



Transformative Learning, Systems Thinking and Behavior Change: Northwest Earth Institute's Pedagogy for Sustainability

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Abstract

Education has historically functioned to reproduce society and societal systems, but sustainability education aims to follow a new path: to re-create society and shape human systems and approaches to the rest of nature that are just, equitable, and regenerative. Instead of continuing to educate for the current environmentally and socially degrading global marketplace, education can transform and renew society by helping citizens discover new ways of thinking and being and by modeling collaboration and critical thinking. In so doing, educational institutions can shift our current destructive and unsustainable societal paradigm to one that is creative and life-sustaining. In essence, sustainability education aims to transform students into leaders who are critical thinkers and active doers.

This paper connects transformative learning, systems thinking, and behavior change concepts and research, demonstrating how each component is integral in implementing effective environmental and sustainability education. The paper also highlights Northwest Earth Institute's pedagogy for sustainability, rooted in 25 years of experience offering environmental education and engagement programs.

At Northwest Earth Institute (NWEI), we believe the solution to the planet's biggest challenges lies in the power of collective action. NWEI's mission includes helping people who already care about the environment figure out new ways to take meaningful action in their lives, educational institutions, businesses, communities, and in the world at large. We connect transformative learning with behavior change, leading people from awareness to new knowledge to transformation to action. Our aim is to offer resources that advance the shift from ecological knowledge to social action. We believe in making change more possible, more social, and more rewarding by helping people connect with their communities and take action, together. By connecting people with those around them, we start the shift from individual behavior change to broader cultural change. We see cultural change as absolutely essential in creating a more sustainable world.

While many people claim that they care about specific or general environmental issues, their behaviors do not often align with their expressed environmental values. People often have strong desires to live more sustainably, but find changing their behaviors to be much more difficult than their desire would suggest. In this paper, we explain why behavior change research is important in the context of transformative learning and environmental education, what behavior change theory offers, and how NWEI uses behavior change theory as well as transformative learning concepts and systems thinking tools in our environmental education and engagement programs.

The environmental challenges faced today are highly complex. There is a high degree of uncertainty in how humans will respond to the challenges and opportunities present. Individual transformation as well as broader culture change is necessary in reinventing our relationship to the natural systems that support us. NWEI has created an effective pedagogy for social responsibility and agency by integrating transformative learning practices, participatory and peer-to-peer models of engagement, a systems thinking approach, and behavior change research. Our ultimate goal is to increase awareness that leads to fully engaged social action.

Transformative Learning and Systems Thinking: NWEI's Pedagogy for Sustainability

Educational institutions educate and prepare the citizens, policy makers, teachers, business people, and molders of opinion of today and the future. While the ideas of sustainability education have gained significant interest in many parts of the world, educational institutions have accomplished little toward the transformation of academic culture called for by key sustainability education advocates (Sterling, 2002). In fact, most education today still “contributes daily to unsustainability” and “does little to sustain the 'whole person' – spirit, heart, head and hands” (Sterling, 2002, p. 12).

Education has historically functioned to reproduce society and societal systems by educating students to live in the world as it currently is. Sustainability education is founded on the recognition that the socio-cultural and economic systems humans have created are not currently sustainable. Our current human systems are unjust, inequitable, and degrading to the natural world. Sustainability education thus aims to follow a new path: to re-create society and shape human systems and approaches to the rest of nature that are just, equitable, and regenerative by educating students to both critique and transform current systems. Instead of continuing to educate for the current environmentally and socially degrading global marketplace, education can transform and renew society by helping citizens discover new ways of thinking and being and by modeling collaboration and critical thinking. In so doing, educational institutions can shift our current destructive and unsustainable societal paradigm to one that is creative and life-sustaining. In essence, sustainability education aims to transform students into leaders who are critical thinkers and active doers.

Because of its different aim, sustainability education requires different teaching methods than old educational models. The connection between transformative learning and sustainability education is a well-established theme in literature about sustainability education (Pigem, 2007; Haigh, 2006; Sterling, 2004). Building on this emergent connection, UNESCO's 2017 publication on *Education for Sustainable Development Goals: Learning Objectives* acknowledges that “ESD is holistic and transformational education” and that ESD “asks for an action-oriented, transformative pedagogy” (UNESCO, 2017, p. 7). Transformative learning is centered on “the notion of recreating underlying thoughts and assumptions about the systems, structures, and societies that we are part of” (Moore, 2005, p. 86). Through critical reflection, participants make visible their invisible assumptions about the way the world works and their places in it. In short, “transformative learning develops autonomous thinking (Mezirow 1997, p.5).” The goal of transformative education is to empower individuals to change their perspectives, and the educator's role is to create an environment that is supportive and open to critical self-reflection.

