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Parts of the Whole: The Last Column: Freire's Pedagogy of Liberation

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Abstract

The educational theory of Paulo Freire is briefly summarized for instructors of quantitative reasoning, with a focus on what it means to give students “agency.” Some examples are given of how to implement his basic ideas.

Keywords

quantitative literacy, quantitative reasoning, mathematics education, Freire

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Cover Page Footnote

This will be the last column in the series “Parts of the Whole.” I wish to thank the journal for the opportunity to share my thoughts on teaching and education in general over the past 12 years. I owe a special thanks to Len Vacher for support, reflection, and editing. Teach well, friends.

Parts of the Whole

A Column by D. Wallace

The problem of how best to improve the numeracy of a society is a thorny one, addressing the learning process of a single student but rising in scale to include the management and alteration of an entire system of education. With the issue of quantitative literacy always in mind, this column will consider various aspects of the systemic workings of education: the forces acting on classrooms, teachers, and students and mechanisms of both stasis and change. With the issues of volume 9, the column has grown to include thoughts on pedagogy, in addition to continuing to explore strategies for systemic change in quantitative education.

The Last Column: Paolo Freire's Pedagogy of Liberation

Up until recently the Mathematics Department at Dartmouth offered a teaching seminar for graduate students, which I helped design and co-taught many times. Of all the readings given to our students, by far the most challenging was Freire's *Pedagogy of the Oppressed* (Freire 1972 [1968]). Freire is internationally famous for his work with adult literacy in Brazil and Chile, subsequently holding advisory positions with international organizations. His writings influenced education in the U.S. also, and he was honored by a statue in Sweden where he sits in a group of figures including Mao Zedong and Angela Davis.

For Freire, a deeply committed socialist, education was inseparable from the cultural and political situation of the learner. This insight led him to construct a literacy program in Brazil that was fast and effective, leading to the creation of "cultural circles" that would spread literacy among adults and, with it, raise their own awareness of their state of oppression. These circles lasted only a few years, until a military junta declared them unsuitable, and Freire a traitor, upon which he was exiled from Brazil.

Freire has published extensively, with *Pedagogy of the Oppressed* being perhaps his most famous work. Because of the socialist framework used to define the problem of teaching well, this book is filled with oppressors and oppressed, critical pedagogy, colonial and anti-colonial approaches, dialectics, and other strange words that made our graduate students cringe. They did not see the relevance and probably did not see themselves as capable of oppressing a student. This column considers some of Freire's basic ideas on adult literacy, translated into

words free of jargon and, I hope, made relevant to issues of teaching quantitative reasoning.

The Banking Theory of Education

Freire contrasts the approach he is introducing with the standard format of lessons at the time, which he describes as based on the “banking theory of education.” In this paradigm, the teacher imagines students as empty vaults waiting to be filled with information, as one would deposit money in a bank. To paraphrase a former colleague, “I know the information and they don’t. So, the efficient thing is to just tell it to them.” This was said in reference to teaching statistics and perfectly exemplifies the banking theory of education.

Against this attitude Freire created what he called “critical pedagogy,” an approach that would recognize that individuals learn, not as passive observers, but as engaged humans struggling with their social, economic and cultural situation. For Freire, the purpose of education was to give humans agency, and enable them to transform not only their personal situation but the world itself. Recognizing that the world doesn’t usually want to be transformed, he described teaching as a profoundly political act.

All of this was said 80 years ago, and the benefits of “active learning” are now recognized in terms of cognitive advantages to the student. And yet to me, Freire is still fresh. It is a long way from “See if you can figure out how to solve this open-ended problem” to “What problems would you like to solve?” much less, “How would you like to change the world?”

Yet much of quantitative reasoning is about exactly that question. Do you want to convince others of your opinion? Do you want to green the desert? Do you want every family to have universal basic income? Quantitative reasoning is involved in accomplishing any of these and, equally importantly, trying to foresee the likely consequences.

