

Not Another Brick In The Wall

Defining and Assessing Social Learning in Natural Resource Management and Environmental Education

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ABSTRACT

In the following paper I develop a framework for understanding “Social Learning Systems” as an educational pedagogy for environmental educators, resource managers, and others. Originally pioneered in natural resource management, I study how social learning has pervaded other fields and integrate research from multiple disciplines to argue for a framework that effectively describes core dimensions of social learning as it appears in a variety of contexts. In response to critics who suggest that educators do not fully understand what makes social learning systems effective, I propose a means of assessing key aspects of these systems within the framework for social learning I propose. This assessment mechanism and theoretical approach to social learning offers a viable means of by which design principles and theory of social learning systems can be improved, both in environmental problem solving and education writ-large.

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INTRODUCTION

It goes without saying that the 21st century is dominated by narratives of a fast-paced, interconnected, and rapidly changing world. We are abandoning industrial economies for knowledge economies, building and sharing massive stores of data, and rapidly transforming the way people process and receive information with the growth of the internet. The narrative of this era is increased decentralization, non-hierarchical structures, complex systems, and an increasingly messy and intermingled web of global relationships (Latour 1996, Latour 2005, Davis 2013, Brafman and Beckstrom 2006, Tsing 2005). This understanding has an intimate intellectual marriage with our growing understanding of ecological complexity and our efforts to manage the natural world, which is increasingly seen as a field that requires innovative new ways of thinking and understanding (Capra 1996, Hanson 1995, Meadows 2008, Keen et al. 2005). These meta-narratives have simultaneously pervaded educational thinking, with a focus on group learning, organizational management, and systems-based approaches to an education rooted in the psychology of how people learn more than the epistemology of what knowledge is (Block 1993, Senge 2010, Benson et al. 2012, Bingham et al. 2010, Dirksen 2011).

Social Learning Systems (SLS) are, at their core, educational programs that attempt to address the complex narratives emerging from 21st century environmental challenges. Their premise is simple: every human brain is a supercomputer designed over millennia of evolution and imbued with years of unique life experience. When a group of such brains interacts in such a way that every actor in the social network can participate and engage with any other the results can be extraordinary. And in a world of increasing environmental conflict and strain on resources we need the extraordinary. Through my research I have come to believe that the merger of techniques used in natural resource management with educational and organizational management theory can provide a more effective means of educating citizens on environmental issues, whether in the context of a specific resource dilemma or as part of a more general environmental education program. In this paper I investigate the use of social learning techniques within the context of environmental studies programs on a college campus, and propose a general theory for their use.

Natural resource managers and other environmental specialists, especially educators, frequently need to integrate multiple perspective on controversial, value-laden environmental problems in a way that inspires learning and common understanding. In this paper I develop a

theoretical framework for social learning systems as a tool of environmental education and resource management, intentionally using a wide span of interdisciplinary research to develop and assess social learning mechanisms. To do this I first provide a brief history of the growth of social learning systems, contextualizing it within the intellectual development of environmental education, resource management, and ecology prior to the development of social learning. I then provide a broad theoretical framework for social learning, broadly referential to its use in multiple disciplines and contexts. Critics of social learning frequently acknowledge that social learning is effective and demonstrates improved outcomes, but argue that advocates for these systems have no specific understanding for *why* social learning works or how it could be improved (Keup 2013). Previous definitions of social learning are useful, but suffer from vagueness and concepts that are difficult to measure (Reed et al. 2010, Muro and Jeffrey 2008). I propose a framework of understanding in line with the definitions currently proposed, but with assessment in mind. I also propose a mechanism for measuring various aspects of social learning systems within my proposed framework. I conduct a preliminary study to explore the viability of that assessment mechanism, with the intent of providing scholars of social learning a means of analyzing what specific manipulations in educational design and social learning promote desired outcomes. In doing this I hope to encourage scholars of social to move away from attempting to explain what social learning is, in favor of understanding more critically what elements of education design can make social learning a more effective educational tool.

I argue that social learning systems can be effectively defined and assessed as having three component parts:

- 1) An explicit and intentional governing system for the learning system.
- 2) A social network that is interactive, integrated, equitable, diverse, and consists of a learning group of invested individuals.
- 3) A basic belief that all participants can contribute valuable knowledge to the system.

After testing my assessment tool on a variety of social learning opportunities on a college campus, I conclude that the proposed assessment mechanism effectively identifies differences between various forms of social learning exercises and would be able to assist education designers in developing improved social learning scenarios. Though it requires some modification, this tool can be a resource for educators in a wide range of social learning based programs moving forward.

THE ENVIRONMENTAL CHALLENGE

Consider the challenge of the resource manager, community organizer, environmentalist, or land user. Faced with a variety of cultures, perspectives, and backgrounds you must somehow find enough agreement and consensus within a group that decisions can be made regarding some space or resource. Perhaps you are not yet even afforded the luxury of a decision – first you need solutions to decide between! This great challenge can be found in varied environmental issues all around the globe, and the field of natural resource management has emerged as a result. In recent years natural resource management and environmental education are increasingly integrating their approaches, largely under the banner of social learning. This marks a distinct shift from the emergence of both fields in the 1960s, an era in which our cultural understanding of ecology similarly limited and shaped the history of fields. As our cultural imagination changes and new scholarship emerges, the potential for new interactions and collaborative development of both fields seems likely to emerge under the banner of social learning.

“In recent years it has become increasingly evident that the human dimension plays a key role in resource management,” and there is an increasing effort to combine resource management theory with educational technique (Pahl-Wostl & Hare 2004). This was not always the case. Early positions in resource management were “junior posts, typically involved in ‘cleaning up the mess,’ whether as pollution control or dog catchers” (Keen et al. 2005). Policies were simple, and generally sought to achieve certain optimums or efficiencies, whether that be of produced goods, land conserved, people fed, or other metrics. Early agencies emerged around the 1960s and were guided by this theoretical approach with limited success (Keen et al. 2005). In the pursuit of these metrics cause-and-effect have been assumed to be linear and incremental. Many scholars are now arguing that this approach is too limited and missed critical details introduced by complexity (Walker & Salt 2006). Early agencies lacked resources or power, and “could not support a process of social learning, or foster the necessary change process for improving environmental management” (Keen et al. 2005).

Simultaneously, early forms of environmentalism were putting non-scientific pressure on the very sciences required by natural resources, forcing ecology to fill an advocacy-based role. The science was popularized by Rachel Carson’s Silent Spring (1961) and as a result ecology became “much more popular with the public,” causing a reversion “back to natural history” in

many non-technical circles of environmentalism (Benson 2000). Popular claims about ecology in the 1960s “did not stress the adaptive character of fauna and flora, which is perhaps ecology’s cornerstone” (Benson 2000). Nature, long a cultural association to the ecosystem concept, “was viewed as relatively constant in the face of change and repaired itself when disrupted, returning to its previous balanced state”, an idea only reinforced by the conceptual construct of the ecosystem (O’Neill 2001). This heritage remains today, with public and professional ideas still differing dramatically, in a large part because “these views were once held by many ecologists” (Cain et al. 2011). Nature became divisible from human beings, thus human action became antithetical to rich biological wealth, health, or beauty (Cronon 1995, Inglis and Bone 2006, Latour 2007, Dunlap et al. 1978).

This fundamental approach to natural systems made its way into environmental education in the same decade. William Stapp’s 1969 article “The Concept of Environmental Education” was one of the earliest works specifically identifying environmental education as its own field. Stapp proposed environmental education as a means to produce “a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution” (Stapp et. al. 1969). He emphasized environmental education as a way to change behaviors by encouraging understanding of the causes and consequences of environmental problems. Stapp argued that it was an educational priority “that man, wherever he lives, comprehend that his welfare is dependent upon the proper management and use of [natural] resources” (Stapp et. al. 1969). Education on said “proper management” would, Stapp claimed, result in better decision-making and the resolution of many of the environmental issues of the day.

Much like resource management and ecology, environmental education was also limited by the cultural demands for simple cause-and-effect understanding present in the era in which it emerged as a field. Criticism ranged widely, citing a lack of frameworks for a progressive development of knowledge, a failure to address controversial environmental issues, a failure to recognize the reality of trade-offs between decisions, and serious flaws or (hailing to popular depictions of 1960s ecology) superficial coverage of science (Sanera 1998, Nicol 2002, ICEE 1997). Additional critics spoke to apocalyptic messaging, a lack of differing perspectives, and the mix of science with advocacy (Sanera 1998). Other critics of environmental education claim that it oversimplifies complex problems and promotes cosmetic solutions that emphasize rewarding specific actions (i.e. recycling, riding a bike) rather than changing value systems or altering

entrenched systems of production and consumption (Kronlid and Öhman 2012). In essence, environmental education has been critiqued in the same way early ecology and resource management were: as oversimplified, impractical, and unable to generate outcomes substantive enough to match today's more complex notion of environmental "Wicked Problems" (Rittel & Webber 1973).

Yet these critiques are only half the story, and the critical importance of effective environmental education remains. Environmental education continues to grow in popularity and recognition. President Obama's 2011 Fiscal Budget, for example, increased education funding by 17% and mandated the inclusion of environmental literacy in a "well-rounded education" (Department of Education 2011). Furthermore, the original cultural assumptions that trapped all three fields are increasingly being challenged. Social learning emerged in the early 1990s as part of that response, though early iterations of the theory stem back to the late 1970s and early 1980s (Muro & Jeffrey 2008). Its growth over the last two decades has been rapid and enthusiastic, and "social learning is increasingly becoming a normative goal in natural resource management policy" as education and resource management blend (Reed et al. 2010).

Efforts have been made to conceptualize social learning, though consensus has not yet been reached. Keen et al. (2005) call it "a new approach to environmental management that supports collective action and reflection directed towards improving the management of human and environmental interrelations." Muro & Jeffrey (2008) note that there is consensus that "social learning requires the communication and interaction of different actors in a participatory setting which is believed to result in a set of social outcomes," such as knowledge generated, technical skills gained, or the development of trust or relationships that may be a source for common agreement or action in a given scenario. Reed et al. (2010) make the most direct attempt at defining social learning. They note that early social learning theory was rooted in psychology, and was "individual learning that takes place in a social context and is hence influenced by social norms." Faced with the breadth of this claim a range of scholars developed a new conceptualization between, publishing a series of papers between 2006 and 2010 that argues social learning is "a process of social change in which people learn from each other in ways that can benefit wider social-ecological systems." Reed et al. (2010) go on to identify their own definition of social learning, namely that social learning demonstrates that change has taken place, that this change goes beyond the individual to wider social units or communities, and that this change occurs through social interactions between actors in a social network.

Despite the lack of consensus, it seems resource management experts see educational tools – social learning in particular – as a means to help address the complex perspectives of ecology, a shift away from management techniques that assumed expert planners knew the right way forward (Walker and Salt 2006). Natural resource managers, like educators, are in a position where they must prioritize educational models that result in behavior change. However much of the research on changing behavior stems from other disciplines. The “new conceptualization” seen in the late 2000s in social learning, for example, built off of theory from organizational management developed in the late ‘80s and early ‘90s (Reed et al. 2010). That field is similarly steeped in systems thinking, perception psychology, and behavior studies (Senge 2010, Meadows 2008, Block 1993). Scholars are increasingly looking to apply these approaches to both environmental and general education (Benson et al. 2012, Brown and Adler 2008, Jackson 2013, Keen et al. 2005).

Displacing one paradigm of environmental education for another is challenging for a range of reasons. Not least of all is the prevalence of an older model. In 2013 Toys “R” Us (2013) released an advertisement that featured a group of kids getting on a bus for an outing with “Friends of Trees,” a fictional organization created for the spoof. Evidently bored, the participants sit sullenly while a spirited and energetic environmental offers a lecture on leaf identification. Then they pull into a Toys “R” Us parking lot and the jig is up: the kids are actually going to go to the toy store. They excitedly leapt from the bus and frolicked about the store.

The advertisement sparked rage within the environmental education community, and even prompted multiple petitions and condemnations. I followed the drama through a few e-mail list-servs, slowly finding through the rage a few voices of concerned dissent. Rather than condemn Toys “R” Us, we argued, what does their advertisement suggest about our own field? Advertisements are built off the notion that they will effectively hail an audience, connecting to them in some meaningful way. If the idea of a boring, didactic environmental education program is thought to have enough hailing power to make it into a national advertising campaign perhaps it is our own way of approaching our work that requires assessment. Perhaps social learning, with its rich history of development in environmental issues and the promise of more results, offers a means by which that stigma could be broken.

Some of the key theoretical foundations underlying the practice of environmental education include the belief that knowledge or awareness of the problem is a prerequisite for action, as is awareness of potential solutions or courses of action that can be undertaken; skill in applying this knowledge, and the desire to take action to solve the problem (Hungerford et al. 1987). This behavior change and learning is the very thing resource management professionals are today seeking. As emphasis increases on complex socio-biological systems “environmental management has expanded to become environmental governance, the concern of all citizens at every scale of society,” a fitting match to Stapp’s arguments about citizenship (Keen et al. 2005). These mutual goals suggest that a partnership between environmental education and natural resource management through social learning could be of great value. The question is whether social learning is ready for yet more interdisciplinary breadth, especially as it is not yet a cohesive idea. In the apparently eager embrace of the technique within natural resource management there is concern that advocates are pushing for something not yet fully understood. “There still remains much to learn about the more fundamental questions in relation to social learning,” including but not limited to the limits to applications of social learning, the risks inherent in managing participatory processes, and the lack of quantifiable measurements surrounding social learning cases to date (Muro and Jeffrey 2008). Similarly, while many disciplines contribute to an understanding of social learning, few “of these frameworks are specifically about social learning” (Reed et al. 2010). Proponents are trumpeting a new model of education before we fully understand how to explain and assess that model.

