

The Cosmopolitan One Room School (CORS)

A Modest Proposal

By: Charlie Martin, Science and Technology Editor, PajamasMedia.com

Table of Contents

1. Introduction
2. Schools: An Abbreviated Historical Sketch
3. Traditional and Conventional Schooling
4. A Model of the One Room School
 - 4.1 Progress by Age Cohort
 - 4.2 Topic Mastery
 - 4.3 Teacher's motivation directly tied to the students
 - 4.4 Longer term teacher-student relationships
5. A Conceptual Description of a Manhattan One Room School
6. Financial Aspects of One Room Schooling
7. Curriculum
 - 7.1 Literacy
 - 7.2 Basic Business Arithmetic
 - 7.3 Geography
 - 7.4 History and Civics
 - 7.5 Languages
8. Attracting Skilled Teachers
9. The Problem of Administration
10. Conclusions

1 Introduction

This is a business proposal for a new (?) model for public schools called the *Cosmopolitan One Room School*, a revival of the idea of the one-room school house in a modern and metropolitan setting. This “modest proposal” grows from three things:

- a visit to the Adams County Historical Society museum, which includes the preserved one-room schoolhouse from Adams County at the turn of the last century;
- reading the somewhat controversial eighth-grade graduation test from the Salina Kansas School System of about that time;
- and a continuing interest in the costs and apparent ineffectiveness of modern schools.

In this proposal, we investigate what is a fairly radical restructuring of the modern school, and compare its costs with the current models.

The original idea of this exploration and proposal was to ask the question “what do public schools pay for?” by looking at a *different* school model. Twenty years ago, Steven Jay Gould was the Commencement speaker when I received my Master’s, and his speech was all about how we should pay teachers more. (No hints how: I guess that was meant as an exercise for the interested student.)

So now I’m working that exercise: with *no change in the cost per student* what could we pay a teacher if we were to go back to an older — but apparently effective — model of primary education?

2 Schools: An Abbreviated Historical Sketch

For much of history, a school has consisted of “a log with a teacher at one end and a student at the other.” Hunter-gatherer cultures teach their children in the course of day-to-day life, through stories and examples; agriculture added new demands, and a separation of roles, so children learned to make pots, or plow fields, or be tyrannical satraps, from adults who already had these skills and who found ways to pass them on. In most places, this became a system of apprenticeship: a child was placed with an adult expert who taught them. Even cultures that gave a lot of emphasis to academic learning, like the Jews, and the Chinese following Confucius, taught these academic topics in small groups with a school master (or mistress) who took responsibility for the students’ accomplishments and progress.

In the new United States, thinkers like Thomas Jefferson realized that universal suffrage (or what was then thought of as “universal”) required universal education. Primary education became mandatory, or nearly so,

but this education was still provided by an individual teacher with a few students who might remain with that one teacher for several years.

This led, especially on the frontiers, to the institution of the “one room school house”. These were purpose-built schools, reduced to the minimum: a reasonably weather tight building, student desks, books, blackboard, and a teacher to operate it. There would be an outhouse, and often a well.

The population of the US surged from about 1830 to 1930, and universal schooling in the cities became a bigger operation. The combination of pragmatic progressive education, and the beginnings of industrial engineering and assembly-line manufacturing coincided with this growth, and a new model of schools became popular: larger, with students separated out into age cohorts with more consistent curricula, and an expectation that students would move from grade-level to grade-level. Whether it was consciously modeled on Henry Ford’s assembly line or not, this was essentially an “industrial” model: students were being treated as “workpieces” that were graded and sorted as they moved from one “workstation” to the next. There were many reasons for this transformation, and the connection to an assembly line may be considered somewhat controversial; a thorough examination of this history is beyond the scope of this proposal. The point is to note that, whatever the causes, our whole model of education is radically different now from what it was in 1900.

This isn’t necessarily a bad thing: after all, we have a radically different environment from the world of 1900 as well. It’s not clear, however, that in this case the radical change in model has had the effect we might have hoped. Anecdotal stories about students who can’t locate Iraq on a map or who don’t know the basics of the US government are too common even to cite, and the reason the Salina graduation test is repeated over and over in small-town newspaper columns is that most adults look at it and think “could I pass that?”