The Key to Adult Literacy

Of the many ideas in Freire’s writings it is difficult to choose a single “key,” but I will do so here with the admission that Freire himself might not put this idea first. For me, it is the idea of giving students agency in their own education.

Usually, if you want to get a college degree, you must fulfill a suite of requirements for your major and another collection of breadth, or general education, requirements. In each class, you must complete the homework, learn specific facts or skills, and demonstrate this knowledge on a test. All of this requires compliance on the part of students, rather than agency. There is an assumption of trust, on the part of students, that the knowledge we impart will be useful to them in the future.

Freire questions that this assumption of trust is true for adult students, and the critique he offers is stated in terms of class and colonialism. The passive education

that requires compliance is not politically and socially neutral. Rather, it reinforces the domination of one group by another. And it was failing to produce good results in adult literacy programs. He makes particular fun of phonetics, pointing out that learning to read sentences such as “Go and gather the green leaves on the grass” cannot have much intrinsic relevance to adults.

He addressed this problem by giving students agency throughout the learning process. There are four important aspects to “agency.” First of all, it is assumed that the student brings a lot of knowledge to the table in the first place. This knowledge will be in play throughout the learning process and is worthy of the instructor’s attention. In our courses, we somehow train students to expect that all the facts they need to solve a problem are stated clearly in the problem itself. Anything the student may know about such problems, that is not in the text or explicitly developed in the course, is knowledge that is better checked at the door. A student once asked me if they could use material they learned in another class to help with some problem their group was tackling, illustrating how deeply engrained is this attitude. It simplifies things for the instructor but removes agency from the learner.

The second important way to give students agency is to allow them to pose the problems that will be addressed with their new knowledge. It turns out that Freire’s adult learners were not that interested in making alliterative statements about gardening. They were interested in reading about current developments in their community and writing to authorities with various requests. Our graduate students in mathematics could appreciate very well why this might be the case, but they found it hard to translate this principle into material they were going to teach. Most students in introductory calculus courses, for example, are not there because they can immediately recognize problems of interest to them that will require calculus as a tool. We are in a better situation with quantitative reasoning, but it is still the case that we will have to work harder than Freire to help students figure out how to pose their own problems.

The third aspect of “agency” is the actual solution of the problem by students themselves. We typically use group work to accomplish this and many of us are familiar with what happens on the path to a solution, as we walk around and talk with students without giving away an “answer” that would mark the end of the learning. In my department, we routinely observe classes in progress that are taught by non-tenured faculty. I can attest to the fact that using group work in this manner does not come easily to instructors. Impatience with the process, the human desire to be helpful, the fear that students will feel like failures if they don’t get the answer in five minutes or less, all work against giving students the agency that comes with knowing they can solve the problem by themselves. If we believed, as Freire seems to believe, that learning comes with the struggle, not the answer, we would do a better job of leaving them to succeed on their own.

Fourth, Freire imagined humans in constant dialogue with history, an idea drawn from Marx. Action is the mechanism of this dialogue. When his students wrote letters to an authority, it fulfilled the final and most important meaning of “agency.” Educational institutions are starting to recognize the importance of this, offering “real world” internships and service experiences to students. But for Freire, this sort of action was inseparable from the basic literacy he was offering his adult learners. It was not something that happened separately, or after, the class was over. Freire proposed to the Brazilian government adult literacy courses lasting only 45 days, and his program was successful. This time frame is shorter than most academic quarters or semesters. And yet, the path from “What do you bring to the table” to “Use your knowledge to make a difference that matters to you” seems so impossible in that short time. Making this idea work in my class would require a close association with service learning opportunities, an association that does not currently exist. It points to the need for a systemic change in how we think about the boundaries between classroom and “internship” or “service.”

Culture Circle

Freire imagined a space in which instructor and student arrive as intellectual equals, in which dialogue among all participants leads to both problem posing and problem solving, and from which action emerges. It’s a lot of baggage to add on to something as seemingly straightforward as “group work”, which is already difficult to do well. But it is worth imagining the possible consequences of moving group work in that direction.

