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Three-Legged Stool: A Peace Education Framework for Weaving Together Spirituality, Science, and Technology

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Technological advancements and political-economic shifts are necessary to meaningfully address climate change. However, there is a difference between addressing climate change and transforming underlying behaviors to allow mass support of these changes, sustain the efforts of those working for change, and remodel global society so that changes are lasting and impactful. While technology is central, spirituality should be its companion. The spiritual component allows people to reimagine their relationship to the planet, to one another, and to global inhabitants who may be more devastatingly impacted by climate change. Grounded in the core values of holistic Earth care, relational existence, and global consciousness, this article explores how peace education encourages technological responses to climate chaos to be cognizant of the root causes of systemic violence in all its forms via intersectional, interspiritual, and interreligious lenses. The "three-legged stool" framework includes science, which imparts knowledge and evidence; technology, which offers solutions and adaptations; and spirituality, which provides grounding and transformational thinking.

Introduction

The mission of the Institute on Religion in an Age of Science (IRAS), to "cultivate a community of informed and respectful inquiry and dialogue at the intersections of science with religion, spirituality and philosophy in service of global, societal and personal well-being" (IRAS 2023), is deeply aligned with the aims of peace education, which include promoting "the development of an authentic planetary consciousness that will enable us to function as global citizens and to transform the present human condition by changing the social structures and the patterns of thought that have created it" (Reardon 1986). Raising questions of how science and religion can be used together to address existential crises is a worthy endeavor and one I have explored for many years as a peace educator. It is quite clear that humanity is firmly living in climate crisis, or more accurately, climate chaos. The numerous manifestations and downstream repercussions of this existential crisis hit hardest for the poorest and most historically oppressed societies—an oppression that is the direct result of the hegemonic practices of colonization, resource extraction, and slaughter of people and land, as well as the excuse of "bringing people into modernity." Thus, people of conscience and creativity are called to imagine solutions to stem the tide of suffering. This call is necessary. However, it must be remembered that this crisis cannot be solved with the same mindset that created it. This existential crisis calls for a paradigm shift.

In my work as a peace educator, scientist, science educator, theologian, and Unitarian Universalist minister, I have grappled with how to facilitate this paradigm shift. The IRAS annual conference theme for 2023—The Wizards of Climate Change: How Can Technology Serve Hope and Justice?—is compelling and begs the question: can scientists and technology really "fix" the climate crisis? In numerous venues and conversations around climate chaos, a regular response is that technology has the solutions. However, this response gives me great pause.

In this article, I share my "three-legged stool" framework for considering planetary health and imagining solutions for the climate chaos and environmental injustice in which humanity is mired. The three-legged stool analogy is often used when describing a conceptual structure because it represents balance. While many are more practically acquainted with stools (and chairs and tables) with four legs, the three-legged stool has existed for ages simply because it provides balance on uneven ground, which can be quite handy when, say, milking a cow. The balance analogy, however, goes beyond functional usage, as it also implies that the three legs of the stool must be of the same length, meaning that each leg of a conceptual three-legged stool must be examined and applied equally. For my purposes in discussing climate chaos, peace education is the overarching paradigm and the seat of the stool is supported by the following three legs that will be interwoven throughout this discussion: science, which provides data and understanding; technology, which provides possibilities and solutions; and spirituality, which provides grounding and the tools for holistic transformation.

Why a Peace Education Framework

To set the stage, I want to share some foundational aspects of peace education: "Originally a study of the causes of war and its prevention, peace education has evolved into the study of violence in all its manifestations and educating to counteract the war system for the creation of a peace system; a peace system on both the structural and individual level. The content and the methodology of peace education are progressive; promoting egalitarian learning environments, open inquiry, and significant learner participation" (Ardizzone 2002, 16). Peace education has been implemented around the world from early childhood to post-graduate formal education settings, various informal education settings, and non-governmental organizations, as well as more formally through international treaties and documents. Peace education focuses on uncovering the root causes of small and large issues and conflicts utilizing a broad definition of violence drawn from peace researcher Johann Galtung (1969). According to Galtung, existence is deeply mired in a culture of violence, the three forms of which are structural violence, cultural violence, and direct violence. Structural violence is the violence embedded in institutions that manifests as oppression, marginalization, the deliberate withholding of resources, wealth disparity, etc. Cultural violence is the violence that makes structural violence acceptable and/or invisible and is largely perpetuated through education, organized religion, and mass culture. Direct violence is the form of violence most commonly understood since it involves actors perpetrating violence directly on others. Using a planetary or environmentally aware lens, structural violence can be seen as colonial practices that subjugated (or obliterated) millions of people and as exploitative resource extraction, which gives Earth value only as something that can be commodified. Cultural violence is seen as scriptural interpretations that give humans dominion over the Earth and peoples viewed as less than. It is also seen in the subpar to non-existent science and environmental education provided in schools and in the inculcation of materialism and consumerist disposability as the only acceptable lifestyle. Direct violence is the physical harm caused to the planet from acts of war, deforestation, pollution, mining, extraction, and folks committed to having nice, green lawns. A cursory review of the recent news stories sharing images and stories of environmental destruction around the globe illustrates the interconnected ways that the violence done to people and place yields more violence in the form of destruction, displacement, and death.

