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The Road Less Traveled: Leading Students into Messy Learning

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Abstract

This paper is about taking students "on the road" into the world of places, environments, people, and ideas. I have spent most of my forty years in undergraduate and graduate education working with students in travel/study classes. Most education in classrooms is only a partial reality; students who emerge from classroom courses leave with partial learning. Although teachers may realize this, they do not necessarily acknowledge it with their students, because they often do not believe that field experiences are as reliable as rigorous classroom academics. This paper makes the argument that if we are not clear that our lectures, books, models, and classrooms are a simulacra for the real thing, we are dishonest with our students who trust us to deliver authentic education. Of course, students accumulate knowledge in classrooms, but they are not usually exposed to the academic awareness that comes from being in a "messy" learning environment. Classrooms are far too mediated and "tidy" to provide the chaos needed to develop aptitudes for deep understanding.

Keywords: Travel/study, classroom pedagogy, messy learning

The Road Less Traveled:

Leading Students Into Messy Learning

Lumpers and Splitters[*]

I have attended more than one faculty meeting at my university where some version of

the question, "What do we want our students to know?" has led to a curricular rift between the

lumpers and the splitters. Typically, the splitters are the most vocal, wanting to add more

academic content to the existing courses, and add additional required courses to the curricula

covering areas that they see as critical to undergraduate enlightenment. They do not fully grasp

Perkins's point: "Knowledge and skill in themselves do not guarantee understanding. People can

acquire knowledge and routine skills without understanding their basis or when to use them"

(1993, para. 8).

On one occasion, we divided into groups to address this question, each group reporting

out the results of its discussion. I was the spokesperson when it was my group's turn, and I stood

up and said: "We want our students to know how to figure out, in each discipline, what the

questions are that interest them most. Our role as teachers needs to be to help them figure out

how to answer those questions." I continued, in response to the splitters' suggestions for new

essential coursework, "There's an endless amount of 'stuff' that we can tell them about, but it

doesn't mean it leads them into deep understanding." Some colleagues still believe in Aristotle's

tabula rasa and what Freire (2000) termed the "banking model" method of instruction. In this

view, students' brains are mostly empty and in order to educate them we have a responsibility to

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[*]Apparently, Charles Darwin was the first to use these terms: "Those who make many species
are the 'splitters,' and those who make few are the 'lumpers'" (Darwin, 1857, "Charles Darwin
to J.D. Hooker," para. 2). In any discipline, a "lumper" is an individual who assumes that the
broader view is more important than a narrower one, while "splitters" insist on creating new
categories.

open them up and pour in endless information—sophisticated thinking is then (somehow) an epiphenomenon of this process. In the sciences, this sort of pedagogy is often criticized as a "cookbook" approach, as students work on experimental problems with known solutions and expected results (Fukami, 2013). The splitters never like it when I object to this instructional narrowness, but I am a lumper.

I am a lumper because in 40 years of teaching, I have spent more time outside a classroom with students than inside. When you are "on the road," subjects, theories, facts, ideas, and disciplines all lump together—everything blends, even if you make an effort to divide it all into discrete academic categories. When hiking with students through the wilderness, you can study the individual plants, animals, rocks, and topography in a forest, but since you are surrounded by that forest, you will eventually have to deal with the complete forest organism in all its messy, ecological density—some part of which will always remain a mystery. Studying the whole forest is "messy," because there is much beyond the "easy stuff" of identification of geneses, species, rock and soil types, landforms, plant and animal interactions, pH levels, and weather. To truly understand the forest you will have to include: invasive species, climate change, pheromonal animal and plant communication, aberrant migration patterns, toxic substances in the soil, water, and air, human uses including hunting, poaching, and development, local and national politics, historical and sacred beliefs about forests, indigenous peoples' relationship to the land, and so on *ad infinitum*.

Although students can successfully study individual pieces of the forest (i.e., the "easy stuff"), being able to arrive at something conclusive about the whole forest becomes complicated very quickly. But it is in that unknowable and messy mystery where all the fun—and deep understanding—is located. Such a level of thinking can only come from students confronting

non-routine problems. They do so when they are encouraged to apply scholastic creativity in unexpected ways, and in settings where there are no "cookbook" answers—kind of like one disorienting dilemma (a la Mezirow) stacked on top of another. Most teaching probably does not lead to deep understanding, as Perkins (1993) says: "The teacher teaching for understanding needs to add more imagistic, intuitive, and evocative representations to support students' understanding . . . " (Support learning with powerful representations, para. 2):

> It's all too easy to conceive of learning with understanding as a matter of taking in information with clarity. If only one listens carefully enough, then one understands. But this idea of understanding as a matter of clarity simply will not work. . . . you may listen carefully to the teacher and understand in the limited sense of following what the teacher says as the teacher says it. But this does not mean that you really understand in the more genuine sense of appreciating these implications for situations the teacher did not talk about. Learning for understanding requires not just taking in what you hear, it requires thinking in a number of ways with what you heard—practicing and debugging your thinking until you can make the right connections flexibly. (How can students learn with understanding?, para. 3)

