"But You Needed Me"

Reflections on the Premises, Purposes, Lessons Learned, and Ethos of SENCER
PART 2

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This paper is based on the opening plenary address at the 10th annual SENCER Summer Institute delivered by SENCER's co-founder, the paper's author. SENCER (Science Education for New Civic Engagements and Responsibilities), supported by the National Science Foundation, works to improve learning and strengthen civic engagement in undergraduate courses that teach through complex, capacious, unsolved civic issues to canonical knowledge and practice in STEM and other fields. Part one appeared in the last issue.

Introduction

In part one of this paper, I described the origin of the SENCER project and discussed some of the connections between scientific and democratic practice. Serving as the principal investigator of the SENCER project over the past 10 years has given me the opportunity to work with a vibrant and diverse community of scholars, administrators, students and researchers who represent, as we in the national office say as often as we can, the intellectual capital of our work. Over these years, much good has come from the efforts of these scholars who have been engaged in connecting the science of learning to the learning of science, as we try to do in the SENCER project. It has been my distinct privilege to observe the good that can come—as well as some collateral issues that emerge–when this work is undertaken. So on this 10th anniversary of SENCER, I offer an abbreviated and highly personal list of some of the things I have learned from my work with our National Center for Science and Civic Engagement and the SENCER community.

Lessons Learned

Here are seven lessons that I submit for your consideration:

1. Teaching gets "transformed" through SENCER participation, not just courses.

We began the SENCER project focused on the non-STEM major where change was possible because, frankly, it seemed like almost nobody in power (except deans, who were worried about STEM education and so called "student apathy") really cared very much about the non-major. We used to say that when you saw the science float, you could be pretty sure the "gen ed" reform parade was just about over. The so-called non-major was neglected.

We chose the non-major as the target of our efforts and we proposed interventions at the course level—that basic building block and unit of academic currency. It's not that there were no champions of the approach we were advocating. There were plenty of brave pioneers, and they flocked to our program, in part because, until we created it, they were like dozens of John the Baptists, voices crying in the wilderness.

Indeed, I even coined a DSM-III[1] term for the condition we observed. I called it VDD—validation deficit disorder. It seemed like a pretty curable condition: to recover you only had to discover that other smart folks thought there was something less than ideal about how science and math were being taught in college.

With the help of some wonderful colleagues, we set about creating courses, course intersections, and learning communities, and "SENCERized" parts of courses. While this was happening the people doing it began to realize that they were changing as well. They were more engaged, they were more interested. They were remembering what they knew about learning, but had somehow forgotten. They were changing their notions about student capacity and ability. Most important, they were reminded about why they got into teaching in the first place.

The biggest implication here is that the SENCER ideals don't stay confined to the courses for non-majors. Once you start teaching this new way, you start wanting to teach this way in all the teaching you do, so we observe the migration, slow to be sure, from the margins closer to what some observe as the main mission, majors.

I think this migration is spurred by changes in pedagogy and successes that come from the different kind of political community that a classroom becomes when failure is no longer mistaken for rigor and disengagement is not attributed solely to defects in the person accused of apathy and indifference.

So the lesson I want to offer is: **get ready to experience changes in yourself as a teacher as you change your courses and programs to attune them to matters that are real, relevant and of vital interest to citizens in a democracy.**

2. Less may not always be more, but more is almost always less.

Folks trying to reform STEM education wrestle with the content versus context question. The fear is that if you take the time to establish "why" learning matters, you'll sacrifice some of the "what" that has to be learned.

In my observations at least, this has proved to be more theoretically than practically correct. No less an eminent cognitive scientist, Father Guido Sarducci, who has made video appearances at SENCER Summer Institutes courtesy of John Bransford, has lectured us on "the five-minute university"—hilariously reductive and dangerously close to being true. [2] Yet some of us persist in believing that this hyper-reductiveness is not what happens in the lives and minds of our own students after they take our courses. And we sometimes believe this even though we are not prepared to risk testing students on materials we "covered" that were assessed in a prior examination.

