Educating for Radical Social Transformation in the Climate Crisis

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Acknowledgement

This book was written during an extraordinary period of social and intellectual isolation due to the Covid-19 health crisis that swept the world in 2020-2021. When I initially conceptualized this project, I envisioned a research process that would link theoretical and historical research with a series of empirical case studies of innovative examples of climate change education. Plague and lockdown confined me to my desk, and as it transpired, the theoretical and historical work provided more than enough material to complete a book: empirical studies would have made the book overly long and hopefully can be picked up in follow up work in the future.

However, while the writing was done in a state of relative isolation, the ideas in this book were developed through opportunities spanning over the last two decades to engage with and learn from many others. My first academic job was at the University of California, Berkeley, where I had the privilege of working with two different centers that have shaped my thinking about education, social justice, and social change ever since. One was the student-developed Center for Popular Education and Participatory Research (CPEPR), that in the early 2000s ran a series of workshops and conferences bringing together people from across North America working with traditions developed by Paulo Freire and others. Though I had read Freire previously, this was where I learned to think carefully about this vital tradition. I am deeply grateful to those involved in creating and running CPEPR, including: Andrea Dyrness, Emma Fuentes, Shabnam Koirala, Soo Ah Kwon, Kysa Ngreen, Patricia Sánchez, and the late Professor John Hurst.

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Introduction

As concern with global climate and environmental crisis has escalated, a call has appeared for new approaches to education that can facilitate the radical social, cultural and economic transformations across the planet that are deemed necessary to deal with this crisis effectively. In October 2018, the Intergovernmental Panel on Climate Change (IPCC) released its *Global Warming of 1.5℃* report, that argued that limiting global warming to no more than 1.5°C above pre-industrial levels – the threshold beyond which severe social, economic and environmental devastation caused by a warming climate was increasingly likely – would "require rapid, far-reaching and unprecedented changes in all aspects of society" (IPCC 2018b). "Education, information and community approaches," the IPCC (2018a, p. 22) suggested, "can accelerate the wide-scale behaviour changes" needed for "adapting to and limiting global warming to 1.5°C." A few months earlier, a study published in the *Proceedings of the National Academy of Sciences* by an international group of climate scientists warned that "widespread, rapid, and fundamental transformations" in global society and economy will be essential to prevent extreme forms of climate change, and stated that we "need new collectively shared values, principles, and frameworks *as well as education* to support such changes" (Steffen et al. 2018, p. 6, emphasis added). UNESCO, which has adopted the slogan "changing minds, not the climate" for its campaign to confront the climate crisis, insists that "education is the most powerful element in preparing for the global challenges that climate change brings" and "a key enabler for a more sustainable future" (UNESCO 2017, p. 2). In 2015, UNESCO Director-General Irina Bokova and UN Framework Convention on Climate Change Executive Secretary Christiana Figueres argued that "education can bring about a fundamental shift in how we think, act and discharge our responsibilities toward one another and the planet," and schools "can nurture a new generation of environmentally savvy citizens to support the transition to a prosperous and sustainable future" (Bokova & Figueres 2015).

Calls for climate change education have not always had such a sense of urgency and radicalism. International declarations on climate change education, as Fumiyo Kagawa and David Selby (2015, pp. 33, 53) note, have often been characterized by "blandness" and reluctance to strongly question "business as usual." The authors point to the example of the *Lima Ministerial Declaration on Education and Awareness-Raising* from the 2014 United Nations Climate Change Conference in Peru, and its vague and tepid move to "encourage governments to develop education strategies that incorporate the issue of climate change in curricula," without specifying what such strategies could and should look like (p. 44). Indeed, for a long time, climate change education has been primarily approached as a form of science education, focused on increasing students' climate science literacy about the physical processes that are driving climate change (Busch, Henderson & Stevenson 2018; González-Gaudiano & Meira-Cartea 2019; Henderson & Drewes 2020). But as recognition has spread that addressing the climate crisis will require fundamental and rapid social change, a shift has occurred in how climate change education is talked about as well. There has been an acknowledgement that climate change education cannot be seen simply as a form of science education, but needs to be cross-disciplinary; and that it must be concerned

not just with understanding the ways in which human societies have triggered a growing global climate and environmental crisis, but learning how to radically transform societies and economies to address this crisis as well. "'Climate change education' isn't simply 'climate education,'" Alan Reid (2019, p. 768) writes. Climate change "is not just a scientific phenomenon" that "involves the natural sciences," argue Stevenson, Nicholls and Whitehouse (2017, p. 68), but a "complex socio-scientific issue that demands … educating for change [and] engaging the social sciences and humanities." Consequently, there been an explosion of research, theory and practice oriented literature that seeks to identify the most effective forms of educational intervention that can address the climate crisis and facilitate a radical and swift transformation toward worldwide sustainability.