It is not easy for students to acquire this depth of understanding in a classroom, but it happens naturally "on the road." I was once with a group of students in Second Mesa, Arizona on the Hopi Indian reservation. We were involved in a week-long unit studying the impact of the Peabody Coal Mine on Hopi and Navajo communities. During the week, the students set up appointments, contacted the tribal governments, and made plans with individuals so we could: attend ceremonial Kachina and *Yé'ii* ceremonies, interview members of the Hopi and Navajo tribal counsels, meet with Hopi and Navajo citizens, talk to Native spiritual leaders and

environmental activists, visit the Black Mesa coal mine, question a (non-Native) mine representative, attend a hydrology class, and read editorials on the issues in the local Native papers.

At week's end, we sat down for a full-day seminar to pull it all together. The discussion ranged across myriad topics: local geology, the science of coal mining, Native spirituality, the Hopi/Navajo land dispute, resource conservation, land management, US government law, Peabody Coal's political power, mine and land reclamation, the effects of substantial monetary income, and the mine's adverse impact on the aquifer and local wells. In trying to categorize what we had covered during the week, we realized that the individual disciplines became an interdisciplinary blur.

Our week was "messy" education, as all of the disparate, sometimes contradictory, and generally overwhelming data merged into a rich, but exceptionally challenging, understanding of the situation the Hopis and Navajos were up against. The disciplines blurred, or rather combined within this disordered: "problem-solving learning environment" (Jonassen, 2010). Certainly we want students to come away with answers, but too many comfortable answers mean that they may have missed the dynamic intricacy involved in real problems. Davis (2013), echoing John Dewey who made close to the same points in 1910 (pp. 49-50; 52), is discussing secondary education below, but he is not far off the mark for many undergraduates:

> And yet the dominant model of public education is still fundamentally rooted in the
> industrial revolution that spawned it, when workplaces valued punctuality, regularity,
> attention, and silence above all else. (In 1899, William T. Harris, the US commissioner of
> education, celebrated the fact that US schools had developed the "appearance of a
> machine," one that teaches the student "to behave in an orderly manner, to stay in his

own place, and not get in the way of others.") We don't openly profess those values

nowadays, but our educational system—which routinely tests kids on their ability to

recall information and demonstrate mastery of a narrow set of skills—doubles down on

the view that students are material to be processed, programmed, and quality-tested.

(para. 7)

When teachers design classroom lessons, they understandably feel that it is practical to

intellectually contain what is covered. This is the smart didactic choice, as too much classroom

messiness appears unproductive. In the Cold War years following WWII, when researchers were

focusing on applying the equations of Quantum Mechanics (QM) to the discovery of the modern

electronic gadgets that evolved from these equations, university classes, their textbooks, and

professors—across the United States—did not include or permit discussions or research into the

deeper philosophical and mystical problems surrounding QM: the "big questions" which had

powerfully engaged Bohr, Einstein, Heisenberg, and Schrödinger. These compelling albeit

problematic concerns, having to do with how reality itself was configured and understood, were

seen as too abstract and confusing for both undergraduate and graduate students, and as a waste

of textbook space, class schedules, and research time. Many initially motivated physics students

became uninspired, as they were told to "shut up and calculate" (Kaiser, 2011, p. 1). In fact, the

unfathomable enigmas had drawn them into the field. Students left physics departments in droves,

because the emphasis was placed on solving the relatively uninteresting technical problems of

QM (the "easy stuff"), while avoiding the messy philosophical mysteries. Only in the mid-1970s,

after much pushback by students, did physics professors, classes, and textbooks return to those

profound questions (Kaiser, 2011). Fiske's (1992) criticism of public schooling is apt here, "The

most destructive characteristic of the factory model classroom was not that teachers had the

answers but they controlled the questions" (p. 65).

Teaching "on the road" makes one realize that messy education works by incorporating inexplicable complexity into the lesson plan (which most easily happens out-of-the-classroom, but not necessarily): 1) Multiple disciplines are embedded within each experience, and barely recognizable as separate entities; 2) Although the component parts are studied, the way that problems are deeply understood can only be imagined intuitively, as an unabridged whole; and, most importantly 3) Students do not need comfortable answers, but they do need real problems that are too involved for easy resolution. This does not mean that in messy learning students fall short of achieving clear scholastic results—it is just that they are not asked to look for quick, cushy answers. Although classrooms can be designed to be messy, messiness is routinely part of travel/study classes, as students encounter intricate problems during the chaos of immediate experience.

