

THE TEACH-IN ON GLOBAL WARMING SOLUTIONS AND VYGOTSKY: FOSTERING ECOLOGICAL ACTION AND ENVIRONMENTAL CITIZENSHIP

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ABSTRACT. The Teach-in on Global Warming Solutions is part of a larger socio-environmental movement concerned with combating climate change. Highlighting the history and elements of the teach-in as a model of learning, the article examines the teach-in movement, using a local event at the University of Calgary as an illustration. Conceptual resources from Vygotsky – the Zone of Proximal Development, and learning as social/relational transaction – are used to illuminate specific aspects of the teach-in. The article concludes by discussing the challenges and opportunities facing the global warming movement regarding public education.

LE FORUM ÉDUCATIF SUR LES SOLUTIONS POSSIBLES AU RÉCHAUFFEMENT DE LA PLANÈTE ET VYGOTSKY : FAVORISER UNE ACTION CITOYENNE POUR L'ÉCOLOGIE ET L'ENVIRONNEMENT

RÉSUMÉ. Le forum éducatif sur les solutions possibles au réchauffement de la planète est partie intégrante d'un vaste mouvement socio-environnemental visant à lutter contre les changements climatiques. Retraçant l'historique et les éléments du forum qui en font un modèle d'apprentissage en s'appuyant sur un événement ayant eu lieu à l'Université de Calgary, cet article fait l'examen du mouvement des forums éducatifs. Les concepts mis de l'avant par Vygotsky – tels que la zone proximale de développement et la cognition résultant de processus d'interaction socio-relationnelle – sont mis à profit pour illustrer les défis et les opportunités auxquels font face les tenants des mouvements anti-réchauffement climatique en termes d'éducation publique.

I think H. G. Wells has it right when he said that we are in a race between education and catastrophe. (Orr, 2004, p. xiv)

On a Friday afternoon in a Calgary winter, a young woman nervously and yet purposively arose from her seat in a large room to express her concerns about global warming. But rather than confining herself to speaking about her fears regarding climate change, she passionately described how this environmental crisis also represents an opportunity to create a more just and sustainable

society. She was followed by an expert on solar energy who talked eloquently about buildings and climate change, after which a biologist spoke affectionately about his work with polar bears, underlining his fears about the prospects for survival of this species. Each of the three speakers addressed a group of forty to fifty persons for ten minutes.

After the three speakers concluded, the facilitator thanked the three speakers and invited the crowd to break into small groups to discuss what elements of the presentations resonated with each person in a personal manner, or what aspects of the mini-talks captured their imagination. As the participants shared their responses in small groups in this second phase, the speakers hovered outside the groups, eavesdropping on the conversations for the next twenty minutes, noting the elements of the discussions which touched them in some way. Finally, the facilitator invited the groups to conclude their deliberations, allowing the three initial speakers to share their brief reflections on what they heard in the discussions, providing a circular closure or literary *inclusio* to the hour of listening and dialogue. For four hours, this same three-fold pattern – speakers, dialogue groups, speakers – within an hour-long format was repeated with different presenters and participants. During this time, multiple speakers of diverse ages shared their responses to the two key questions that lay at the heart of the educational event: 1) what concerns you the most about global warming? 2) what does your specific profession have to offer by way of solutions to the problem of climate change?

As one begins to reflect on this event, some questions emerge: what was the nature of the educational event that was taking place in this crowded room over a four hour period? What was the social movement that provided a larger context for these learning events? What kind of learning was being transacted through this particular format? How could we interpret or understand the nature of the learning that occurred on that day, and how was it a microcosm of the larger social movement combating global warming? In this article, I discuss ways that the conceptual resources of educational psychologist Lev Vygotsky regarding learning as a social and relational transaction may be helpful in illuminating the dynamics and processes represented in this activity.