This central question that is now being explored with a sense of urgency in the context of climate change education – whether and how education can be harnessed effectively for a broad-based, social justice inspired project of radical social transformation – is a vital one for all of us to consider, not just for addressing the climate crisis, but to tackle any number of other social, economic, political and environmental problems and crises as well. Currently, however, our ability to answer this question is often limited by two striking absences. First, despite the growing recognition in climate change discussions of the central role that needs to be played by education, educational researchers, theorists and educators have frequently been conspicuous by their absence from these discussions, as the field is dominated by research in psychology and communications. The IPCC *Global Warming of 1.5℃* report, despite repeated mentions of the importance of learning and education in addressing the climate crisis, contains almost no references to work done by education researchers, drawing instead primarily on work done in the field of psychology. Anne Armstrong, Marianne Krasny and Jonathan Schuldt's (2018) book, *Communicating Climate Change: A Guide for Educators*, exemplifies this state of affairs, as it seeks to show climate change educators what they can learn about how best to do climate change education by drawing on "research from environmental psychology and climate change communication." As discussed in Chapter Two, the literature on climate change education has long been dominated by a behavioral science framework, that seeks to identify optimal conditions for fostering pro-environmental behavior change among individuals on a mass scale. There is no doubt that psychology and communications have much to offer for developing effective climate change education. But, equally, we are likely missing out by failing to look more closely at what the field of education theory, research and practice might have to offer as well.

Second, not only has the field of education research, theory and practice (beyond its subdisciplines of science education and environmental education) been slow to take up the challenge of addressing the climate crisis (Henderson et al. 2017); it has tended to neglect as well the broader question of how education can be used effectively to support projects of radical social change. The sociology of education, for example, has long been preoccupied with the question of how formal education works to prevent radical and progressive social change from occurring, by enabling the reproduction of structures of race, class and gender inequality in society (Gewirtz & Cribb 2003). Works like *Education and Social Change* (Coffey 2001), long used as an undergraduate education studies textbook in the UK, don't ask how education can lead to social change, but how education responds to and is impacted by social change that is occurring already. Much educational practice, theory and research is

focused principally on supporting the ability of all children and learners to succeed and participate as equals in society as it now exists, rather than teaching them how to radically transform contemporary society. There is one vital area of education research, theory and practice where the question of how to use education to create a more just society has long been grappled with, drawing on different traditions of popular, progressive, feminist, anti-racist, anti-colonial, labor and democratic education (among others), but it has remained relatively marginalized in the field of education studies overall. This area is often referred to as the theory and practice of radical education (Fielding & Moss 2010; Sukarieh & Tannock 2016). Radical education, as Emily Charkin and Judith Suissa (2019, p. 394) write, may be defined as education that has an "underlying commitment to both critiquing the dominant norms, practices, values and institutions of existing society, and in positing an alternative." To be a radical educator, as Paulo Freire (2000, p. 37) suggests, is to approach education as a "process of liberation," one that is "nourished by a critical spirit" and committed to "ever greater engagement in the effort to transform concrete, objective reality."

The aim of this book is to start filling in these "striking absences" by bringing together work being done in climate change education with the broader and older traditions of radical education, to develop our understanding of how education can be, and often has been, used effectively to support collective projects of radical social transformation in the name of social justice. More specifically, this book seeks to address two core questions. What can we learn from current work being done on climate change education that can help us to better understand the possibilities and challenges of using education effectively for social justice inspired projects of radical social change more generally? How, in other words, can climate change education contribute to the larger field of research, theory and practice of radical education? Conversely, a second core question asked in this book is how the larger field of radical education can support and strengthen efforts to develop effective climate change education. Or, to pose the same question in a different way: what can the long, rich and diverse traditions of radical education offer current attempts to address the climate crisis, as one of the most essential issues of our time? In engaging with these questions, the book, in some chapters, seeks to pull together, build on and extend the links between these two bodies of educational work that a handful of scholars, researchers, educators and activists in the field of climate change education have already started to make. In other chapters, the links between climate change education and radical education that are explored are ones that, to a considerable degree, have been largely left missing in discussions of education and the climate crisis so far.