Make no mistake: it is possible for a motivated student, with a little luck, placed in an effective school system, to get a good education in a modern public school. It appears, however, that it is easier to complete K-12 schooling while *avoiding* a good education than it ever was before.

Annoying Anecdote Number 1

There is an active “home schooling” movement in the United States. The reasons are many, and its practitioners probably have as many approaches as there are students, but one thing that shows up over and over, again anecdotally, is the number of home schooled students who then excel academically in competition with conventionally schooled students. This can’t be easily examined statistically; it may well be the result of sampling bias — for example, perhaps parents who home school are both more educated themselves and have higher IQs that they pass on to their children. But considering the relatively small number of home-schooled students, compared both to public schools and private schools, it’s very ... interesting.

3 Traditional and Conventional Schooling

Let’s start by considering some of the differences between the traditional one-room school and the modern “factory school” approach. I make no claim that this is a completely unbiased and even-handed approach, because, after all, I’m starting out by wondering whether the modern approach isn’t deeply flawed. On the other hand, I do expect this to be testable and falsifiable, so I’ll be talking about what measures and appropriate tests might be.

As the initial step in this, let’s state clearly what our *null hypothesis* would be:

A traditional (as represented by a one-room school and by the approaches taken in home schooling) approach to k-12 schooling has no better outcome over a large diverse population of students than does the current conventional method.

The point here is to see if we can distinguish these methods from conventional schooling, and if we can, does the comparison come out to the advantage of the “traditional” or “conventional” approaches?

4 A Model of the One Room School

What was a one-room school like? For obvious reasons, there is little modern research on the way teaching was done in the traditional one room school, but we’ve got many descriptions of it, from Little House on the Prairie to personal recollections I’ve collected since I became interested.

Annoying Anecdote Number Two

I lived in Germany in the early 80's. A woman in the apartment below mine had a five year old son who was just fascinated that I came from **another country**. He wanted to learn English, and so every time I saw him, I'd teach him a new word or phrase that he seemed to absorb instantly, down to my accent.

I found this simply amazing, until I realized that he didn't speak *any* language very well — he was learning German in the same way and at pretty much the same rate. I wouldn't have been astonished if one of my peers' children had been acquiring English the same way. Partly, it was amazing because I was having to put a lot of effort into learning German; I expected it to be as hard for him.

As I got to know him better, though, there was a second aspect of his attitude toward learning English: I realized there wasn't much he liked better than learning new words and new things. I've seen this in many three, four, and five year old's; by the time a child is seven or eight, however, they seem to have replaced this attitude with the attitude we expect, of not liking school and needing to be coerced to attend school.

I found myself wondering, how does this happen. Thinking back to my experiences in school, I have to wonder: is the real difference in attitude between five and eight a *product of our methods of schooling*?

With the clear caveat that this *is*, after all, the things *I* found significant, let's look at some of the differences.

4.1 Progress by Age Cohort

In the modern school, students are expected to progress more or less in synchrony with their peers. There are a number of issues with this that are handled in more or less effective ways, such as the need of finding a necessarily arbitrary date on which to make the cut-off. I saw an example of this in my own life, where since I was born slightly before September 1st I entered first grade a week after my sixth birthday — while my brother, who was born in September, entered school just before his *seventh* birthday. Children change pretty quickly in those early years, and the effect of this is that late-year students may be significantly less physically and emotionally prepared than the early-year students in their same grade. Some parents, aware of this and of the suggestions that entering school a year later may lead to greater academic achievement, are purposefully holding their children back a year.

Once a child is *in* school, the expectation is that the child will progress “at grade level”, and the courses and lesson plans all reflect this assumption. There is relatively little flexibility.

By contrast, in a one room school, *each* child is more or less on their own. Because the classroom has a mixed population, potentially across the full age range of k-8 or k-12 education, the teacher must necessarily be more flexible, directing each child individually with sensitivity to what the child has learned and is ready to learn. It would appear reasonable that this would mean the students get exposed to topics when and as they are ready for them.

In addition to this, students are exposed to the need to work independently, starting early and continuing through their education. While a teacher is concentrating on primer material for the younger students, older students are working at the desks on more advanced material. This prepares students for future education — these are study skills that will serve them well in college — and with the modern innovation of “programmed learning” texts, students can often make substantial progress on their own. At the same time, the teacher is available as a tutor for hard parts of the curriculum.