There are an abundance of conceptual lenses through which the learning activities in the teach-in could be interpreted, such as a Bakhtinian dialogic process moving from monologue to intersubjective dialogue (Bakhtin, 1981, 1984, 1986), as a form of distributed cognition (Cole & Engestrom, 1993), or as a variety of legitimate peripheral participation in situated learning (Lave & Wenger, 1991). However, for this article, the idea of learning as a social and relational transaction between persons as developed by Lev Vygotsky – described as the Mozart of psychology (Toulmin, 1978) – was selected as offering the most promising theoretical perspective. From Vygotsky's writings, two ideas in particular were chosen as conceptual resources that could offer some insight into the learning activities in the teach-in. Firstly, the teach-in could be viewed

as a cluster of *multiple, overlapping Zones of Proximal Development (ZPD)* where participants act successively as both teachers – or, to use Vygotsky’s language, “more capable peers” – and as learners for other teach-in participants. Secondly, the teach-in as a form of adult learning was oriented by the guiding principle that learning about global warming and the ways in which we can take action as a global community best emerge from within a social context that is fundamentally *relational, dialogical, and interactional*.

In the development of his thought and practices, Vygotsky placed both of these notions at the heart of his own work as an educational and cultural psychologist. Newman and Holzman (1993) insist that Vygotsky forged linkages between his science as a psychologist and his educational practices as a political and social critic, highlighting the many ways in which he initiated and utilized ZPDs as *tools of social change* in his own life with individuals in a variety of settings and social networks, first as a youth facilitator, and later as an adult educator. The spirit of social change is a thematic thread that transverses and pervades Vygotsky’s practices as well as the learning models in the environmental movement, such as the teach-in. The intent of the teach-in is to facilitate the emergence of engaged action and sustained commitment in combating global warming through social change in the form of environmental citizenship. It should also be noted that insights from Vygotsky’s thinking regarding the cultural/economic context as well as the social and material forces underpinning the teach-in and comparable models of ecological learning could be helpful in highlighting the limits of these models as tools of social change, a question for which the environmental justice movement (Gosline & Teelucksingh, 2008; Hossay, 2006; Athanasiou & Baer, 2002) would provide some crucial perspectives.

Finally, this article will conclude with some reflections on the challenges and opportunities that the movement against global warming faces as it seeks to develop and refine its educational and political advocacy activities as a means of fostering ecological literacy, environmental citizenship, and committed social action. Given the urgency and magnitude of the ecological crisis that we are facing as a species on Earth, what possibilities for facilitating the emergence of environmental citizenship lie within the practices of the teach-in, and what further developments could be made to enhance its effectiveness?

THE TEACH-IN ON GLOBAL WARMING AS A SOCIAL MOVEMENT

We cannot win this battle to save species and environments without forging an emotional bond between ourselves and nature as well – for we will not fight to save what we do not love. (Gould, quoted in Orr, 2004, p. 140)

The development of the teach-in on global warming as a network

The event described above was one of over 1,900 teach-ins that took place on January 31, 2008 (or in Canada at the beginning of February) across North

America as part of a network called *Focus the Nation*. This network of public educators has developed as a social movement in its own right, even though it is clearly part of a larger series of a diversified and variegated cluster of over a million social movements which have emerged centered on advocating and educating for environmental sustainability and social justice (Hawken, 2007). With an organizational staff led by environmental economist and activist Eban Goodstein (1999, 2007, 2008), the network initially focused its organizational efforts on universities and schools, but found that their proliferating web of locally organized teach-ins spread like a virus deep into the community, both into local organizations and worksites, and most robustly, through the structures of diverse religious groups across the United States.

