



## Using Experiential Simulation to Teach Sustainability

*Authors Susan Svoboda and John Whalen offer this practical guide for developing and using a simulation exercise to help MBA students and working professionals build an understanding of sustainability.*

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Creating sustainable business solutions requires seeing a business as part of a much larger system involving a wide variety of stakeholders -- more like the complex interactions in a natural ecosystem. Leadership in this complex and dynamic context requires a perspective that incorporates social and environmental dimensions as well as economics, and requires a flexible, adaptable, and inclusive approach. Results-oriented MBAs and executives often prefer systems that emphasize efficiency and order rather than adaptability and openness. They may struggle with how to integrate dynamic natural systems and complex social processes with control-oriented management systems. The perspective and skills required for this integration can only be learned through experience. This makes simulations an ideal medium for teaching sustainability.

This article is a practical guide about using experiential simulations to teach sustainability in a business context. The article draws on the authors' experience developing and using a simulation exercise called Transformation with hundreds of groups in business schools, corporations, government organizations, and nonprofit organizations over the past six years. The article describes the benefits of using simulation in building understanding of sustainability, describes the Transformation simulation, discusses typical lessons learned, and

provides a checklist of the characteristics of an effective sustainability simulation.

## **Experiential Learning and Transformational Change**

Experiential learning is one of the most effective ways to promote positive change in individuals and organizations. The experiential learning model consists of cycles comprised of four basic steps: Act, Reflect, Reframe and Apply.

- *Act*: Experiential learning is based on actions and their observable results as the basis of learning.
- *Reflect*: Experiential learning provides an opportunity for participants to get feedback on their actions and explore the results, as well as, discover mental models.
- *Reframe*: When participants gain understanding of the impact of their actions they can change the mental frames that prevent them from achieving the results they want.
- *Apply*: Experiential learning makes learning transfer explicit: building clear linkages between the insights gained in the “artificial” learning process and the real world challenges facing the participants back on the job.

Successful experiential learning processes usually run through this cycle two or more times to deepen integration of the learning. This enables participants to experience the results of acting within their current frame of reference and mental models, have an opportunity to reflect on and analyze these results, and experiment with shifting their behavior and seeing how the results change based on the shift. They can then reflect on how to best apply their learning to the real world in the form of new ways of thinking and acting in their jobs.

One of the sources of the power of experiential learning is that it engages the whole person, involving the participant’s mental, emotional, and somatic intelligence. You might say experiential learning treats the person as a complex living system!. In this sense

the medium is the message -- experiential learning may be the most ecological kind of learning experience other than real-life experience itself.

## **Business Simulation as a Mechanism for Teaching Sustainability**

Business Simulation is a type of experiential learning that is well suited to teaching sustainability for several reasons:

**Complex systems interactions.** One goal of sustainability education is to raise people's awareness of and understanding of complex systems. If participants don't understand the system in which they are working, they may take actions that produce unintended consequences. For example, without an understanding of the product lifecycle, a team may make a product design change to eliminate a hazardous substance in the manufacturing process that creates more pollution/risk when the consumer uses the product. Simulation places the participant in the middle of a complex system and enables them to experience the impact of their actions on that system in a low-risk environment.

**Cross-group collaboration.** A simulation bridges differences in expertise, professional languages and cultures by drawing on each individuals accumulated knowledge and skills. At the end of they cycle, participants have an opportunity to reflect on and discuss their results, learning with colleagues from other backgrounds. To build truly sustainable solutions, collaborative learning is an essential aspect to working with stakeholders with multiple and conflicting interests.

**Integration of economic, environmental, and social dimensions.** By combining traditional indicators such as income statements and balance sheets together with sustainability benchmarks, such as pollution or impact/product, a simulation can enable students to explore how to increase profits by optimizing their use of natural and human capital. This integrated approach is much more powerful than attempting to teach business people about sustainability as an issue separate from concerns for profitability, market share, and revenue. A

simulation is an ideal vehicle to demonstrate the interconnections between these dimensions in a relatively short amount of time.

**Consequence-free practice.** The simulation's hypothetical context enables participants to disengage from their existing paradigms and open themselves to broader perspectives. It provides a rare opportunity to experiment and try new behaviors in a relatively consequence-free environment with immediate feedback on what is working and what is not. If we want managers to make the best decisions when it really "counts" we have to give them a chance to practice.

## **The Transformation Exercise**

Transformation is a reality-based, team-building simulation that helps participants understand how to translate the concepts of sustainability into tangible action. The Transformation simulation uses Stuart Hart's sustainability portfolio (described in "Beyond Greening: Strategies for a Sustainable World," Harvard Business Review, Jan. 1999) as the framework for categorizing sustainability issues and the strategies by which teams in the simulation compete. Teams represent companies that produce products, and individual team members take on roles within their companies. Each team makes a product and runs their company in the context of life-like conditions such as time pressures, budgetary constraints, unpredictable stakeholder interventions, changing market conditions and limited information. At the end of the decision cycle, participants sell their product in a dynamic market that allows companies to take market share from one another, and record their decisions, which are "scored" electronically.