Scholars embracing principles of social learning are beginning to appreciate the remarkable potential I describe in the introduction: dozens of collaborative human minds sharing amongst themselves can generate things the experts never could create. This is the essence of social learning, and the reason I will argue that integrating thriving theories across multiple disciplines – resource management included – into a comprehensive notion of social learning will prove a boon to all disciplines involved. “Social change is inevitable,” and there is an increasing need for “equitable learning partnerships between the combined expertise” of many stakeholders (Keen et al. 2005). We need to learn together to create solutions, solve problems, make decisions, and understand the state of the contexts and environments we live in.

SOCIAL LEARNING

It should be clear from the above that social learning lacks a comprehensive and cohesive definition. While I cannot claim to have the final word on what social learning is, I use this section to identify common aspects of social learning across disciplines and to contribute to that effort. Based on a synthesis of interdisciplinary literature I propose common and measurable components of a social learning system with the intent of developing an assessment system to measure those components. Starting broadly, I place social learning in the context of education in general. I identify major contributors to social learning ideas, and also identify common aspects of education that are confused with social learning but may not fit under the category of social learning. Finally, I outline the theoretical basis of social learning for which I propose an assessment mechanism.

WHAT IS SOCIAL LEARNING? (Part 1/3)

Wikipedia defines learning as “acquiring new, or modifying and reinforcing, existing knowledge, behaviors, skills, values, or preferences,” a process that “may involve synthesizing different types of information.”¹ This is perhaps the broadest sense of learning possible, and it is the one I subscribe to throughout the course of this project. Any circumstance in which someone is expected to be a little smarter, a little more able, or a little different by the end of it can be a learning experience. Education is thus a process by which this occurs over time and across generations, cultivating ideas between people and the media we use to convey those ideas. This mirrors the argument of John Dewey, a father of progressive education who argued that “the continuity of any experience, through renewing of the social group, is a literal fact. Education, in its broadest sense, is the means of this social continuity of life” (Dewey 1916). He highlights education as a process of cultural transmission not dissimilar to the ways biology is transmitted through genes. In this way, his argument is like Dawkin’s exploration of “memes” of cultural expression, and the idea that culture can actually transmit itself and evolve over time (Dawkins 2006).

¹ Wikipedia is a product of multiple individuals collaborating to create knowledge content, or what I refer to as an “artifact.” I use it to intentionally capture that process of social construction of knowledge, as the website serves as a model for the idea of socially constructed knowledge and learning.

Sometimes this education is formal and intentional. At other times learning may very well “just happen” – this is the essence of life experience. It almost always happens in tandem with others, whether they are classmates, coworkers, teachers, community members, or the people who write the textbooks. But while nearly all education is simultaneously social and a learning process it cannot fairly be conveyed by the term “Social Learning” as this paper – and many others – use it. If the *only* alternative to social learning is an autodidactic process then nearly any educational system, formal or informal, qualifies as “Social Learning”. A professor lectures before a class and the learning is social. A 3-year old watches his mother prepare a meal and years later uses the same process and the learning is social. Dewey knew this, noting that acknowledging such learning situations “is a means of getting us away from an unduly scholastic and formal notion of education. Schools are, indeed, one important method of the transmission which forms the disposition of the immature, but it is only one means, and, compared with other agencies, a relatively superficial means” (Dewey 1916). These examples are intriguing in understanding how we learn, but they do not necessarily lend themselves to a specific social pedagogy, the goal of this project.

Social learning cannot be understood by its name alone or we have simply placed a new categorical title on a centuries-old understanding of education. For an understanding of what social learning means in the context of this paper we must do what the Social Learners might do: look to our stakeholders and others in our learning community.

Who has contributed?

Social learning theory sits at an interesting intersection in the realm of education. There are very few cohesive interdisciplinary theories of social learning, yet a vast array of research has been done within a variety of disciplines. Social learning ideas are not undeveloped. They are simply uncoordinated, lacking a certain cohesion that comes with being an interdisciplinary field of study unto itself. Thus resource managers are left to develop their own methodologies and approaches to social learning, resulting in partnerships “within traditional disciplinary or managerial enclaves” or actions “hampered by old institutional and social arrangements” (Keen et al. 2005). Only recently, as in Keen’s (2005) Social Learning in Environmental Management have fields like organizational management and systems management integrated with resource management, and the integration with education theory is just beginning to blossom. Described below are some of the major stakeholders and industries leading research into social learning

from whom most of my research and theory is drawn. This project represents a combination of theories from across the disciplines in an effort to generate a comprehensive and interdisciplinary understanding of social learning.

Natural Resource Managers

Social Learning has become a major part of conversations about natural resources management (Pahl-Wostl and Hare 2004, Pahl-Wostl 2006, Ison et al. 2007). Critics in that same field have attempted to identify exactly *what* a practical understanding of social learning entails. As a general rule, natural resource management requires concerted and well-informed action from a wide range of stakeholders with differing priorities. Terms like complexity, adaptive management, uncertainty, and others routinely appear in the literature and suggest a field where many perspectives bring diverse information that must be integrated into management decisions. This is intended as a learning process for those decision makers. Socio-ecological systems are particularly adept at providing the rich and multifaceted context that makes a strong case for the value of social learning. As a result, work in natural resource management readily forms a vanguard in research into social learning (Reed et al. 2010).

Digital scholars

The rise of social media in the digital sphere has caused a spike of interest in social learning topics. Modern audiences will be familiar with the tremendous growth in social media over the last few years. In higher education, Massive Open-Online Courses (MOOCs), tools like Moodle, Google Drive, and Twitter, and even the ubiquitous presence of laptops on college campuses and in the classrooms are personal testimony to this growth. A Google search for “Digital Humanities” returns 39,700,000 hits². These include a Center for Digital Humanities, a Journal of Digital Humanities, and whatisdigitalhumanities.com, which pulls from a database of over 500 definitions of the Digital Humanities (“DH”) and shows me one every time I refresh the page. Digital Humanities may very well be “the next big thing” (Pannacker 2009).

² Google searches are one means by which we can assess the influence of large-scale social influence on prioritizing and sorting knowledge. Every item in question must be generated, and (non-advertising) top results are there due to their popularity and ability to attract information seekers (learners).

As education and social media are increasingly paired together, the inevitable child of the marriage would appear to be some sort of social learning. Organizational Management scholar Dan Pontefract worries about this, arguing that social learning and social media should not be conflated: “Quite simply, one is a noun whilst the other is a verb. You can’t do ‘social media’, but you can ‘social learn”” (Pontefract 2012). Critically, digital mechanisms are a modality – but only one modality –by which the action of social learning can be carried out. This leaves room for non-digital dimensions of social learning that are not dependent on excluding digital means: social learning can bridge the digital divide. Social media offers opportunities to augment social interactions beyond traditional physical limits, and that can contribute to enhanced learning opportunities. But a lecture conveyed across social media that still offers no opportunities for interaction or response is a lecture all the same.

Psychologists, Sociologists, and Organizational Scholars

Psychologist Albert Bandura is one of the most reoccurring names in social learning, even now. The first Google recommendation when searching “social learning theory” is “social learning theory bandura.”³ He developed Social Learning Theory in an effort to explain human behavior that could not be explained entirely in terms of inherent human responses to an environmental stimulus (i.e. learned behaviors). In the 1960’s and ‘70s he coined the term “social learning” in reference to a body of theories about the ways people learn from each other (Grusec 1992). His work is similar to a scientific exploration of Dewey’s philosophical argument that education is a social system of cultural reproduction, with an emphasis on observation. Unlike traditional learning in schools, which as Dewey notes has a heavy emphasis on knowledge and information, Bandura’s work strongly emphasizes behavior (Dewey 1916, Grusec 1992).

Sociologists have taken the ideas of social learning in interesting directions as well, especially through the use of social network theory. The role of groups and networks in shaping each individual’s priorities, decisions, efforts, behaviors, and other phenomena has been well documented and provides potential implications for social learning (Christakis and Fowler 2009). Though less critical in *defining* social learning, social network theory could prove

³ Google is again used here as a mechanism for understanding how lots of people have created an artifact or indicator (i.e. combining a name and a theory) in a simple and straightforward way through its programming.

valuable in *understanding* social learning. Especially as one introduces theories like Bruno Latour's Actor-Network Theory (ANT), which intentionally seeks to blur biological and social boundaries, network analysis offers a chance to engage with complex socio-biological systems seen in resource issues and discussed in environmental education (Latour 2005).

Drawing from this field, scholars of organizational theory and management provide a great bulk of the literature on social learning. With a strong focus on the business sector and team management, they assess power, authority, influence, creativity, and many other products of social interactions. These works range widely, providing ample empirical evidence and applications of theory in practice (Senge 2010, Block 1993, Bingham et al. 2010, Brafman and Bekstrom 2006, Gray et al. 2010). Scholars like Peter Senge (2010) are explicitly moving into the realms of environmental education paired with resource management. Senge has been critical to establishing an "Academy for Systemic Change" (<http://www.academyforchange.org/>) that explicitly works in the realms of education, marine ecosystems, and community development using a systems perspective. Scholars in this field are increasingly targeting education theory and policy with the intent of reforming education, often in the pursuit of improving environmental management (Benson et al. 2012).

SO, WHAT ISN'T SOCIAL LEARNING? (Part 2/3)

Perhaps it is easier to start with what social learning is *not*. It is, for example, *not* the modes by which social learning occurs; rather it is the process of learning itself (Pontefract 2012). The concern is that “social learning as a concept is frequently confused with the conditions or methods necessary to facilitate social learning, such as stakeholder participation” (Reed et al. 2010). These modes are what I broadly refer to as **tools of social learning** – the tools and techniques educators can use to manage a social learning system - but they are not part of the **social pedagogy** – the philosophy and defining points of a social learning environment. Tools help you to engage a group, assess a system, or structure a discussion. They will not be discussed at length in this project, and for more thorough guides on tools readers are encouraged to consult Keen et al. (2005), Gray et al. (2010), Gookin et al. (2004), and other resources cited below.

Social learning is also not to be confused with its outcomes (Reed et al. 2010). A group of people can all learn from the same experience but the social dimensions of that experience may have little to do with the information. Similarly, information may be conveyed about specific **content** – the topics or material the system is built around – but simply conveying that information does not necessitate that a social mechanism or tool has been used to do the conveyance. Social learning is not limited to specific content, specific actors in society, specifically formal or specifically informal learning, or digital media of learning (Bingham et al 2010). Social learning systems may incorporate those things, but they aren't required or essential.

Social learning is also distinct from “innovation-diffusion” models of learning. Though they may occur among peers, these systems treat knowledge as content rooted in authority to be passed down to passive learners (Freire 2000). While these models utilize social networks to convey information, they limit interaction, which seems to be one of the critical cornerstones of social learning (Krasny and Lee 2002). Innovation-diffusion is a means of knowledge distribution, while social learning systems are meant to also serve as a source of knowledge creation and construction (Seely and Adler 2008, Freire 2000). Innovation-diffusion is seen in resource management or education when the “right answer” or a new technology is given out by an expert, who trains learners who may eventually even train others in the exact same technique or “right answer.” Social learning is seen in resource management when conflicting stakeholders

engage in dialogue with one another to develop a right answer within a specific socio-biological context or setting, with or without support from external expertise.

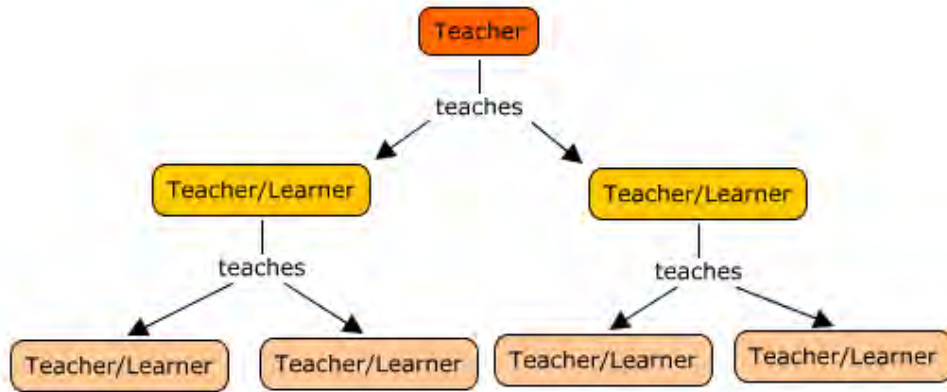


Figure 1 - Innovation Diffusion

In “innovation-diffusion” models knowledge is expressed through social networks, but it is unidirectional. This is traditional education using social networks, but not necessarily utilizing tools or pedagogy of social learning.

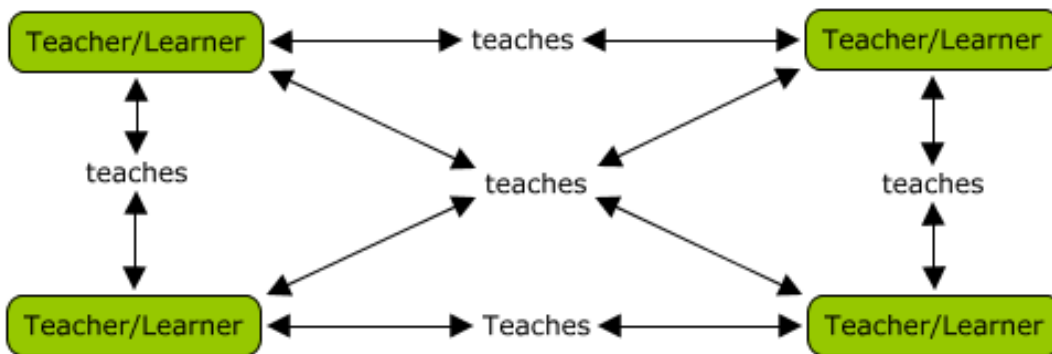


Figure 2 – Social Learning

In a social learning model, social networks interact and learning occurs in multiple directions. Social learning tools help to facilitate this kind of integration and interaction, and pedagogically the assumption of a dichotomy between “teachers” and “learners” is dismissed in favor of a teacher/learner concept.