Historically, the teach-in movement that coalesced in the *Focus the Nation* network over the last two years emerged from an earlier and more modest organization called the Green House Network, founded in 1999 by Goodstein – an ecological economics professor at Lewis and Clark College in Portland, Oregon – and a fellow public educator, Matthew Follett. In his critical appraisal of what he calls “compromised activists” in the movement against global warming, Gelbspan (2004) offers a favourable assessment of the Green House Network (pp. 140-141). In organizing these educational events for climate change activists, Goodstein (2007) consciously drew on the collective experience of the civil rights movement regarding the centrality of learning in building a robust social movement, including his own family’s experience with the Highlander Centre near Sewanee, Tennessee that provided education and training to civil rights activists such as Rosa Parks and Martin Luther King Jr. (pp. 89-91). By focusing on offering a series of intensive three-day educational workshops for students, educators, and community leaders across the US, the Green House Network provided a learning experience for these community leaders, facilitating a return to their communities to offer their own educational events to galvanize social action against global warming.

In its three years of operation, the Green House Network trained almost 250 activists in thirty states (Gelbspan, 2004, pp. 140-141; see also Goodstein, 2007, p. 7). The community-based leaders who had “graduated” from these training events organized more than 600 educational events in 30 states. In so doing, the “network has contributed to a remarkable proliferation of climate groups over the last decade... both informing and inspiring individuals, congregations, campus groups, and local organizations around the country to begin to take action on the climate crisis” (Gelbspan, 2004, p. 141). By the end of this initiative, the Green House Network had equipped a total of over 500 community leaders with foundational tools: a *conceptual* framework, a *community* of practice and activism, and the *pragmatics of organizing* a movement centered on combating climate change (Goodstein, 2007, p. 91).

In 2006, Dr. James Hansen, one of the more respected climate scientists, and Director of the NASA Goddard Space Center at Columbia University, issued a startling statement in an interview on global warming. Hansen warned that we

have to stabilize emissions of carbon dioxide within a decade, or temperatures will warm by more than one degree. That will be warmer than it has been for half a million years, and many things could become unstoppable. If we are to stop that, we cannot wait for new technologies like capturing emissions from burning coal. We have to act with what we have. This decade, this means focusing on energy efficiency and renewable sources of energy that do not burn carbon. We don't have much time left. (Hansen, 2006, quoted in Goodstein, 2007, p. 137)

It was this statement of urgency on the part of Hansen that precipitated the emergence of *Focus the Nation* as a national network facilitating the planning of educational symposia in centers and organizations. This “red alert” signal which spread through the public coincided with other warnings arising in the scientific community – the rapidly melting ice in the Arctic and Antarctic regions being just one striking example (see Homer-Dixon, 2007) – regarding the fact that the changes in the environment resulting from global warming were exceeding even the most pessimistic predictions of the Intergovernmental Panel on Climate Change (IPCC). There was, of course, already a rising groundswell of climate change activism and education that preceded this turning point in 2006, as many groups had been preparing the foundations for a large-scale social movement for several years.

For Goodstein – the Project Director for *Focus the Nation*, its predecessor, the *Green House Network*, and its present successor, *The National Teach-in on Global Warming Solutions* – the motivation for organizing did not spring from merely an intellectual apprehension of the scientific evidence regarding climate change and its threat to both human society and the Earth's biosphere. Rather, for Goodstein, his commitment to combating global warming proceeded from a deep affection for life on Earth, or what the Harvard biologist, E. O. Wilson (1984), calls *biophilia*, an innate tendency within human beings to affiliate themselves with life. In a telling introduction to his book, Goodstein (2007) reveals how his partner perceived the absence of his “heart” in the “languishing” first draft, and encouraged Goodstein to rewrite the book so that it was animated by his own deep biophilic attachment to the Earth as well as his sense of grief and sadness regarding the environmental losses – both present and future – that we are facing. This component of developing and deepening one's sense of attachment to the environment and the biotic community of life within it is a key component of learning and ecological literacy for both the environmental movement in general (Orr, 2004, p. xiv), and the movement against global warming (Isham & Waage, 2007, pp. 55, 179, 240).