Rather than try to talk the doubters into believing as I do on this topic, may I propose an experiment? See if what is "left"—what is available intellectually as knowledge, or skill, or inclination, or attitude—at the end of a course, the residuum, is greater in the instances where pared but higher level expectations were clear, active pedagogies were employed, and real issues framed the academic experience. Design an experiment to test this. When students get the main points, the big picture, the dimensions of what Ellen Goldey and Byron McCane call the really big questions or what Rick Duschl and company have identified as the four strands[3], are they both better equipped and more likely to get the stray or new content on their own? Moreover, do they have what we might call intrinsic desires to do so? I think the answer is yes for the most part. See what you find out.

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1   The allusion in this jocular reference is to the *Diagnostic and Statistical Manual of Mental Disorders,* published by the American Psychiatric Association; DSM-III was the version originally brought out in 1980.

2   See: http://www.youtube.com/watch?v=kO8x8eoU3L4

3   For a discussion of the "four strands" see: *Taking science to school: learning and teaching science in grades K-8* (Richard Alan Duschl, Heidi A. Schweingruber, Andrew W. Shouse, National Research Council, 2007. "Really Big Questions" is a title Ellen Goldey and Byron McCane have given to large trans-disciplinary matters. Here's how they described them in their session at SSI 2010: "Big problems and polarizing conflicts do not have single-discipline solutions but instead require critical reflection and purposeful integration of multiple perspectives. Therefore, we must do a better job of modeling for our students what it means to take an intellectually sophisticated approach to 'really big questions' (RBQs). Only a citizenry that respects scholarship, is accustomed to ambiguity, and engages with complexity can identify and act on solutions to society's capacious problems. The workshop leaders (a biologist and an archaeologist/religion professor) will briefly overview how interdisciplinary programs have engaged our colleagues and students in contemplating RBQs, such as that of human origins. Participants will brainstorm polarizing views of this RBQ as reflected in the popular media, contrast such dualistic views with higher-order levels of intellectual development (Perry, 1970), and demonstrate how we can construct new knowledge through the integration of different fields of scholarship."

It is difficult to underestimate the importance of having clear learning goals in connection with producing the results you want. As textbooks grow longer and attention spans grow shorter, this planning work becomes even more critical. Beyond goals, matching of aims with the right pedagogies is critical. Assessments, too, should be tailored to both course goals and corporate aims that the course seeks to advance. [4]

The lesson I've learned: **It helps to think really hard about the learning that you think really matters and connect that learning to things that really matter to the learners.** See for yourself if the results aren't better than those that come from one current approach that I liken to opening the fire hose of 10,000 facts, training it on the students, and hoping that they don't dry off entirely by the time the next semester begins.

A coda: where you are not in control of what is expected in a course, find ways to engage people at the policy level who are, so that you can help influence the conditions that give rise to the broken pedagogies in the first place, be they exams (like Advanced Placement tests), the expectations of accreditation bodies, transfer considerations, etc. In short, engage.

3. People do need people because change is socially mediated.

It is true that people learn differently (there is a whole industry dedicated to propagating this notion). It is also true that most of what we need to know about how to make learning better is already known, published, and available in several dozen reports, a few of the better ones written by Jay Labov, Stephanie Knight, Elaine Seymour, John Bransford, Jose Mestre, Rick Duschl and other folks who have been kind enough to lend their intellectual gifts to our SENCER efforts over the years.

The reports are great, like our models, our extensive and quite wonderful digital library, and lots of other useful assets. All too often, however, they remain un-accessed. "Women come and go, talking of Michelangelo" as T.S. Eliot wrote in Prufrock. Perhaps so, but, borrowing from a source that I am afraid remains unknown to me, how many of us believe that "Scholars come and go, talking of Cross and Angelo"? [5]

What seems to change this—what gets Cross and Angelo and lots of other valuable assets off the shelf and into practice—is face-to-face experience, time for conversation, live demonstrations, and the formation of groups who share similar concerns, aspirations and goals. People open the doors to these other resources to one another. That is why our Institutes have proved so valuable over the years. It is why we invest resources in efforts to keep people connected. It is why we indulge in what starts as a useful fiction of creating teams to attend our institutes, because sometimes teams really work and that makes all the difference. [6]

The lesson I've learned is this: **Working together face-to-face is vital, hard as it is to find the time these days.** Once you've met face-to-face, you can call upon colleagues to help. Creating and sustaining a community of practice[7] is entirely within our capacity and is necessary to achieving larger scale reforms.