Perhaps most critically, social learning “is not constantly social in the same way a party is” (Bingam et al 2010). People can be alone and learning socially, though they *cannot* be isolated from the *ideas* of others and the opportunity to respond to them. In this sense, I can be physically alone sitting at my computer on an online forum. Even if no one else is actively logged on, their posts are “artifacts” of learning that I can learn from, reflect on, and add to. As long as

they too can return and do the same with my “artifacts” the learning is social, though we never interact as bodies in the same space. As long as ideas, information, experiences, and artifacts are mingled between people then knowledge as a product of “social construction” may occur. In simple terms, this is the idea that “when you engage with people, you build your own insight into what’s being discussed. Someone else’s understanding complements yours, and together you start to weave an informed interpretation” (Bingham et al. 2010). This requires time to share. It also requires time to reflect. Social learning may be most evident when people are actively talking and bouncing ideas off each other, but taking individual space is important too! For the purposes of this project I assess social learning that does occur in the same physical space and time, but it is important to acknowledge that theory does not demand such.

A failure to appreciate these subtleties means that traditional forms of learning sometimes masquerade as something social: these approaches “claim to be ‘integrative, participatory, and adaptive’ but there is a tendency for them to be more of the same”. That does not mean they are without value, but when “social and ecological sustainability ultimately depend on our capacity to learn together and respond to changing circumstances” it becomes critical to ensure that the approaches to education and collaboration we are adopting *do* authentically represent social learning (Keen et al. 2005).

WAIT, SO SOCIAL LEARNING IS WHAT? (Part 3/3)

Social learning systems, for the purposes of this project, are defined by (1) the presence of an assumption that knowledge is socially constructed, (2) a form of governance over the interactions of those involved, and (3) the formation of a learning system network. I argue that these are common traits of effective group learning in a formal setting across topics and disciplines.

Every learning community forms a network that can be assessed using six spectra I developed after reviewing literature on group learning, social learning, and organizational management: scale, integration, interaction, equity, investment, and diversity. While a social learning system may be placed over a wide range on any one of the spectra (i.e. it may be large with limited interaction, small and highly integrated) all must be present within the social network. Differences along these scales may require an educator to manage a particular social network differently, and not all social learning tools are universal. Despite that, the fundamental presence of these scales remains. Social learning systems seem to universally share at least these qualities, though others may be present.

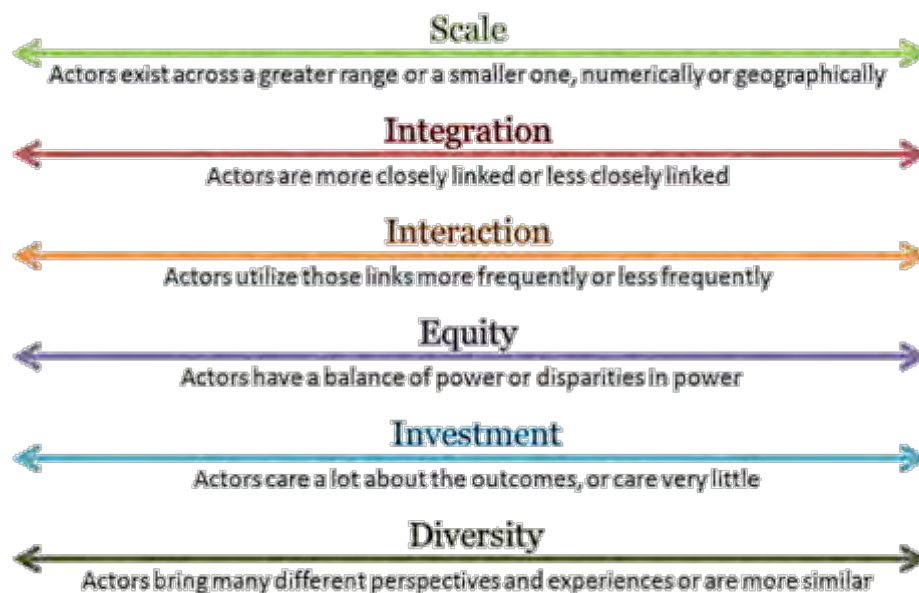
Another distinctive phenomenon of social learning practices is **governance**, an overarching term referencing how a group is managed, conflicts are resolved, decisions are made, and leadership is determined (Block 1993). Though it is uncommon to find specific reference to “governance,” structures and rules of engagement between participants in social learning systems is a common theme throughout the literature (Bingham et al. 2010, Reed et al. 2010, Senge 2010). Internal leadership – or its absence – plays a critical role in the function of a group and is worth specific assessment (Brafman and Beckstrom 2006, Wenger 2000). Peter Block (1993) intentionally uses the term “governance” in managing organizations because it calls to mind notions of managing power, privilege, and wealth – in the learning organization wealth of knowledge – and acknowledges the fundamentally political reality of social organizations.

Finally, social learning is dependent on the idea that **knowledge is “socially constructed”** and can be created through social interaction. This is to say that learning is a product of actors interacting and collectively utilizing experience to generate knowledge. While these actors are often seen as human individuals, they may be groups, non-humans, or others

that can induce reflection or generate a change in understanding within multiple individuals in a simultaneous process (Latour 2005, Reed et al. 2010, Bingham et al. 2010). Rather than considering learning content as something to be transferred from an authority to learners, the content is situated as part of the process where the content is subject to change based on the inclination and knowledge already possessed by the group (Brown and Adler 2008).

Six Social Spectra

6 Spectra of a Learning Community



The above spectra reoccur throughout literature on social learning in ways described below. While I do not intend it as a definitive list, I propose that most social learning systems can be understood as networks that can be measured along the spectra listed above. When I use the term networks, I am generally referential to Bruno Latour's idea of Actor Network Theory (ANT) in which objects, non-humans, non-individuals and individual humans can all be considered connected in dynamic networks of relational interaction that are subject to change (Latour 1996). Latour considers ANT to be "as much an ontology or metaphysics as sociology," and conceptually situating learning communities within his extensive academic grounding mirrors educational theory in which reflection on objects, ideas, or groups by the learning community provides a useful learning experiences (Freire 2000). It also supports the rejection of a Cartesian worldview inherent in social learning systems, which are deeply rooted in ideas of

social construction of knowledge rather than knowledge existing as absolutes (Brown and Adler 2008).

Critically, the network is not independent of actors creating it, so any educator that traces their learning community as a network must consider their own role as an actor within it. For example, an expert ecologist cannot remain unaware of the fact that her uniqueness relative to those she may be working with factors into any efforts at teaching she may attempt in a non-scientific community, just as an adult educator must bear in mind how his age influences the way what he says is interpreted by younger students. Where people come from and how they are seen influences how what they say is interpreted, and as such it is critical to be mindful of who is in a network and how they might see others. This drives at a broader philosophical point to be addressed elsewhere: membership in a social learning system is very widespread, and may need to be bounded for pragmatic reasons. The goal of using networks is not a specific “map” of participants in a social network (i.e. Christakis and Fowler 2009), though that is valuable – the point is to view the learning community through the ontological reality Latour tries to demonstrate throughout his work (Latour 1996). Similarly, these spectra use ANT only as a means of *assessing* a relationship of associations, not determining *why* or *how* they form (Latour 2005).

Scale

There is a common theme that social learning can occur not at the individual level, but at the group level as well (Reed et al. 2010, Wenger 2000, Dewey 1916, Salomon and Perkins 1998). The notion that an organization (i.e. a classroom, a village, a city, a corporation) itself can learn has become a norm and even its own discipline (Senge 2010, Bingham et al. 2010, Brafman and Beckstrom 2006). Collective community learning may be essential to authentic increases in understanding that promote social and behavioral change (Freire 2000). Organizations of classrooms or schools are of great concern to the educator, and community organizing is increasingly seen as essential to resource management professionals. Networks are no longer groups of individual stakeholders, but entities in-and-of themselves.

Social learning can cross these boundaries, allowing information to occur through “brains, bodies, routines, dialogue, and symbols” and other expressions (Reed et al 2010). While this can be geographic (across space) or numeric (numbers of people involved), it would be a mistake to consider solely those terms of scale, or to look at scale as a quantitative measure

alone. This runs dangerous close to Latour’s “tyranny of geographers” (in the spatial sense), when it is perhaps better to assess scale in terms of the number of *potential* associations within the network (Latour 1996). A large space or group certainly increases scale, but the *social* scale is not increased until interaction and integration occurs – which is why those spectra swiftly follow.

Integration

There seems to be a general consensus that social learning must occur not through the traditional “one-to-many” relationship of a classical educator, but through the complexity of many multi-faceted relationships that make up the educational framework. That communities function this way is common sense to anyone who has lived in a small-group setting, but this mentality is only beginning to enter classrooms or influence the way resource managers work to educate and learn from their stakeholders. The notion of social network theory gives us models and terminology by which we can interpret this, with more integrated social networks (more connections between more of the stakeholders involved – i.e. “denser”) make something a “more social” experience (Christakis 2009). If social interaction – or more broadly, interactions between an individual and a great many other things (i.e. non-human actors, ideas, etc...) are truly potential sources of educational value, than social learning systems seek to maximize these associations between the various actors participating in the learning system. This includes integrations across media (i.e. digital and “in-person” associations between people, associations between ideas and people, etc...) (Rovai and Jordan 2004, Latour 1996). Often these relationships need not be *created*, but simply identified by the actors actually within the network for the value to be realized.

Interaction

Social learning systems revolve heavily around the idea of a learning community (Krasny and Lee 2002, Zhao and Kuh 2004, Wenger 2000). This is particularly evident in digital learning, where forums, discussion boards, and programs like Moodle, Twitter, or others allow for active response by all members of a course (Rovai and Jordan 2004). This is a far cry from an older model in which a student might submit a project to faculty and receive a grade, marking the end of interaction. Today, it is possible for ideas to be viewed, reviewed, and assessed by multiple actors at once – the essence of much of the multi-stakeholder interaction present in social learning (Krasny and Lee 2004, Reed et al. 2010). Learning becomes a product of socially

constructed knowledge between multiple actors in a relationship (Brown and Adler 2008, Bingham et al. 2010). This is the essence of interaction.

Directionality of learning (i.e. “who teaches who”) is also critical to relationships in an educational network, with social learning systems emphasizing cyclical processes of feedback while traditional learning systems are more linear, as in an innovation-diffusion model (Gray et al. 2010, Reed et al. 2010). Actors must act on each other and not simply be acted upon. Not only are systems connected, and densely so (integration), they are reciprocal and actors feed back into each other (interaction). This is perhaps part of how Latour justifies differentiating his “Actor-Networks” from networks in the sense of computer systems or established web-like structures where information flow is pre-determined. In the latter case, interactions do not allow for a change in the network itself and dynamism is reduced, all of which counter Latour’s (1996) explanation of ANT. Integration occurs, interaction does not.

Equity

If integration is to be achieved – especially across scales and across difference – relationships of power between the actors attempting to use their relationships for a learning purpose must be taken into account. Politics, as the structuring of power in a group, is therefore of utmost concern in a social learning system. For this reason, Social Learning Systems are education systems that must have a means of governance (the management of politics) and a political structure (the management of governance).

Just as integration suggests that individuals must be able to influence and forge relationships with each other, and scale suggests that learning may occur both within individuals and within the group, politics suggests that individuals must be able to have influence across scales and consider issues of governance of the group as much as they consider relationships with one other individual. Latour identifies the risks of conversing about power, given its frequent misinterpretation as a sort of militaristic agency to be possessed. Rather, power should be interpreted as the result of actors being “something that acts, or to which activity is granted by others” – which is to say, it can result in change in the network itself (Latour 1996). Equity then suggests that every actor is given a chance to influence the learning and knowledge implicit to the system – every person or idea considered should have some opportunity to change understanding or behavior, and thus should be respected and taken

seriously by all participants. The expectation is that everyone's knowledge and experiences contribute to a greater understanding, and all voices must be heard. This may require a careful assessment of amounts of power, and is the reason equity is chosen over equality. Many systems in which every participant still has right and a clearly defined role may not allow for the equitable distribution of power (Block 1993). It is worth noting that environmental experts may be uncomfortable giving voice to individuals who question fundamental ecological tenets, doubt climate change, or propose theories that appear ridiculous relative to traditionally accepted ideas. Let the need for equity be a the gentle reminder that their perspective does not make controversial claims more or less true, it simply provides a space for every other actor in the network to understand the position of a fellow learner or another stakeholder in the community.

Investment

People often talk about gauging the “energy” or “taking the pulse” of a group. This is, in short, a reference to people's buy in or willingness to participate. Also known as engagement, it is strongly associated with the ability to identify with the learning community and feel a sense of belonging (Wenger 2000). Notions of “participatory learning” are prevalent, and there is a sense that anyone involved in the social learning organization has a right to information and knowledge about what is going on elsewhere and with others (Brown and Adler 2008, Block 1993). Learning may have a pragmatic element, as with farmers who might consult with experts to improve their livelihoods, or even be competitive, as people with different stakes in an issue attempt to advocate for their own perspective while still seeking out a sense of others (Krasny and Lee 2004). Pragmatism, competition, necessity, and other factors all could potentially contribute to increased investment in the learning process

Investment is often interpreted as an inherent human tendency to build relationships that support survival, whereby groups “create and [sustain] social capital – the stock of social trust, norms, and networks developed through a flow of information and reciprocity drawn upon to solve common problems” (Bingham et al. 2010). This requires a sense of connection to the goals of the learning system and the actors within the learning system, which can be generated by common experiences, the construction of artifacts specific to that learning system, and a range of other community building practices (Wenger 2000). In essence, learners need to find some meaning in their relationships with each other and any learning goals intended by the facilitator.