On January 31, 2008, organizers in the network enacted mini-symposia involving persons from diverse backgrounds sharing their personal concerns about

climate change, followed by dialogue regarding proposed solutions to global warming. In the evening, political round tables involving the participation of elected officials from municipal, state, and federal levels encouraged the formation of links between the personal experience and professional solutions shared by participants, and the need to translate these discussions into public policy and political advocacy. In his account of the teach-in as a public educational experience, Goodstein (2007) outlines the three operative principles of each local teach-in: 1) honour the *complexity* of the global warming issue, 2) engage individuals from *diverse backgrounds*, encouraging them to interact with each other, and 3) support and encourage all participants to act and to develop their role as *public educators* (p. 139).

THE TEACH-IN AT THE UNIVERSITY OF CALGARY: AN ILLUSTRATION

The teach-in on global warming as a reflecting process

At the University of Calgary, organizers drew on a format of adult education called “reflecting processes,” originally a clinical practice derived from family therapy (Andersen, 1987, 1992) where a reflecting team listens in on a conversation of a family and therapist from behind a one-way mirror, subsequently offering reflections on the family’s discussion. In the third stage of the reflecting process, the originators of the conversation – the family and therapist – reflect on the reflections of the reflecting team. Such a format of a three-stage structure of listening and talking has been adapted as a learning tool for a variety of adult educational contexts, including the education of counsellors (Lysack, 2003) and social workers (Woit & Brownlee, 1995).

Two features of reflecting processes were visible in the teach-in on global warming. First, the teach-in adapted the *tri-partite structure* of talking-listening-talking in the reflecting processes. In this format, a primary presentation or “text” was enacted by three presenters while other participants in the teach-in listened. This was followed by multiple conversations in small groups of the listeners as “outsider witnesses” who highlighted the ideas in the presentations that resonated with them. Finally, the original presenters selected the themes that captured their imagination as they listened in on the small group discussions, sharing these reflections with the entire group. This three-fold structure was intended to enhance *deeper listening between* the participants, to facilitate a greater movement between *listening and talking* on the part of each person, and to encourage a rhythmic interaction between *inner speech and outer word* for each participant (Emerson, 1983). This three-fold format was also intended to privilege talking-in-order-to-listen, rather than listening-in-order-to-talk, and to support interactive processes where a multiplicity of meanings are generated and “laminated” together as the listening and sharing in the teach-in continued.

Rather than the teach-in simply consisting of a collective iteration of facts about climate change, it was important for the teach-in as a reflecting process to focus

upon the dialogic interaction of the *personal responses* of each participant to the responses of other participants within a *community* of concern. The goal of this orientation to personal responses was to encourage the emergence of not only of a greater *awareness* of the urgency of global warming and the potential solutions offered by others, but also to facilitate the development of a deeper sense of personal and collective *agency* on the part of each participant. In other words, the teach-in's emphasis on personal and collective responses was intended to foster the emergence of both engaged *ecological literacy* (Orr, 1992, 2004) and *environmental citizenship*, i.e., political advocacy and civic participation in democratic structures in order to advance environmental causes and to take action to protect the ecosphere from the impacts of climate change. While there is a growing proliferation of books on approaches to cultivating ecological literacy (Bowers, 1995; Orr, 1992; O'Sullivan 1999; O'Sullivan & Taylor, 2004), it is still the case that we "know very little about the cognitive origins of ecological learning and biosphere perception" (Thomashow, 2002, p. 193) As the activities within a social movement are intended in part to be a "vehicle for public education, social engagement and political pressure," Meyer (2007) argues that the intentionality of those who facilitate the learning that takes place within a movement – such as the teach-in network on global warming – is strongly vectored towards maximizing the degree of mobilization and readiness for public action on the part of the members of that movement (pp. 452-453).