Transformative learning requires practitioners to take risks, be willing to be vulnerable, and possess openness to having their attitudes and assumptions challenged. Within this paradigm of learning as change (as opposed to learning for acquisition), learning is understood as a creative, participatory, and reflexive process, and knowledge is recognized as approximate, provisional, and relational (Kelly, 2010). Because transformation cannot be taught but must be learned, the role of the educator in transformative learning is to create the space for critical reflection and transformation to occur (Cranton, 2002).

However, it is important to remember that because of the deconstruction necessary for worldview transformation, transformative learning can be both threatening and regenerative. Creating safe trusting spaces is essential to allow for greater risk taking and transformation that is hope-based, renewing and regenerative (Kelly, 2010). The constraints of formal classrooms and assessment methods can make true transformative learning difficult. If participants do not possess the necessary reflection skills, transformative learning can be frustrating, awkward, and scary. However, Mezirow suggests that a certain amount of discomfort is needed in order to undergo transformation in our understanding (1997).

Transformative learning involves experiencing a deep, structural shift in the basic premises of thought, feelings, and actions. It is a shift of consciousness that dramatically and irreversibly alters our way of being in the world. Such a shift involves our understanding of ourselves and our self-locations; our relationships with other humans and with the natural world; our understanding of relations of power in interlocking structures of class, race and gender; our body awarenesses, our visions of alternative approaches to living; and our sense of possibilities for social justice and peace and personal joy (O'Sullivan, 2003).

It is important to remember that as students are learning about complex and complicated issues and deconstructing their own assumptions and worldviews, the learning environment should remain a safe place to express feelings, be vulnerable, and ask questions. Students need to be able to look for solutions and opportunities for positive action or to make change. Otherwise, sustainability education and transformative learning become processes devoid of hope, and students become apathetic and cynical.

Theory: Systems Thinking

Systems thinking is a foundational concept in sustainability education and shares many of the components of transformative learning, particularly the focus on making visible the invisible assumptions we have about the world. The term *systems thinking* broadly refers to a way of approaching the world that asks how various elements within a system — which could be an ecosystem, an organization, or something more dispersed such as a supply chain — influence one another. Rather than reacting to individual



Figure 1: NWEI's Iceberg model for systems thinking

problems that arise, a practitioner of systems thinking will ask about relationships to other activities within the system, look for patterns over time, and seek root causes.

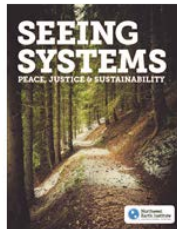
One systems thinking model that is helpful for understanding global issues is the Iceberg model. We know that an iceberg has only 10 percent of its total mass above the water while 90 percent is underwater. But that 90 percent is what the ocean currents act on, and the iceberg demonstrates the influence of those forces at its tip. Global issues can be viewed in this same way. The Iceberg model helps practitioners understand the complexity of global issues, as well as the different 'leverage points' at which one can intervene to change a system or address an issue using systems thinking.

A key part of this model is the deepest and most challenging level of systems thinking: transforming mental models. Mental models are the attitudes, beliefs, morals, expectations, and values that allow structures to continue functioning as they are. These are the beliefs that we often learn subconsciously from our society or family and are likely unaware of. Practicing systems thinking allows practitioners to see the patterns and structures behind the more visible events and crises in our current social structure. Transformative learning aims at the deeper levels of the Iceberg, helping practitioners identify their own invisible mental models, deconstruct them, and then consciously reconstruct them through a process of engaged evolution.

Methodology: Northwest Earth Institute's Model Uses Transformative Learning and Systems Thinking

Tools: Discussion Course Books

- Solutions-based, reflective pedagogy rooted in transformative learning & behavior change theory
- Inquiry-based, participatory learning
- Additional resources, action planning tools and real-world action assignments



Northwest Earth Institute (NWEI) is a 501(c)3 sustainability education nonprofit founded in 1993 with the mission of “inspiring people to take responsibility for Earth.” NWEI offers a catalog of programs that encourage systems thinking and inspire participants to make positive change in their own lives.