Messy learning leaves students with larger, unanswered mysteries—but the learning is more powerful *because* it is messy. After messy experiences, students can clearly articulate multiple scholarly ideas, concepts, and issues, but they are also left with persisting questions. The thoughts posed by this student, after visiting the Navajos, represent the speculative intensity of deep understanding:

> I keep asking myself several questions: What are the reasons that brought me here? How can I orient myself in this secret and mythical world? What knowledge/attitude do I learn from this ancient and "primitive" culture, and further apply it to my personal growth in my culture? On one hand, I have started to conceptualize all these answers in a whole picture with the amazing experience. On the other hand, I got lost and don't know how to

absorb/interpret such abundant information and unexpected knowledge from the other

culture. (Y. Ting, personal communication, 2011)

Messiness Outside the Classroom, Tidiness Within

Since there is a twofold way of acquiring knowledge—by discovery and by
being taught—the way of discovery is higher, and the way of being taught is
secondary.

—Thomas Aquinas (1225-1274), *Summa Theologica*

A la McLuhan, classrooms educate students primarily about classrooms—what they

study within those spaces is mediated by the walls, the building, and the teaching style that is

defined by them (McLuhan & Fiore, 1967). As Savery (1995) points out: "We cannot talk about

what is learned separately from how it is learned, as if a variety of experiences all lead to the

same understanding. Rather, what we understand is a function of the content, the context, the

activity of the learner, and, perhaps most importantly, the goals of the learner" (p. 1). By design,

classrooms are meant to be tidy, not messy (e.g., pedantic lectures, films, PowerPoints, and facts

memorized for exams, are tidy). The message of the classroom is always in part the classroom,

even when accompanied by passionate teaching. In a classroom, unlike in a forest, you are not

physically and tangibly embedded in your subject. One encouraging example of untidy

classroom work can potentially be found in math courses. Although students must acquire basic

concepts, strategies, and theorems, the substance of the course can involve working on unique

and demanding problem-solving. At times, students do not need to arrive at the correct answer,

only to show a thoughtful process (Dorier & García, 2013; Dorier & Maass, 2014). However,

when standardized tests or required outcomes dictate curriculum and content (Open the

floodgates?, 2014; Kovac, 2014), messy learning is undermined.

A few educators make their classrooms messy through a mindful and contemplative

pedagogy, which could be philosophically founded in Goethe's "gentle empiricism" (Zajonc,

1998, p. 27). Although not appreciated during the development of 19th century scientific methodology, Goethe tried to move scientific materialism, abstraction, and reductionism toward a more direct, intuitive, and intimate experience of nature. In his class, Zajonc brings students closer to complex, messy learning though contemplative practice: "We must learn to be comfortable with not knowing, with ambiguity and uncertainty" (2006, p. 3). Ambiguity and uncertainty are not aspects of a tidy classroom, and he continues:

> Gentle and vulnerable intimacy leads to participation by the contemplative inquirer in the unfolding phenomenon before one. Outer characteristics invite us to go deeper. We move and feel with the natural phenomenon, text, painting, or person before us (p. 3). . . . Several students told us that they had given up on education, becoming cynical about it in high school. They learned to perform whatever was asked, even if it failed to connect to their lives, their deepest questions, and most intense longings. . . . Set the bar anywhere, and they would jump over it, not out of sincere interest, but because they were smart and well-trained. It took time to win them over, to reawaken in them the root aspiration they all have, which is not primarily about education as an instrument for wealth acquisition. Instead, it is about transformation, development, and becoming all they can be. (p. 5)

This is not the kind of insight that most school systems attempt to promote. But this mindful coursework is scholastically sound. In her mindfulness course, Waring says she is committed ". . . to experiential education, in conjunction with critical thinking and analysis" (p. 166):

> If meditation practice induces a mind state that is both tranquil and alert, wouldn't half an hour of practice poise students for optimal engagement in theoretical discussions and analysis of the readings? (p. 171). . . . Until recently I could not have imagined that I would be teaching a mindfulness course in which students of literature or art therapy

would be enthusiastically applying their minds to scientific papers on subjects such as

amygdala activity in meditators versus non-meditators as measured by functional MRI.

(Waring, 2014, p.173)

These messy courses are not about filling students up with interminable facts, but about creating

a classroom pedagogy which helps students reach into their internal natures thereby motivating

scholasticism—these students are "on the road" inside the walls of their classrooms.

There is ongoing debate among teachers about the merits of content over inquiry-based

experience in the classroom. Which is more important, and how do we know? It is undoubtedly

valuable for students to know basic facts and information, but the line about how many facts they

need to absorb, how many disciplines they need to know them in, or how many majors, minors,

and specializations they need to acquire, often ends in pedagogic disagreement:

"The fundamental basis of the [American educational] system is fatally flawed," says

Linda Darling-Hammond, a professor of education at Stanford and founding director of

the National Commission on Teaching and America's Future. "In 1970 the top three

skills required by the Fortune 500 were the three Rs: reading, writing, and arithmetic. In

1999 the top three skills in demand were teamwork, problem-solving, and interpersonal

skills. We need schools that are developing these skills." (as cited in Davis, 2013, para. 8)

What teachers think students should know often gets in the way of what they want them to learn.