The teach-in at the University of Calgary

Given that the Teach-in on Global Warming was the first to be organized at the University of Calgary, there was no previous experience upon which the organizers could draw in their planning of the event. Documents posted on the *Focus the Nation* website (www.focusthenation.org) offered substantial guidelines, such as an outline of the goals and objectives of the teach-in, an interdisciplinary model for structuring the event, and other supplementary resources for would-be organizers. Invitations to present were circulated by email for a few weeks prior to the teach-in, highlighting that the teach-in did not require presenters to be scientists or climate researchers, but that one only need be a citizen who was deeply concerned about a public policy issue. It was hoped that such an educational philosophy for the teach-in would serve to relieve anxiety and ease the pressure of expectations on the part of presenters. The invitation for presenters was distributed primarily through the key organizer's electronic listserves and networks, supplemented by several other networks both within the university and through organizations external to the institution in the community.

The focal point of each presentation was two-fold, and each posed in the form of a question:

- 1) the personal response and lived experience of the presenter to the crisis of global warming (What concerns you the most about global warming?), and
- 2) the pragmatic contributions that were available by way of innovative responses and possible solutions to combat climate change, aiding in the transition to a society based on renewable forms of energy and a respectful relationship with the Earth. (What resources or possible solutions does your own profession offer to combating climate change and moving to a more sustainable society?). Participants were asked to limit their presentations to a maximum of ten minutes, encouraging the emergence of a sharp focus on the part of all presenters.

As a result of three “calls for presenters” circulated through email networks for a period of three weeks, a total of fourteen individuals offered to present. On the basis of their order of application, twelve of these candidates were selected to participate in the teach-in as actual presenters, with attention devoted to making sure that students as well as faculty were represented, and that there was a balance in terms of professional background. Seven different professional backgrounds were represented in the range of prospective presenters: social work, education, biology, business, environmental design, religious studies, and veterinary medicine. The presenters were organized into triads of speakers so that no two professional backgrounds were duplicated in a one-hour block. The topics for the Teach-in consisted of a wide diversity of issues: A Prosperous Solution; Building and Climate Change; Potential Impacts of Climate Change on Polar Bears; Social Justice and Climate Change; How a Diverse Group of Students from Calgary’s Post-Secondary Institutions are already Taking action on Climate Change; Environmental Stewardship: Prairie Conservation and Climate Change; Social Work, the Environment, and Disfluency: Why Social Workers have Trouble talking about the Environment; Creating Political Will; Business Strategies for a Warming World; What is Climate Change doing to the Energetic Costs of Arctic Breeding Shorebirds; Earth as Sacred Trust: The Ramifications of Ethics and Faith; and Métis Observations from Rural/Northern Manitoba.

The three presentations were followed by small-group reflections for a 20 minute period while presenters listened in (but did not participate in) the dialogue. Subsequent to the small group discussions, a five-minute block was devoted to an opportunity for the three presenters to offer brief reflections. The final five minutes of each hour-long block of the teach-in was for participants to transition in and out of the room in which the teach-in was located, allowing individuals to enter or to exit the learning event without disruption. Over the course of the four hours of the teach-in which began at 12 noon and concluded at 4 pm, a total of over 150 participants participated in the event, ranging in age from late teens/early twenties to retired individuals from the community in their sixties and seventies. The average number of participants

in each of the four one-hour blocks that made up the teach-in varied from 34 to 55 learners.

The evaluation of participants of their experience of the teach-in

Although no formal evaluation of the teach-in was completed, the comments informally shared with organizers by participants were very positive. Participants described how they believed that the teach-in had enabled them to see new connections between issues and solutions, as well as to deepen their sense of being empowered to voice their concerns on global warming to families and colleagues more frequently and with greater confidence. For instance, one young adult with a background in engineering and psychology commented that the “teach-in created bigger linkages for me. I found courage to speak out more about the environment from a personal level” (Dulaney-MacNicol, 2008, p. 2). Another young adult appreciated the multiplicity of perspectives that the teach-in generated in the course of the afternoon. She found that each “discipline brought something different to the overall picture, and listening to the scope of solutions that were offered made quite an impact” (Dulaney-MacNicol, 2008, p. 2).