To critically examine manifestations of violence beyond the headlines, peace education invites learners of all ages into an analysis of root causes. This is done in peace education to organize what the world is facing and take a temperature check on how individuals and communities are feeling about these issues. Oftentimes in environmental science or eco-justice spaces, discussion heads directly to problems and solutions and ignores the emotional toll that climate

chaos takes on people, both those directly impacted and those who carry fear and woe for the future. Thus, digging into this core work of peace education and identifying root causes also allows for the naming and sharing of the fear, grief, worry, and despair people are carrying (see Figure 1). This also is a reminder of how central pedagogy is to peace education; peace educators not only educate about peace, but for peace. Thus, activities such as determining root causes use a dialogical pedagogy, a model of teaching necessary for transformation. In any setting, a peace education pedagogy, which is grounded in the revolutionary work of Brazilian educator Paulo Freire (1970), calls practitioners into various practices: problem posing, multiple perspective analysis, and acknowledgment that oppression wreaks havoc on both the oppressed and the oppressor.

The root causes activity invites an analysis of the manifestations of violence in order to name the foundational (and thus also the historical and philosophical) aspects of current crises. The root cause analysis can be applied in any education setting to identify all barriers to peace, but in the context of this year's IRAS conference theme, I focus on climate chaos and environmental injustice. This deracination engages participants in connection-making and demands going past surface-level arguments—which, when tied to manifestations of violence, can make it easy for some to dismiss data and facts. In undertaking systemic deracination in order to illuminate what lies at the core of the issues being faced, the root causes of the climate crisis and its co-ills of racism and environmental justice are capitalism, colonialism, white supremacy, white Christianity, heterosexual-patriarchy, greed, and a historic separation from nature. Naming these structural and systemic factors allows for a deeper analysis of their many manifestations, the interconnections between them, and their impacts downstream.

Figure 1: Root causes as well as manifestations of violence as developed by my students in the course Science, Spirituality, and Peace Education: Addressing Climate Change. Photograph by author (2023).

Addressing Violence, Grounding in Values

One of the founders of the field of peace education, Dr Betty Reardon (1986), put forth three core values to
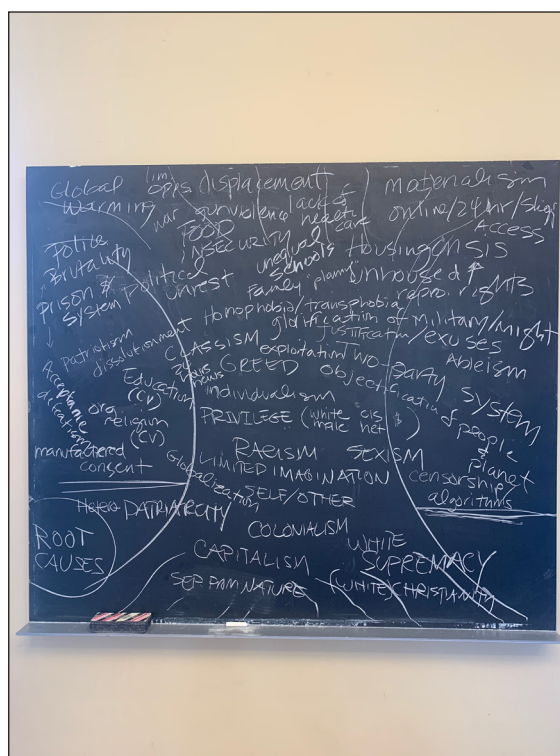
guide her peace education work: planetary stewardship, humane relationship, and global citizenship. These three overlapping values guided my work for many years. However, just this year, at the urging of a student who pointed out the problems and limitations—and anthropocentrism—of these terms, as well as based on discussions I had with colleagues at IRAS in the summer of 2023, I have reformulated these core values to better capture and guide my work moving forward: holistic Earth care, relational existence, and global consciousness.[1] These updated core values provide a framework for knowing, learning, and acting to support the creation of positive peace as well as provide a structure that can be applied in any setting to address climate chaos.