An article titled, "What's Wrong with Undergraduate Education?", describes a conference on the

curriculum at Boston University, and echoes my discussion of lumpers and splitters, including

one telling question from the conference organizer: "How can learning transcend the boundaries

of a classroom's four walls?" (Berdik, 2008, para. 10). Facing this question is central to

establishing whether college curricula lead to deep understanding.

Educators aware of the pedagogical short-comings of classroom teaching created valuable instructional strategies through outdoor (Woodhouse & Knapp, 2000), place-based (Sobel, 2004), inquiry-based (Keys & Bryan, 2001), hands-on, constructivist (Savery & Duffy, 1995), and experiential education, this last with a long history (Joplin, 1981). Many of these strategies were originally employed by educational theorists Rudolf Steiner, Maria Montessori, and A.S. Neill, and continue to be the basis for learning in Waldorf, Montessori, and Summerhill-based schools (Rawson & Richter 2000; Standing, 1957; Vaughan, 2006), but not (since this country's alternative school movement in the 1970s-1980s) in public schools and colleges.

It is easy to recognize that environmental sciences belong out in nature (Haury & Rillero 1994), and that everyone should get outside more (Louv, 2006), but faculty tend to opine that "on the road" is not the way to learn *rigorous* academics or *theory*. However, messy education is just the way to accomplish this—although, it is never tidy. Hands-on, experiential education gets some support in the halls of academia (DeHaan, 2011; Fukami, 2013), but it is not acknowledged that messy learning is far richer academically than most of what happens in classrooms. Here's an example:

I regularly teach a classroom course called "Native North Americans," a survey covering the religions, philosophies, histories, and lifestyles of the indigenous people of North America. We read, write, discuss, watch films, visit a museum, have discussion and research groups, listen to lectures, and have local Native speakers come into the class. Among other things, the speakers cover the impact of Europeans on Natives, especially from Christian missionaries. According to the student evaluations, it is a good class. The students enjoy it and feel they have gained a lot of knowledge—but I know that over the course of the semester they are "not going to truly learn

very much about Natives," which I tell them at the beginning of the course. They will study ideas, concepts, and theories, but the lessons will be kept relatively "tidy," and they will not learn who Natives actually are. The class is a simulacra, allowing students to believe they have learned something by providing much information, and intellectually stimulating discussions, but never getting them close to the real thing. I know this, because I have also brought many students to visit Natives and reservations throughout the US, including some that are easily accessible from my university.

One time my students and I were in southern California studying cultural history, and interested in the historical and contemporary relationship between indigenous peoples and Euro-Americans, especially the interaction between Natives and Christian missionaries. At a seminar, one of the students held up a map of southern California, and we looked at the many tiny Native reservations that dotted the desert. What had been the relationship of these diverse cultures with the European immigrants?

A student called an historic local mission asking if we could talk to a missionary about their work with Native Americans, and they arranged a time for our visit. I remember the scene distinctly. We arrived at a sizeable and stately mansion surrounded by ample grounds, all of which must have been an impressive symbol to the Natives of the newcomer's authority. We were shown into a large meeting room, where twenty-three of us sat around an enormous wooden table, and waited. Finally, the priest arrived. He was a "Gray Robe," a Franciscan, and I thought he looked strikingly like friar Tuck—including the bald pate. We began asking questions and soon found ourselves not very happy with his answers.

He explained to us how, yes, the missionaries had come into this area of the continent to convert the Natives to Christianity, but it was both acceptable and necessary work as the

indigenous people "really didn't have much of a religion anyway."

As we had spent a month studying Native beliefs and culture, we were not receptive to his argument. Pointing out all the different tribes we noticed on the map, one student said, "But, didn't the Natives have thriving, on-going cultures at the time the Europeans arrived here?"

His answer expressed his Euro-centric judgment: "Oh no," he assured us, "they didn't have much culturally, religiously, or much of anything else. In fact, they were barely surviving in their desert shanties, living under a few branches that they gathered together for shelter. They readily came to the mission for help once it was open."

In fact, Natives across America willingly visited churches and missions, mostly for the food, medicine, and metal utensils they offered. When they did not come, they were often forced to come at gun point. My students have been told many times by Natives that mission churches in the southwest were built with the grief and blood of their congregations.

As we sat in that room, listening to the good friar, I had the distinct impression that my students were hopelessly gripping the table, digging into it with their fingers, in an effort to maintain composure. They were using extreme self-control. The day before, we had a long discussion about being polite and decent to this man of the cloth, regardless of what he said (Trocco, 1999). Our visit to the mission was not simply an informative historical lecture, but an experiential encounter loaded with dimensions of personal emotion, cultural hegemony, and religious oppression, all of which left much to examine.