One obvious consequence is that we, as instructors, have to be able to guide a discussion. Those of us with quantitative backgrounds may have little experience doing this. I, for one, don’t think it is easy. If the goal of the discussion is posing a problem that is not already in the head of the instructor, it becomes even harder.

The closest approximation to this in my class is the point at which groups of students have to find their own idea for a term paper, which will be based on some biological phenomenon that they wish to model. Somehow, they always manage to do this, with only minimal intervention from me. They will want to know if their ideas seem reasonable, whether their assumptions behind the model are reasonable, whether their equations look correct, and why their code won’t run, and whether the results of the model are right. In the interest of illustrating how to treat students as intellectual equals in the process of posing and solving their own problems, I will explain how I address each of these questions.

Is this a reasonable idea for a project? In response, I ask questions. Can you find a research paper that clearly explains the system you want to model? Can you express that system in a compartment diagram so that you can use the tools from this course on it? These tools are systems of ordinary differential equations, and I

make this rule only because of time constraints. Can you find research papers with enough measurements or data that you can parameterize your model?

Are the assumptions behind our model reasonable? Can you state all the assumptions you are leaving out? What do the scientists say about them? This one doesn't seem reasonable to me, can you justify it? All models leave some things out in the end; I won't hold that against you!

Do the equations look correct? There are lots of different possible equations that could describe your system. Let's look at various scenarios. What if there are no prey? Do the lions still exist or do they die out? What do you think would actually happen? Is there other prey that's not in your model? What if there are no lions? Will the impala population grow forever or stop? What do think will happen, and why? *That* term is interesting. Why did you choose it? And so forth depending on the problem.

My code won't run. That is normal. It never runs the first time. Let me have a look. Here, I found a syntax mistake. Check for this mistake in other places, then tell me if it still doesn't run. If you get stuck on code while I'm unavailable, find the nearest engineering student because they all know how to do this. Buy them a cookie.

Do these results look right? Show me the time series for every population you are tracking. What are the units? Does it make sense that the lion population is larger than the giraffe population? Why or why not? Would it help to think in different units? Maybe kilos of giraffe consumed per lion per day, instead of giraffes consumed? What do the biologists say about the relative sizes of trophic levels? Is your model kind of doing that? Also, I see that this population crashes. Does it crash if you leave some of the other ones out? Modeling is a conversation with three participants: the model you made, the simulation it produces, and the observations people have made in the real world.

To teach this way requires the kind of trust Freire hoped to build with his culture circles. The students have to believe that I will judge them on their struggle, as expressed in the arguments they make in a paper, as opposed to whether they got some "right" answer that I know and they do not. It also helps if they believe me when I tell them, "Don't worry, I'm a member of every group so your success is mine also." And also, "You know what I really want? I want to learn something new from you." Which happens frequently.

I don't for a minute think it would be easy to have "culture circles" in quantitative reasoning courses. But I do think that some of the desired effects are worth considering. Harking back to the origins of the QL movement, we are after habits of mind. Although a teacher of adult literacy, most of Freire's writings are about the underlying habits of mind.

Who owns the knowledge?

Any situation in which some men prevent others from engaging in the process of inquiry is one of violence. The means used are not important; to alienate men from their own decision-making is to change them into objects. (Freire 1972 [1968])

I once asked a graduate student whether he felt that all the mathematics he had learned really belonged to someone else, and not to him. If I remember correctly, we were discussing Freire's book in the teaching seminar at that time. At that moment, the light bulb went on. The graduate student was suddenly able to see past all of the jargon used to describe theories of socialism, past the oppressed and the oppressor, to the gist of what made Freire relevant to his life and his classroom.

Reference

Freire, Paulo. 1972 [1968]. *Pedagogy of the Oppressed*. Trans. Myra Bergman Ramos. New York: Herder.