude that the dialogues students engaged in around environmental issues might have found many who had not really spent too much time immersed in environmental discourses, and as such whose views had not been cemented one way or another. This would be consistent with Serrano et al.'s (2018: 8) findings which noted how students' 'perspectives changed when confronted with "the unfamiliar" in a learning situation.'. In the case of this module, one might imagine apparently coherent positions being presented in the module discussions by participants occupying the more transformative spike in Figure 2b being relatively compelling. It is also possible that in some cases the philosophical elements in the module aimed at improving the rigour of participant thinking might have resulted in improved logical coherence within student choices. For instance, students in the pre-module evaluation might have felt an instinctive sympathy towards saving the rhino because of their proximity to rhinos which occur in Africa, but no equivalent sympathy towards polar bears. However, the exposure to informal logic might have forced them to a more logically consistent perspective on these two species. And if this logically consistent perspective retained the sympathy for rhinos, this would have increased their environmental concern scores. Finally, it might even be possible that somehow thinking about environmental concerns is simply easier in general which might also explain why in the sustainability education discourse this is the emphasis.

On the basis of this, one might conclude that the module is a failure where socio-economic issues are concerned but at least it was a success where environmental issues are concerned. With all of this in mind, do we then write off this module as a failed experiment at applying critical pedagogy in the sustainability education domain? I offer the following comments in an attempt to rescue some dignity. The first draws some hope by invoking a distinction between quantity and quality and taking comfort out of the latter. Long before the design process for this module got under way, I was intimately aware of the enormity of task of challenging the neoliberal capitalist hegemony, especially in its heartland of economic and management sciences education. The same can surely be said for any critical teacher who sets their sights on attempting such a project. Certainly, this would be true of anyone who has read Freire in any depth. As he put it: 'The teacher who thinks critically cannot afford to imagine that the course or seminar that she/he is conducting is going to transform the whole country' (Freire, 1998: 120).

It is for this very reason that many critical pedagogy papers will speak in terms of 'possibilities' rather than certainties (e.g. Apple, 2020; Luitel, et al., 2022). Or as Serrano, et al. (2018) noted, critical pedagogues who they interviewed claimed that their modules embodied 'personal transformative *potential*' [emphasis added] (Serrano, et al., 2018: 7). Ultimately, a pedagogy which is true to Freire's notions of critical pedagogy cannot set out to *impose* transformation. It can only set out to create spaces where 'transformative potential' exists. And the character of any transformation that might happen cannot be predetermined. From this it follows that critical pedagogy is necessarily humbling as Jeyaraj and Harland (2014) note. It was for this reason that very early in the development of the module I had stated that, if the module impacted 'positively' on even a tiny proportion of our students, then I would be personally

satisfied. I originally stated 'even 1%' as a satisfactory target. In this regard, of the sample of 1000 students considered in this study, 24 or 2.4% of them 'improved' *both* their socio-economic concern and their environmental concern scores by at least 100%. In other words, while mass progress was a disappointment, some students showed large 'positive' changes in their sustainable development concern locations.

My second comment again reverts to Freire (1998) and this time to his notion of unfinishedness. As he put it: 'As a teacher with critical acumen, I do not cease to be a responsible "adventurer" disposed to accept change and difference.' (Freire, 1998: 51). In this regard, one might consider this somewhat humiliating reflection on the impacts of this module as a critical adventure. At this point a paradox in the principles of critical pedagogy, at least those articulated by Freire, comes into focus. On the one hand there is the essential critical pedagogy principle of not adopting a banking pedagogical approach of dictating what students must do or think (or say in assessments). On the other hand, there is the fundamental responsibility inherent in the notion of praxis, the responsibility of the teacher to develop their own authoritative (as opposed to authoritarian) subjectivity and moral consciousness (Fleming, 2022), and, on the basis of this, to 'intervene in the world' (Freire, 1998: 122). And intervening for a teacher inevitably involves advancing one's subjective views about the world with epistemic rigour. Being too forceful in one's advancement of their views might cross the Rubicon from dialogic pedagogy to banking pedagogy. Being not forceful enough might represent an unhealthy self-disciplining or self-censoring, and even a betrayal of the responsibility to intervene through participation and persuasion. This paradox represents an eternal source of unfinishedness in any teaching approach with critical pedagogy aspirations.

Returning then to the findings here, it seems to me that in the case of this module, the balance in terms of this paradox might have swung too far in the direction of abdicating responsibility, at least where socio-economic matters are concerned? In particular, it seems to me that there might be room in the module for a more deliberate advancement of my own 'red and green political economy' (Burkett, 2009) subjectivities in the dialogues that make up this module, with a view to trying a bit harder to persuade economic and management science students of the possibility of transformative options for confronting the world's sustainable development challenges. As a teacher we must be a learner. But beyond this, as Freire noted, the recognition of unfinishedness is the source of hope.