At another time, while studying the Yaqui Indians in Arizona, who were Christianized by the Jesuits, the "Black Robes" instead of the "Grey Robes," a student had these thoughts after talking with a woman about her tribe's history:

I wanted to ask her a million questions, but I could not bring myself to it. I felt pathetic

standing there in the plaza in the New Pascua Village, judging the Yaquis. Have they not

suffered enough? Do they need my reasoning? Why can I not stop blaming them for

[accepting] what the Jesuits did to their culture? (S. Garcia, personal communication,

2010)

The difficult conflicts contained in the discussion with the mission priest, and the final question

that this young woman had to personally confront, made for good days in a messy class.

Messy Learning Leads to Deep Understanding

Many teachers now incorporate small-group work, peer-review (DeHaan, 2011), and

inquiry-based practices in undergraduate classrooms. These worthwhile efforts give students

experiences where they can "collaborate" (Palincsar, Stevens, & Gavelek, 1989), forming a

"sense of community" (Chickering, Gamson, & Poulsen, 1987), as a "learning community" in

the classroom or (even) online (Drouin & Vartanian, 2010). There is growing evidence that these

techniques lead to more engaged learning. But do they lead to abstract and theoretical (and deep)

understanding? Perkins (1993) describes deep understanding as a "performance perspective":

In brief, this performance perspective says that understanding a topic of study is a matter

of being able to perform in a variety of thought-demanding ways with the topic, for

instance to: explain, muster evidence, find examples, generalize, apply concepts,

analogize, represent in a new way, and so on (What is understanding?, para. 5). . . .

Understanding performances contrast with what students spend most of their time doing.

While understanding performances can be immensely varied, by definition they must be

thought-demanding; they must take students beyond what they already know. (para. 7)

When students are "on the road" surrounded by their "subject," when the data are so rich as to be

nearly overpowering, when they are immersed in and interacting with the questions they are

"studying," when those questions are impossible to answer with absolute confidence, and when the learning is not attenuated by memorization of facts, the experience often leads to deep understanding.

A word about the word "messy": I have used "chaotic" to describe these lessons, and suggested offering students classes and experiences with questions that are unanswerable. I am not trying to set an impossibly high bar to classroom practice, or to hopelessly confuse students and teachers—messy is not muddled, and it can be accomplished in the classroom (see mathematics and mindfulness examples). Therefore, "on the road" is in quotes throughout the paper. A clearer metaphor for what I am describing might be to consider complexity theory, where systems are so chaotic (i.e., the available information is so dense) that they cannot be accurately modeled or completely fathomed. However, underlying patterns can be investigated leading to significant insight. What I am calling deep understanding is getting close to this underlying pattern, empowered by the process of messy learning, as in the following example.

Although between the Anabaptist Mennonites and Amish there are too many sects to make generalizations possible, collectively these communities shun all the wondrous modernisms that most Americans work so hard to enjoy. There are many variations among their communities, although typically they use a horse and buggy for transportation; they do not have easy access to (or even use) electricity; they do not have telephones, TVs, or radios in their homes; they heat with wood and coal; and they use horses and mules to pull their farm equipment. Some carry pocket watches instead of wristwatches (a sign of the modern world), wear suspenders instead of belts (a new and unacceptable way to hold up your pants), use hooks instead of buttons (they are pacifists and buttons were originally worn only by the military), and young people court in the old-fashioned parlor as their parents sleep in an adjoining room. These

people are a glimpse at a forgotten way of living, which is culturally and epistemically remote from all the students I have brought to study with them. As we arrive on the farm, my tech-savvy students always ask: "Why do they hold onto the past?"

During my class's stay with a Mennonite farmer, he took us to an Amish farm where a barn had burned down and a new one was under construction. Two weeks earlier the enormous barn, full of cows, hay, a team of horses, tack, farm equipment, and the family cat, had burned to the ground and everything was lost. The family did not have a telephone, but before the embers had stopped smoking, people began arriving. The women took over the kitchen, bringing quantities of food and home-canned goods. The men, carrying tools from home, went to the barn site and began clearing away the burned debris. In a day or two, lumber started arriving by horse and wagon.

On the day we arrived, the mortise and tenon frame was up and there were dozens of men in black trousers, broad-rimmed hats, suspenders, and white shirts, climbing all over the structure. While the barn's future owner showed us around, the farmer who brought us immediately left our group and joined the work force. Soon, the students were all engaged: the male students were outside, sawing, lifting, and hauling with the men, while the women students helped in the kitchen. We spent days working alongside these rural farmers, and every evening until midnight (even though we were all up at dawn to begin the work day) my class crammed into an overly hot farmhouse living room to discuss Mennonite and Amish lifestyles, customs, and religion with the barn-builders.

Within a month of our visit, the family had a new barn, tack, equipment, hay, cows, horses—and a cat. All of this, plus the food to feed the workers and everyone's labor, was donated by community members. It happened without the family making a single telephone call.

The Amish and Mennonites do not have insurance policies. At least, not the same kind that their "English" neighbors (as they call them) are dependent on (Trocco, 1999). As we left the farm, our time there helped some students understand why these folks "hold onto the past."