Holistic Earth Care

Holistic Earth care calls for an acknowledgment of interdependence, interconnection, and interbeing as described by Vietnamese Buddhist Monk Thich Nhat Hahn. All are responsible for caring for the planet on local and global levels, not as "stewards" in any traditional sense but rather because humans are of the Earth and all its component parts are within us. Humans are not separate but deeply dependent. Think of the Buddhist concept of dependent co-arising, wherein it must be acknowledged that any sense of "individual-ness" is impossible because all existence is connected to and/or arises from other members of the Earthly and universal sphere. Without understanding that Earth care requires seeing all life, including things typically deemed non-living or abiotic, as fundamentally one or united, humans will continue to fall into a trap of separation or of superiority—that humans are above all other life forms. A value of holistic Earth care serves to mitigate the effects of structural, cultural, and direct violence as they show up in a culture that views the planet as a commodity to be exploited. Simply, to paraphrase Unitarian Universalism's seventh principle, all people have a responsibility for the interconnected web of life of which everyone is a part.

Relational Existence

Relational existence is an invitation to consider how one relates to and interact with all members of their community on a variety of planes and scales, spanning from the interpersonal and communal to the global. By remembering that one's existence is grounded in and founded upon relationships, one is called to interact with others more mindfully and to cultivate reciprocity. This requires a few things. First, one must see oneself as a relational being. Second, one has to make peace with or at the very least acknowledge the fact that the current state of affairs is a result of creating hierarchies in relationships and deeming certain peoples beneath the need for relation. This has made and continues to make it perfectly acceptable to exploit and kill without regard to the inherent

dignity of those deemed "other." Finally, a true sense of relational existence seeks to right the wrongs of the past and thus requires deferring to voices who have historically been marginalized, many of whom demonstrate a relational spirituality and/or model of living in a relational community with all beings. In other words, the inherent worth and dignity of all beings must be seen and honored and all must act in accordance with their rights, whether as humans, other mammals, or other forms of being. Relational existence diminishes manifestations of violence by inviting mindful, compassionate relationships via authentic communication.

Global Consciousness

Global consciousness invites people to see themselves as part of a global system, not merely as an individual or members of an exclusionary definition of community. If, as Carl Sagan (1973, 189) is famous for saying, "we are all star stuff," then it would serve humanity to call into question the barriers and deleterious forms of separation we cling to, including notions of borders, private property, and the NIMBY (not in my back yard) mindset. People must see themselves as co-travelers of the cosmos and thus live with a sense of responsibility to all inhabitants of said cosmos, not only those who think or look like them or who live next door. Climate change has proven that local choices—primarily lives lived in excess that require fossil fuels and extractive, exploitative capitalism—have global impacts. Global consciousness can counteract the manifestations of violence by expanding understanding of the human condition and the interdependent nature of existence.

Using these interconnected and overlapping core values as a framework and putting them into action provides not only the opportunity to address the root causes of crises but also the chance to create a framework for a reorientation of the very ground of existence, which is what is needed if the damaging forces humanity has unleashed are to be addressed.

Core Problematics

In peace education, after or concurrent with the naming of root causes, it is helpful to name core problematics—manifestations of violence and/or barriers to true positive peace. Unlike negative peace, which means removing violence and war, positive peace is a lasting peace based on creating a society wherein structural oppressions and barriers to human rights and equity are removed and replaced with an orientation towards fostering true peace. Positive peace is only possible if society is reshaped with justice, equality, and a full menu of rights and responsibilities. With this in mind, and analyzing the realm of the current climate chaos, I see at least six core problematics that are manifestations of various forms of violence and root causes, and that indicate primary sites of

action. Furthermore, I believe that each of these problematics appear because the interplay among science, spirituality, and technology—my aforementioned three legs of a stool—is out of balance.