Climate crisis, education & radical social change

Over the past few years, a small group of researchers and educators working in the field of climate change education have begun to explore some of the questions that are at the heart of this book. Asking what kinds of education are needed to help make the radical social, cultural and economic transformations that are essential for stopping and reversing climate change, this group calls for the embrace of "transformative" or "transgressive" learning and education (e.g., Boström et al. 2018; Lotz-Sisitka et al. 2015; Macintyre et al. 2018). The ideas and arguments currently being proposed in this small, still marginal but growing literature are vitally important. Yet, in this book, rather than take this literature as a

starting point, it serves instead as an endpoint, arrived at in the book's concluding pages. There are a couple of reasons for taking this approach. One is that there is a risk of tautology in calls for transformative education, as some of the group's authors themselves recognize. If what is needed is radical social transformation, then almost by definition, the kind of education that can support this will be a form of radical or transformative education. "This all sounds good and well," as Michael Peters asks one of the group's leading authors, "but what does social, transformative and transgressive education look like in practice?" (Peters & Wals 2016, p. 186). After all, as Selby and Kagawa (2018, p. 306) warn:

> [The] ubiquitous, bandwagon usage of the notion of transformative learning carries its own downside. The language of transformation … 'can become so appealing it begins to be used for myriad purposes.' In other words, … it enters the realm of 'jelly words,' that is, terminology whose meaning becomes entirely malleable according to the agenda of the user…. [E]ven though sustainability educators frequently embrace the notion of transformative learning, there is little real consensus as to what sustainability-related education of transformative intent looks like.

A key task, therefore, is not just to invoke these broad labels of radical, transgressive or transformative education, but to start filling in the details of what these labels might mean in practice. How can we actually carry out an effective radical or transformative education that can help us address the climate crisis?

A second concern with some of the literature on transformative or transgressive climate change education is that it risks facing some of the same problems that have long faced critical pedagogy – which has been one of the more prominent streams of radical education in recent times, particularly in North American school-based education. Critical pedagogy has frequently been criticized for its inaccessibility to the very people it seeks to mobilize and empower, because it tends to favor highly theoretical, abstract and obscure language. As Barry Kanpol (1999, p. 159) notes, "some students … rightly argue that critical pedagogy's obscure language makes radical educational ideas almost impossible to grasp" (see also Darder, Baltodano & Torres 2009). Similarly, some texts in the transformative climate change education literature adopt this same genre of highly theoretical language, telling us, for example, that to develop effective climate change education that can support radical projects of social change, we need to embrace "(1) reflexive social learning and capabilities theory, (2) critical phenomenology, (3) socio-cultural and cultural historical activity theory, and (4) new social movement, postcolonial and decolonisation theory" (Lotz-Sisitka et al. 2015, p. 73). It is not that such arguments are necessarily wrong. On the contrary, many of these claims will be supported in this book, albeit in different ways and using different language. But to take this as a starting point requires a lot of time and intellectual energy to familiarize oneself with bodies of theory that are not always the easiest to understand, and work through how they may or may not be relevant and useful for effective climate change education practice.

The approach adopted in this book is to begin with relatively simple concepts that are regularly encountered in discussions of climate change education as key elements for doing this education effectively; and then, to turn to different traditions of radical education to explore how they can help to critique and develop these concepts in the places in which these concepts remain problematic, limited, contradictory or under-specified. The chapters

are thus organized around concepts such as *hope*, *place*, *power*, *self interest*, *children and youth*, *curriculum*, and *nudging*. An advantage of this approach, it is hoped, is not only that most of these concepts are familiar and recognizable; but also that many educators, activists and researchers in the field of climate change are working with such concepts already, and thus might be able to see immediately what radical education traditions might offer for thinking through these concepts in alternative, more critical and transformative ways. The method for identifying the core concepts in this book was relatively simple: I selected key concepts that tend to appear frequently and/or prominently in popular and academic discussions about climate change education, and are concepts that radical education traditions have clear and important insights to contribute toward their effective development and operationalization. The list of concepts that runs through the chapter titles is not intended to be definitive or comprehensive; and we could easily think of other important concepts that might be additions or alternatives to the ones discussed here. However, all of the key concepts discussed in the chapters of this book point directly to theoretical arguments and practical, strategic engagements that stand at the heart of many, if not most, radical education traditions. The aim in focusing on these concepts is to initiate or push forward an engagement between climate change education and radical education traditions that will hopefully continue to develop in the future.