Our Discussion Courses are self-facilitated in small groups by people in organizations -- students, employees, church congregants, or community members. Discussion Courses feature content

focused on a particular sustainability issue, suggested discussion questions and activities, and action plans to help people move forward in addressing what is important to them. Discussion Course participants meet once a week for each session, talk about their relationship with the planet, and share in discovering new ways to live, work, create and consume.

Tools: Online EcoChallenge

- Create or Join a Team
- Choose your Challenge
- Invite Others
- Take Action
- Track Impact



The EcoChallenge is a free two-week online program that gives people the tools and inspiration to change their habits and reduce their impact on Earth. EcoChallenge participants can choose actions from nine different sustainability-related categories. A participant joins or leads a team,

earns points for taking action, shares their story, and encourages other participants in their new behaviors through an online social networking platform that was custom-built for NWEI.

All of NWEI's programs are centered around three important elements of transformative learning: collaborative discovery (*connect*), personal reflection (*reflect*), and opportunity for action (*act*). These can be incorporated into many different kinds of education and classroom experiences.

Connect: Shared Discovery

An important aspect of Northwest Earth Institute programs is the collaborative construction of knowledge—what sustainability looks like in our current context is an unknown, and requires the participation of people from all levels and experiences. Program participants bring their own unique experiences and perspectives to the learning process and share their insights and knowledge with each other. Together, they construct an idea of what sustainability means for them in their time and location. This collaborative learning process is rich and social—we have found that learning is easier and more fun when it happens as a community. More than 90% of surveyed Northwest Earth Institute Discussion Course participants report that the group process and support inspired them to make personal changes. Together, participants discover new ways to live, work, create and consume that make sense for who they are and where they live.



Figure 2: NWEI's pedagogical process

Reflect: Personal Reflection

A second key component of Northwest Earth Institute programs is personal and critical reflection. By reflecting on their own values and experiences, participants understand themselves, their peers, and their world better. The critical aspect is vital to transformation—participants must become critical of their own assumptions in order to transform their unquestioned frame of reference. NWEI Discussion Courses encourage transformative learning by posing questions targeted at personal and critical reflection. Some examples:

- We read in this session about how the American standard of living is dependent on moving our environmental costs elsewhere. Can you think of a specific way that the consequences of your consumption might be shifted elsewhere? Explain. (from *Seeing Systems*)

- Consider Marion Nestle’s outline of seven strategies food companies use to encourage us to eat more. Which of these, if any, are you most influenced by? (from *Menu for the Future*)
- David Orr contends that our innate “biophilia” is the best hope for our future, as opposed to technological cleverness or abstractions about progress of one kind or another. How do you respond to this? (from *Reconnecting with Earth*)
- When looking at our society’s reaction to climate change, where have you observed the “split between what we think and what we do” that Michael Pollan mentions? How does this split play out in your own life? (from *Change Is Our Choice: Creating Climate Solutions*)

Act: Positive Action

NWEI programs are designed to facilitate community and relationship development. When program participants have built-in support from their own community of change, taking action feels easier and more rewarding. Taking action encourages feelings of inspiration and empowerment, an important antidote to the feeling of being overwhelmed that commonly occurs when presented with new and challenging information about the current crises we face.

Participants are encouraged to start where they are, with small actions that make sense in their own lives. From changing an incandescent light bulb to an LED bulb, to divesting from fossil fuels in their portfolios, to planting a garden, participants take small and achievable steps toward sustainable living. Collectively, those steps lead to real impact, as demonstrated in Figure 3. The reward of feelings of accomplishment and satisfaction help participants feel encouraged to make more positive actions and engage in positive lifestyle change. NWEI programs lead students from taking small individual actions to taking larger collective action in their communities and circles of influence. Participating in social action can lead to critical reflection (Mezirow, 1997), which closes the loop on NWEI’s pedagogical model (see Figure 2 above).