The first problematic is climate misinformation and climate denial, especially the denial of anthropogenic climate change. Misinformation has its roots in poor science education, a lack of environmental education, and the fossil fuel lobby, whose efforts to secure society's addiction to carbon as they line their pockets are well known and well documented. In her book, *Miseducation*, Katie Worth (2021) explores the role education has played in the current climate crisis, concluding that although there is a deep history of both scientific and popular awareness of global warming, when the American Petroleum Institute, whose original aim was to address the amount of carbon dioxide being added to the atmosphere, chose to move from advocacy to secrecy in the 1980s, science education became a conduit for the maligning of global warming. Worth (2021, 27) states, "They adopted the same tactics that the tobacco industry had used to hide their products' link to cancer. The idea was to raise questions about the validity of the science, which would cause the public to doubt whether government regulation was warranted." Versions of this obfuscation continue through today. Meanwhile, teachers feel increasingly disempowered by the top-down "reforms" that limit what can effectively be taught in science. While the Next Generation Science Standards explicitly include content and standards around climate change, they are implemented differently from state to state depending on political orientation, demonstrating the power of the fossil fuel lobby. Furthermore, even when science teachers do want to make climate change part of their curriculum, they often come up against antagonistic colleagues (or administrators) who not only do not support scientific data being disseminated but also go so far as to teach "alternative perspectives," one of which being that climate change is a hoax.

The second problematic is apocalyptic religious thinking. In many Christian traditions, the focus on the afterlife—the true Kingdom of Heaven—creates a wholesale ethic of acceptable uncaring about what happens to life on this planet. There is a rejection of anthropogenic thinking since scripture foretold these circumstances, or perhaps more accurately, things are "simply unfolding as God planned," and believers are heading to Heaven or an idyllic afterlife anyway; caring for the here and now is unnecessary. Jonathan McPhetres and Miron Zuckerman (2018, 17) found that "religiosity is negatively related to science knowledge and is associated with more negative attitudes towards science" and "religiosity is associated with less interest in science and the belief that science is less important." The damage can be seen when scientific understanding is replaced with religious zealotry. This lack of responsibility for the planet and all her inhabitants is a formidable obstacle to overcome but it is not the only religious mindset that works against taking action to ensure planetary survival. In many

traditions, doctrines of separation and dualism create us/them thinking among peoples and, perhaps more fundamentally, between humans and all other forms of life. Nature is viewed as "external" and "not of us," while the reality is that we humans, as primates, are in fact part of nature. Many organized religions see humankind as superior, different than, separate from, and independent of the cycles and manifestations of nature. Dualism—the separation of self and other, humans and other life, self and an external god—is pervasive in many organized religions. Finding a way to rectify this is part of humanity's task.

The third problematic is a bit more challenging to articulate and what I will call the purely heart-centered work of Earth care, or what some folks dismiss as "woo-woo" spirituality. While I see in them deep resonance with spirituality that is strongly linked to pre-Christian ideologies, these beliefs and practices are often dismissed—by organized religions, through the mainstream media, by scientists and techno-progress types—because they harken back to ideologies of true connection such as indigenous thought and religious practices, deep ecology, or even, in some cases, forest fairies and other marginalized spiritual ways of connecting to all life on Earth. The challenge here is that since the current culture is steeped in a paradigm that values reason and empirical data, these Earth-centered spiritual folks are easily ignored or name-called. Clearly, their hearts are in the right place, but as Elizabeth Minnich (2017, 36) reminds us, "Doing good is also more than a matter of feeling." To sustain this work and to bring others along, grounding is needed.

The fourth problematic represents the other side of the previous problematic: the response to the hardcore scientific mindset. As a person deeply steeped in the sciences and drawn to the value of empirical research, I have learned that, given the limits of science education in the United States educational system and the deliberate dumbing down of the educational system, anything "jargony" will be misunderstood and/or ignored, which means in many cases that scientists also get ignored or dismissed. Perhaps even more harmfully, reliance on data and facts actually scares people, and it has become quite clear that such fear motivates no one. Scientists do no good giving people data only because data does not necessarily change hearts and minds. To be clear, data is important, compelling, and necessary, but how it is disseminated is the issue here. Science has a communication problem—in part due to the active misinformation campaigns previously mentioned, but also of the science community's own making—that must be addressed, especially in the realm of climate change.