As this engagement between climate change education and radical education is developed in the following chapters, a number of patterns or themes emerge, about what it means to take a transformative or radical approach to climate change education. One is the movement beyond a concern with education as the development of knowledge about the climate crisis, to a recognition that education must also focus on the problem of learning how to take effective action that contributes to the radical social changes that are needed to address the crisis. A second is a shift away from a focus on how elite actors – government, business and civil society leaders, scientific experts, educational policy makers, and so forth – can reshape individual behavior toward the climate and environment, to ask how individuals, as citizens or community members, can come together to critically analyse and contest dominant social structures and cultural discourses, as well as the often problematic self interests and ideological agendas of elite actors in society. A third is the rejection of universalist and apolitical approaches to the climate crisis ("we're all in this together"), and insistence on recognizing the importance of deeply political, conflictual and situated differences in identity, power, status and location in shaping how different communities are impacted by and might be expected to take action (or not) to address the climate crisis immediately, as a matter of urgency. A fourth is the recognition that effective learning to address the climate crisis is not a narrowly academic, intellectual or cognitive matter, but one that is often deeply emotional and experiential, engaging all of our different senses. A fifth is the insistence that climate change education must encompass education in the broadest sense, to include not just schools, colleges and universities (formal education), but a broad range of nonformal and informal learning institutions and spaces as well. For those familiar with the different traditions of radical education, none of these themes will be a surprise. For all of them – the commitment to fostering education that can help to change and not just understand the world, the focus on structural analysis and collective rather than individual learning, the insistence on the inherent political nature of education, the embrace of holistic approaches to education, and the creation and use of informal and

nonformal as well as formal education spaces – are, in many ways, part of what defines the core essence of radical education itself (see, for example, Fielding & Moss 2010).

It is important to be clear about what this book does not aim to do. This is not a book that focuses on climate science or how to teach and learn about climate science. There are plenty of other good sources for these topics now. Rather, the focus here is on climate *change* education, or how to develop a form of education that can effectively support projects to radically transform contemporary society and economy, in the ways that are necessary to address the climate crisis. This book also does not attempt to make any argument about the specific kinds of social, cultural and economic changes that are needed to address the climate crisis. It may well be, as many now argue, that to address the climate crisis we need to move beyond capitalism as the prevailing social and economic system in the world, or beyond the obsession and structural imperative with fostering never-ending economic growth. It may be true, as well, that to address the climate crisis, we need to confront structural racism, patriarchy, colonialism and extractivism in society. However, while these and other such important arguments surface regularly throughout this book, the focus here is on education. The central question of concern is: what are the educational theories, strategies, practices, processes, institutions and locations that might be effective for enabling learners to engage directly with this kind of thinking about the necessity of and correct direction for radical social, cultural and economic change? Finally, this book is not intended to be a definitive or comprehensive overview of radical education, or the many different traditions – popular, progressive, democratic, feminist, anti-racist, anti-colonialist, and so on – that comprise the field of radical education as a whole. The strands of radical education that are engaged with are among some of the most influential, particularly in the western context. But there are many more vital radical education traditions beyond those discussed here, that we undoubtedly have much to learn from for tackling the climate crisis. The aim of this book is to contribute to and promote a necessary conversation about radical or transformative climate change education. But it certainly does not seek to have the final say on the subject.

Can education really help to change society?

When asking how education can help support a broad based, social justice oriented project of radical social change, it can be useful to begin by paying attention to the claims of those skeptics who have long cast doubt on the possibility of education being able to lead to fundamental social change. Perhaps the most well known of these is Émile Durkheim's (1897/2005, p. 340) argument that looking to education to change society is "to ascribe to education a power it lacks." For Durkheim:

> [Education] is only the image and reflection of society. It imitates and reproduces the latter in abbreviated form: it does not create it. Education is healthy when people themselves are in a healthy state; but it becomes corrupt with them, being unable to modify itself…. Education … can be reformed only if society itself is reformed. (p. 340)

Durkheim's position presents a highly deterministic, derivative and uncontested account of schooling and education (Goldstein 1976). But it also poses an important challenge to those

of us hoping that education can help to foster radical social change, to be able to answer exactly how, why and where schools and other education institutions might be expected to acquire a transformative agency towards larger social and economic structures, within which they themselves are often deeply embedded. As Christina Kwauk and Olivia Casey (2021, pp. 63-64) note, as they argue for the promotion of a transformative climate change education, "the education system is characterized by a high degree of structural inertia and resistance to change," and any efforts to push for a "radical reorientation of the purpose and vision of education" risk "being avoided by teachers, rejected by ministries of education, and lobbied against by vested interests."