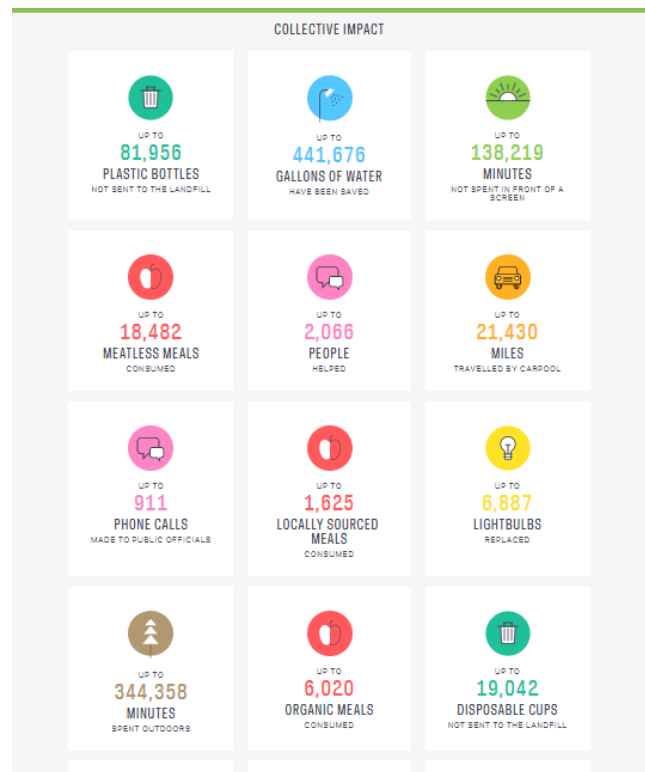


Figure 3: Collective impact of 2016 EcoChallenge

As NWEI programs have evolved, our emphasis on the Action component of our pedagogical model has grown. We have found that getting people to commit to long-term behavior change can be challenging, even when people say they want to make a change.

Behavior Change

When Northwest Earth Institute was founded in 1993, not many people had heard of sustainability, or knew much about climate change. Books and the news on network television largely disseminated information. In “inspiring people to take responsibility for Earth,” one of NWEI’s main goals was to educate people on the urgency of the environmental issues that we faced. Now, more than two decades later, information about climate change, pollution, deforestation, overconsumption, and a host of other environmental issues abounds. A quick Google search offers a deluge of data, opinions, and prompts to action to address these crises. So much information exists, in fact, that it can quickly become overwhelming to figure out how to respond. More information and improved awareness are clearly not enough to change people’s behaviors (Verplanken and Wood, 2006).

While many people claim that they care about specific or general environmental issues, their behaviors do not often align with their expressed environmental values. People often have strong desires to live more sustainably, but find changing their behaviors to be much more difficult than their desire would suggest. Several studies have shown that one’s belief that they should act and their intention to act are often not enough to help a person change an ingrained behavior, or to develop a less convenient or more difficult alternative to the habits they currently perform (Duhigg, 2012; Muraven and Baumeister, 2000; Verplanken and Wood, 2006).

Effective environmental education now requires helping people who already care about the environment figure out ways to take meaningful action in their lives, businesses, communities, and in the world at large. Connecting transformative learning practices with behavior change helps to lead people from awareness to new knowledge to transformation to action. This is a continuation of what we have been doing for over twenty years: making change more possible, more social, and more rewarding by helping people connect with their communities and take action, together.

The environmental challenges faced today are highly complex. There is a high degree of uncertainty in how humans will respond to the challenges and opportunities present. Individual transformation as well as broader culture change is necessary in reinventing our relationship to the natural systems that support us. NWEI has created an effective pedagogy for social responsibility and agency by integrating transformative learning practices, participatory and peer-to-peer models of engagement, a systems thinking approach, and behavior change research. The ultimate goal is to increase awareness that leads to fully engaged social action.

Theory: Behavior & Behavior Change -- A Constellation of Habits

The concept of behavioral change can be more easily understood by thinking about the habits that make up our overall behavior. Habits are more than just frequent actions, though. They can become automatic behaviors when cued or triggered by something else. Changing habits is difficult, even when one believes they should and wants to make a change. Habits become ingrained. Human brains are wired to work as efficiently as possible, and habits help them do that. Habits require minimal awareness and are often difficult for our conscious mind to control.



Figure 4: The cycle of a habit

The best way to change an existing habit is to change the *routine* of the three part cycle. A person can use this information to disrupt and change the routine. While it is much more effective to change existing habits to your desired behavior, you can also consciously form new habits by associating them with your environment. Sometimes the trigger for a habit can be your environment. For example, sitting at your desk may cue Google searches. Sitting on the couch may cue watching Netflix and snacking. Lying in your bed may cue checking Facebook and Instagram on your smartphone. But you can also intentionally create a new habit by associating it with your environment. By altering your environment or context, you have to rely less on **willpower** to change your habits.