The Transformation scenario addresses sustainability in the broadest meaning of the term -- the companies must compete in an environment where success depends on their ability to select a market, create a product that is attractive to that market, design and deliver that product profitably, and deal with social and environmental issues that may increase their costs or hinder their ability to compete.

**The roles.** Participants are assigned to functional roles in their company, including marketing, product design, manufacturing,

finance, and environmental management. Each role has instruction manual that explains the goals of the exercise, team and individual objectives, and scenarios. As in the real world, each member of the team has some shared and some unique information and goals.

**The process.** Participants come together as a team, select a market, design and build a product, and create a marketing campaign for that product, while competing with other companies. They must also complete market and profitability analysis. The “product” is made using K’nex toy construction components, balancing the economic, environmental and social impact of the components. The product is evaluated on how it meets several performance criteria and the company is evaluated on leadership and management issues such as being proactive, transparent and innovative. Reflecting the real world, the management teams often find they are working with incomplete, changing or conflicting information. The facilitators role-play different stakeholders, influencing the proceedings proactively and in response to company actions. These stakeholder interventions allow the exercise to be customized to address particular issues of importance to the participants. It also enables us to re-shape the exercise at the spur of the moment, compelling participants to react to changing circumstances.

**The results.** For the purpose of evaluation, participant companies form an industry comprised of five to nine company teams, the number that experience has proved to be optimal for learning. Proprietary software tracks company decisions and generates income statements, pollution reports, and balance sheets while facilitator evaluations offer qualitative feedback on team performance, stakeholder interactions and industry dynamics. Each industry is comprised of 15-40 participants, and groups larger than 40 participants are divided into multiple industries.

## **Multiple Levels of Learning**

Participants in a simulation operate at several “nested” levels simultaneously, and therefore have rich opportunities to learn on all these levels.

**Personal.** At the personal level, the simulation teaches participants about their assumptions about how the world works, and about how they work in the world. For example, some participants are surprised to find that they did not seek out new sources of information, did not listen to their customers, or assumed that a “green” product would have to cost more than a traditional product. They learn about their own behavior and the mental models it reflects.

**Interpersonal.** At an interpersonal level, the simulation teaches participants about how they relate with other individuals on the team, and how those patterns of relating support or hinder success. For example, they may withhold viewpoints until it is too late in the process, and find their perspective would have prevented a major problem if they had been more assertive. Or they may find themselves taking more risks than they usually do in “real life” to reach out and build trust, and see that this creates positive results.

**Role.** The simulation can enable participants to see a situation from a new functional perspective, as well as illustrating how an issue cuts across all functions. For example, when participants with an environmental background take, say, the Finance role, they quickly learn why the finance department is concerned with its issues, and how to relate in a way that is more meaningful and relevant with these folks in the future.

**Team/Organization.** Today, most work is done in teams; so learning should be done that way too. The simulation shows how to work more effectively as a team by aligning individual practices through sustainability strategy. For example, common lessons include the tendency to assume buy-in or support of other parts of the organization without doing anything to gain it. Also, teams frequently realize that unless their sustainability practices align with their business model, the commitment to sustainability will be sacrificed to other business priorities.

**Industry.** Simulation gives participants a chance to practice how sustainability strategies can produce marketplace advantage, if they are implemented in a way that creates more business value than their competitor. For example, over the course of a workshop, practices that early in the day appear innovative -- such as pollution prevention

-- lose their competitive edge as every team in the industry adopts those same practices. As the bar rises, teams must look for new ways of creating sustaining value, including stakeholder dialogue, clean technologies, and dematerializing.

## **Lessons Learned in the Transformation Simulation**

Through the simulation, participants learn to see sustainability as an integral part of the business model, and experience how this new frame can lead to business success. This is a major shift from viewing sustainability issues as external to the enterprise's sphere of interest and influence. As part of this shift, participants learn:

**The Importance of Listening to Customers.** About a third of the teams fail to talk to customers during the concept and design process, resulting in activities that tell customers what they “should want” rather than listening to them and delivering what the customer really wants. For example, some teams decide since this is a “green” simulation, customers will buy a product that is environmentally “correct” but sacrifices performance. On the other hand, those teams that create a real dialogue with customers position environmental characteristics in terms of value perceived by customers -- for example, they will talk about a durable product that offers the customer reliability and convenience while creating less waste.

**The Benefits of Stakeholder Engagement.** Most teams start out the exercise thinking of stakeholders as a nuisance that must be managed to ensure they do not interfere with the efficient operations of the business. A key learning for most participants in Transformation is that stakeholders, when engaged, have valuable knowledge and perspective that can help them to achieve their goals more quickly and with higher quality results. Some teams go through a superficial communication process with stakeholders, asking them for input at the start of the exercise but not engaging them in continuous dialogue or incorporating their ideas into the team's strategy. These teams almost always lose to competitors who integrate stakeholders in a more comprehensive way into their process.