Yet another adult participant (Perdue, 2008), the director of the Office of Sustainability at the University of Calgary, suggested that the teach-in reminded her of a social space or arena for the expression of “public worry” about global warming, adding that she was struck by what she experienced as a slow, incremental, and “mysterious” emergence of hope as each stage of the teach-in unfolded throughout the duration of the afternoon. This image of the activities within the environmental movement being a crucial public space or “echo chamber” for communal expression and witnessing of fears and hopes regarding global warming has been echoed by other environmental activists, such as writer and activist, Bill McKibben (Isham & Waage, p. 4; see also McKibben, 2007) in his perception of the dynamics of the global warming network, Step It Up (McKibben et al., 2007) – now morphed into the international network to combat global warming, 350.org.

THE TEACH-IN ON GLOBAL WARMING: A VYGOTSKIAN PERSPECTIVE

[Vygotsky] gives language both a cultural past and a generative present, and assigns it a role as the nurse and tutor of thought. (Bruner, 1986, p. 145)

The teach-in as multiple zones of proximal development

Perhaps Vygotsky’s most famous notion bequeathed as a legacy to education is his notion of the Zone of Proximal Development (ZPD), an idea that is emblematic of Vygotsky’s understanding of learning as a relational interaction. Vygotsky (1978) defines the Zone of Proximal Development as being “the distance between the actual developmental level as determined by independent problem

solving and the level of potential development as determined through problem solving under adult guidance or *in collaboration with more capable peers*" (p. 86, emphasis added). Although Vygotsky developed this idea specifically regarding the learning of children in a structured school environment, the notion of the ZPD could also be utilized to understand the teach-in process as involving multiple, overlapping zones of proximal development for each participant in the activity, whether they are the original presenters or participants in the teach-in event. Vygotsky's reference to "more capable peers" is suggestive of participants in the teach-in, where they successively and interchangeably act as more capable peers with each other.

For Vygotsky (1978), learning "presupposes a specific social nature and a process by which children grow into the intellectual life of those around them" (p. 88). This image of growing into the intellectual life of those around them could function as a metaphor for understanding the teach-in as a cluster of simultaneous learning processes, where the semiotic meaning-making process is transacted within a dialogic "space" of intersubjectivity. Bruner (1986) drew comparisons between the ideas of Vygotsky and psychological research with respect to the activity of tutoring, where learning is described in this setting as facilitating learners to develop a "vicarious consciousness." Bruner suggested that the learning process in this tutorial relationship could be perceived as an event where the learner "borrows" the awareness of another person, or where the student transacts a "loan of consciousness" from the tutor (pp. 74-78).

Bruner's notions could be one way of understanding this notion of "growing into the intellectual life of others" in a manner that is useful in describing the teach-in as a form of adult learning. I would conceptualize the teach-in as being a series of multiple and reciprocal "loans of consciousness" between the presenters and the members of the teach-in event. The teach-in as a reflecting process could be viewed as a collectivity of vicarious consciousnesses, one of whose purposes is to facilitate the emergence of new co-emerging personal and relational knowledges regarding global warming and possible responses to climate change. The "intellectual life" into which a person grows is not a fixed attribute of a presenter in a hierarchical relationship with other participants in the teach-in, but rather is a fluid quality of the process that moves and shifts around the teach-in as members share in the discussion groups. In one moment, a person may be a "tutor" or facilitator who "loans a consciousness" to another teach-in participant who is listening in on the dialogue. In another moment, the same person may be a "learner" from another member of the teach-in who "loans their consciousness" in facilitating learning.

Vygotsky's sociogenesis: Emergence of human awareness in relationship

Vygotsky conceptualized the human person not as an isolated individual - a discreet being whose meaning is construed in reference to itself - but rather as a being-in-relation within a larger interactional context. The genesis of hu-

man consciousness is not *sui generis*, or self-generative, but emerges out of a network of relationships in a social and cultural context. Vygotsky (1986) insists that “the true direction of the development of thinking is not from the individual to the social, but from the social to the individual” (p. 36). In one of Vygotsky’s (1978) best-known quotes, he describes the internalization of higher psychological functions in children.