This experience led to deep understanding, meeting the criteria of Perkins' "performance perspective"—pushing students to understand way "beyond what they already know." Although we read a great deal about this culture, both to prepare for our visit and afterwards, the students had no "teacher" mediating their experiences besides the farmers, the farm, and the Lancaster Pennsylvania landscape. The students had to learn how to interact with members of another culture, work beside them, fulfill unfamiliar demands, decide what questions they had, and get those questions answered on the job and in our evening living room discussions. These students, right in the United States, found themselves grappling with an intellectual paradigm far removed from their own. This is messy learning, or as Mitra, a proponent of "minimally invasive education" (Mitra, & Rana, 2001) puts it: "The bottom line is, if you're not the one controlling your learning, you're not going to learn as well" (as cited in Davis, 2013, The bottom line is . . ., para. 3).

After the visit, the students documented their learning using field journals (which they kept during the week) and research essays (all in proper APA format), because "messy" does not mean there is no scholastic structure.

My argument in this paper is founded on the belief that teachers are not taught to trust students with directing their own education. The level of trust we have in our students marks the difference between a cognitivist model of education (Merriam et al., 2007), where learning is a process of building upon and linking together past information to acquire new knowledge, and a constructivist model (Hein, 1991), where students develop meaning through their experiences

and interactions. Hein (1991) points out the conflict for educators contained within these teaching styles: "It is this tension between our desire as teachers to teach the truth, to present the world 'as it really is,' and our desire to let learners construct their own world which requires us [teachers] to think seriously about epistemology and pedagogy" (Constructivism, para. 9).

By trusting students to construct their own knowledge, our experience on the farm sounds a lot like Savery's (1995) discussion of problem-based learning, which was developed for medical students, working in hospitals *with actual patients*:

The students begin the problem [in the form of a patient entering with presenting symptoms] "cold"—they do not know what the problem will be until it is presented. They discuss the problem, generating hypotheses based on whatever experience or knowledge they have, identifying relevant facts in the case, and identifying learning issues. The learning issues are topics of any sort which are deemed of potential relevance to this problem and which the group feels they do not understand as well as they should. A session is not complete until each student has an opportunity to verbally reflect on their current beliefs about the diagnosis (i.e., commit to a temporary position), and assume responsibility for particular learning issues that were identified. Note that there are no pre-specified objectives presented to the students. The students generate the learning issues (objectives) based on their analysis of the problem. (p.7)

The "Road Less Traveled" becomes the "Road Not Taken"

Two roads diverged in a wood, and I—
I took the one less traveled by,
And that has made all the difference.

—Robert Frost, 1920

Secondary education classrooms reflect what students find in college: Bush's "No Child Left Behind," Obama's "Race to the Top," and today's "Common Core" invoke standards and

standardized testing to certify that high school graduates are educated (Strauss, 2013):

> Standards have often codified sanitized versions of history, politics, and culture that
>
> reinforce official myths while leaving out the voices, concerns, and realities of our
>
> students and communities. Whatever positive role standards might play in truly
>
> collaborative conversations about what our schools should teach and children should
>
> learn has been repeatedly undermined by bad process, suspect political agendas, and
>
> commercial interests. (Rethinking Schools, para. 22)

Educational historian Ravitch had this to say in a speech to the MLA, which reminds us of Davis'

earlier sentiments:

> Behind the Common Core standards lies a blind faith in standardization of tests and
>
> curriculum, and perhaps, of children as well. . . (para. 40). There is something about the
>
> Common Core standards and testing, about their demand for uniformity and
>
> standardization, that reeks of early twentieth century factory-line thinking. There is
>
> something about them that feels obsolete. . . (para. 48). The tests are the necessary
>
> ingredient to standardize teaching, curriculum, instruction, and schooling. (para. 49).
>
> (Strauss, 2013)

The boundaries between secondary and post-secondary education are permeable: colleges

employ professors who have come from that system and who design classroom courses with

many of the same constraints. The demands of the splitters for more "reading, writing, and

arithmetic" do not change from high school to college. Besides, the official standards have a

dramatic impact on all educators because social norms influence curricula across every level of

education according to what educators and administrators, and even politicians (Strauss, 2014;

Strauss, 2014), believe students "need to know," in order to understand the world "as it really is" (Hein, 1991).

Classroom studies are contained, organized, and over (relatively) quickly, and, although teachers may feel that much of what happens is not under their control, the instruction is seldom intellectually messy—indoor classrooms are dramatically influenced by the surrounding walls, and very little that is disordered gets in or out. Being immersed with students in nature, on a farm, on a Native reservation, on the street outside the school building, or inside a purposely untidy classroom is just like the wilderness—it is chaotic and messy. Understanding exactly what you have learned takes time, patience, and analysis because the data are so rich, and the problems realistically thorny. Accordingly, much of the challenge in a messy classroom comes because the students are focused on their depth of thinking, rather than on chronicling facts.