Mixing grade levels and age cohorts has another important possible advantage: in the old fashioned one room school, older students were often expected to help the younger students. As anyone who has taught knows, there’s no better way to make *sure* you master a topic than to need to teach it.

4.2 Topic Mastery

The need to keep a class “on grade level” has another necessary consequence: the time spent on a topic must necessarily be fixed more or less to the students average progress. More talented students must wait for the less talented; the less talented are often struggling to keep up; and when the topic is over, it’s over and the whole class goes on. The only mechanism that’s really defined for dealing with a student who doesn’t “get it” the first time is repeating a class, which has such a pejorative association that most schools are nearly unwilling to do it.

Again, I have personal experience with this: it happened that I found arithmetic very hard, reading and art very easy, and when the time came, I found geometry a glory and a joy, which led me into higher maths. But when I found long division a difficult process, there wasn’t really any way for the teacher to slow down and work with me: there were 19 other third-graders to get through long division by Friday, when her lesson plan said it was time to go to decimals.

Now, let's compare this, first, to an apprenticeship. When someone is learning to, say, make pots, the master potter doesn't spend a week on throwing a basic pot and then say "okay, we're going on to handles now" without looking back. It would be pointless: a master accepts an apprentice not to occupy their time for a week or a month or (traditionally) seven years, but to *teach them how to make pots*. The apprentice doesn't stop trying to throw basic pots until they can reliably throw a damn pot, at which point they move on to the next task.

In other words, the master potter's responsibility is not to teach the student for a period of time: it's to see to it that the student *masters* the subject.

Compare this to a teacher in a conventional method school: the class meets for exactly an hour every day, and there are 20 (let's say) students who are all expected to study the same topic for the same interval. At the end of that topic, the students are given grades, from A to F in most American schools. These grades show the degree of mastery: an A student has excelled, and F student has failed to master the topic.

The problem is that then, whether a student is failing or not, the class moves on as a collective. It's not possible for the less skilled students to *continue* studying the material.

A teacher and student in a one-room school have the luxury of continuing the topic until the student masters it; since the relationship is, to some extent, one of tutor and student, each student gets the opportunity to complete the mastery of a particular task before moving on.

Does this mean that every schoolmarm was able to teach every topic to every student? Probably not, for one reason or another. We can only say that it appears likely the opportunities are greater.

4.3 Teacher's motivation directly tied to the students

There is one more point at which I think the one room school has a distinct difference from our modern conventional schools. This one will probably put me on the NEA's *index expurgatorius*: in the traditional one-room school, the schoolmarm's success was directly a function of the success of her students. If the parents or the school board didn't feel the students were learning, or were learning the right things, the teacher's contract could be cancelled or not renewed, and a new teacher could be hired.

This was certainly not an unquestionable good: a teacher with any sort of unusual views or unconventional methods could be fired by a group of unreasonable parents. But it did mean that a teacher was directly and personally responsible for the results, which in general has a tendency to encourage the results desired.

Compare this to a modern conventional school: a teacher is usually both a civil servant (notoriously hard to terminate, even for cause) and – by what is in my opinion a false analogy to university teaching – often has tenure in the position. Neither the teacher’s direct rewards, nor their continued employment, is really conditioned on the success of their students.

4.4 Longer term teacher-student relationships

The fact that a student is likely to be in the one-room school for several years, and that it’s at least possible a teacher will also remain in the school for several years, means that a longer term relationship has the opportunity to develop. Having had a few teachers in high school that I had the opportunity to study with for more than one year, and a number of favorite professors in college and graduate school that I worked with for many years, I can’t help but think this is an advantage.