Diversity

Because social learning systems are dependent upon the experiences and perspectives of those within them to lend to the learning experience, how distinct those differences are is of critical importance. Groups must be able to identify enough with each other to effectively communicate but must be different enough to not simply reinforce the existing knowledge, perspective, and understanding of the actors involved. This is a difficult balance. For example, there are reports of stakeholders that were at such different places coming into a social learning experience that they were unable to reach productive common ground (Muro and Jeffrey 2008). Sometimes there is fundamental disagreement about facts, morality, or otherwise between actors. On the one hand it is valuable to interact with, accept, and learn from these differences independent of what is actually “true.” On the other hand, too much disagreement can derail effective group processes. Thus it is important not to always assume that more diversity is ideal, but to try and think intentionally about how much diversity is required, how different perspectives will each be given space and power (equity) to achieve buy in, and similar. For example, rather than letting individuals within a group argue about “truth” (since different truths can be mutually exclusive), frame things a discussion about “perspective” (since mutually exclusive perspectives can still co-exist, though not without challenges). Ultimately, the diversity of a learning system determines how much knowledge – the sort of “raw material” of learning – is present in the first place. The question is how much is needed.

Governance

Nearly universal in social learning are structures for managing human behavior for the end goal of the learning system. In personal communications with facilitators, a reoccurring theme has been making sure people are prepared for the demands and norms of the learning system. Though people are used to interacting in social groups, and many learning communities readily form around common interests without requiring the intent of individuals, there remains a degree of “artificialness” in intentional learning communities (Wenger 2000). Facilitators often describe the need for people to be “given permission” to talk, explore, or interact with each other in new ways. It is, in fact, the essence of a lot of facilitation work (Rhonke and Butler 1995). This becomes critically important once one considers that integrating diverse parties means many individuals may have alternative social norms that govern how they engage with others. Providing a common set of rules, providing training or guidance to follow those rules, and ensuring that everyone is comfortable (or equally uncomfortable) with those rules can preserve equity across diversity.

The “Waterline Model,” used as a diagnostic tool to assess problems in group function, encourages group managers to find structural causes of problems before looking to group, interpersonal, or intrapersonal concerns (Gookin and Leach 2004). This emphasizes the critical role structure (things like rules, roles, goals, schedule, and decision making processes) play in managing communities. Social governance is the means by which groups establish these structures for themselves. Governance often expresses itself through mental models of expected behavior, and need not be a product of intentional dialogue (Senge 2010). Most social groups have a shared and implicit normative sense of how certain social interactions will be carried out (Rhonke and Butler 1995). For example, I am from a family where long pauses typically follow any sentence. People rarely interrupt each other. We do not discuss prior to conversations that we will interact that way, it simply happens. But when I am in a group where people respond quickly, I often find myself silenced – the structure and governance of the group has changed, and I have to be intentional about reassessing how I respond. Governance is that process of intentionally setting up the rules so everyone can be on the same page. When you intentionally allow people to see the rules that exist, and then play by a different set, you open up a tremendous learning opportunity. This involves encouraging people to move beyond their pre-existing mental models.

Mental models give us “deeply held internal images of how the world works” and can “limit us to familiar ways of thinking and acting” (Senge 2010). Risk managers are increasingly aware of a process of “sense making,” whereby we “make sense” of a situation based on mental models formed by our previous experiences. The role of sense making in decision making processes, and the roots of that process in “latent conditions” like organizational factors, distribution of authority, and role definition, are critical to understanding how individuals react to new scenarios (Jackson 2013, Jackson 2013). While much of the research on mental models has focused on risk and perception, it is increasingly evident that it has to do with how we perform and operate in social organizations as well (Senge 2010). Human actors in educational systems may have backgrounds in more traditional, less social learning structures. Their mental models may not support a new approach to social interaction without it being made explicit, and explicit social management is governance (Block 1993). This is largely behind the counterintuitive claim that establishing rules can support and even enhance creative process (Gray et al. 2010).

In the sense that mental models can be inherited and passed between individuals they can almost be said to be cultural – specific groups may have a mental model that is not mirrored by other groups when considering similar processes, places, or ideas. They are built on experience, and thus a series of common experiences can generate incredibly strong mental models. Indeed, “entire industries can develop chronic misfits between mental models and reality” (Senge 2010). In social learning governance is valuable because of its ability to encourage, or even demand, new forms and structures of interaction. People simultaneously learn explicit new forms of social interaction while having experiences that confirm the possibility of those social interactions in the first place. Governance can build new mental models of social interaction.

This tendency for mental models to become culturally inherited has huge ramifications for managers and educators. Humans “selectively identify systems of concern to them from myriad complex interrelations that form reality itself,” with the simple outcome that the same system may have distinct meanings to distinct individuals (Keen et al. 2005). Despite the fact that “wolf” has a consistent dictionary definition, the concept of wolf – rooted in cultural systems and personal experiences – means very different things to an environmentalist and a rancher (or their children, should they share a classroom). The same word is used, but the meaning is different. Sometimes the mental model is as simple as what the “proper state” of an ecosystem might be – governing structures puts the onus on the facilitator to get participants on the same page, even if “we are left to negotiate with each other on the basis of our personal values” (Keen et al. 2005). In that scenario there is at least a common understanding that competing values (non-mutually exclusive) rather than competing truths (mutually exclusive) are guiding environmental decision making. That is a governing decision, dictating what people are and are now allowed to express (i.e. claims of values are legal, claims of truth are not).

Governance also lends direction to what could otherwise be a directionless system. In Gamestorming, a book highlighting the use of games for processes of knowledge creation, Dave Gray, Sunni Brown, and James Macanufo speak to the governance of social learning systems. They use “play” is the experiential process of learning, whereas “rules” turn “play” into a “game” in which multiple participants collaborate in a controlled structure to generate outcomes. They provide an example of a boy kicking a ball. “Associative play” is the process by which he learns to associate movements of his body with movements of the ball in space. If another boy wanders in, according to Gray et al., “the play has gained a social dimension” as the boys kick back and

forth. But it is not until rules are established - “Let’s take turns trying to hit that tree. You have to kick the ball from behind this line” – that it becomes a game that can generate outcomes and accomplish goals in a distinctly *intentional* way (Gray et al. 2010). When learning together with the goal of solving a problem these goals can be very important and clear: develop a policy to help manage water usage in this area, for example.

Of course “play” as described above *can* be a means of learning with a social component that can generate outcomes or accomplish goals. Still, it may not be a “social learning system.” Intentionality is critical to an educational system, and results from a governing structure by which individuals or organizations decide to accomplish something as a collective. Peter Block (1993) describes this through the mission of an organization, and the way shared commitment to that mission or broader goal guides and motivates the work of all members of effective organizations. There is meaningfulness to this intent that serves as a major inspiration for many participants in these systems (Senge 2010). The distinction between “play” and “games,” or “learning socially” and “Social Learning” can be made concrete. Games, learning communities, and other explicitly educational social systems all generate artifacts or knowledge, and all have boundaries (Wenger 2000, Gray et al. 2010). Play *can* do all these things, but it is not guaranteed.

Consider, for example, the difference between “pub talk” –running into people at a pub and having a conversation – and a collaborative working group trying to develop a product. In both cases you have social interactions that have the potential to generate new knowledge. But pub talk lacks boundaries. You could go in any direction, discussing politics, the media, pop culture, philosophy, or a great many other things. The collaborative working group, though its conversations may stray and vary from any predicable outcome, ultimately is working within “fuzzy boundaries” towards a “fuzzy goal” of a final product (Gray et al. 2010). Pub talk also lacks a demand for artifacts or knowledge. A social learning system is intended to produce something new – generally knowledge, or something that conveys knowledge (an artifact, like a text, video, or book). If it does not, it has not succeeded in being a true “learning” system. This expectation for the generation of artifacts (read: socially constructed knowledge) does not apply to pub talk. You can spend a night in a pub and generate no new ideas or thoughts. The social interactions may still be rich, but there is no product to show for it at the end of the night.

Governance takes the inclinations we all have to communicate and dialogue with each other (all visible in “pub talk”) and gives it intentionality, focus (boundaries), and a fuzzy goal (artifacts or knowledge construction). Learning-oriented governance takes social interactions that occur every day and turns them into a new model of education, one that can both help people engage new knowledge content *and* solve problems collaboratively.

Social Construction of Knowledge

A final component of social learning is its dependency on the idea that knowledge is a product of social construction. Socially constructed knowledge is understood “through conversations about that content and through grounded interactions with others” (Brown and Adler 2008). Rather than assuming that knowledge or educational content is in a final form, where human actors “pass a claim without themselves undergoing dramatic changes,” knowledge – and individuals transferring it – effect and are effected by the content (Latour 1996). Knowledge of any sort is built, not in the physical sense, but by a process of interaction from many sources in many minds and through many artifacts (documents, images, etc...) over time. Like a building, a concept may appear to have a final form. Constructivism simply suggests that this final form comes from *somewhere* rather than existing absolutely, and that “by adding to any existing entity its time dimension” you can explore historical origins that give meaning to the subject in question (Latour 2005). And, of course, the “final” form is not so final – it too can be built upon and transformed in the minds of those in the educational network.

This differs from an essentialist view of knowledge often associated with traditional western Cartesian thought. In this perspective, knowledge is content in a final form that can be transferred unchanged, with the primary concern of pedagogy being the best means of transference (Brown and Adler 2008). Little room is left for the information to be transformed, translated, or interpreted – all processes which suggest some change – by the individuals receiving the knowledge. This mirrors “innovation-diffusion” models of learning in which authority-experts (possessing of the vast majority of power and knowledge in the learning community) pass that learning on, versus social learning, where teacher-learners (power and knowledge shared by all) interact (Krasny and Lee 2002). Often called the “Banking Model of Education,” Paulo Freire (2000) critiqued it for the way it “transforms students into receiving objects... to control thinking and action, leads men and women to adjust to the world, and inhibits their creative power.”

This poses a challenge to many traditional disciplines of learning, where content is typically structured around facts that are, for all intents and purposes, widely accepted truths (i.e. physics, chemistry, etc...). This can be a particular struggle to the environmental educator or resource manager trying to convey their values of the importance of an ecosystem or biodiversity, or the truth of climate change or carrying capacity. Two debates stem from this, both of which I hope to avoid within the context of this particular project. The first is a philosophical debate about whether that knowledge does exist absolutely, independent of human observers and any process of construction – this is intriguing but not relevant. I make no claims about the verifiability or “truth” of any particular branch of knowledge. I simply acknowledge the reality that the mechanisms by which we learn knowledge are, inevitably, social (Dewey 1916). Knowledge that is scientifically replicable and practically useful can go on being just that and still fit well within the framework of social learning I propose. I simply introduce the layer that other’s perspectives of the same phenomena add layers and complexity that are worth understanding. It can be valuable to know what the farmer thinks of the ecologist’s claims, even if you do not grant that the farmer’s perspective has any bearing on the accuracy of those claims. Social learning does not necessitate that the group has ownership over “truth.” The pedagogy simply demands acknowledging that everyone has their own perspective, and that the educational process must work from that perspective to get to another.

The second debate is a practical argument about how subjects can be taught in a social learning system. As with many courses in quantitative reasoning and science there is an expectation that there is right and wrong content and right and wrong answers. Some students may not wish to learn from peers, especially when those peers are novices and available faculty are experts. This is a less equitable learning system, however, as knowledge is distributed so unevenly. At least according to the theories I propose above, one would expect such a scenario to be less social as a result of that inequity. But even so, valuable social learning may occur. For example, a traditional chemistry or mathematics lecture could be supplanted by group work devoted to solving problems within those fields. Whether or not this is a more effective method when it comes to accomplishing learning outcomes, it is undoubtedly more social.

If, however, at a philosophical level knowledge is a sort of essential “product” that can be transferred between human beings then much of social learning’s philosophical underpinnings may be questionable. For the purposes of this project, I assume that knowledge is fundamentally created through social construction. This implies that knowledge does not exist absolutely, but

rather is simultaneously created from shared understanding and continues to be transformed and interpreted through ongoing interactions. Shared experiences support each other, experiences that differ must be explained, and the content of knowledge becomes “more powerful than any one participant could create individually” (Bingham et al. 2010). That means you cannot reliably count on content to be unchanged by a social learning process, and in fact have to be open to new interpretations or means of understanding – even on widely accepted truths. This has deep implications for social learning at a very pragmatic level for the educator, since curriculum cannot rely on content. The content may change over the course of the curriculum! Instead, “this perspective shifts the focus of our attention from the content of a subject to the learning activities and human interactions around which that content is situated (Brown and Adler 2008).