It is important to understand that changing habits is not always easy. Recognizing the trigger for your habit and the rewards you need, can help you be prepared for those challenging days, and you can begin to build up your *willpower*. But to compound matters, *self-control* and *willpower* can only get you so far because they are exhaustible resources. When your willpower is used up, your emotional mind does not listen to your rational mind (Heath & Heath, 2010).

For all of these reasons, habits can be annoyingly hard to change, and sustainable behaviors are no exception. There is a variety of interwoven factors at play that typically relate to: 1.) the context of the individual who is trying to change a particular behavior (e.g., age, family, access to sustainable options), and 2.) the ability for that person to practice the sustainable behavior within a setting that mimics the “real world” that they experience every day (which the learning community offered through NWEI programs aims to recreate).

Research has shown that “many environmental educators often make the mistake of focusing specifically on the behavioral outcomes rather than the steps required to reach those outcomes” (Heimlich and Ardoin, 2008, p. 218). If educators are able to focus on “local, tangible, and actionable aspects,” behavioral interventions, especially at the individual level, are most successful (Anderson, 2012, p. 191). By developing simulations that relate to the real-world, providing time to practice, understanding that there is no single solution, and anticipating what

factors can constrain learning a behavior, educators and leaders can help ensure behavior change success for their participants (Brymer and Davids, 2013, pp. 59-60).

Theory: Behavior Change and Systems Thinking

As described above, the Iceberg model offers a framework for different ways to intervene in a system. If you were to view the Iceberg as a representation of an individual's beliefs and actions, behavior change is aimed at the top levels of the Iceberg. Individual actions are still interventions in the system, just at a shallower level. Individual actions collectively have a big impact, but we also need to change policies, structures, laws, and ultimately culture. However, enough encouraged individual actions within an organization can lead to organizational culture change, which can then influence policies, structures, laws and practices. NWEI's approach uses a combination of transformative learning techniques and behavior change theory to leverage change at multiple levels within a system, aiming simultaneously at immediate changes and long-term, deep changes in systems.

Methodology: Behavior Change in NWEI's Programs

At NWEI, we want to make it as easy and as fun as possible for people to change their behaviors in order to lead lives that are better for themselves and for the planet. Our programs have evolved over time based upon what we have seen work well with our participants, as well as established best practices in transformative learning and behavior change research. As a result, NWEI's Discussion Courses and EcoChallenge are built on several key characteristics that have been shown by research to lead to successful behavior change. The programs are: 1) rewarding; 2) social; 3) personally transformative; and 4) sequential by focusing on changing one habit at a time. These four characteristics of our programs overlap, so while they are described separately, it is best to think of these as overlapping and feeding into each other.



Figure 5: Successful Behavior Change Characteristics

Behavior Change Component - Rewarding: Inspiring and Fun

NWEI's messaging focuses on every person having the power to make positive change. This inspiring messaging welcomes all people into multiple larger solutions -- ways of acting that are better not just for themselves, but also for the larger world. Self-control and willpower are both exhaustible resources (Duhigg, 2012; Heath & Heath, 2010). However, research has shown that

by reminding themselves both of their life-values and the specific reasons why they are pursuing their goals, people are better able to sustain the self-control needed to achieve the goals they have set for themselves (Muraven, 2008; Schmeichel & Vohs, 2009). Likewise, if people practice building up their willpower (e.g. through journaling), it can be possible to change habits that might otherwise be quite difficult to change (Duhigg, 2012). By helping participants identify and continually connect to what is important to them – in short, by inspiring them – our programs help participants act in line with their identified values and better sustain behavior change.

Additionally, in order to get a changed behavior to ‘stick,’ the behavior must in some way be intrinsically rewarding (Duhigg, 2012; Muraven, 2008; Unilever, 2011), appealing both to a person’s rational mind and emotional mind (Heath & Heath, 2010). People feel pleasure in reminding themselves of their values and then acting upon those values (Muraven, 2008). Sometimes, this self-affirmation alone is enough reward to motivate behavior change, but often people need additional rewards and reinforcements to be able to sustain a new behavior long enough that it becomes a habit (Verplanken and Woods, 2006). As detailed above, NWEI’s programs help reinforce participants’ commitments to action by grounding them in their personal values. Each of NWEI’s programs offers other intrinsic rewards, including fun through socializing and gamification, and inspiration through the recognition of individual and collective impact.