4. Change takes time, but time flies.

When Karen and I started this project we were woefully wrong about just how much time it would take for even enthusiastic colleagues with the power and resources to do so to make the kinds of changes we envisioned. Sure, there were notable examples—UNC-Asheville being one where very major campus-wide changes actually happened within a relatively brief period of time. But, for the most part, the kind of course-level and learning-community-level change took more than the year or year and a half that we had originally envisioned. The good news is that the changes brought about by SENCER faculty members have been remarkably durable (some 90% of created courses having entered the permanent curriculum.)[8] We may have sacrificed speed for durability, a

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4   By corporate aims, I mean the goals the institution has for student learning outcomes, such things as developing critical thinking skills, effectively communicating, being capable of evaluating claims made numerically or statistically—the kinds of overall outcomes that are not specific to only one course but are expected to be developed in most courses.

5   T. S. Eliot's *Prufrock and Other Observations* (1917). Cross and Angelo refers to the important book, *Classroom Assessment Techniques: A Handbook for College Teachers* (Jossey Bass, 1993) by Thomas A. Angelo and K. Patricia Cross.

6   Respondents who had attended more national SENCER events were significantly more likely to assert that SENCER participation had improved their perception of student ability to engage in critical thinking, problem solving and to collaborate and engage in group work. This finding is drawn from a survey of SENCER program participants who attended at least one national or regional workshop between 2001 and 2010. All told, 602 individuals (a response rate of 45%) participated in the 70-item web-based survey conducted between October 13, 2010 and November 30, 2010. From a forthcoming publication by J. Ballou and D. Kraus Tarka.

7   See: Wenger, Etienne. *Communities of Practice: Learning, Meaning, and Identity.* Cambridge: Cambridge University Press, 1998.

8   For program assessment data including the findings that "the majority of instructors answering the online survey said their courses would continue into the future (93%) and that their SENCER course was part of the permanent curriculum of their institutions (81%)", see: www.ncsce.net/About/pdfs/ SENCER-EvaluationReport.pdf.

reasonable trade-off. While it took longer for things to happen, it also seems to me that time is just flying by. It may just be my age: a summer doesn't last forever as it did when I was a child.

So where does this leave us? I think the take-home lesson is simple: (1) it will take longer than you think to get things done, and (2) because time is flying, you'll feel like you have less time to try to get things done. **So start now, do something small rather than doing nothing at all, and then build on what you have done. Don't wait to have the perfect course before you teach it. You'll find out how good it is by teaching it.** As Henry Petroski, the eminent engineering professor from Duke, has shown us, form follows failure, not function.[9] So set some short and longer range goals and approach this work as a natural scientist would approach a problem in natural science, improving as you go along depending on what you discover.

5. Student partnerships are keys to success.

This is true at so many levels. I think it is safe to say that the SENCER courses and projects that have been designed with students helping all the way just tend to be better. They are more likely to capture something that truly matters to and interests students. They are more likely to be "advocated for" by students and recommended to other students by students. This is not always the case, but it is generally so.

Engaging students in planning (and delivery) is one anodyne for the pains that can come from the disease of solipsism. You need students to help you find out if your topic is as interesting as you think it is. Creating a "market pull" for courses should be a desired end. You want students not because they have to take your course, but because they want to take your course. Courses and programs that meet both important institutional and student needs and contain opportunities—for community engagement, service learning, internships, research projects and other experiences made possible by progressive pedagogies—are very likely to create this "pull." Students can therefore become the engines for these desired changes and they can help establish some continuity of interest within the student body, where such continuity is currently lacking.

Students can make vital and valuable intellectual contributions to course content and design, development, and refinement. Indeed, I would suggest that a partnership approach will not only improve the course or program being designed and taught, but it will also enable the modeling of collaborative and mutually respectful engagement, while promoting respect for scholarly authority.