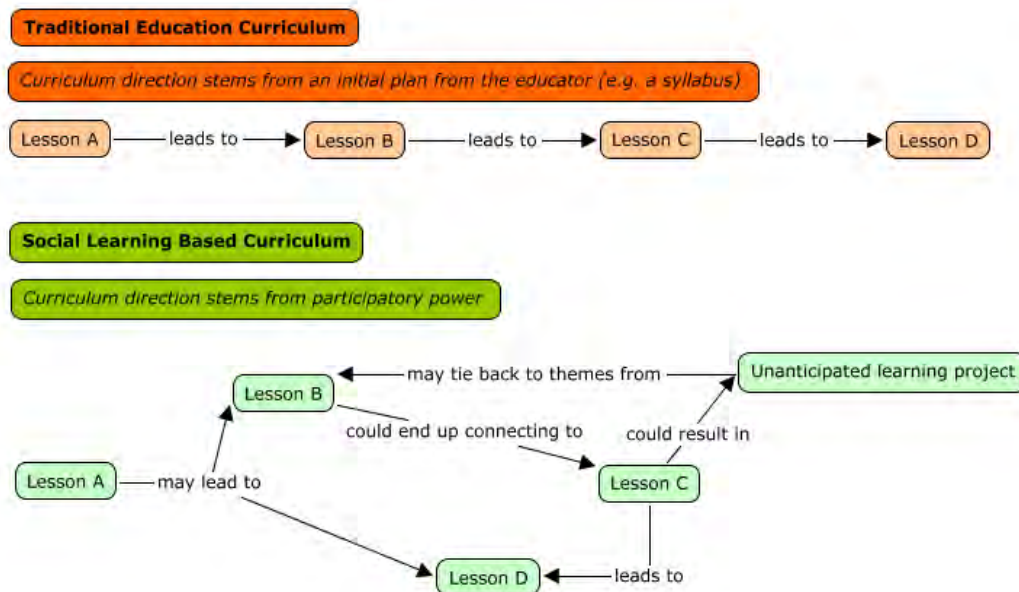


Figure 3 – Traditional educational content versus content in Social Learning

Curriculum in a traditional learning system versus that of a social learning system. In the former content is predictable, as there is no expectation of participatory changes. But participation can change the direction and nature of content in a social learning system, where learning is thought to be socially constructed.

Content is, of course, still necessary. Educators may have the luxury of fuzzy outcomes, but the drive to assessment or demand for a resource manager to develop a plan requires certain goals and information to be transferred. Thus knowledge production that is external to the learning system can always be introduced as a focus. This is at the root of one of Freire’s (2000)

approaches, whereby an artifact to be reflected upon is presented to a community and knowledge, both of the community and the artifact, is drawn from the reactions to it. For example, an educator is welcome to bring in ecological theories that may be foreign to the stakeholders they work with. It simply cannot be presented as unquestionable truth: everyone must have the opportunity to test, play with, and gauge the claims against their own knowledge and experience. As an educational curriculum focuses less on a predictive flow of information within a category results become less predictable. Content, too, becomes less predictable, since every actor in the actor-network of the learning system brings a unique set of understandings and perspectives simultaneously reflected upon and changed by all the other actors. For some this unpredictability is a discomfort and a weakness: so be it. It comes with the territory, and the ability of these techniques to function in relation to any environmental issue and to draw from many sources of experience or knowledge may very well be the greatest strength of SLS.

What matters for an educator in this new model is not the extent of his or her knowledge content or expertise. What matters is his or her ability to manage a group or actor-network, the relationships within it, and to establish or work within the governing process at play in the system. This is a skill, and like traditional teaching, it can be learned, taught, and improved upon. But this will require a new set of skills and training to be disseminated, tools that may help define the educators of the future.

HOW TO TELL IT'S A SOCIAL LEARNING SYSTEM

You can place it on the 6 spectra.

It has a governing model.

Everyone believes knowledge is socially constructed.



The “Holy Trinity” of social learning.

It’s probably fun.

It has fuzzy goals (curriculum/learning outcomes).

After a while you can’t tell who is in charge.

Rules are sacred. It’s a game, not play (even if it is playful).

It has boundaries (pub talk can go anywhere, a social learning system won’t)

It has artifacts (you’re not trying to create anything in pub talk, you are in social learning).

SITUATING SOCIAL LEARNING

The second part of this project was to assess the theories I propose above. Assessment is a critical practice in education, and the importance of the ability to associate identifiable changes in the educational system with measurable changes in outcome cannot be overstated. This effort is largely an attempt to propose a mechanism by which social learning can be assessed and understood and to identify intriguing hypotheses that merit further study in effective social learning. As such, the emphasis is not on the outcomes *per se*, but on developing a tool that can tease out differences between social learning systems in a way that could be of use to educators using social learning in the future. My primary intent is to develop that assessment mechanism, with the secondary intent of gaining insight into developing effective social learning systems. Over the course of several weeks at Lewis & Clark College I found a variety of peer-to-peer learning exercises and activities both within the Lewis & Clark Environmental Studies program and within residential living-learning communities on that same campus. I used a feedback survey designed to assess the degree to which a learning opportunity fits into the model of social learning I develop in earlier in this paper. I discuss the results of this research in this section followed by a reflection on the assessment mechanism and technique.

METHODOLOGY

I acted as an observer, and occasionally as a participant, in a variety of social learning opportunities. I sought out opportunities pertaining to a wide range of topics, though I emphasized activities taking place within environmental studies courses. Activities and discussions were facilitated by non-experts or peers rather than faculty or trained educators. During the course of the activity I observed a several factors, including who spoke and how frequently, the size of the group, the structure of the activity, the degree to which people would relocate, the amount of time conversations were on track, and when group discussions would start, begin to peter out, and stop. I listened in on discussions to see how on track they were relative to the anticipated learning outcomes provided. Occasionally I would interview participants following activities to record their perspective. A fairly comprehensive, though brief, guide to observing group learning in classrooms can be found in Chapter 9 of Elizabeth Cohen's (1994) Designing Groupwork: Strategies for the Heterogenous Classroom, and that work inspired my observational approach.

In addition, I provided a consistent survey across several of the larger activities I observed. I collected 161 individual surveys over 7 different activities. I personally attended all activities at which data was collected and administered the surveys myself. Surveys were distributed at several other activities, but I received 0 responses from activities at which I was not present. The survey consisted of two parts, one for a facilitator and one for the participants, as seen in Appendix A (facilitator survey) and Appendix B (participant survey). The facilitator survey offered an opportunity for the coordinator or coordinators of the activity to identify learning outcomes, a structure, or their own assessment mechanisms. This was compared to explanations of the outcomes, structure, and feedback from participants. By comparing these two sections, researchers can gain a sense of how well-aligned the perspectives of both parties were in any given activity. The participant survey also asked participants to rate the accuracy of several statements (provided below) on a 9 point scale. On the facilitator survey, those statements were clustered to provide scores for all spectra except “scale”, a “general satisfaction” score, and a “social construction” score. Fourteen statements were used in accordance with a 9 point scale (1 being low agreement, 9 being high agreement) as follows:

- a) I benefited from the presence of others in this activity.
- b) I have strong connections to the others participating in this activity.
- c) I felt included in this activity.
- d) I was welcome and able to actively participate in this activity.
- e) This activity was personally engaging.
- f) I encountered different perspectives through this activity.
- g) I had fun in this activity.
- h) I had a meaningful experience or conversation.
- i) I was able to influence the flow of the activity.
- j) I willingly participated in this activity.
- k) I was invested in the outcomes of the activity.
- l) I had something valuable to contribute to this activity.
- m) Other participants contributed something valuable to this activity.
- n) I am glad I took the time to do this activity.

These statements were then clustered in a number of ways to measure the participant’s response along several spectra. Statements that were relevant to multiple aspects of social learning were repeated, and thus “weigh more” in the final count. The clusters were as follows:

SPECTRUM	SUM OF SCORES
<i>Scale</i>	<i>Measures used (i.e. # of participants)</i>
<i>Integration</i>	<i>b,h,k,l</i>
<i>Interaction</i>	<i>a,i</i>
<i>Equity</i>	<i>c,d,i,j</i>
<i>Investment</i>	<i>e,g,k</i>
<i>Diversity</i>	<i>f</i>
<i>Social Construction</i>	<i>a,i,l,m</i>
<i>Overall Satisfaction</i>	<i>a,e,g,l,m,n</i>

The survey provides a mechanism by which participants in a social learning system can report out about their experiences. That reporting can be converted into a quantitative understanding of where the activity fell along the six spectra of social learning, the degree to which learners felt they were part of the knowledge creation process, and their overall satisfaction with the educational program. In addition, the form allows for a comparison of the governing structure understood by participants relative to the structure a facilitator intended. This helps researchers assess whether or not common understanding across all participants and facilitators was achieved.

Respondents are also encouraged to identify any other participants whom they “learned from, taught, or engaged with in a meaningful way”. By documenting these participants, researchers could conceivably create networks to assess interactions within the activity, whether the network was one integrated whole or composed of smaller outlying groups, or similar network phenomena. One can also use data to determine how many people a facilitator might expect any one individual to engage with given different activities. This, combined with quantitative assessment, understanding of governing structure, and general feedback, offers an opportunity to create a “profile” of any given learning experience or educational program.

RESULTS

Approximately 161 surveys were collected over a span of 7 activities, 6 of which involved environmental studies programming. Four activities included 28 persons, one had 19 respondents, one had 18 respondents, and one had 12 respondents. Surveys were aggregated into the clusters devised above, and responses were averaged. Due to the many variables in every learning activity surveyed there was no strict “control.” To accomplish such a control, a consistent educator working with a consistent demographic sample might consider surveying responses to a variety of governing structures. For example, the same group could go through discussions or activities following different structures with only a few differences. Their surveys could be collected and compared to specifically test certain variables changed within the governing structure.

In this study that degree of control was not available when conducting research. Rather than testing a single variable (i.e. one structural change with an impact on the learning system), the testable difference can be summed up as “being activity A” versus “being activity B.” As the method currently stands, observers must reflect on notable factors from any given activity and interpret possible causes for any measurable differences that occur. For example, differences in diversity across activities could be a result of some aspect of the structure of a learning system, but it could also simply be because the group was composed differently. Since multiple variables changed across activities (i.e. group composition *and* governing structure *and* size) an alternative baseline for comparison is required. In order to achieve this, results from each individual activity were calculated relative to the sum of all activities when combined together. Rather than provide an absolute comparison, activities are assessed relative to each other and can be rated based on how well they performed relative to the norm. This essentially ranks activities on a spectrum of “how social” they are relative to other social activities, providing the researcher with activities that can be assessed relative to others (Table 2).

ID	Year	#	Structure
2	3rd/4th	28	The group was split in half, with each half tasked to develop an activity for another course.
3	4th	18	The group was encouraged to generate artifacts of major “takeaways” or ideas from a four year program. The group then split in half to develop activities using those artifacts. One group focused on designing an activity for another course, another group focused on designing a discussion for another course.
4	1st / 2nd	28	This was a simulation activity. Small groups were organized to represent differing stakeholder interests. Groups assembled to develop their own priorities, and then were mixed so that ‘stakeholders’ could talk through their needs with different parties.
5	1st / 2nd	28	A 10-minute lecture on a theoretical concept preceded open small group discussion on that theory and its applications. Discussions ranged more widely in practice.
6	1st / 2nd	19	The course was encouraged to generate a list of topics and themes of interest. Those were aggregated by facilitators, who then led open discussions within groups of varying sizes on those topics.
7	1st / 2nd	28	A structured discussion, where small groups were split and half and asked to take sides for and against different scholars and their claims.

Table 1 – Summary of ENVS Activities Sampled

Each activity surveyed is described in brief. ID refers to the identification number of the activity. Year refers to the years of college for post people in a given course (i.e. 4th = seniors, 1st = first year). “#” refers to the number of participants in an activity. Structure provides a brief outline of the how the activity was managed.

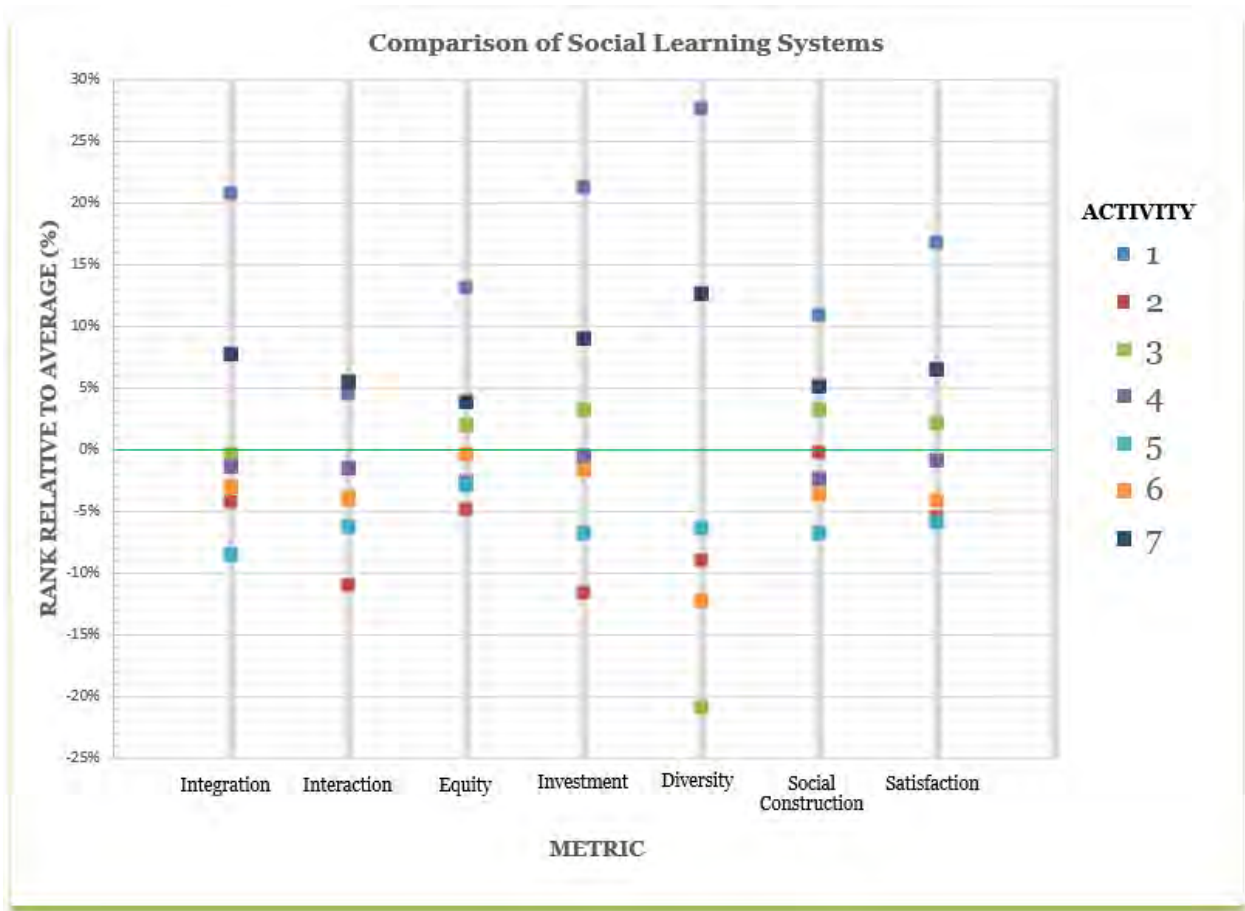


Table 2 – Results Relative to Aggregate

The aggregate of all scores of each activity are compared to the average scores of all activities. Each activity is color coded and showed according to metric. The green line marks the “0%” point, or the average score across all activities.