This is why, at universities, often the "road less traveled" becomes the "road not taken." What is learned from a messy curriculum does not follow the standards and it is tricky to assess, challenging the current emphasis on student outcomes. You might think of the difficulty of evaluating messy learning as similar to the problem physicists have trying to measure a moving quantum: it is not a particle or a wave until you look at it. Until you look, you are never quite sure what you've got!

DeHaan (2011) claims that what is really needed in classrooms is creativity, reflected through "associative (divergent) thinking, in which thoughts are defocused, intuitive, and receptive to a broad range of associations . . . ," which he finds even more important than "analysis, synthesis, and critical reasoning" (p. 1499), words used throughout the academy to define the elements of good teaching. DeHaan's recommendations are the very ones that students demonstrate "on the road," as this student does while visiting the Navajos: "My eyes and my

senses are essentially not trained to view the world this way and interpret events like this. It's truly fascinating to me to try to understand this difference in viewing reality and how this can lead to misunderstandings between cultures and individuals" (A. Magnan, personal communication, October 2011).

Messy learning can happen in the classroom, however, it is much harder to facilitate, as teachers need to let go of expectations about what it means to "teach," and importantly, how much class time messy lessons take. Time is not an issue "on the road," as the assumption is that students, immersed in their lessons, are learning all day.

In *Teaching With Your Mouth Shut*, Donald Finkel (2000) challenges the model in which teachers tell students what they should know. Finkel would agree that classroom teachers should: ask questions in class and on tests to which they, the teachers, do not have the answers, and which in fact do not have clear answers; unpack their pedagogy, so students know why they are being asked to study the things they are; have students design the questions that the students want to answer, and then help them figure out how to answer them; send students out on local field trips, surveys, and community investigations; allow the students to become teachers and take over class sessions, including choosing the readings. These approaches come with the territory in a class of messy encounters, and they are easiest to accomplish "on the road." In the classroom, they can appear unwieldy and cause teachers to feel out of control—because they would be! After all, classes are intended to be concentrated periods of instruction: tidy, not messy.

Question: What is left out when lessons are made tidy? Answer: The very dimensions of learning that most educators would like students to come away with. All students cannot physically leave the classroom, but a classroom poses inherent challenges to messy learning and

therefore deep understanding—unless a teacher's lesson plan takes students "on the road." It is not the amount of stuff we know that determines understanding, it is how capable we become at applying what we know to unique, real circumstances. Let us be honest with our students, and acknowledge that what happens in classrooms pales by comparison to the real thing. Tidy classroom experiences are as far removed from the truth as discussing the history, rules, and strategies of football, on a rainy day in your living room, is from going outside in the rain and playing—and getting messy!

References

Berdik, C. (2008, March 17). What's Wrong with Undergraduate Education? Friday's New

    Humanism conference looks to revamp curriculum. *BU Today*. Retrieved from

    http://www.bu.edu/today/2008/what%E2%80%99s-wrong-with-undergraduate-

    education/

Chickering, A. W., Gamson, Z. F., & Poulsen, S. J. (1987). Seven principles for good practice in

    undergraduate education.

Darwin, C. (1857). *The Life and Letters of Charles Darwin—Day 153 of 188*. Retrieved from

    http://www.turtlereader.com/authors/charles-darwin/the-life-and-letters-of-charles-

    darwin-day-153-of-188/

Davis, J. (2013, October 15). How a radical new teaching method could unleash a generation of

    geniuses. *Wired*, 21(10). Retrieved from http://www.wired.com/business/2013/10/free-

    thinkers/

DeHaan, R. L. (2011). Teaching creative science thinking. *Science*, *334*(6062), 1499-1500.

Dewey, J. (1997). *How we think*. MA: Courier Dover Publications.

Dorier, J. L., & García, F. J. (2013). Challenges and opportunities for the implementation of

    inquiry-based learning in day-to-day teaching. *ZDM Mathematics Education*, *45*(6), 837-

    849.

Dorier, J. L., & Maass, K. (2014). Inquiry-Based Mathematics Education. *Encyclopedia of*

    Mathematics Education, 300-304.

Drouin, M., & Vartanian, L. R. (2010). Students' of and desire for sense of community in face-

    to-face and online courses. *Quarterly Review of Distance Education*, *11*(3), 147-159.

Finkel, D. L. (2000). *Teaching with your mouth shut*. Portsmouth, NH: Boynton/Cook

    Publishers.

Fiske, E. (1992). *Smart schools, smart kids: Why do some schools work?* NY:

    SimonandSchuster.

Freire, P. (2000). *Pedagogy of the oppressed*. NYC: Continuum.

Frost, R. (1920). Retrieved from http://www.bartleby.com/119/1.html

Fukami, T. (2013). Integrating Inquiry-Based Teaching with Faculty Research. *Science*,

    339(6127), 1536-1537.