Discussion Courses are Rewarding, Inspiring, and Fun

NWEI’s Discussion Courses focus on personal values and self-reflection to help participants ground their commitment to action in what is most important to them (e.g. food, climate change, business). Participants share their motivations and commitments to action with their discussion groups, and are rewarded by group support and encouragement. NWEI’s Discussion Courses also feature inspiring content, including stories of change. These stories of how others are acting in line with their values to create a more sustainable world offer examples and ideas for those wanting to make change in their own lives, and help them to believe that real change is possible.

NWEI’s Discussion Courses are also inherently social, and research has shown that learning and action are much more fun and effective when done in a group (Duhigg, 2012). Many Discussion Course participants find the community they build with other participants so rewarding that they continue meeting with their groups for years, whether continuing NWEI programs or not. By learning together, supporting each other’s commitments to action, and celebrating their achievements, groups reinforce behavior change and inspire and empower each other to continue making positive changes in their lives and communities.

EcoChallenge is Rewarding, Inspiring, and Fun

By allowing participants to choose their own Challenges (e.g., bring a packed lunch to work each workday; bike to school three days a week), EcoChallenge helps participants act on what they most value in ways that make sense for their own lives. Being able to post their commitments and accomplishments on their

EcoChallenge page and in the general EcoChallenge feed allows for positive feedback from other EcoChallenge participants. Seeing other people's stories and accomplishments reinforces participant's belief in their ability to change their own behaviors. And seeing the collective impact of everyone's individual EcoChallenges shows participants that small individual changes really can lead to big overall impact.

EcoChallenge is set up as a game, where participants and teams can earn points and compete against other teams while increasing their impact and engaging their communities. Tracking their progress, sharing their stories, connecting with other EcoChallengers, competing against other teams, and discovering new ways to take action all reinforce behavior change while offering EcoChallenge participants a fun game in which to participate. By tracking their own impact as well as the collective impact of all EcoChallenge participants in measurable categories, participants are inspired and empowered to keep acting to make real change.

Behavior Change Component - Social

Participating in a social group or community that encourages different behaviors can be one of the most effective catalysts for radical behavior change (Duhigg, 2012). While a person trying something new alone might feel skeptical or discouraged about their ability to change their actions, a community of supporters helps them to believe in themselves (Duhigg, 2012). Both NWEI's Discussion Courses and EcoChallenge rely on social learning and community building to move people toward individual and collective action.

Discussion Courses are Social

Discussion Courses take place with groups of six or more people. The circle question and suggested discussion questions for each session are designed to build community and trust within the group and encourage personal responses. Discussion Course participants bring their own unique experiences and perspectives to the learning process and share their insights and knowledge with each other. Together, they construct an idea of what sustainability means for them in their time and location. This collaborative learning process is rich and social. Together, Discussion Course participants discover new ways to live, work, create and consume that make sense for who they are and where they live. By practicing new behaviors and sharing them with each other, they reinforce behavior change through encouragement and support.

EcoChallenge is Social

EcoChallenge participants also discover new ways to act with each other -- through EcoChallenge teams and competitions between those teams, and through self-reflective posts about their experiences. These posts can be shared with their team members and supporters, as well as the broader EcoChallenge community through the public feed. When program participants have built-in support from their own community of change, taking action feels easier and more rewarding.

As mentioned in section III.1. above, even after their participation in a Discussion Course or EcoChallenge is over, groups and teams often find themselves discussing sustainability and sustainability behavior, encouraging each person's individual goals for change, and collaborating on larger projects to move their organizations and communities toward sustainability.

Behavior Change Component - Personally Transformative

An additional key component of NWEI's programs is personal and critical reflection. By reflecting on their own values and experiences, participants understand themselves, their peers, and their world better. Reflection can be a vital component of behavior change -- by reflecting on their values, their personal assumptions about the world, and the factors that motivate their current behaviors (known in behavior change research as **triggers**), participants discover "aha" moments that transform their perspectives and help them move toward effectively changing their current habits into more sustainable ones (Duhigg, 2012).

"Aha moments" can also come from experiencing a transformative life experience -- a big revelation moment that resets one's behaviors, and sometimes their entire life course in the same way that changing keystone habits can change people's lives (Duhigg, 2012). NWEI's Discussion Course and EcoChallenge programs are designed to ignite "aha" moments of learning and experience for program participants through collaborative learning, trust building, personal bonding, and reflecting on current and new behaviors. These "aha" moments are always paired with opportunities for reflection and immediate, but doable, action. It is worth noting that in our research, we found NWEI's approach to pairing transformative learning with behavior change methods to be a unique pedagogical approach.