The lesson: **It helps to invite students into the planning and delivery process to create opportunities for student leadership and engagement.** Listen to student interests and needs, connect these, as William James earlier instructed us, with your own learning goals "so that the interest, being shed along from point to point, finally suffuses the entire system of objects of thought." [10]

6. Assessment should be integrated with practice.

Too often we suffer from what seems to be an oppressive divorce between pedagogy and assessment. Assessment becomes something that is done to you and is thus to be watched carefully and with some suspicion, sometimes with the "gloomy foreboding" of the butler in *Sullivan's Travels*. After all, you have probably observed that "the evidence on evidence" is not so clear. [11]

Things are assessed unevenly and often not just at the wrong intervals but at the wrong times, as well. Does it really make sense to assess learning in a "final" exam, or should we come back sometime later and ask, how much was, in Bacon's terms, actually "digested"?[12] And can we responsibly wait until a midterm to find out how many students are lost? Terry McGuire once observed that students can get lost in places we never knew existed.[13] It's our responsibility to find out who is lost and to do what we can to repair the situation.

9   Henry Petroski, *The Evolution of Useful Things*, New York: Alfred M. Knopf, 1992.

10   William James. *Talks to Teachers on Psychology and to Students on Some of Life's Ideals.* New York: Henry Holt and Company, 1899, pg. 96.

11   See: Elaine Seymour's *Tracking the process of change in U.S. undergraduate education in science, mathematics, engineering, and technology.* Science Education (86): 79-105 and the recent *Determining Progress in Improving Undergraduate STEM Education: The Reformers' Tale* by Elaine Seymour, Kris DeWelde, and Catherine Fry, accessible at www.nae.edu/File.aspx?id=36664

12   See Francis Bacon's *Of Studies*: "Some books are to be tasted, others to be swallowed, and some few to be chewed and digested." Of course, something we could call "digested learning" is what we should strive for, as opposed to the "memorize and dump" that all too many students have become habituated to (and rewarded for) doing.

13   See: *Reinventing Myself as a Professor: The Catalytic Role of SENCER* by Terry McGuire; retrievable at: http://serc.carleton.edu/sencer/backgrounders/reinventing_myself_professor.html.

Then there is the issue of: When we do assessment, are we asking the right questions?[14] Shouldn't the questions emerge from the design of the course or learning experience? Let's measure the right things.

We need to reconnect assessment with pedagogy if for no other reason than to inform and improve our instructional design and delivery (this is a strength of the SALG instrument[15] that we helped to design and the use of which we advocate).

To those of us who rely on multiple sources of information to make our most critical judgments, what students think about their learning and our teaching is essential data, not dispositive perhaps, but surely worth knowing. But it is even more worth knowing if it is derived from some appreciation for what we were actually trying to do. Hence the need for customization of instruments so that they are sensitive and specific to our uses and purposes.

The lesson learned: **It helps to tie assessment to pedagogy (including reflection on course activities like service learning, research, etc); assess frequently and at intervals short enough to enable you to make "repairs" and mid-course corrections; imagine (and try to over-determine) how what you are teaching helps achieve broader institutional goals (that may be assessed later and in other ways).** This is a "citizenship" duty. And to students, I'd like to make a special plea: find ways to let your professors know when you genuinely don't "get" something. This is not an excuse for shirking responsibility, but rather a plea for taking on responsibility for learning.

7. Success matters.

Over the last 10 years, I have been awed by the hard work, the energy, the ingenuity, the good will and the bravery, generosity, and desire for community of the faculty, administrators, community representatives and students that we have been privileged to meet through SENCER. There are exceptions, of course, but they prove the rule.

The single greatest ingredient in the success of the best of the SENCER projects is the degree to which those creating them are genuinely committed to identifying their own success as a teacher with the success of their students. This is not a romantic idea or one that romanticizes students. You know better than I that we are all made of that same crooked timber of humanity that Kant wrote of long ago.[16] Students are too.

But the difference between success and failure seems to lie in part on how engaged the parties to possible success seem to be in the transactions and collaborations that make up the learning experience or, for that matter, the larger civic community. "The medical care was great but the patient died," no longer cuts it in medicine. Finding out why the death occurred and making sure it doesn't happen next time if it doesn't have to becomes the obligation of the physician and all the members of the healthcare team. Our losses in education may not be as profound, but they can be as permanent.