The fifth problematic is the individual responsibility versus wholesale structural change discussion and debate. The carbon footprint game, introduced thirty-plus years ago, seemed on the surface an invitation to individuals or families to learn how to live in greater alignment with an ecological or conservation mindset. However, it was created by British Petroleum as a targeted effort to

shift attention away from the fossil fuel industry writ large and instead make the average consumer question all their choices as they relate to their carbon usage. A result has been circular arguments about whether individual action or structural change matters more. Thus, for many, a heightened sense of apathy or ineffectiveness arises, with regular folks saying, and believing, that their individual acts do not matter. Coupled with this is the judgmental mindset pervasive in the climate movement, admonishing folks who do not do "all the things." Just as unhelpful, this attitude and its attendant squabbling breeds resentment, division, and disengagement among the folks who allegedly care about the situations being faced. Shame is not a motivator. Individual acts are indeed important, as are collective actions. At the very least, individual acts encourage individuals, families, and communities to live more in alignment with planetary consciousness and, hopefully, to live more simply and mindfully. However, this models ways of being that run counter to the current dominant mindset of accumulation and disposability. Thus, this modeling/witnessing can lead to alternative collective ways of living. However, even as individuals make better personal choices, the structural and systemic issues at hand cannot be dismissed. Fossil fuel entities, corporations, banks, lobbyists, educators, and governments must be held accountable. To get trapped in this false duality of individual versus collective only serves to empower the puppet masters of destruction.

Finally, the sixth problematic brings me to the theme of this year's IRAS conference—the selling of the notion that technology will fix everything. I have had this conversation numerous times with people who truly believe that all will be well because technology has the needed solutions. Some have said flippant things like, "Everyone just needs to buy an electric car or put solar panels on their house," which completely discounts socio-economics and how class and pervasive poverty make these actions impossible for most. Even more importantly, statements such as these ignore the environmental and human costs of extracting the elements needed to build all those electric cars and batteries and photovoltaics as well as other technological inventions. Technology has answers but technology that remains steeped in exploitative capitalism and a colonialist mindset will not fix anything. Furthermore, one could argue that the pervasiveness of certain current forms of technology should serve as a warning for the deeper psychological and spiritual impacts of relying on technology for answers. A cursory review of research on anxiety and depression in pre-teen and teenage girls, among others, shows that technology in any form is far from a panacea. Increased incidences of cyberbullying, depression, and suicide should give pause in the assumption that technology is always a good thing. Pair this with the materialism and disposability omnipresent in the tech world via designed obsolescence and societal pressure to have the newest technology and one has to wonder if the harms done to ecosystems and the people who are

exploited to extract necessary components to support technological products can actually be "solutions."

I share these problematics in no particular order, recognizing that each can be contextual; the extent of their presence may vary upon location and community. Furthermore, many of them are interconnected; one could argue that extreme religious thinking is directly connected to misinformation and educational weakness, which in turn connects to misguided efforts (or non-efforts) related to personal responsibility. The naming of problematics remains a valuable practice, even if it only serves as a reminder that root causes and downstream manifestations are deeply connected and thus climate work in various settings requires a systemic analysis.

Facilitating Transformation

As an educator and minister, I have been grappling with this core question for years: How can a transformation from extraction to regeneration, from exploitation to reciprocity, from separation to interconnection be facilitated? I believe this question needs to undergird thinking about solutions to the climate crisis, especially if some believe that technology is the only answer.

While solutions that cut down on greenhouse gas emissions, promote carbon capture, and assist those who are the most and first impacted (who not so incidentally contribute least to global warming) must certainly be focused on, the question of wholesale transformation must be engaged with if "green technology" and "green capitalism" are not to perpetuate the current mode of existence. The false narrative of green capitalism—itself an oxymoron—is already underway as seen through the marketing efforts to convince people to buy LEDs, eco-friendly detergents and products, and anything labeled "green." These products, to be sure, are better for the planet, but the drive for unmitigated consumption is still there. Products are just being replaced without questioning what is needed (versus what is wanted) in the first place. Thus, if the transformative work is not done before the tech-based interventions, humans will still be wasteful, still be mindless, and will still treat resources and labor as if they are inexhaustible. Imagine for a moment all the people in the United States, who already live so wastefully, being told, "Go on, keep doing your thing because now we are using the sun for energy!" without encouraging a conservation or Earth-care mindset. What is needed is a transformation in hearts and minds, and I believe that the integration of science and spirituality can guide people to that. In 1967, Pierre Teilhard de Chardin made the effort to "lay before both the world of science and the world of religion the controversial proposition that there is and can be no real opposition between the two. Each needs the other" (Aller 1967, 16). IRAS is an example of the imaginative possibilities that can develop when these two areas, so often deemed opposites or even enemies, come together. And now, the climate crisis is precisely the moment when these

two areas—connected with a real analysis of technology and technological solutions—can provide much-needed guiding principles.