Conclusion

In this paper, I set out to reflect critically on any impacts of a Freirean inspired module designed to conscientize and implicate economic and management science students in relation to pressing sustainability challenges. The mapping of the sustainability prior positions or common senses of these students revealed the following: In terms of socio-economic wellbeing and equality concerns, while the sample of economic and management science students in this context seemed to recognise socio-economic problems associated with the status quo, their common senses remained very firmly grounded within 'capitalist realism' (Fisher, 2009). The central

tendency among them was therefore reformist in its character. This position proved to be rather resistant to any sort of displacement by participating in the module. In terms of environmental concerns, the picture was different. The polarised/polarising character of the popular discourse around environmental sustainability was very evident in the sample with two distinct clusters emerging. While the majority of students clustered around an impulse to maintain the status quo where environmental issues are concerned, there was a very striking minority of students who occupied a far more radical transformative space – at least in their beliefs. Besides this, it seemed that the environmental common senses of this sample of students were much less entrenched than the socio-economic ones.

From this, I think that it is safe to say that, against entrenched common senses like capitalist realism, trying to deliver critical pedagogy is likely to be a humbling, even humiliating experience. And critical pedagogy is almost by definition deployed against entrenched common senses. Furthermore, in such situations, striking a balance between being respectful of student subjectivities and giving persuasive expression to one's own subjectivities is no trivial matter. In fact, this is almost certainly a primary source of a permanent state of unfinishedness where any attempt at critical pedagogy is concerned. Finally, I think that small victories should never be overlooked. Perhaps someday these will coagulate into substantive transformative movements.

Declaration of Generative AI and AI-assisted technologies in the writing process

No generative AI tools were used in the writing or editing of this paper.

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Appendix 1:

Multiple choice questions used in calculating student positions in Hopwood, et al.'s (2005) sustainable development space. Where a score has a value in brackets after it, this indicates a question which might indicate both a socio-economic and environmental position generally in radical opposition to one another. The value in the bracket is the score added to the dimension that question itself is not located in.

Socio-economic questions	
"The assets of the three richest people in the world match the combined annual GDP's of the 48 poorest countries." My personal opinion on this statement is most closely described by:	
a. Good for them – they worked hard to get their wealth	-1
b. The only problem I have with this is that this money is in their bank account and not in mine	-1
c. No problem with this – many of these people give huge amounts to charities	0
d. I think that it is morally wrong for anyone to have that much money	1
e. I think that active steps should be taken to correct such immoral wealth imbalances	2
"It is for the sake of trivial gains that the world's affluent, and their governments and international organizations are keeping the poorer half in severe often life-threatening poverty." My personal opinion on this statement is most closely described by:	
a. Rubbish!	-1
b. The only way to make money out of poor people is to keep them poor.	-1
c. Who's to say what is trivial?	-1
d. The rich get richer and the poor get poorer	1
e. We must mobilize ourselves and rebel against this unjust state of affairs.	2
"Every day some 20,000 children die prematurely from poverty related causes, mostly treatable diseases." My personal opinion on this statement is most closely described by:	
a. Who cares?	-1
b. It's hard to say it, but given the rising human population, perhaps this is a blessing in disguise for the human species as a whole	-1(2)
c. It's hard to say it, but this just means less people competing with me for scarce opportunities and resources.	-1
d. This is morally wrong, but practically, I think that it would cost too much money to solve	0
e. It is morally unacceptable for a single child to die of a preventable disease and we should collectively fix this irrespective of the cost.	2
"The business of business is to increase profits for shareholders" My personal opinion on this statement is most closely described by:	
a. This is how it is AND how it should be	0
b. This is how it should be. Unfortunately, in reality, businesses have become distracted by social and environmental issues	-1

c. This is how it should be. Unfortunately, governments have been messing around with business and have imposed all sorts of unnecessary social and environmental responsibilities	-1
d. This is how it should be, so long as there are strong legal frameworks in place to ensure that this doesn't lead to negative social and environmental consequences	1
e. Unfortunately this is how it is. Ideally business should have a much wider set of responsibilities, including both social and environmental responsibilities.	0
f. This narrow view on the responsibility of business is incorrect and went out of fashion in mainstream business years ago.	1
"The world population is 7 billion. 4 billion live in poverty" My personal opinion on this statement is most closely described by:	
a. Who cares?	-1
b. If population growth rates of the poor were not so high they wouldn't be so poor.	-1
c. This is sad but there is not much I can do about it.	0
d. This is sad, but to be honest, it is not going to stop me from focusing on my own wellbeing first.	-1
e. I think that individually we can and should strive to eliminate poverty.	1
"Don't let's lose sight of what creates wealth. It is open markets, it is capitalism." My personal opinion on this statement is most closely described by:	
a. Absolutely – any threats to the free market must be squashed	-1
b. Yes – capitalism is how we create wealth, but the markets must still be managed a little	1
c. I'm not sure about this – I think that it might be time to consider some sort of different economic system	2
d. No – the market needs to be extensively managed to ensure that the wealth that is created is good wealth rather than bad wealth	1
e. Rubbish – capitalism creates monstrous wealth for a few and abject poverty for many. We need a much more equitable economic system	2
"In 2010, Whitey Basson the CEO of Shoprite earned ZAR 620,000,000.00." My personal opinion on this statement is most closely described by:	
a. Who cares?	-1
b. Good for him – he worked hard to earn this	-1
c. The only problem I have with this is that this money is in Basson's bank account and not in mine	-1
d. I think that it is morally wrong for anyone to earn that much money	1
e. I think that active steps should be taken to correct such immoral executive remuneration practices	2
In my opinion, the financial crisis which began in 2008 was caused by…:	
a. Government interference in the financial markets	-1
b. A lack of regulation of the financial markets	1
c. Corporate greed	1
d. Government incompetence	0
e. Inevitable economic cycles	0