We can no longer tolerate the high casualty rates in our courses, the losses of talent, the unopened doors, the dropouts, the "never-tried-to-begin-withs"—all these things that may have passed as markers for excellence in earlier days. Why? For our economic welfare, of course, but that too seems less convincing: if you can outsource your customer service program, why can't you outsource engineering, actuarial work, basic research, as well?

I think there is a larger and more persuasive answer: If nothing else, this is important because this stuff—the stuff of SENCER courses and the subjects of the work of our colleagues from community and governmental organizations—really matters. And there seems to be more to think about and to do every day. As I mentioned before, our systems are indeed too complex to fail.

So, if I have learned nothing else, it is that we need to change our basic paradigm from one that somehow confuses failure with rigor. Instead **we should measure our success by the success we encourage, enable, and engender.** This means giving something up, or at least temporarily surrendering some of the status you earned through your hard work in a system that seemed to think little about the morality of boiling off the dross in order to come up with the gold. But I think we can recover from this condition—this culture, if you will—though a renewed commitment to both access and

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14 Early on, when Karen Oates and I were planning SENCER, we heard over and over again from faculty members we interviewed how disappointed they were that the traditional teacher evaluation "systems" were loaded against innovative pedagogies.

15 The Student Assessment of Learning Gains instrument was originally designed by Elaine Seymour. Its contemporary, web-enabled and NSF-sponsored version can be accessed at www.salgsite.org.

16 Immanuel Kant wrote "Out of the crooked timber of humanity, no straight thing was ever made" in *Idea for a General History with a Cosmopolitan Purpose (1784), Proposition 6*. It was through Isaiah Berlin that I became familiar with Kant's observation. See, among other Berlin works: *The Crooked Timber of Humanity: Chapters in the History of Ideas* (Henry Hardy, ed. Knopf, 1991).

success and though new partnerships with others. As tired as members of the professoriate are from working hard and achieving less than they had hoped to achieve, I know that refreshment comes from the prospect of the success and accomplishment of genuine learning.

Ten years is quite a while and I am sure that on other days and in other circumstances, I would have a different (and much longer) list of the lessons I have learned to share with you, but this is today's. I hope you will find some of what I have noted helpful to you as you plan ahead and work towards better outcomes in STEM learning and renewed civic engagement.

Four Promises and the SENCER Ethos

Over the years, I have been asking colleagues to make promises to one another and to me as we embarked on the work of our Summer Institutes. These Institutes are intensive, multi-day residential "workshops" at which many of participants are meeting one another for the first time. The participants find themselves constituting a little "polity" or political community that is temporary, to be sure, but in a more optimistic scenario, might last longer than the few days to be spent together. My belief is that people who make these kinds of promises—covenants, if you will—with one another will stand a better chance of enlarging the scope of possibility and achieving important goals. The four promises stake out what we might call an ethos for our work. I offer them here because I think they have a general applicability:

Let us promise to work hard to fulfill our obligations to those who are making it possible for us to do the work that we are about to do. In the case of the SENCER Summer Institute, this means, in the first instance, ensuring that the investments made by NSF and our other donors and funders are well spent. But it means more, especially since the NSF is essentially a trustee of funds allocated by Congress. It means being conscious of all the people, the farmers and ranchers, the miners, the folks who own and operate beauty parlors, the bond salesmen, the nurses, the CEOs, indeed everybody who works at things for a living and who pays taxes, or makes charitable donations in lieu of paying taxes, or who supports our work in other ways—like the people who fly the planes that get us to workshops, or clean the rooms we inhabit while we attend them.

Higher education exists because others are paying for it to exist, whether in direct state subsidies, foregone tax income, student aid, and other sources. We owe a lot to the kindness of strangers. We owe it to them to be serious, to be productive, to maintain the trust they have implicitly and often anonymously extended to us.

The second promise will be more challenging than the simple market transaction that a reductive version of the first promise could become:

Let us promise to be moral today. It is so easy to have perfect knowledge of what we would have done in the past. None of us would have participated in the system of chattel slavery. We wouldn't have confused European-borne infectious disease with God's plan for land redistribution. We would have all joined the French resistance, repaired the gas tank on the Pinto, installed back-up systems to close undersea well heads without the benefits of a loss vs. cost projections, even paid more attention to our nuclear power plants.