An interpersonal process is transformed into an intrapersonal one. Every function in the child’s cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological), and then inside the child (intrapsychological)... All the higher functions originate as actual relations between human individuals. (p. 57)

This idea of *sociogenesis* was a key feature in Vygotsky’s first public presentation which he gave at the Second All-Union Congress of Psychoneurologists in Leningrad in 1924. Vygotsky (1979a) concludes this inaugural talk by referring to the sociologization “of all consciousness, the recognition that the social dimension of consciousness is primary in time and in fact” (p. 30). Vygotsky (1979a) proposed that we

are aware of ourselves in that we are aware of others; and in an analogous manner, we are aware of others because in our relationship to ourselves we are the same as others in their relationship to us. I am aware of myself only to the extent that I am as another for myself. (p. 29)

Elsewhere, Vygotsky (1989) writes that we “become ourselves through others” (p. 56). “Any higher mental function was external because it was social at some point before becoming an internal, truly mental function. It was first a social relation between two people” (1979b, p. 162). Drawing on these ideas of Vygotsky, we could begin to understand how the teach-in, as a set of interpersonal relationships and interactions in a learning context, could be a generative event for participants. Vygotsky (1979b) writes: “We could therefore say that it is through others that we develop into ourselves and that this is true not only with regard to the individual but with regard to the history of every function” (p. 161). In this way, Vygotsky views a human being as a social person, “an aggregate of social relations, embodied in an individual” (1989, p. 66).

If we translate Vygotsky’s notion of sociogenesis – individual awareness emerging out of social relationships and interpersonal interaction – into an adult educational context such as a teach-in on global warming, it is possible to interpret the development of the thinking and awareness of a teach-in participant as a process of emergences from systemic and social interaction with other participants. Through mutually interactive processes of listening, talking, and reflecting, a teach-in participant would be influenced and *in-formed* by the dialogue that is transacted between participants. At the same time, each participant would also *act upon* others as a formative influence as they engaged with the conversations during the teach-in.

Vygotsky's foundational notion – an individual becomes aware through dialogical interaction with others in a learning environment and social network – is a thematic thread that also runs through the literature of the movement against global warming. For instance, Isham and Waage (2007) insist that it is only through the “process of face-to-face persuasion and collaboration” that a vibrant social movement may develop (p. 19). Other climate change activists suggest that organizations and groups that privilege listening and consultation as part of their ongoing processes facilitate the emergence of a new vision of key eco-social values, mobilize resources within the networks, and generate both organizational and individual learning (Doppelt, 2007, pp. 169-181).

CHALLENGES AND OPPORTUNITIES

[W]e must make the rescue of the environment the central organizing principle for civilization. (Gore, 1992, p. 269)

A critical question remains unanswered for the movement against global warming: what are the most effective learning processes that encourage ecological literacy to deepen into environmental citizenship and committed action? This issue is not merely an academic conundrum, but is a priority concern for this movement if it is to motivate the general public into taking decisive action in transitioning from a carbon-intensive economy to a society centred upon renewable forms of energy and a benign relationship with the environment. The time frame for making crucial changes as a global community is a very modest one at best – perhaps as short as ten to twenty years if we are to avoid the severe consequences of global warming – as even the most dire predictions of the IPCC are overtaken by the accelerating rate of climate change presently occurring. While our political leaders continue to dither and fail to provide any significant leadership on climate change, many in the scientific community – Hansen being only the most visible proponent among many scientists of this position – have intensified their communication with the general public about the imminent crossroads that we face as a human species on Earth regarding global warming within the next decade or so.