In my work with children (grades kindergarten through twelve as a science educator), young adults (at the university level), and members of the clergy (through interfaith work and dedicated programs for Unitarian Universalists), I generally focus on three fundamental ideas: promoting greater connection with what is commonly called nature; implementing practical changes at all levels; and calling upon faith (or the spiritual and/or religious beliefs that ground people) to serve as impetus, practice, and sustenance. In the next section, I discuss these in conjunction with other ideas that can address the previously mentioned core problematics all within the three-legged stool framework.

Reconnection

Regardless of one's role in society, one of our central aims should be promoting biophilia, or a love of the life that fills the planet. E. O. Wilson invited people so many years ago to engage in biophilia, to find love for the natural world and experience the pleasure of being surrounded by living organisms. Ideally, this reconnection will facilitate a shift to an understanding that Earth is a living, breathing, complex organism, an intricate web of life in which humans are a small part. Through biophilia, learners can see Earth as a member of an extended and intricate family and recalibrate how they think about and interact with living things. To initiate this process and counteract the separation and othering of nature, children (learners of all ages, actually) need not only exposure to the natural world but an opportunity to explore and connect with the hows and whys of their biome. Experiences fostering this connection will have a two-fold impact: a greater affinity for the flourishing of all life, inspiring a call to connection and care, and an active subverting of the limitations of science education in formal education. One activity I have used with learners of all ages is an outdoor scavenger hunt that utilizes a multi-page field guide inviting explorers to use their senses to engage with specimens ranging from rocks to trees to scat and other evidence of living things. Observing, listening, drawing, writing, sharing, and even collecting allow for connection and questioning. Children invited into a world of wonder at a young age will not be so ready to relinquish this way of knowing and exploring even if schooling attempts to actively undermine this type of epistemology. The creation of a more scientifically literate citizenry will override the religious zealotry that demeans nature by refusing to steward the planet here and now. I would argue that this connection with all life can and should occur in religious settings as well. Religious education settings could also add an experiential component that invites children into a connection with Earth. As can be seen from the growth of environmental programming in a variety of religious traditions, creation care is becoming central. From individual movements by Catholics, Unitarian Universalists, Muslims, Jews, and

even Evangelical Christians to interfaith coalitions such as Interfaith Power and Light and GreenFaith, religious folk are attempting to foster reconnection with all forms of life on Earth. Furthermore, interfaith coalitions are deeply impactful. The Unitarian Universalist Ministry for Earth, for example, offers year-round programming that weaves questions of science, spirituality, and solutions together for activists and seekers alike. GreenFaith is an organization that has deftly brought the scientific data that supports the urgency of climate action to the global interfaith religious community.

By meeting religious folks where they are and creating inroads for dialogue on how religious texts and scientific knowledge call people to greater relation, GreenFaith has fomented a global movement to address local issues as well as promote the end of human reliance on fossil fuels. To bring together science, spirituality, and technology, several years ago I developed a method for preaching that integrates scriptural text with climate data and action steps. I have shared this model with interfaith clergy members. The 4Es model starts with entry (theology/spiritual grounding), a reading chosen based on the faith tradition that sets the theological stage for a transformational encounter with scripture via an exegesis grounded in my second E: empathy (eco-theology). For this second E, an ecological lens is used to exegete or analyze the reading. To ground this and connect to current experience, the third E is utilized: evidence (global climate change data), which invites the inclusion of relevant climate change data and/or manifestations to make the connection impactful. Finally, the sermon (or talk or teaching) closes with the fourth E, engagement (accountable action steps), where leaders inspire their listeners to take an action, small or big, ideally something that is directly and specifically related to the evidence provided. This model is one example of how, in religious settings, science and spirituality can be integrated with an eye toward increasing scientific understanding and developing action strategies that are spiritually rooted and possibly connected to technological solutions.