But what about today? What do we do with the knowledge we have today. Thinking about HIV in Africa is what moved me to work on a project to do what we could to end the curricular silence there.

It similarly has led Sherryl Broverman and some terrific students from Duke and Rose Odhiambo and some terrific students from Egerton University to found a girls school in Kenya.[17] Who would have thought this possible? It is what moved some faculty members and students from Francis Marion University to engage in a public campaign to change policies about health warnings for South Carolina's pole fishermen.[18]

Promising to be moral today is another way of thinking about what obligations come with the knowledge we've been lucky enough, worked hard enough, and been privileged enough to acquire. This, I hasten to add, also applies to our knowledge about teaching and pedagogy. How do we justify maintaining instructional practices that we have evidence produce results that we could not call desirable?

While promising to be moral today is a deeply individual promise, the third promise is especially important in the context of group endeavors, such as our Summer Institute:

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17   For more information about the WISER project, see
     http://wisergirls.org.
18   Hanson, Lynn and Lisa Pike. The mercury problem in South
     Carolina's freshwaters: a project funded by the Sustainable Universities Initiative. CD-ROM. Florence, South Carolina: Francis Marion
     University, 2003.

Let us promise to use our power to enlarge what we all know. At our institutes, or at professional meetings, and surely on campus, on any given topic, any one of us could most likely, if we chose to, make it pretty clear how much many of the rest of us don't know. Indeed, we have become so advanced in learning things nobody else knows that we're all quite vulnerable to being found out as people who indeed know very little. So to avoid embarrassment, we've developed a fairly broad set of defenses.

Finding ourselves in these conditions—that is, being among a huge group of people all of whom probably know more than we do about the things they do know about—we have a choice to make. We can use our time together to show what people don't know or we can use our time together *to enlarge what we all know.* Choose the latter, not because you want to avoid the rigor and give and take of a robust critical gaze, but because we can achieve more if we think about what we have to teach and how we can help each other learn. Engaging with complex issues outside our areas of expertise involves risk for scholars; engaging in active pedagogies can also pose risks for students who have performed well in conventional contexts.

Our last promise deals with risk:

Let us promise to encourage intellectual risk but also to act to reduce damage to those who have the courage to take the risks. I added this promise after we started to realize that some very good students were resisting some very good pedagogy. I wrote about this in a piece called "With Friends Like These."[19] In short, we were asking students—especially accomplished students—to come out of the "comfort zones" of their previous patterns of study and knowledge production and take risks that exposed them to harm. Some of these risks were cultural: you can't expect someone from a tradition of deep respect for authority to "challenge" a professor, argue with authority, become Meno to your Socrates, etc. (Malcolm Gladwell uses the Korean airlines crash to make a similar point in the Outliers book.[20]) Other resistance is parsimonious and economical: For students who have mastered the study and memorization techniques that earned them a 4 or 5 on their AP tests, it might be a little risky and even

self-destructive for them to try a course where one couldn't memorize the answers because they weren't yet really known.

So we began to pay attention to risk and to the moral obligations, if you will, that come from asking our students, our "friends," to take risks. This also applied to faculty members in our programs who were being asked to avoid the hegemony of the textbook or the security of a "tried and true" syllabus in favor of the "inventiveness by which the one is able to mediate…associations and connections" to recall James once again. So if we are going to encourage intellectual risk, as I believe we must, then what can we do to mitigate the possible harm that can come to those who take the risk?

I suggest just two strategies we can employ to fulfill this last promise. When we discussed this question of risk at a Summer Institute in San Jose, Linda Gonzalves of Stockton University, offered a suggestion: "when I increase risk, I decrease ambiguity." This is easier said than done, but it is worth trying. Its corollary might also be worth thinking about: when I increase ambiguity, I decrease risk. All of this relates to the larger obligation of being as clear and transparent about learning objectives, reasons for assignments and exercises, rationales for what is being learned, and compensatory strategies that provide "second chances" for students who took the risk and didn't do well.