"The only way to make money out of poor people is to keep them poor." My personal opinion on this statement is most closely described by:	
a. This is how it is AND how it should be.	-1
b. This is how it should be. Unfortunately, a bunch of do-gooders are trying to mess up this natural law.	-1
c. Fortunately this is just not true.	-1
d. This is unfortunately true, but there is nothing I can do about it other than make sure I am not poor.	0
e. This is unfortunately true in today's world, and I believe we are morally obliged to try and do something about it.	1
"With a shift of only 2 percent of global household income, all the great deprivations of the poorer half of humankind could be avoided." My personal opinion on this statement is most closely described by:	
a. Who cares?	-1
b. Let the poorest work for their money like the rest of us.	-1
c. So long as no one takes 2 percent of my income.	-1
d. Just proves - if poverty was an issue for the rich we would solve it by throwing money at it.	2
e. Let's solve it then!	2
Environmental questions	
"Unless fossil-fuel use slows dramatically, the earth's average temperature could rise by six degrees Celsius in the next 100 years." My personal opinion on this statement is most closely described by:	
a. Who cares?	-1
b. I don't believe this climate change nonsense	-1
c. Six degrees will make winters much more bearable to me personally	-1
d. I'm a bit concerned about this, but there is nothing that I can do about it	0
e. I'm a bit concerned about this, but why should I invest my personal time, effort or money in solving a general social problem.	0
f. I think that individually we can and should strive to solve this problem for the greater good	1
"If the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years. The most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity." My personal opinion on this statement is most closely described by:	
a. I don't believe this tale of doom.	-1
b. Yes we are consuming natural resources too fast, but I don't think this is a problem as there is plenty of time to find technological solutions to problems that emerge	0
c. Yes we are consuming natural resources too fast. The first priority in solving this is to put the brakes on human population growth.	2(-1)
d. Yes we are consuming natural resources too fast. The first priority in solving this is for rich people to reduce their consumption significantly.	2
e. Yes we are consuming natural resources too fast. The first priority is for poor people to not have more kids than they can afford.	2(-1)

f. Yes we are consuming natural resources too fast. And frankly I don't see any solution because increasing consumption is the basis of our economic growth.	0
"If arctic ice melting continues, we are likely to see the loss of two thirds of the world's polar bear population within 50 years." My personal opinion on this statement is most closely described by:	
a. Who cares?	-1
b. If it boils down to choosing between driving a luxury SUV and worrying about polar bears I'll take the car any day.	-1
c. While this is sad, polar bears aren't really very important to my personal welfare which is my primary concern.	-1
d. While this is sad, polar bears aren't really very important to general human social welfare.	-1
e. I don't think polar bears are all that important to human welfare. However, their plight is a symptom of climate change which is a big problem to future human welfare.	1
f. I think it is morally unacceptable for humans to put their interests ahead of the rights of other species like polar bears.	2
"It is estimated that humans are consuming natural resource at a rate that is 30% above the renewal rate. If we continue to consume in this way we are likely to suffer dire consequences which could include extinction." My personal opinion on this statement is most closely described by:	
a. Yes we are consuming natural resources too fast, but I don't think this is a problem as there is plenty of time to find technological solutions to problems that emerge	0
b. Yes we are consuming natural resources too fast. The first priority in solving this is to put the brakes on human population growth.	2
c. Yes we are consuming natural resources too fast. The first priority in solving this is for rich people to reduce their consumption significantly.	2
d. Yes we are consuming natural resources too fast. And frankly I don't see any solution because increasing consumption is the basis of our economic growth.	0
e. I don't believe this tale of doom.	-1
"Save the rhino!!" My personal opinion on this statement is most closely described by:	
a. Why?	-1
b. Let the people who want to use this resource pay to protect it.	0
c. We have bigger problems than worrying about rhinos.	-1(2)
d. We must save the rhinos for our children.	0
e. We must save the rhinos because it is the right thing to do.	2