Core Values Framework and Peace Education Practice

Since the temptation is great to rely on technology as the panacea for climate chaos, having core values to frame our work—whether as educators, researchers, ministers, or activists—provides the necessary grounding to analyze problems and solutions from an intersectional lens. The values put forth in this article, holistic Earth care, relational existence, and global consciousness, are just one example that can be applied. Once a values-informed framework has been established, peace education pedagogy can be utilized. Beginning with a sharing of assumptions ensures that all ideas and voices are part of the conversation. I find that this activity—which I have done with teenagers, college students, adults, and clergy members—can be done as a "popcorn-style" sharing (and written on a board). This allows participants to name all they know, want to know, have heard, are worried about, are curious about, etc., creating a visual starting

point of their perceptions about a given issue. If looking at climate change, the responses will be many and varied and may also include wonderings about solutions. I like to categorize this initial "brain dump" via discussion, creating thematic groupings so that any assumptions attached to what they shared can be unpacked. Following this with the root cause practice allows for a deeper analysis: what is at the core of these issues? How are they interconnected? What about the roots can be addressed? Can technology even address these root causes? Interestingly, when looking at some of the root causes of the climate crisis, one must realize that colonialism, capitalism, white supremacy, and greed cannot be solved by technology. Rather, they need to be analyzed and addressed through sociocultural, economic, and spiritual lenses.

The root cause activity can lead to another peace education model: the use of problem posing and analysis of an issue through multiple perspectives and stakeholders (what I like to call the "fly-eye analysis"). This intersectional lens can also be used to examine possible solutions so that learners can, in essence, do a planetary cost-benefit analysis of the ideas they are generating or studying.

Another aspect of peace education pedagogy that could prove useful is the use of "futures-orientation" work as put forth by David Hicks (2004). Not unlike the seven generations mindset of indigenous peoples, peace educator Hicks invites learners to imagine the future they want to see and then consider the steps it will take to get there. In doing so, a variety of eventualities can be explored, thus limiting the possibility of overwhelm or apathy and eliminating outcomes that maintain the status quo. As Hick states:

> Students also need to explore the range of solutions that have been put into place or are being proposed for such issues. Not to do this can lead to a sense of alienation and despair. Doing this appropriately can lead to a growing sense of empowerment and encourage the first steps in responsible global citizenship. (Hicks 2004, 166)

Radical Inclusivity

Since it has already been established that the developed-ness of what is commonly referred to as the "developed world" is only due to the exploitation of peoples and lands around the globe by colonizers, it would behoove all those committed to change to practice radical inclusivity as part of the work of imagining alternative futures and developing solutions to this wicked problem of climate change. In this sense, I am referring to including the voices of those who are feeling the effects of climate change first and most devastatingly (such as inhabitants of island nations, the global south, former colonies, and the poor and disenfranchised); indigenous societies whose worldview, in almost all cases,

is oriented around living in reciprocal relationship with all life forms rather than trying to overpower them; and persons and communities that offer economic, social, cultural, and religious models that counter capitalism, regardless of scale.

Replicable Versus Scalable

As previously mentioned, the primary root cause humanity is up against and where the transformation needs to start is an acknowledgment of the ills of capitalism. Through peace education pedagogy, how inconsistent capitalism is with democracy and egalitarian ideals can be analyzed. I would also remind folks to examine internalized capitalism or attachment to the dominant paradigm, as it may limit one's ability to openly explore the suggestions of others, especially younger learners. I have heard critiques among my own colleagues of students' creative, local, sustainable responses to climate chaos. They deem them "not scalable," which is the language of exploitative capitalism. The solutions the world needs now need not be scalable or profitable but rather replicable, especially in local communities. This shift in language is a signifier of the paradigm shift needed to move away from a competitive capitalist consumption model of life on Earth to a communal collaborative model that sustains all life on Earth. Replicability over scalability also reminds those involved in climate action to balance the three legs of our stool.