"But You Needed Me"

As I mentioned, taken together, these promises constitute a kind of ethos that guides our work and that could be considered as guiding principles for our democratic engagements with one another, as well. There is another element, a foundational notion, if you will, underlying them that we need identify and think about as we do the very important work of education reform and civic engagement. Permit me to use the words of the author of one of my favorite books, An Intimate History of Humanity, the Oxford historian Theodore Zeldin, to identify this element:

> 'My life is a failure.' Those were the words with which I began this book, and I finish it with the story of a murderer who repeated that phrase many times, until one day…
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> Half a minute is enough to transform an apparently ordinary person into an object of hatred, an enemy of humanity. He committed a murder and was sentenced to life imprisonment. Then in his desolate jail, half a minute was enough to transform him again, into a hero. He saved a man's life and was pardoned. But when

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19   The essay is retrievable at: http://serendip.brynmawr.edu/sci_cult/scienceis/burns.html.

20   Malcolm Gladwell. *Outliers: The Story of Success,* Little, Brown and Company, 2008.

he got home he found his wife living with someone else and his daughter knew nothing of him. He was unwanted, so he decided that he might as well be dead.

His attempt at suicide was also a failure. A monk summoned to his bedside said to him, "Your story is terrifying, but I can do nothing for you. My own family is wealthy, but I gave up my inheritance and I have nothing but debts. I spend everything I have finding homes for the homeless. I can give you nothing. You want to die, and there is nothing to stop you. But before you kill yourself, come and give me a hand. Afterwards, you can do what you like.'

Those words changed the murderer's world. Somebody needed him: at last he was no longer superfluous and disposable. He agreed to help. And the world was never the same again for the monk, who had been feeling overwhelmed by the amount of suffering around him, to which all his efforts were making only a minute difference. The chance encounter with the murderer gave him the idea which was to shape his whole future: faced by a person in distress, he had given him nothing, but asked something from him instead. The murderer later said to the monk: 'If you had given me money, or a room, or a job, I would have restarted my life of crime and killed someone else. But you needed me.' That was how Abbe Pierre's Emmaus movement for the very poor was born, from an encounter of two totally different individuals who lit up a light in each other's heart. These two men were not soul mates in the ordinary, romantic meaning of that word, but each owes the other the sense of direction which guides their life today.

It is in the power of everybody, with a little courage, to hold out a hand to someone different, to listen, and to attempt to increase, even by a tiny amount, the quantity of kindness and humanity in the world. But it is careless to do so without remembering how previous efforts have failed, and how it has never been possible to predict for certain how a human being will behave. History, with its endless procession of passers-by, most of whose encounters have been missed opportunities, has so far been largely a chronicle of ability gone to waste. But next time two people meet, the result could be different. That is the origin of anxiety, but also of hope, and hope is the origin of humanity. [21]

"*But You Needed Me.*" This is the take home message I want to leave with you. We are so accomplished at telling people what they need from us, telling students what they need to learn from us, telling ordinary people that they need to understand science, and so forth. We need to get a lot better at thinking about what part of our project—be it intellectual, pedagogical, political, or theological— we can't do without the contributions that the "objects" of our endeavor can offer. Working

together we need to invent ways to enact this reversal of the ordinary approach.

For these reforms to work and indeed for democracy to work, students, colleagues and citizens need to be needed and to feel that they are needed, much like the prisoner discovered himself when he received the greatest gift that the monk could provide (and the monk really needed what the prisoner could offer him as he established his Emmaus project). So the conclusion I reach in thinking about 10 years of encouraging attention to the things that SENCER has focused on is quite simple: We need you. Our democracy needs you. We cannot do the intellectual work we need to do, make the improvements in learning we need to make or build a just society, without you.

About the Author

Wm. David Burns is the founder and principal investigator of SENCER, the NSF-supported national dissemination project. He is also executive director of the National Center for Science and Civic Engagement and professor of general studies at the Harrisburg University of Science and Technology. Prior to establishing the National Center, he served as senior policy director for the Association of American Colleges & Universities (AACU). During his nine years with AACU, he established the CDC-sponsored Program for Health and Higher Education and created the Sumner Symposia dedicated to exploring the power that students have to improve the health of colleges and communities. David is the principal author and editor of *Learning for Our Common Health* and, among other publications, the article, "Knowledge to Make Our Democracy."

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21   Theodore Zeldin, *An Intimate History of Humanity* (HarperCollins, 1995),