Discussion Courses are Personally Transformative

NWEI's Discussion Courses offer both content and discussion questions that lead participants to personal and critical reflection of the ways things currently work in the world. These questions help participants connect to their values and consider how to align their behavior to act in accordance with their values. The questions are also designed to help participants explore their values without placing judgment on themselves and fellow discussion members. NWEI's Discussion Courses have been successful in many contexts in leading to transformative learning (Cagle, 2014). In addition to being reflective, in order for transformative learning to be effective, it must happen in a group where community and trust has been built (Cagle, 2014; Kelly, 2010). As discussed above, NWEI Discussion Courses are designed to build trust so that the opportunity for critical reflection can be encouraged, and so that that reflection can lead to immediate action. Each weekly session of a Discussion Course ends with a call for each participant to commit to one action for the week, often accompanied by an overall action plan. Notetakers take note of each person's commitment and check back in on it the next week. At the end of each course, participants engage in a celebration session, in which they are encouraged to engage their communities and organizations, and to commit to a group action moving forward. By offering participants time and motivation to practice throughout the course, NWEI ensures they are taking the

steps needed to reach the desired outcome: environmentally sustainable behavior change (Brymer and Davids, 2013).

EcoChallenge is Personally Transformative

The EcoChallenge offers participants an opportunity to change their behavior in a way they have often already identified but have not found the motivation to pursue. In the EcoChallenge, participants start with committing to action, then reflect on their experience in acting over a two week period. This reflection is focused on their progress - including successes and difficulties, their motivations for acting, their impact on the planet, and what could help them to be more successful. Participants are also encouraged to reflect on what this action means in their own lives, as well as in a global context. Two weeks of committed action helps to build longer-lasting behavior change, and allows participants to “try on” lifestyle changes in a supportive space and group, and in a real world setting (Brymer and Davids, 2013). EcoChallenge appeals to participants rationally by offering data on their individual and collective impacts throughout and at the end of the EcoChallenge. It appeals to participants emotionally by offering inspiration through the visual representation of one’s own and others’ progress, encouragement through the comments of others in the EcoChallenge community, and fun rewards through points accrual and competitions with others.

When used alone, EcoChallenge is very effective at promoting environmentally sustainable habit development. When combined with NWEI’s Discussion Courses, the EcoChallenge can be an even more effective multi-layered approach to sustainability-focused behavior change, both in an individual’s life and in the broader culture of participating organizations.

Behavior Change Component - Sequential: One Step at a Time

Often when people want to change their behaviors, they make the mistake of trying to change too much at once. Habits are ingrained and often unconscious and automatic. Trying to change too many habits or too big of a habit to start can leave people exhausted and set them up for failure (Duhigg, 2012; Heath & Heath, 2010). NWEI’s programs help people focus on one action at time, building change inspired by transformative learning. Taking one step at a time also builds in practice so that over time people gain the capacity to make more changes with continual practice.

Taking action encourages feelings of inspiration and empowerment, an important antidote to the feeling of being overwhelmed that commonly occurs when presented with new and challenging information about the current crises we face. In both Discussion Courses and the EcoChallenge, participants are encouraged to start where they are, with small actions that make sense in their own lives. From changing an incandescent light bulb to an LED bulb, to divesting from fossil fuels in their portfolios, to planting a garden, participants take small and achievable steps toward sustainable living. Collectively, those steps lead to real impact. The reward of feelings of accomplishment and satisfaction help participants feel encouraged to make more positive actions and engage in positive lifestyle change.

Discussion Courses are Sequential

By choosing one action to commit to per week, Discussion Course participants explore how to act on their values and gain confidence through success in small steps. In some courses, participants can create an action plan over the timeline of the course, helping them to identify their commitment, as well as the obstacles they might face and the resources they might need to be successful. By sharing their new behaviors with each other, participants are reminded that there is no single solution to our environmental issues, and no one right path to choose. As Brymer and Davids have noted (2013), this understanding – along with time to practice their new behavior(s) throughout the Discussion Course, individual and group reflection on the constraints and challenges of changing their behaviors, and practicing their new behavior in a real-world setting – leads to more effective behavior change outcomes.