Activity 1, a free-form discussion amongst 12 people, 5 of whom were asked to be “experts” based on their personal experience, was the session that set the proverbial bar. It was ranked as the leading activity in all measures excepting interaction, with an overall satisfaction score that was 17% higher than the average of all activities combined. Only Activity 7, a small group discussion activity with a ~2:6 ratio of facilitators to participants earned a higher score, and only in the interaction category. A key distinctive feature of Activity 1 was the near-complete absence of power dynamics. Participants were asked to come speak about a topic (political systems around the world) without any designated expert on hand. Participants from different nations simply discussed political systems from their own perspective on their home nations. One participant summed up the difference between this type of learning and social learning, noting that:

“It’s very different talking with and listening to real people – especially ones I know and love – than sitting and reading about, or being lectured on, something.”

Participants surveyed after the event generally cited its informal atmosphere and a topic where the personal experience of anyone involved had relevance and could be shared. Nearly all participants had prior personal relationships with one another, and were in this activity voluntarily. This, and the density of their social network due to prior relationships, could be a likely explanation for the particularly high degree of investment and integration seen within this group. Whereas all other activities took place within the academic context of required classes in an environmental studies program Activity 1 was voluntary, open to all majors, and emphasized bringing together participants from different nations. This could explain the higher diversity rating. Given the dramatic degree of difference between this non-environmental program and most other scores, it seems reasonable to compare environmental studies activities without factoring in this outlier. This is seen in Table 3, below. I expand on prescriptive recommendations as a result of this data below under “Implications for Environmental Studies,” simply noting interesting trends in this section.

METRIC	#	% Δ	#	% Δ	#	% Δ	#	% Δ	#	% Δ	#	% Δ
Integration	5.83	-3%	6.07	1%	6.01	0%	5.58	-7%	5.91	-1%	6.56	10%
Interaction	6.07	-8%	6.56	0%	6.71	2%	6.39	-3%	6.55	0%	7.20	9%
Equity	6.71	-4%	7.19	3%	6.87	-2%	6.86	-2%	7.03	0%	7.32	5%
Investment	5.63	-10%	6.57	5%	6.33	1%	5.94	-5%	6.26	0%	6.94	11%
Diversity	6.00	-5%	5.22	-18%	7.43	17%	6.18	-3%	5.79	-9%	7.43	17%
Social Construction	6.82	1%	7.06	4%	6.68	-2%	6.38	-6%	6.59	-3%	7.19	6%
Satisfaction	6.42	-4%	6.94	3%	6.73	0%	6.39	-5%	6.51	-3%	7.23	8%
ACTIVITY	2		3		4		5		6		7	

Table 3 – Results Relative to Aggregate (ENVS Courses Only)

Average scores of each activity are compared to the average scores of all activities. “#” refers to the score on a 9 point scale, and “%Δ” refers to the difference (positive or negative) between that score and the average of all scores.

Integration Scores

Activity 7 was the clear leader in integration with scores 10% greater than the average, while all other activities hovered just above or below the average. This suggests a higher degree of connection to others in the activity, meaningful conversations, and a sense that one could contribute value to something they cared about. Notably, Activity 5 – composed of the exact same respondent group – had the *lowest* integration score at -7%, suggesting that either activity or the duration of time passed between the two activities (~2 weeks) is a likely factor in the difference. In both cases, peer leaders (upperclassmen) divided the largely first-year class into five small groups and led them in discussion. In Activity 7 this split occurred almost immediately following introductions, whereas in Activity 5 this split occurred after 10 minutes of lecturing. In Activity 7 the governance of the learning system required participants to take opposing sides and debate each other. No rules governed discussion in Activity 5, and a greater degree of speaking time was taken up by the facilitators than by the participants.

Interaction Scores

Activity 2 was the lowest ranked activity, and Activity 7 again saw the highest scores. Activity 2 involved two groups of 14 persons developing activity plans, whereas Activity 7 involved much smaller groups. Activity 2 scores suggest that participants felt they could not control the flow of the activity, and were not benefited by the presence of others. Indeed, when groups were organized in that activity only 4 participants of the 28 present actually moved beyond turning their desks. It appeared only a small cadre of voices in each of the two groups made up the bulk of the conversation. One respondent suggested that “our organization of small groups was poor because some [people] looked excluded and/or couldn’t see the board.” While it is true that participants formed circles that did not include all participants, it is not clear from the data that spatial arrangement is a major factor in influencing interaction rankings. While observationally the ability and freedom to move around during activities seemed to increase the “energy” of the room (i.e. volume, # of participants talking, etc...) this did not manifest in data besides activity 2.

Equity Scores

Activity 3 and Activity 5 were the highest ranked in equity, suggesting that participants felt included, able to participate, able to influence the activity and willing to be there. Activity 3 was composed entirely of graduating seniors in the environmental studies program, and the degree to which it was composed of self-identified “friends” may have contributed. This was one of the only activities in which “artifacts” (i.e. environmental knowledge “containers,” in this case post-it notes with concepts on them) allowed participants to contribute without necessarily speaking, which may have contributed as well. Activity 5 and Activity 3 were both more personal and less conceptual in their topics, with a focus on shared experiences. This could be another potential factor in contributing to the scores.

Investment Scores

Activity 2 scored 10% lower than the average and the Activity 7 scored 10% higher. Feedback submitted with surveys for Activity 2 suggested that many participants felt rushed, excluded, or that the learning process was inefficient. Several respondents were unable to participate in the activities that were planned during this activity, reducing their investment dramatically. The success of Activity 7 in this category is likely related to its success in other categories – perhaps the general sense of engagement and participation generated its own sense of investment in outcomes.

Diversity Scores

The leading activities 4 and 7 both had specific governing structures that asked individuals to take stances that differed from one another, which is likely behind their dramatically higher diversity rankings. Notably in Activity 3 a variety of feedback suggested the rationale behind the diversity scores: that seniors in a multi-year environmental studies program had all been taught to see and react to things in the same way. One respondent commented that “I learned the perspective I have as a senior ENVS major is pretty [expletive] identical to everyone else’s,” another commented that “as seniors, we have had very similar experiences in the ENVS department,” and a third noted that “we don’t have a ton of diverse thoughts anymore.” Activity 4 and Activity 7 had the highest diversity scores, settling at 17% above average. Notably these were two different groups in which the governance of the activity

required taking alternative sides of a debate or a perspective, a technique which appears to have been successful.

DISCUSSION

While there were some shortcomings with the assessment tool, as a general rule it was successful. The quantitative methods of the assessment mechanism were able to detect notable differences between activities. “Fill-in-the-blank” answers collected useful and intriguing feedback, but were not as clearly applicable to assessing the governance of the educational system in question. While there were some issues with assessing social networks, it is clear that minor changes to activity structure would allow for more thorough network analysis of social learning systems. In addition, preliminary results in the data do present potential hypotheses worth pursuit in more controlled assessments.

The methodology applied has some shortcomings. One weakness of this analysis relative to traditional scientific study is the absence of single, identifiable variables and changes across test cases. The presence of an observer, however, can lend itself to sorting out relevant differences in activities and proposing useful hypothesis for further study. A higher degree of control over learning activities allowing for more direct comparisons and manipulation would make this a far more effective approach to research, especially when attempting to understand how specific changes in group dynamics effect the social learning system.

On the whole these activities were preferred to traditional classroom environments. Of the 161 surveys collected only 1 survey actively argued against group learning in favor of a traditional lecture setting. Several suggested that the opportunity to learn from peers and a group was welcome. This could either be because that sort of learning is implicitly preferred, or because it is simply anomalous and non-traditional. Research supports the former explanation that social learning is, in fact, preferred. For example, in one study individuals went through a digital learning exercise with a computer. In one case they were told that the computer program was a real human being on the “other end.” Others were led to believe they were simply interacting with a computer program. Those in the virtual reality system that were under the impression they were engaging with a live human being showed more signs of paying attention and their metrics suggested a more successful learning experience (Okita et al. 2008). Collaboration, competition, and “social proof” – the phenomenon by which people tend to

associate more importance to things they know others are doing – are all considered useful tools in learning design (Dirksen 2011). In essence, a social element of learning increases the interest of participants and effectiveness of learning.

The assessment mechanism in this study appeared sophisticated enough to tease out differences along the proposed spectra of social learning. Use of self-reporting statements is common practice in group work evaluation (Cohen 1994). A 1-to-9-point scale allowed for a “middle” number, and seemed to offer enough variability to return meaningful outcomes. Less common is the generation of a “control” by assessing all activities relative to the total and seeking clusters distinctive from the average. Changes to methodology that allow for more controlled distinctions between learning systems could result in more sophisticated analysis. Despite that, differences in outcomes could be meaningfully associated with specific changes in the way learning systems were managed or specific experiences of participants. For example, increased diversity rankings were strongly associated with activities where participants were actively asked to take sides, and feedback on activities often directly explained – from the participant’s perspective – factors that led to rankings that were either exceptionally positive or exceptionally negative. Further study could find more specific ways to increase the degree to which learning systems are social, and refine the ability of educators or resource managers to utilize these tools effectively. The fact that these differences were associated with changes in the way a learning system was managed also provides further support that governance is a critical feature of social learning theory. This assessment mechanism appears to function effectively within the context of the theoretical framing of social learning I proposed.

Some aspects of the assessment mechanism were less successful. Participant’s descriptions of their governing structure tended to range widely, and provide only a general sense of the intention of the activity. While dramatic differences in opinion were readily apparent, more subtle guidelines for interaction were not identified in the surveys. It is unlikely that a majority of participants will take out the time to document all the rules of a more complex governing structure. It may be better for future models to utilize a similar approach to that used to assess the social spectra. For example, questions could address a scale of confusion to clarity or how well others in the group seemed to understand the activity. Though less specific to governance, this might provide a proxy measure that can be utilized more effectively.

Open responses for feedback and social connections established in the course of the activity were more effective. In scenarios where participants did not know the names of individuals they “taught, learned from, or engaged with in a meaningful way” they often were unable to identify those connections in a way researchers could use. This was fairly frequent. Researchers who wish to use this technique should ensure that introductions, by name, are a common part of social learning system at every point where people could be interacting with new strangers. In scenarios where this phenomena did not occur some useful social network data could be compiled, though more sophisticated mechanisms of network analysis could be in order.

The Importance of Context

This assessment tool is intended to measure “how social” a learning experience and to assess more specifically what *aspects* of social learning were minimized or maximized by the techniques in question. This is a major distinction from “how good” a learning experience was, which might require alternative or additional assessment. While there are clearly relationships between social learning and the ability of a learning system to meet learning outcomes (Eagle et al. 1992, Keup 2013, Okita et al. 2008, Pike 1999, Schmidt et al. 1993), anyone who intends to utilize social learning should put some thought into whether or not that meets the needs of their learners and any intended learning outcomes. Context is constantly at play when interpreting or assessing the value of social learning. Indeed, there are contexts and circumstances where social learning may have no viability whatsoever. Below in “Limits to Social Learning” I address some of those broader concerns facing the field. Here I explore some complexities incurred by using the same ideas of social learning across distinct contexts.

Throughout this paper I describe learning as it occurs in business environments, natural resource management scenarios, educational settings, and elsewhere. While I argue for the integration of theory and practice from across these fields for the purposes of a more cohesive concept of social learning, there is little doubt that important differences exist between these contexts. All the data for this project was collected within a single educational institution in the Pacific Northwest of the United States. In terms of age, occupation, interest (and likely other demographics) there was by necessity a fairly limited degree of diversity of perspective and engagement. Participants were enrolled in classes that were mandatory for processes that were

short term and typically lasted only an hour. These are common aspects of modern educational systems

Social learning in resource management faces a very different set of challenges. People's income and professional standing may depend on outcomes, and action steps are as important as learning outcomes in the eyes of policy makers, tax payers, stakeholders, and others. Whereas two of the activities I studied required students to take perspectives that represented opinions other than their own, in actual resource management scenarios these perspectives are often represented 'in the flesh and blood.' Students may be used to collaborating with peers, and it can be far easier to establish a social relationship within the university context than within the context of a larger society. Notably, social learning in resource management can be a long and difficult process, sometimes ranging into multiple years (Measham 2013). These differences will dramatically influence how one goes about designing a learning system. For example, while efforts were made within the courses I studied to *increase* diversity and conflict due to the perceived homogeneity of perspective, I have heard accounts of programs where the intention is to *decrease* conflict as much as possible in early stages of learning. Indeed, some authors note the risks inherent to participatory process when stakeholders find themselves in aggressive disagreement and ultimately common ground is not built – and may even be reduced (Muro and Jeffrey 2008).