Spiritual (or Religious) Grounding

Finally, I truly believe that the shift needed will be guided by a connection to a spiritual calling to do better. For my own grounding and to promote an ethic that calls on everyone to collectively address climate chaos, I coined the phrase: "Science provides us with the data, *our* faith compels us to act." I chose the collective terminology since I believe that individualism is one of the root causes of climate chaos. Therefore, all of humanity—regardless of how we define faith or what religious teachings we follow or spiritual practices we adhere to—have to work collectively to care for all life, for the planet, for place, for people. Spiritual guidance coupled with a regular spiritual practice that calls people into connection, that nourishes the work of educators, advocates, and activists, is needed on the personal and global scale. Spirituality as a concept is in many ways a moving target as various definitions of spirituality exist and not everyone has either an interest in or an adherence to something they would deem spiritual. For some, religious ideologies supersede a sense of personal spirituality—following the norms of a religion may or may not include a true connection to the spiritual. For others, including members of my Unitarian Universalist community, humanists, and non-theists, rationality can either override or completely dismiss the notion of spirituality. Thus, in a previously published article, I utilized this characterization of spirituality:

> My current working definition of spirituality is: a personal connection to that which is greater than yourself. It's ambiguous in form —this connection could be to nature, God, gods, Buddha, love, the collective, wonder, the ineffable, or a call to change the world through good works. What matters is how this spirituality manifests in how we act and live our lives. Spiritual people often take part in some form of self-improvement through reflection. Led by the feeling of connection spirituality generates, they seek to do good in the world by helping others or working for justice, peace, equity, and environmental health. The spirituality discussion gets muddy because of the tension in relation to religion. Crucially, one can be spiritual without being religious and vice versa. Religion—if we go to the root word—is about being bound together, being tied to one another or a specific community by a shared belief system. This need not include god or creed or dogma—as is the example of Unitarian Universalism—rather focusing on an identifiable commonality. Within any religious system, we may all have our own forms of spirituality and our own connections to the divine or holy or unknown (or whatever you'd like to call it), which gives us our path and our callings. (Ardizzone 2022, 4)

However one defines spirituality, and however one chooses to embody it, the spiritual aspect of humanity's collective transformation cannot be understated.

Moving Forward with Accountability

Implementing practices that address the climate chaos humans have unleashed and exploring technological solutions to ameliorate suffering invites the following questions, which should be applied consistently: 1) Am I using an intersectional lens to examine assumptions to ensure that all points of view are included? 2) Who is helped? Who is harmed? 3) Have I centered the voices of those most impacted? 4) Have I looked to ancestors or First Nations/indigenous/native people for wisdom and models? 5) Am I considering seven generations into the future? 6) What is my spiritual practice teaching me or calling me to do?

The work those of us committed to planetary change are called to do right now is urgent and daunting and will not be remedied by any quick fixes. If we see ourselves as members of a collective, called to care for creation in a way that ensures a healthy flourishing of all life for generations to come, we must act.

Notes

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References

Aller, Catherine. 1967. *The Challenge of Pierre Teilhard de Chardin*. New York: Exposition Press.

Ardizzone, Leonisa. 2002. "Towards Global Understanding: The Transformative Role of Peace Education." *Current Issues in Comparative Education* 4 (2): 16–25. DOI: https://doi.org/10.52214/cice.v4i1.11352

———. 2022. "Science, Spirituality, and Climate Change." *Peace Review: A Journal of Social Justice* 34: 64–72. DOI: https://doi.org/10.1080/10402659.2022.2023430

Freire, Paulo. 1970. *Pedagogy of the Oppressed*. New York: Continuum.

Galtung, Johann. 1969. "Violence, Peace, and Peace Research." *Journal of Peace Research* 6 (3): 167–91. DOI: https://doi.org/10.1177/002234336900600301

Hicks, David. 2004. "Teaching for Tomorrow: How Can Futures Studies Contribute to Peace Education." *Journal of Peace Education* 1 (2): 165–78. DOI: https://doi.org/10.1080/1740020042000253721

IRAS (Institute on Religion in an Age of Science). 2023. "About." Institute on Religion in an Age of Science. https://www.iras.org/about.html.

McPhetres, Jonathon, and Zuckerman, Miron. 2018. "Religiosity Predicts Negative Attitudes Towards Science and Lower Levels of Science Literacy." *PLOS ONE* 13 (11): 1–20. DOI: https://doi.org/10.1371/journal.pone.0207125

Minnich, Elizabeth. 2017. *The Evil of Banality: On the Life and Death Importance of Thinking*. Lanham, MD: Rowman & Littlefield.

Reardon, Betty. 1986. *Comprehensive Peace Education*. New York: Teachers College Press.

Sagan, Carl. 1973. *The Cosmic Connection: An Extraterrestrial Perspective*. New York: Anchor Press/Doubleday.

Worth, Katie. 2021. *Miseducation: How Climate Change Is Taught in America*. New York: Columbia Global Reports. DOI: https://doi.org/10.2307/j.ctv2dzzqvp