5 A Conceptual Description of a Manhattan One Room School

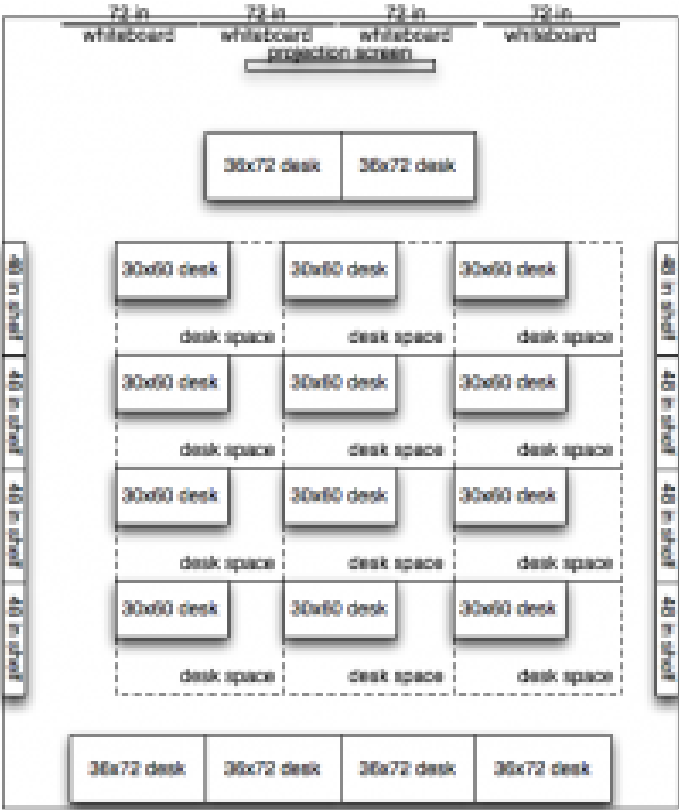
So, we have a picture of the one-room school that we propose to re-create: a small group of students, of mixed age and background, working with a single teacher for what is expected to be their full time in primary education. At the end of that primary education, they will be expected to demonstrate full competence, even mastery, of the appropriate topics in the curriculum — “reading, ‘riting, and ‘rithmetic,” with geography, civics, and some knowledge of art and music thrown in. The students and teacher will work in the same large classroom, but we will make one new assumption: the teacher will have access to new technology, from programmed instruction texts to computers to the Internet, as the teachers think is appropriate to fulfill their view of the best approach.

With that in mind, we can lay out the basics of this one room school. To make our proposal definite, and because this is a known difficult area for public schools, we’ll assume this school is going to be established in Manhattan, using both the Manhattan public school per-student budget and Manhattan commercial real estate rates.

We start with a “student workstation”, also known as a “desk”. I’m going to assume a student desk 30 inches by 60 inches for each pair of students, with 30 inches between them. This gives us a 60 by 90 inch “unit” – that is, five feet by seven and a half feet – for each pair of students. That gives us 450 square feet, and we’ll a little more than double that to account for space around the desks, including the teacher’s desk and some other things we’ll come to. So, we will but the whole school into a 30 by 35 foot room. That’s 1,050 square feet.

We add a table across the full width of the back of the room, and just to make an estimate, we'll assume we make that with the same 60 inch wide tables used for student desks. One long wall of the room will have half-height bookshelves with whiteboards and cork boards above them, the other half-height bookshelves with windows (suitable for staring out of during boring lectures). At the teacher's end of the classroom, we'll have more whiteboards and a ceiling mounted projection screen. In order to fill the screen *with* something, we'll add a ceiling mounted HD projector capable of projecting both HD television and computerized graphics.

The classroom will be equipped with 15 megabit/second cable modem as a connection to the Internet; to use it we'll add wireless Internet connectivity and wired Internet connections to the classroom computers. Because I'm a Mac bigot, all the computer hardware will be Macintosh: 13 24-inch high speed iMac computers (one per pair of students plus one for the teacher) and a Mac Xserve with 2 TB of disk as a shared server. We also assume a good quality audio system integrated with the teacher's computer or the server. (Complete financial estimates are included in the next section.)



CORS Classroom nominal layout (24 students)
 30 x 35 ft scale 1 in = 5 ft

We will also assume a \$1000 per student per school year allowance for books and materials, and to ensure that the money is spent on the students, we'll arrange that any excess is returned to the parents. The teacher's gross salary will be the excess of the total budget after paying these costs, assuming the computers, video, and audio components are replaced every three years, and the desks and chairs are replaced every five.

Here, then, is how the numbers work out.