EcoChallenge is Sequential

EcoChallenge participants also choose one action to change, but stick with it for two weeks instead of just one. This longer time commitment helps them build their chosen action into an actual habit they can continue once the challenge is over. By choosing from multiple EcoChallenge categories (waste, water, energy, food, transportation, simplicity, community, nature, health) and actions, EcoChallenge participants are reminded that there is no single solution to our environmental issues, and no one right path to choose. Again, this understanding – along with time to practice their new behavior(s) throughout the Discussion Course, individual and group reflection on the constraints and challenges of changing their behaviors, and practicing their new behavior in a real-world setting – leads to more effective behavior change outcomes.

Results

NWEI's pedagogical model offers a case study for effective transformative learning and behavior change in action. NWEI Discussion Courses are designed to be self-facilitated in small groups and are used in faith communities, businesses, and educational institutions – places where people are already organized in some way. The goal of the Courses is to “inspire people to take responsibility for Earth.”

Although educators who have used the Discussion Courses often focus on the quality of content and broad coverage of topics as the reason why the courses are effective, students and participants overwhelmingly comment on the importance of discussion with others and commitment to action as the most important aspects of the courses to their learning and growth. And NWEI Courses have seen real results. Of 1224 Discussion Course participants surveyed from 2009 to 2013:

- 80 percent feel a greater sense of personal obligation for solving environmental challenges
- 72 percent take more seriously the challenges of declining ecosystem health

- 87 percent feel their small group was helpful in creating change
- 79 percent buy more local and organic produce
- 73 percent make reductions in household energy and water consumption
- 60 percent more frequently volunteer for environmental causes and make alternative transportation choices

While the starting point for most EcoChallenge participants is with action instead of knowledge acquisition, the EcoChallenge also takes people through NWEI's pedagogical model, leading them to personal reflection and shared learning. EcoChallenge participants show lasting behavior change and transformed assumptions.

In the 2016 EcoChallenge:

- 71 percent of EcoChallenge survey respondents definitely anticipated continuing the new behaviors they developed during the EcoChallenge. 27 percent anticipated continuing their chosen Challenge in some way.
- 59 percent of survey respondents said that achieving their goals was their favorite part of the EcoChallenge, while 27 percent said engaging with their team was their favorite part.
- Of the 61,793 actions selected, 73 percent were daily actions, which led to changing old or building new habits, versus one-time actions like installing solar panels or low-flow faucets.
- Over 86 percent of responding participants judged themselves to be “moderately successful” to “100% successful” in achieving their goals.

Conclusion: Connecting Transformative Learning, Systems Thinking and Behavior Change

There is a high degree of uncertainty in how humans will respond to the complex environmental challenges currently at play. Many environmental challenges are “adaptive” in nature, meaning the solutions are highly elusive and the problems themselves are highly complex and evolving. Ron Heifetz, author of *Leadership without Easy Answers*, describes an adaptive challenge as “a particular kind of problem where the gap cannot be closed by the application of current technical know-how or routine behavior” (p. 35). While technical challenges are solvable with known information and the solution is tangible, adaptive challenges present a high degree of uncertainty and complexity. Addressing problems related to sustainability is perhaps the definitive adaptive challenge of the time.

In order to make the shift from ecological knowledge to social action that addresses highly complex and adaptive challenges, individual transformation as well as broader culture change is necessary. Sustainability education pedagogy as well as a pedagogy for social responsibility must lay the foundations for not only increased awareness and education, but also actively promote behavior change, personal agency and activism.

To achieve these ends, learners need an understanding of complex systems and an understanding of how to apply systems thinking skills in solving problems. Learners also need to engage in collaborative conversations and processes, where perspective sharing is possible and encouraged.

Participatory approaches to learning are essential, as are opportunities for action rooted in real world situations.

Today's learners and those working to effect broader change will need both strong skills coupled with motivation needed to rise to environmental challenges. Furthermore, beyond knowledge acquisition, we need education that encourages behaviors that line up with knowledge. We need not only critical thinkers, but also active doers. Encouraging peer-to-peer learning, real-world action opportunities and support is key to success. Transformative learning, systems thinking and behavior change pedagogical practices should be implemented in order to foster strengthened understanding, awareness, social responsibility and action.

NWEI programs meet these objectives and support participating individuals in finding ways to take meaningful action in their lives, educational institutions, businesses, communities, and in the world at large. NWEI's Discussion Courses and EcoChallenge connect transformative learning with behavior change research, engaging people in a process of moving from awareness to new knowledge to transformation to action.

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