Haury, D. L., & Rillero, P. (1994). *Perspectives of Hands-On Science Teaching*. ERIC

    Clearinghouse for Science, Mathematics, and Environmental Education, Columbus, OH.

Hein, G. (1991). Constructivist learning theory. *Institute for Inquiry.* Retrieved from

    http://www.exploratorium.edu/ifi/resources/research/constructivistlearning.html

Jonassen, D. H. (2010). *Learning to solve problems: A handbook for designing problem-solving*

    learning environments. London: Routledge.

Joplin, L. (1981). On defining experiential education. *Journal of Experiential Education*, *4*(1),

    17-20.

Kaiser, D. (2011). *How the hippies saved physics: Science, counterculture, and the quantum*

    revival. NYC: W.W. Norton.

Keys, C. W., & Bryan, L. A. (2001). Co-constructing inquiry-based science with teachers:

    Essential research for lasting reform. *Journal of research in science teaching*, *38*(6), 631-

    645.

Kovac, M. (2014, August 19). Legislators hear testimony supporting repeal of Common Core.

    Retrieved from http://www.crescent-

news.com/ohio%20statehouse/2014/08/19/legislators-hear-testimony-supporting-repeal-of-common-core

Louv, R. (2006). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books of Chapel Hill.

McLuhan, M., & Fiore, Q. (1967). The medium is the message. *New York, 123*, 126-128.

Merriam, S. B., Caffarella, R. S., & Baumgartner, L. (2007). *Learning in adulthood: A comprehensive guide* (3rd ed.). San Fransisco, CA: Jossey-Bass.

Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco, California: Jossey-Bass.

Mitra, S., & Rana, V. (2001). Children and the Internet: Experiments with minimally invasive education in India. *British Journal of Educational Technology*, *32*(2), 221-232.

Open the floodgates? Indiana becomes first state to scrap Common Core. (2014, March, 25). Retrieved from http://www.foxnews.com/politics/2014/03/25/indiana-becomes-first-state-to-drop-common-core-standards/

Palincsar, A. S., Stevens, D. D., & Gavelek, J. R. (1989). Collaborating with teachers in the interest of student collaboration. *International Journal of Educational Research*, *13*(1), 41-53.

Perkins, D. (1993, Fall). Teaching for understanding. *American Educator: The Professional Journal of the American Federation of Teachers*, 17(3), 8, 28-35. Retrieved from http://www.exploratorium.edu/ifi/resources/workshops/teachingforunderstanding.html

Rawson, M. & Richter T. (2000). *The Educational Tasks and Content of the Steiner Waldorf Curriculum.* Great Britain: Steiner Schools Fellowship Publications.

Rethinking Schools, Eds. (2013, June). *Washington Post: The Answer sheet*. The Common

      Core's fundamental trouble. Retrieved from

      http://www.washingtonpost.com/blogs/answer-sheet/wp/2013/06/18/the-common-cores-

      fundamental-trouble/

Savery, J. R., & Duffy, T. M. (1995). Problem based learning: An instructional model and its

      constructivist framework. *Educational technology*, *35*(5), 31-38.

Sobel, D. (2004). Place-based Education: Connecting Classroom and Community. *Nature and*

      Listening, *4*.

Standing, E.M. (1957). *Maria Montessori: Her Life and Work*. London, England: Hollis &

      Carter Limited.

Strauss, V. (2013, January). *Washington Post: The Answer sheet*. Everything you need to know

      about Common Core—Ravitch. Retrieved from

      http://www.washingtonpost.com/blogs/answer-sheet/wp/2014/01/18/everything-you-

      need-to-know-about-common-core-ravitch/

Strauss, M. (2014, June). Wyoming says teaching climate change would wreck the state's

      economy. Retrieved from http://io9.com/wyoming-says-teaching-climate-change-would-

      wreck-the-st-1591992789

Strauss, M. (2014, August 20). An Anti-Evolution Bill In Ohio Almost Included A Ban On

      Aristotle. Retrieved from http://io9.com/an-anti-evolution-bill-in-ohio-almost-included-a-

      ban-on-1624450396

Trocco, F. (1999). The architecture of community: A Makah long house. *The Trumpeter:*

      Journal of Ecosophy, 15(1).

Vaughan, M. (2006). *Summerhill and AS Neill*. Columbus, OH: McGraw-Hill International.

Waring, N. W. (2014). Integrating Mindfulness Theory and Practice at Lesley University.

Contemplative Learning and Inquiry across Disciplines, 165.

Woodhouse, J. L., & Knapp, C. E. (2000). Place-based curriculum and instruction: outdoor and

environmental education approaches. ERIC Digest. Charleston, WV*: ERIC*

Clearinghouse for Rural Education and Small Schools. ERIC Document Reproduction

Services No. ED 448 012

Zajonc, A. (2006). Cognitive-affective connections in teaching and learning: The relationship

between love and knowledge. *Journal of Cognitive Affective Learning*, *3*(1), 1-13.