6 Financial Aspects of One Room Schooling

First, we note that in 2006 (the most recent numbers I could find) the per-student budget in New York City schools was \$14,119. So, our total budget baseline is \$339,000 per school year. We're renting commercial, class B office space in midtown — which in itself makes this an over-estimate, the places that really need these schools are in the Bronx and Harlem, not midtown — and the average rental per square foot per year is around \$65; thus rent (with heat and lights) is about \$68,250 per year. (Since the classroom wouldn't be in use in the summer, we can probably rent it for commercial classes and the like; this would let us recoup some costs, but we won't consider that for now.)

I went to the online educational Apple Store and configured a powerful 2.8 gigahertz 24 inch iMac at the prices for the Superior Elementary School down the hill from me: \$2,583 each, or \$33,579. A really bodacious Mac Pro server, including 2 TB of disk and a hardware RAID card (don't worry about it, this is just a really good computer): \$8,148. Add an InFocus LP850 DLP video projector at \$3,250 and add \$1000 for mounting hardware and cabling. Total computer cost is \$45,977, amortized over 3 years is \$15,326 per year.

Internet connectivity is about \$600 (\$50/month).

For the moment, we'll just assume \$500 per student workstation, desk, chair, and wiring; including the back wall, that's \$9000, and we'll assume another \$1000 for the teacher's desk, file cabinets, etc.

So, annual budget looks like:

Rough Budget	
Annual per student payments for 24 students	\$339000.

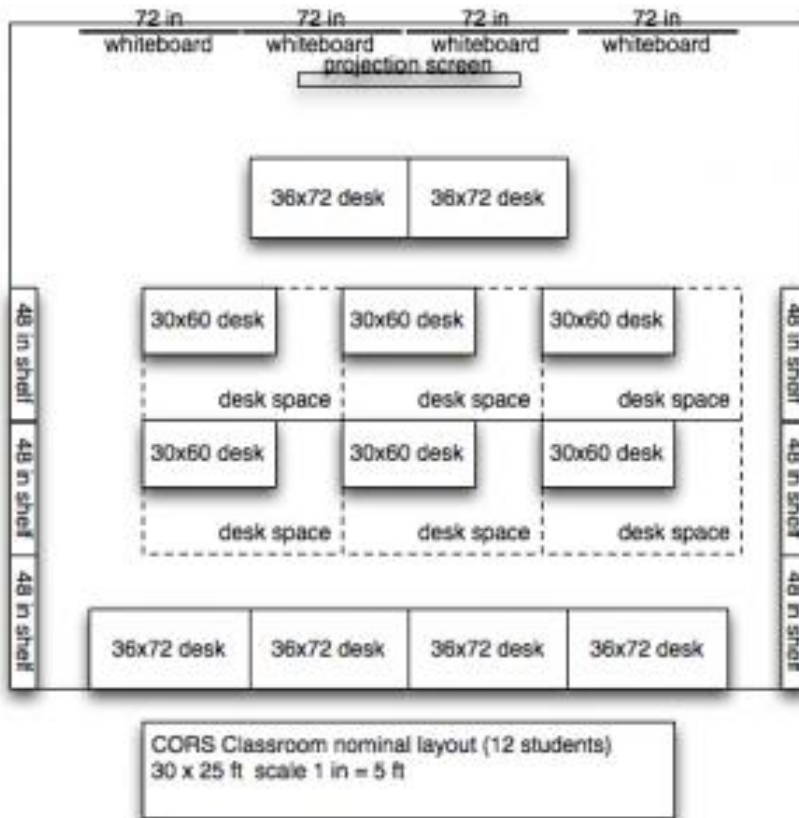
That is, with 24 students at \$14,119, we have \$339,000 in revenue for our one-room school.

Expenses as we've laid them out:

Expenses	
Rental	\$68250
Furniture	\$2000
IT hardware	\$15326
Internet	\$600
Books & mat'l @ \$1000 per student	\$24000
Total	\$110176

Now, the "rules of the game" when I started this exploration were that we'd use the excess of the budget over the costs for teacher salary. So, our imputed teacher salary for a 24 student school is:

Excess of Budget over expenses	
Revenue	\$339000
Expenses	\$110176
Annual Teacher Salary	\$228824



I'll leave it as an exercise to work these numbers for the twelve-seat school example.

7 Curriculum

Let Flowers of Many Kinds Blossom, Diverse Schools of Thought Contend! – Lu Ting-Yi

As I've discussed this with friends, a question that comes up often is “so what curriculum should a new one-room school use?” I've given it a lot of thought, and I think my answer is “a good one.”