Many factors can also influence any given case study. For example, data for this project was collected within the context of a certain course, but only in one class of many within that course. Since this assessment is dependent on social relationships between the learners it is worth recognizing that much of the social arrangement of the course, expectations of governance, and more could be set up by a broader context that was not measured. Similarly, in a resource management scenario there may be prior relationships between stakeholders competing for or working with the same resource. If an external actor comes in to manage or support social learning processes without awareness of that prior context it could provide unanticipated 'bumps in the road.' In a similar vein, when assessing a learning system at its conclusion, it may be worth noting the social elements of the network prior to the introduction of the learning system. If stakeholders have never interacted – or worse yet, were not on speaking terms – than just prompting initial relationship building may be a success relative to cases where ample prior relationships contribute to the learning experience. Educators are

encouraged to consider the goals of a learning system before they actually try to utilize pre-formed networks, and to have a sense of what they are getting themselves into!

Within this is the importance of knowing *which* dimensions of social learning are most critical to a given scenario or set of goals. Diversity of perspective may indicate a better social learning system, but it seems likely that this ranking will actually decline over time as participants in a learning system develop common ground and common understandings. This could be tracked across courses, for example, in the data set collected. The least diverse class was composed of seniors who had spent some years in the same system together, and explicitly acknowledged in their feedback forms that time spent together had contributed to similar perspectives and attitudes. That reflects learning goals of the program in question, however, and being “less social” should not be seen as a bad thing. Similarly, in some cases a highly regulated system of interactions may be effective governance while in other cases effective governance may be laissez-faire. The intention of this assessment metric is not to determine the absolute best mechanisms for managing a social learning system or the final social outcomes one desires – these are likely relative and circumstantial. It is meant instead to address what social aspects of a learning system were notable in a given system and therefore may have contributed to observable outcomes or results. Rather than assuming that an aggregate social score necessitates the best learning system, it is worth acknowledging that this tool can perhaps to which aspects of social learning are and are not important given a certain context.

Implications for Environmental Studies

The vast majority of data collected came from the “core courses” of Lewis & Clark College’s Environmental Studies (“ENVS”) Program, and as such this assessment provides some useful prescriptive outcomes for that program. ENVS emphasizes the use of social learning in carrying out learning goals. Though social learning in this case “specifically refers more broadly to the ways new web-based social media can enhance research,” the presence of interactive group work, project based learning, and discussion heavy classes in the courses studies is evidence of a broader commitment to social learning pedagogy (“Social Learning Tools | Situating the Global Environment” 2014). As with many social learning users, the value of social learning is well understood within the program, while mechanisms by which it is effectively and ineffectively carried out (or the impacts of decisions in learning design) are less comfortable territory.

The Lewis & Clark Environmental Studies program is an interdisciplinary major that emphasizes three broad objectives as follows:

The Environmental Studies Program at Lewis & Clark College provides resources and cultivates an atmosphere whereby students (a) appreciate the intellectual and practical complexities of environmental problems and solutions; (b) master key concepts and methods of environmental analysis drawn from, and integrating, a broad range of disciplines; and (c) fuse this background knowledge and analytical ability with leadership and communication skills to successfully devise and implement creative, academically grounded solutions to environmental problems.

Social learning is seen as a way to help students realize they are part of a “larger community of ideas” and to “find their way skillfully through that community” (personal communication, Jim Proctor). The ‘core courses’ of ENVS progress from an introductory ENVS 160 course to a Senior Seminar and a thesis. The process of the program is meant to be one of deconstruction of commonly held beliefs and ideas (“taking everything that was settled and unsettling it”) followed by academically informed efforts to reconstruct meaning and solutions in later courses. ENVS 160 is meant to accomplish much of that deconstruction, though some of it continues into ENVS 220 – a research methods course – depending on the way students have or have not processed 160 effectively. ENVS 330, a third year course, is generally meant to open up dialogue on possible solutions to environmental problems, paving the way for students in the culminating ENVS 400 Senior Seminar to propose theses – like this document – to actually make justifiable claims about environmental issues.

Given the diverse topics explored by the program (theses from my peers this year alone explore everything from geologic risk analysis in volcanic regions to disenfranchisement of trans* individuals in environmental movements) it can be hard to find a set of core themes or readings to underlie all work in ENVS, at least in terms of subjects studied. Instead, students in the courses participate in project based learning, frequently working with peers to gain background in broad themes situated in specific places, times, or contexts. Efforts are made to find overarching relevant themes and theories across those many situated focuses, part of the pursuit of mastery of “key concepts and methods of environmental analysis.” By encouraging social interaction, students of varying interests and with different academic training and perspective can find these common themes across their works, all while engaging each other using the social skills that “fuse this background knowledge and analytical ability with leadership and communication skills.” As such, a more critical understanding of the ways social learning *actually works* (or doesn’t) in ENVS is of value to the program.

Three ENVS core courses were studied in this project, including Environmental Studies 160 (Introduction to Environmental Studies), Environmental Studies 330 (Situating Environmental Problems and Solutions), and Environmental Studies 400 (Senior Seminar). Activity 3 took place within ENVS 400, Activity 2 took place within ENVS 330, and Activities 4, 5, 6, and 7 all took place in ENVS 160 courses, which allowed for more effective cross-comparison within those courses. In all cases studied social learning was carried out by peers rather than faculty, allowing students from across core courses to integrate. As noted above, it is critical to be mindful of the context of each of these activities. All activities took place within an educational setting, meaning that differences in age, occupation, and immediate living situation were fairly minimal. In addition, every activity was a class within a broader course – as such, some reflections of satisfaction with the course or prior social connection may have played into reporting about the course itself.

Perhaps the most notable take-away from the data collected was the success of the non-ENVS activity, Activity 1. This activity ranked higher than every ENVS activity in every category, including general satisfaction, where it was 17% higher than the average (only one ENVS 160 course even topped the average satisfaction score). A number of factors could explain this, including voluntary participation. Still, written feedback collected in those activities indicated that a great deal of satisfaction came from learning that occurred within the context of a residential community of friends. This mirrors research in other fields that suggests residential education in a college setting is associated with a wide variety of positive trends in academic assessment. These include GPA, satisfaction, engagement, and retention in the learning programs in question (Pike 1999, Stassen 2003, Inkelas & Weisman 2003, Pasque & Murphy 2005, Zhao & Kuh 2004). In fact, these residential learning communities are one of the fastest growing “High Impact Practices” in higher education (Keup 2013). While more definitive work on the role these communities might play at Lewis & Clark is required, there could be strength in developing in-class communities through fostering out-of-class communities.

Following my survey several ENVS 160 students who lived in the same residence hall consulted with me about ways to enhance class discussion. This emerged from discussions they had shared about their dissatisfaction with the way discussions occurred within their course. They were mostly concerned about the perceived lack of participation by their peers and other signs of minimal investment. Intriguingly, their conversations about the course were taking place outside of the course itself. As students work where they live, having students within the

same academic interest, major, or class also share a residence can promote these kind of informal efforts to improve courses. There are two resulting implications. The first implication is described above in the form of living-learning communities or similar residential experiences. Some sort of student-run ENVS organization (i.e. beyond existing symposia, journals, etc...) to simply engage socially around content and courses in more recreational settings could potentially mirror the impact of such a community at less cost, and could provide a viable alternative to a full residential learning opportunity. When asked how much they agreed with the statement “I have strong connections to the others participating in this activity,” ENVS 160 students responded with an average rate of 56% agreement. ENVS 330 students had 67% agreement and ENVS 400 students had 71% agreement, on average. First year students in particular have room for growth in developing connections with one another. Increasing those connections could help to mirror the increased satisfaction and participation evidenced in Activity 1 of my study within the classroom context.

The second implication of this conversation is the importance of time to reflect not only on course content, but on course structure as well. This can either be implemented within the class itself or through some means outside of class. While course evaluations provide an effective means for this once a course has *concluded*, opportunities for feedback and redirection throughout the semester may offer a more substantive chance for student ownership in the classroom. If ownership does indeed enhance investment, than this could be a viable way to increase the social connectedness and general success of courses. The risk here is not asking too much of students who are not learning designers: if ENVS seeks to utilize more social approaches to learning, it will be of critical importance to support students as they move from a familiarity with expertise and authority as linked concepts (the expert runs the classroom) to a learning scenario where expertise and authority are disconnected (the expert is a resource in the classroom). For example, opening a course by offering students the chance to establish a syllabus runs counter to expectations students have, and may result in resistance. Instead, if ENVS 160 was structured as a gradual and intentional process by which students came to own the course and their own learning, one might be able to increase self-driven investment and interaction. The alternative to this is simply having a reliable series of faculty-run interactive activities by which discussions or idea generating sessions can be run. Some examples of these can be found in the bibliography of this work (i.e. Bingham, et al 2010, Gray et al 2010, Dirksen 2011).

This challenge might be somewhat different in ENVS 330 or ENVS 400. These courses often feature students who have built a pre-existing set of relationships and expectations, and are familiar with the structure of ENVS courses. While there is still value in giving students the capacity and means to redirect courses midway through the year, the emphasis on community building becomes less critical in this context. Instead of a roomful of novices who may not feel they have much to contribute, upper division courses involve a roomful of pseudo-experts with knowledge and experience of content to draw from. Frequently altering governing models in these courses may offer students opportunities not only to engage concepts in new ways, but to gain some of the leadership and communication skills identified as a goal of the major. This would be particularly relevant to a course like ENVS 330, where student-led discussions and governance models are already used in class. But a word of caution first: while content expertise and authority (governing expertise) need not be connected in a social learning system, this does not mean that governing expertise does not exist! Simply allowing a group, or individuals within a group, develop a learning activity does not guarantee it will be social learning, and it does not guarantee the quality of the governance model. As I describe further below, social learning is a skill set, complete with its own theories and practices, and facilitation can be an expertise independent of the content of what is learned in a social learning system.

Bearing this in mind, I would advise that courses that attempt to utilize social learning activities, especially those facilitated by students, make room for reflection and feedback on those activities after they conclude. For example, students would spend much of the class time running an activity, but at the end of said activity time would be taken to debrief whether the activity itself was effective. Empowering students to provide useful, critical feedback for growth itself requires training, and simply asking for feedback without modeling effective feedback giving or providing opportunities to practice that skill risks feedback being ineffective or unproductive (Gookin 2004). While assessment in these cases need not be as methodological as that I pursue for this project, some opportunity for reflection, feedback, and assessment could enhance ENVS students ability to present information and manage group learning scenarios while simultaneously improving the quality of the classroom, managing the classroom as though it were a learning organization (Senge 2010). In this way, students can think critically about *how they learn and teach*, in much the same way ENVS ask them to think critically about *how they think*.

An ongoing challenge facing ENV5 social learning programs is the use and implementation of online tools to supplement classroom learning. There can be value in integrating online and interpersonal social learning tools, and there are increasingly technologies that aim to do so in educationally viable ways (Rovai and Jordan 2004). Indeed, the ENV5 program has attempted to use programs like Digg, Diigo, Twitter, and others to integrate classroom learning and social media. At face value, this is a powerful mechanism to enhance interaction and integration opportunities. However the response among students has often been lackluster, and these tools receive limited use or support.

One question I would pose, though I did not test it in this study, is which aspects of social learning ENV5 is trying to enhance through these tools. Given regular opportunity for dialogue among students living and sharing the same space, using digital tools may seem superfluous or burdensome. One of the great advantages of digital social learning is the ability to span scales of space and time (Bingham et al. 2010, Seely and Adler 2008). For example, an online forum can be accessed around the world, and I can leave posts as “artifacts” that others can discover and react to, even if they are logged on at a different time or in a different part of the world. Within the theoretical framework I propose the scale of the learning system is increased, as is my ability to seek out unique interactions with a diverse range of individuals. Within the context of a single course, however, the scale and diversity of the learning system is unchanged. Only potential interactions increase, and if investment is low the quality of these interactions may not justify participation among learners. If these online tools could present a way to truly engage with other students beyond the bounds of Lewis & Clark College, one might be able to accomplish the increase in course scale or diversity that such online forums were designed for. Integrating ENV5 160 with liberal arts minded Massive Open Online Courses (MOOCs), other schools in the region, or otherwise seem like viable means to increase how social learning is. As studies increase that associate increased investment in learning with valuable social connections, this seems like a worthwhile endeavor (Okita et al. 2008, Dirksen 2011).

Ultimately in any course there is only so much time, and social learning takes time. Especially in a learning system where students will demand outcomes in content, it can be a risk to solely utilize social learning. The balance between traditional learning and social learning for any topic or course is probably best left to the discretion of course participants and facilitators. That being said, ENV5 is well-poised to meet this balance. One of the critical features of managing a social learning system is the generation and maintenance of artifacts, stored forms

of knowledge that can be passed between learners to enhance the system (Wenger 2000, Gray et al. 2010). By moving knowledge content into the accessible environment, rather than requiring it be stored in memory or actively taught on multiple occasions, it becomes easier for learners to guide and prioritize their own learning, taking advantage of references and research stored in artifacts as it becomes relevant (Dirksen 2011). This can increase the agency of non-experts while reducing the risk of losing expertise. By creating, maintaining, and improving the work of previous students through posters, blog posts, SGE pages, and online resources ENVIS makes the storage and maintenance of these artifacts a huge part of the major. Ensuring the continued effective organization and management of these resources and continuing to curate a library of readily processed artifacts may provide future students with the support necessary to integrate valuable content into their own worldviews and perspectives, and increase the feasibility of increased time spent on social learning. Though the specific details of these digital resources is subject for debate, their continued existence seems wise from a social learning perspective.