Many of the most important critiques of the limitations of education as a potentially transformative force have been made by scholars and educators who are themselves seeking to use education to change society. Zygmunt Bauman (2005, pp. 12, 14) notes that the "adverse odds" that stand against the transformational impacts of education are frequently "overwhelming," acknowledging that "the hopes of using education as a jack potent enough to unsettle and ultimately to dislodge the pressures of 'social facts' seem to be as immortal as they are vulnerable." In discussing the reasons for this vulnerability, Bauman makes the doubts expressed by Durkheim and others more concrete:

> The thrust of [radical, transformative] education … is to challenge the impact of daily experience, to fight back and in the end defy the pressures arising from the social setting in which the learners operate. But will the education and educators fit the bill? Will they themselves be able to resist the pressure? Will they manage to avoid being enlisted in the service of the self-same pressures they are meant to defy? (p. 12)

The "pressures" referred to by Bauman include prevailing cultural and ideological norms ("the ruling *doxa* and the daily evidence of commonsensical experience"), as well as mundane institutional constraints: school and university "boards of trustees," "government commissions," senior managers, and colleagues who prefer conformity, career security and advancement over the risks that come from "stirring the kids up" (p. 13). This is one of the most important questions confronting would-be radical, transformative educators hoping to address any number of social problems, including the climate crisis. How can an effective, transformative education be developed within schools and other education institutions, if the elite actors who oversee these institutions do not themselves already embrace such a radical ambition? Even if this challenge can be overcome, how can the radical lessons offered to students within schools and universities be retained and acted upon as students move into the realms of the workplace and wider civil society, where, again, dominant actors may be directly opposed to such radicalism? These are not hypothetical questions. In the United Kingdom, for example, the government recently moved to ban use of materials in schools that support calls to abolish or overthrow capitalism, critique white privilege or teach critical race theory, or more generally, promote "fundamental changes in political, economic or social conditions, institutions or habits of mind" (Sukarieh & Tannock 2015, p. 30; Busby 2020; Wood 2020). Arguably, all of these are vital for any effective project to address the climate crisis.

George Counts, whose 1932 polemic, *Dare the School Build a New Social Order?*, is one of the best known and most influential calls to educators to embrace a transformative

vision of education, begins his pamphlet with a critique and warning against the dangers of naïve and ungrounded faith in the power of education to solve social problems:

> Like all simple and unsophisticated peoples we Americans have a sublime faith in education. Faced with any difficult problem of life we set our minds at rest sooner or later by the appeal to the school. We are convinced that education is the one unfailing remedy for every ill to which man [*sic*] is subject, whether it be vice, crime, war, poverty, riches, injustice, racketeering, political corruption, race hatred, class conflict, or just plain original sin. We even speak glibly and often about the general reconstruction of society through the school. We cling to this faith in spite of the fact that the very period in which our troubles have multiplied so rapidly has witnessed an unprecedented expansion of organized education. This would seem to suggest that our schools, instead of directing the course of change, are themselves driven by the very forces that are transforming the rest of the social order. (Counts 1932, p. 1)

Counts warns that education will only have a chance of contributing to radical social change if such naïve faith is questioned, so that "teachers must abandon much of their easy optimism" and "subject the concept of education to the most rigorous scrutiny" (p. 2). As discussed in Chapter Three, simply hoping that education will help us address the climate crisis, or any other social or environmental problem, will not make it so; and worse, could undermine the possibility of developing an effective transformative educational project and agenda.

Paulo Freire's critique of what he called "banking education" in the *Pedagogy of the Oppressed*, widely seen to be a criticism of traditional, mainstream education often found in schools and formal education institutions, was also directed at would be revolutionaries seeking to use education to radically transform society. Banking education is Freire's (2000, p. 73) term for a form of education conceptualized as "an act of depositing, in which the students are the depositories and the teacher is the depositor," and where the teacher "makes deposits which the students patiently receive, memorize and repeat." In banking education, according to Freire, "the teacher knows everything and the students know nothing," and "the teacher chooses the program content, and the students … adapt to it," and "comply" (p. 73). For Freire, banking education is an ineffectual, shallow form of education, and a disempowering, alienating and dehumanizing one. Freire warns that those who seek to radically change the world all too often embrace forms of banking education, and fatally undermine their own cause of liberation, empowerment and transformation:

> Unfortunately, those who espouse the cause of liberation are themselves surrounded and influenced by the climate which generates the banking concept, and often do not perceive its true significance or its dehumanizing power. Paradoxically, then, they utilize this same instrument of alienation in what they consider as effort to liberate…. Those truly committed to the cause of liberation can accept neither the mechanistic concept of consciousness as an empty vessel to be filled, nor the use of banking methods of domination (propaganda, slogans – deposits) in the name of liberation. (p. 79)

The general concern presented here is that educational projects for social change must pay close attention to matters not just of curriculum, but pedagogy and social relationships in educational institutions as well, if they are to have the possibility of success. More specifically, we also find here a warning against what is likely always going to be a strong temptation in developing climate change education, of presenting "the facts" to students –

about climate science, the social and economic causes of climate change, and what needs to be changed in culture, society and the economy to tackle the climate crisis – as uncontested and uncontestable, universal and self-evident truths, and asking learners to sign up for a climate action agenda that has already been fully designed and planned out in advance.

Finally, John Dewey, who, like Counts and Freire, is one of the best known and most influential advocates of using education for social change, points to another set of concerns that must be kept in mind for projects for developing transformative approaches to climate change education (Pérez-Ibáñez 2018). In a short essay on "Education and Social Change," Dewey argues that:

> It is unrealistic … to suppose that the schools can be a *main* agency in producing the intellectual and moral changes, the changes in attitudes and disposition of thought and purpose, which are necessary for the creation of a new social order. Any such view ignores the constant operation of powerful forces outside the school which shape mind and character. It ignores the fact that school education is but one educational agency out of many, and at the best is in some respects a minor educational force. (Dewey 1937/1987, p. 414)

In asking the question of whether and how education can help to support a broad-based social justice oriented project of radical social change, it is essential that we adopt a wide understanding of and approach to education, as not just residing in schools, colleges and universities (formal education), but in countless other social settings as well, in organized, deliberate and collective forms and as an often unplanned and incidental consequence of everyday social experience (nonformal and informal education).

Many of the concerns expressed here about the possibilities for developing effective education for radical social change focus on challenges involved in trying to use schools, universities and other formal education institutions for such projects – and this implies that effective climate change education might best be explored outside formal schooling. There is no doubt that broadening our understanding of what is meant by education is essential, and making use of all kinds of spaces for learning is vital. Furthermore, history shows us that many of the most successful and influential educational spaces for radical social change are ones that have been deliberately constructed outside the school system, as discussed in Chapter Seven. But to turn our back on schools and other formal education institutions as key sites for developing a transformative climate change education would be a mistake, even if these can often be extraordinarily difficult places in which to make much headway.

Rebecca Tarlau's recent work on the Landless Workers Movement's longstanding effort to engage directly with state education systems in Brazil offers important insights into just why this engagement is so important. Even though the Landless Workers Movement is a well established social movement in its own right that regularly creates and runs its own education institutions, projects and spaces, it seeks – despite many obstacles and frequent setbacks – to work with and reshape state run school systems in Brazil as well. One reason for this is the importance of outreach. As Tarlau (2019, p. 40) notes:

> [M]ovements' participation in public schooling can help recruit new activists, and in particular, youth and women to the movement. Public schools and universities are institutions where young people spend many hours each day and are therefore important spaces for investing in local

> leadership development – increasing students' interest in and capacity for social change…. [D]iscussions [about social change] can also happen in other social-movement-led training programs, such as popular education. However, the people who participate in these nonformal educational spaces are often already active supporters or at least sympathetic to the movements…. A social movement's participation in formal schooling can help convince youth, who may have never participated in a contentious protest, to become involved in these collective struggles.

Other key factors pointed to by Tarlau are the fact that schools and formal education institutions usually have access to far more "financial and institutional resources" than are commonly available to non-formal educational spaces set up by social movements; and that "if movements can develop a degree of influence in the public schools," then these schools can be "important locations where social movements can begin to prefigure, in the current world, the social practices that they hope to build in the future," across the rest of society and the economy as well (pp. 40, 42).

In the end, the question about where we should be attempting to develop radical, transformative forms of climate change education needs to be framed not as an "either-or" choice between formal versus nonformal sites of education, but a "both-and" matter that recognizes the potential complementarity of these different spaces of learning. Indeed, the question of "how different educational practices could and should be distributed across different educational spaces," including not just schools and universities, but other institutions such as "political parties, trade unions, social movements, community groups, churches and other faith-based organizations" should be seen a central concern "of both principle and strategy" for all educational projects for radical social change to consider (Tannock, James & Torres 2011, p. 942).

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