The challenge of building a public consensus for making a qualitative re-orientation of our global culture and economy is exacerbated by the emotional responses of the public to the crisis in the global North. Some activists have argued that many “people walked out of *An Inconvenient Truth* feeling disempowered, not empowered, which is why the June 2006 Pew survey found that global warming remains far down the list of the public's priorities” (de Kirby et al., 2007, pp. 65-66). Other researchers have proposed that knowledge or “information alone is not sufficient to produce behaviour change” (Moser, 2007, pp. 85-86; see also p. 65; see also Moser & Dilling, 2007), pointing to research that suggests that while a “majority of Americans judge climate change to be serious or very serious, only one in three is *personally* concerned

or worried” (p. 86). Thomashow (1996) suggests: “Some of us become psychologically numb as we become accustomed to the litany of environmental bad news. Others experience fear and anger, are outraged by the social and environmental injustices that plague the planet. Sometimes people just tune out and ignore or avoid the negative images, rationalizing their inaction, practicing denial and apathy” (p. 143). As our awareness of the magnitude and complexity of the environmental crisis increases, so does the temptation to take refuge in avoidance, denial or defeatism, thereby eviscerating the ability of a social movement to nurture individuals into a heightened sense of motivated environmental citizenship.

Public education regarding global warming needs to achieve more than a simple transfer of information. It is necessary to provide the conditions for individuals and communities to complete the transition to being committed environmental citizens, engaged with protecting the planet’s climate and ecosystems, and actively advocating for substantive socio-economic and ecological change. In a manner reminiscent of the civil rights movement, educational work was an important dimension of the climate change network’s activities from 2001 to 2006 in the “ripening conditions” of this social movement, and became pivotal in its emergence to a full-scale social movement in 2005 (Finley, 2007, pp. 42, 48). In developing public support among citizens in the global North, public education activities on the part of the movement against global warming will be essential (Finley, 2007, pp. 51, 78).

The movement for combating global warming must also provide a sense of *communal belonging* by tapping “into this yearning for community, the moral sense of responsibility that goes beyond one’s small self-interest” (Moser, 2007, p. 81; see also Bateson, 2007; Lysack, 2007). Here the insights of Vygotsky that authentic learning is inherently social and relational in quality is a valuable resource for the climate change movement, and specifically educational networks such as the Teach-in on Global Warming. This sentiment is echoed by Orr (2004) who insists that a relationship (or ZPD) with another person – for example, an ecologically literate adult with children – is critical for cultivating their biophilic capacities and their intrinsic tendencies to affiliate with life, a capacity foundational for sound ecological literacy and environmental citizenship (p. 143; see also 1992, p. 88). In like manner, the Teach-in on Global Warming movement has recognized the inherent value of creating ad hoc communities of ecological learning for those concerned about the impacts of global warming through the organization of teach-in activities in a variety of community settings, all focusing on what each individual would like to protect most from the consequences of climate change.

In order to transcend the narrow self-interest of the individualism inculcated by our present global culture, the climate change movement also faces the challenge of facilitating the deepening of the importance of civic engagement and

participation through enabling individuals to connect their love or *biophilia* of the natural world with an increased sense of the centrality of political advocacy. For some time, conservationists as early as Aldo Leopold (1966) have perceived the efficacy of “biological education as a means of producing citizens” (p. 208) as a countervailing force over and against the hegemony of the dominant industrial culture that privileges individualism and rights over citizenship and responsibility (Orr, 2004, p. 32; see also Grotzer & Lincoln, 2007).

The teach-in movement offers an innovative and promising approach to creating communities of learning and empowerment directed towards enhancing committed social action to combat global warming. At this crossroads of history, it is our love for the Earth and our attachment to the remarkable diversity of life that encompasses the planet that will be the energizing force to equip us for this turning point in history. If our love of life on Earth is true, we will act to defend it and to protect the life around us. For as Wendell Berry (2000) reminds us with a certain vigour: “We know enough of our own history by now to be aware that people *exploit* what they have merely concluded to be of value, but they *defend* what they love” (p. 41).

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