LIMITS TO SOCIAL LEARNING

Natural resource managers have hailed social learning as an effective mechanism for engaging with and educating communities. Meanwhile, scholars of organizational management, business leadership, and education are arguing for its benefits in managing and maintaining groups. But without assessment mechanisms social learning has been subject to limited critique, potentially resulting in cavalier application of theory and practice (Jeffrey and Muro 2008). In addition to a lack of cohesive definition, the social learning concept is also “watered down” by association with other related topics (transformative learning, participatory processes, innovation diffusion models, etc..) that are *not* social learning. (Reed et al 2010). In addition to common confusions about social learning (highlighted above under “*What isn’t social learning*”), social learning faces a series of challenges including unclear understanding of where and when it is best applied and a difficulty with quantifying changes in behavior or learning. These challenges must be addressed by more thorough and comprehensive understanding as social learning becomes its own educational pedagogy.

Jeffrey and Muro (2008) are some of the biggest critics of social learning, noting that “evidence substantiating the main claims put forward in the literature remains limited.” They note that “several studies highlight how context, methods, or process designs stimulate or hinder social learning processes,” which directly identifies the critical importance of assessment

that distinguishes between techniques. Traditional education is also deeply entrenched, and despite having had viable alternatives for decades (i.e. Freire 2000, Dewey 1996) old models remain, a possible testament to their value. “Under certain conditions opportunities for social learning processes are limited,” and it may be preferential to utilize traditional techniques, even non-educational approaches like incentives or regulations in certain cases (Jeffrey and Muro 2008). In addition there is the difficulty that comes from combining multiple mediums under the lens of social learning. Much of the literature is specifically digital, a medium of social learning my assessment did not cover and in which it has not been tested. It is also difficult to convey exactly what social learning is or where it can be applied, and challenges do arise.

Participatory processes themselves have “mixed success,” and “there still remains much to learn about the more fundamental questions” surrounding sharing understandings for agreement and action across cultures, or the particular features, processes, or contexts that support social learning. This becomes particularly true when there are experts who wish to convey some scientific understanding to the public, especially when so much of the science behind resource management is fairly settled (Cain et al. 2011). Students accustomed to traditional learning are often resistant to the introduction of new models, sometimes very rationally so (Freire 2000).

For example, experienced educators have communicated the concern that students often do not enjoy learning content from their peers, and a wide range of complaints encourage resistance to group learning in educational settings (Shimazoe and Aldrich 2010). While I had no opportunities to assess scenarios in which clear, commonly accepted “content” (i.e. scientific theories) were taught in a peer-to-peer fashion, I would speculate that students are more likely to be resistant to traditional learning from peers than traditional learning from experts. The latter scenario is, of course, exactly what traditional learning is designed for. Traditional education treats knowledge like content to be delivered by experts (Freire 2000, Dewey 1916). As such, one would expect it to be more successful with experts.

Indeed, nothing about social learning requires that we reject expertise, and advocates should be cautious in ensuring this point is not advanced, especially since experts in content are known to contribute to the achievement of learning outcomes in a group setting (Eagle et al. 1992, Schmidt et al. 1993). The intention is to recognize that in traditional learning both expertise and authority are centered in the same individuals – social learning simply works to

suggest that authority be more equitable independent of expertise, allowing for more expression of “personal” expertise participants may be able to share (Freire 2000). Content-heavy courses where the interpretation and values of others are of minimal importance are therefore not strong candidates for social learning design, though principles of social learning can still add value. There is minimal room, for example, for students to have reflective discussions on chemistry or the proper medical procedure in an emergency scenario. Group learning principles may enhance these situations, but fundamentally a lot of content simply needs to be transferred and traditional models are well-suited for that need. Social learning is not inherently good, nor is it always the right learning design for a given educational need. It is simply a tool, and one must critically assess when it is the right tool to use.

Social learning is, after all, a pedagogy of education with its own set of skills, practices, and – critically – expertise. While this field is still being defined it is emerging rapidly, especially in the work place of a variety of “learning organizations” (Bingham et al. 2010, Senge 2010, Jackson 2013, Jackson 2013). Tools and techniques are being devised not only for brainstorming, but for opening, exploring, and closing discussions or business processes, along with other stages of the ideation and knowledge development (Gray et al. 2010). Combining social networks and learning theory in residential settings is becoming its own professional practice in higher education (Tinto 1999, Zhao & Kuh 2004). One would cautiously expect that shortly there will be experts and programs in social learning to take advantage of this growth, building off existing work and providing expert facilitators that can guide social learning opportunities while balancing their own knowledge and power with others in the group. Assessment tools like that I propose may very well be one of the first steps towards this professionalization of social learning, giving us more perspective on why social learning works (Keup 2013). This will present a new challenge, as social learning professionals must balance their expertise with the demands for more egalitarian learning social learning requires (Freire 2000, Reed et al. 2010, Gray et al. 2010, Brown and Adler 2008).

To satisfactorily address the complications introduced by social learning “expertise” or facilitation, one would need to study the differences in satisfaction, success, and the achievement of learning goals stemming from highly social learning systems managed both by peers and by social learning professionals, something my data cannot effectively address. Still, the odds are good for social learning’s venture into more traditional learning. Early social learning theory developed out of problem-based learning in medicine and other fields, and

group learning has been associated with increased learning outcomes in STEM fields (Eagle et al. 1992, Schmidt et al. 1993, Springer et al. 1999). Even traditional, content-exchange based learning can use some social principles. But the viability of social learning will, in many contexts, be contingent upon the sort of content that needs to be delivered and the desires of the learners in question. In scenarios where there is a large amount of content, a limited amount of time, limited expertise in social learning design, or high degrees of expertise isolated to very few individuals in the learning network, social learning is not going to be effective. When practical or technological limitations impede opportunities for interaction, integration, or otherwise then it is unlikely social learning will be effective. Any scenario in which there are inherent limitations towards achieving the six spectra associated with social learning networks is not a strong contender for use of social learning techniques. This is not a bad thing: sometimes a good traditional lecture from a brilliant person is indeed in order. Advocates of social learning should be cautious not to confuse advancing one educational doctrine with challenging the legitimacy of another. Participatory process is itself risky, and occasionally can result in more division between stakeholders or learners than before the learning activity occurred (Muro & Jeffrey 2008). More tools can be added to the educational toolbox without taking away others, even while many advocates for social learning seem willing to do away with traditional mechanisms entirely.

CONCLUSION

Modern theory in resource management is increasingly blurring the distinction between education and management (Keen et al. 2005). Environmental educators and resource managers are faced with the same challenge: to provide people with experiences that give them the knowledge, skills, motivation to bring about environmental changes. Both disciplines are facing these challenges while emerging from the same perceptual limitations on ecology, management, and education that emerged in the culture of the 1960s. By combining organizational management scholarship of the 1980s and 1990s with natural resource theory of the early 2000s, social learning offers the opportunity – but only that – to revolutionize both fields (Muro & Jeffrey 2008, Reed et al. 2010, Keen et al. 2005). The question is whether that development will take place, or whether social learning is simply a scholarly “fad,” not yet understood or critically utilized. Especially as concerns emerge over research demonstrating limited connections between learning knowledge and changing behavior (Muro & Jeffrey 2008, Dirksen 2011), social learning is seen very much in the way Bandura originally intended it: as learning that results in behavior change (Bandura 1962). Beyond a simple teaching theory, social learning is increasingly seen as a method that can more effectively bridge the divide between knowledge and values-based behavior change (Muro & Jeffrey 2008). While this debate is far from settled (and deserves far more exploration) recent educational research suggests that some of the most effective behavior change models we know of involve social networks or social proof (Dirksen 2011, Christakis and Fowler 2009).

Beyond behavior change, outcomes from various modes of social learning tend to be substantive, a phenomena that is true across disciplines. Within higher education, “living learning communities” that integrate personal and academic social networks show measurable increases in GPA, satisfaction, engagement, and retention, and those benefits carry to all students involved in those communities (Pike 1999, Stassen 2003, Inkelas & Weisman 2003, Pasque & Murphy 2005, Zhao & Kuh 2004). Social learning is increasingly seen as necessary for effective efforts to manage resources sustainably (Muro & Jeffery 2008, Schusler et al. 2003). Reviews of the field suggest many positive outcomes associated with social learning, though these outcomes are difficult to achieve (Mostert et al. 2007). As a result, engaging social networks through collaboration and dialogue between diverse stakeholders is increasingly a preferred model across interactions with a learning outcome or educational goal (Bouwen & Taillieu. 2004, Davis 2013).

Yet for all of the excitement, there has been very little critical analysis into which aspects of participatory process encourage or discourage success. While there is a sense of consensus across the literature that bringing individuals and groups with different perspectives, values, and interests together can yield positive results, empirical evidence and common sense both tell us that not every interaction between opposing groups is a successful, viable, learning program. In describing this challenge, Muro & Jeffrey (2008) note that:

There still remains much to learn about the more fundamental questions in relation to social learning, namely whether participatory processes lead to a shared understanding of the circumstances on which agreement and action can be based, which process features and context factors foster or inhibit this change and how it contributes to process outcomes. This poses a number of serious challenges because first the literature suggests that social learning involves internal changes which are generally hard to qualify and measure, and second the lack of a consistent concept of social learning complicates the task of defining common indicators to measure social learning as either process or outcome.

In short, there is no guarantee social learning will work well, let alone work. We cannot explain the success, even as we measure its outcomes (Keup 2013). The assessment tool described above suggests that there is measurable variability within social learning systems that is rooted in specific governing processes and features of those systems. Further studies could identify factors that result in those changes. The implication, stated simply, is critical: through all the excitement about social learning, not all social learning systems are equal. The degree to which a learning experience is effective or social depends heavily on the way it is designed and carried out. While this should not deaden the excitement felt around socially-driven learning techniques, it should sharpen the eyes of scholars in the field to begin to assess not only what social learning *is*, but *how one does social learning*.

Within this study some generalizations emerge that provide at least a fuzzy sense of what social learning is. Integrated, interactive, diverse, equitable networks with invested actors operating at various scales; the role of a governing structure to define the interaction; and social construction of information are all important. Mechanisms for assessing these structures can be developed, clearing the way for more thorough research into methods and education design practices that improve the performance of social learning systems. Efforts should be made to not only demonstrate improved outcomes from social learning, but to assess why social learning results in those outcomes in the first place. Only in this more specific effort to approach – and improve – social learning will these educational systems prove to be the sort of pedagogical innovation that can deliver on the dual promise made by both environmental education and environmental management to engage global citizens in the improvement of our world.

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APPENDICES

Appendix A – Social Learning Facilitator Survey


Social Learning System Assessment - Facilitator
Micah Leinbach – Thesis Research

Activity Name	Date	Time	# of Participants
	/ /		
Facilitator		Contact Information (e-mail/phone)	

Please complete the front page of this form before your activity. The back of this page depends on data collected from participants, and should be filled out after the activity.

1. Please explain the "rules" or "process" of the activity you are facilitating as best you can. Do so in a step by step process (i.e. step 1, step 2, etc...)

2. Please identify specific learning outcomes for this activity, and a means to measure them.



Please do not complete the back of this sheet until after the activity has been done, and data has been collected.

3. Quantitative Assessment

SPECTRUM	SUM OF SCORES	# RESPONDENTS	AVERAGE
<i>Scale</i>	N/A		N/A
<i>Integration</i>	33.27		
<i>Interaction</i>	25		
<i>Equity</i>	28.17		
<i>Investment</i>	28.27		
<i>Diversity</i>	7		
Social Construction	63.000		
Overall Satisfaction	60.9166		

4. Please provide documentation as to whether learning outcomes were accomplished, and how you measured them. Attach additional information if needed.

5. Please include any additional feedback that was recurring or particularly insightful.

Thank you for your support! Contact Micah Leinbach (mleinbach@clark.edu) with questions.

Appendix B – Social Learning Participant Survey

Social Learning System Assessment - Participant
Michah Leimbach – Thesis Research

Please complete this brief survey in reference to the activity you just completed.

1. Please explain the "rules" or "process" of the activity you participated in as best you can. Do so in a step by step process (i.e. step 1, step 2, etc...)

2. Please identify, by name, other people you feel you either *learned from, taught, or engaged with in a meaningful way*. Names will be **struck from published research**.

3. Please circle your ranking, with 1 being the lowest and 9 being the highest.

a) I benefited from the presence of others in this activity.
1-2-3-4-5-6-7-8-9

b) I have strong connections to the others participating in this activity.
1-2-3-4-5-6-7-8-9

c) I felt included in this activity.
1-2-3-4-5-6-7-8-9

d) I was welcome and able to actively participate in this activity.
1-2-3-4-5-6-7-8-9

e) This activity was personally engaging.
1-2-3-4-5-6-7-8-9

f) I encountered different perspectives through this activity.
1-2-3-4-5-6-7-8-9

PLEASE CONTINUE ON THE NEXT PAGE

- g) I had fun in this activity. 1-2-3-4-5-6-7-8-9
- h) I had a meaningful experience or conversation. 1-2-3-4-5-6-7-8-9
- i) I was able to influence the flow of the activity. 1-2-3-4-5-6-7-8-9
- j) I willingly participated in this activity. 1-2-3-4-5-6-7-8-9
- k) I was invested in the outcomes of the activity. 1-2-3-4-5-6-7-8-9
- l) I had something valuable to contribute to this activity. 1-2-3-4-5-6-7-8-9
- m) Other participants contributed something valuable to this activity. 1-2-3-4-5-6-7-8-9
- n) I am glad I took the time to do this activity. 1-2-3-4-5-6-7-8-9

4. Please describe something you felt you learned, or taught, during this activity. You are welcome to list up to three.

5. Please provide any other comments or feedback on the activity.

Thank you for your support! Contact Micah Leinbach (mleinbach@clark.edu) with questions.