**The Importance of Vision and Values.** All Transformation teams start by writing a brief vision and values statement that is posted for all to see. When teams run into trouble, such as running out of time or money, very few return to their mission and values statements to help guide them through the process. In some cases, their actions -- such as accepting sub-standard pollution or human rights impacts in their facilities -- are clearly not in keeping with their mission and values. When these teams later reflect on and discuss their performance, they are surprised at how quickly they discarded their vision and values in the effort to get a profitable product to market on time.

**The Value of Relationships.** Many innovative solutions to achieve sustainability require significant changes in thinking and/or cooperation of multiple parties. Many teams have a tendency to assume they have buy-in and support from other parts of the organization without doing anything to gain it. They come up with innovative solutions, but forget to build the support they need to implement them. This is especially evident when teams are moving into new and emerging markets. On reflection they see that their inability to build effective relationships was the downfall of their strategy.

**The Importance of Adaptability and Flexibility.** Many teams focus so intensely on achieving goals they have set they refuse to revisit decisions based on new information. When they run into a roadblock or barrier they simply push harder, rather than taking a flexible and adaptive approach. For example, teams will observe one of their competitor's breakthrough designs and simply ignore it and continue their own struggling project, when they could easily learn from their competitor's success.

## **Challenges and Limitations**

One challenge of using a complex simulation such as Transformation is the time commitment. Transformation requires a minimum of a half-day, and ideally a whole day, plus pre-reading by the participants. A whole day session enables the participants to go through two complete product development cycles, allowing them to create a new strategy and product based on what they learned. Two or three day

sessions allow participants to combine readings and case studies with three cycles of simulation for more in-depth learning. Getting managers in a corporate setting to allocate this much time for such an exercise can be difficult.

Another challenge is that some participants may have a bias against experiential learning, believing that they can't learn anything important by "playing games." This is typically a problem in getting people to attend, but not during the simulation itself. The process of experiential learning, in a well-designed simulation, is so engaging that even most skeptics are quickly swept up in solving the business problem.

An additional challenge is the multiple levels of activity that must be facilitated. Keeping an eye on the work process, the interpersonal dynamics, and coordinating the logistical details of the exercise requires a skilled facilitator. The experiential nature of the exercise, however, creates a largely self-regulating system; real-time feedback from team members, competitive pressure from other teams, and the pressure of the clock help keep participants focused and working effectively.

Although simulation is in many ways much more "real world" than other forms of learning, it is still not the real world. As in all kinds of learning, transfer of skills and knowledge to the real work environment is the biggest challenge. Simulation has a great advantage in that participants are not simply gaining knowledge, but are actually putting knowledge into action -- demonstrating behavior and getting real-time feedback on that behavior. Ensuring transfer of the learning from these experiments back to the work environment is best facilitated by having participants reflect on what they learned and what they will do differently back on the job based on that learning, and developing an action plan they can implement based on their learning. A follow up session some months after the simulation can provide an additional learning cycle and reinforce the new behaviors.

## **Implications for Sustainability Educators**

Simulation is a powerful way to challenge old beliefs and mental models and open participants to new ways of thinking about sustainability. Thus it can be a great way to begin a sustainability course, or to introduce a sustainability planning session, or to build a foundation for more effective teamwork and innovation within an organization. The whole-person learning that occurs through a good simulation can create an openness to other forms of teaching and can lay the groundwork for a different level of dialogue and creative collaboration.

Developing simulations is a complex, time consuming and expensive process. For this reason, many people prefer to use an existing simulation, rather than creating a new one. The following checklist can serve as a useful guide in evaluating effective sustainable business simulations. We suggest you look for ones that will:

- Provide a rich and manageable model of the real world complexity of business, with the business system realistically integrated with social and natural systems that interrelate and affect each other.
- Offer an appropriate level of challenge to keep business people interested and engaged
- Be realistic enough to model the complexity of the real world but not too complex or confusing to enable learning in a short time frame
- Be flexible enough so participants can bring their own knowledge of the latest techniques
- Encourage innovation in technology and behavioral change
- Illustrate both the technical aspects of sustainability as well as the communication objectives
- Be based on a tested framework for thinking about sustainability

- Present an opportunity for participants to take on one or more roles or perspectives that are different than their usual ones.
- Be anchored in things that are important to business people (profitability, market share, innovation, return on investment) and demonstrate how sustainable choices are relevant to these measures
- Prevent participants from failing, yet provide enough challenge to promote learning and use exercise as a safe environment for growth
- Provide learning on multiple levels (personal, team, organization, industry)
- Supply clear and easily understood procedures that ensure a logical progression of activities, including steps or play, cycle critique, rules and policies
- Provide two or more loops through the experiential learning cycle
- Present feedback that focuses on the most important aspects of business sustainability
- Use indicators and an accounting system that reflects tangibly and realistically how a situation or decision has an effect
- Afford an opportunity for clear mapping of the lessons learned back onto the real world environment through critique and debrief discussion

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