There are a number of excellent choices around, from Steiner Waldorf to the International Baccalaureate to the K12 curriculum. I looked at them, and they all sound good. If I were picking a school for my own kids — if I had any kids — I'd be really intrigued by a curriculum taught bilingually by a native speaker of the *other* language, or even a Classics curriculum that included Latin, Greek, Chinese and Sanskrit (hey, this is *my* fantasy.) But then I was a bit of a child prodigy, which translates in adulthood into being a bit of an eccentric polymath.

Recently, a friend of mine pointed out the Montessori method — he went to Montessori schools grades K-8. This looks to me to be very much like what I'd think was a good basis for a primary curriculum.

A really “innovative” or “advanced” curriculum, however, doesn’t strike me as being the real issue. The schools we have now are not comparing to what was done not that many years ago: before we try something more ambitious, simply ensuring that kids get what we would have thought of as an eighth-grade or high school education in 1925 would be a dramatic improvement.

With that in mind — all of it really coming down to saying “I don’t know what a really good choice would be” — here are a few things I think would be worthwhile tests of whether or not a teacher was accomplishing what a teacher is supposed to accomplish, which is to say, student mastery of the basic facts and skills they will need to get by in life.

Some of these, like the section on History and Civics, are just laundry lists of examples that I think are good examples.

7.1 Literacy

If there is *anything* a school is supposed to teach, it’s the ability to read and write. I can tell you, having taught students at prestigious private universities, large state universities, and community colleges, it isn’t happening. Oh, students at Duke can certainly read, but many students (especially engineering students) seem to think that the whole notion is beneath them.

Look, Hemingway wrote at about a Flesch grade level of fifth grade. The Wall Street Journal is supposed to be about eighth grade. I don’t think it unreasonable that a student be able to read *The Old Man and the Sea* and explain basically what happens in it.

Students should be capable of writing: a clear sentence with subject, verb, and agreement between them; a clear paragraph, with topic sentence; a short, reasonably concise essay; and a clear letter of complaint that lays out an issue, explains the problem, and makes a reasonable demand for a resolution without using any words you wouldn’t hear on broadcast television.

7.2 Basic Business Arithmetic

Same thing: have you watched a teenager in, say, a McDonald’s trying to make change? There’s a simple algorithm we all learned, at least in the early sixties when I was in grade school — “Eleven twenty three? Twenty three, -four, -five, fifty, seventy-five, twelve, thirteen, fourteen, fifteen, twenty. Here’s change from your twenty, sir.” A high school graduate should be able to, on demand,

- make change on a purchase using this algorithm without needing the cash register's help;
- demonstrate that they can add, subtract, multiply, and divide reasonably large numbers. (Honestly, I'm a little dyscalculic myself, so I'd even say we could slack this off enough to say if you can demonstrate the process successfully and get a lot of examples right, that's enough. On the other hand, I'm suspicious that if people had known about it when I was nine, I might have never had as much trouble as I did. Remember, the measure here is *mastery*; if a student needs extra time to get it, who cares?);
- figure some basic retail clerk problems — how many miles per gallon, how much a 10 percent discount is, and so on;
- do basic fractions, like “what's a twentieth of one hundred” and “what is a third of a half?”

7.3 Geography

Not “social studies”, geography. What is a continent, where are they? Point to and identify places named in recent news stories, like Iraq, Iran, and Venezuela. Where are the Nile, the Amazon, the Mississippi, and the Yangzi? What's a time zone? What's Greenwich Mean Time and how can you use it to figure out what time it is somewhere.

7.4 History and Civics

What was “The Glory that is Rome”? Did anything interesting happen there? How about Byzantium? China? Egypt? Were there any *other* interesting cultures in Africa? Who were Jesus, Laozi, Confucius, Mohammad, Gautama, the “Sun King”, Winston Churchill, and FDR?

What is the Declaration of Independence? Who wrote it? Why? How about the Constitution? Are “life, liberty, and property” Constitutional rights? How about freedom of assembly, the right to bear arms, and the right for women to vote? Have these rights changed? (Extra credit, because I'm one of those “natural rights” guys: did the Nineteenth Amendment recognize a right, or create one?)

7.5 Languages

This one is a little off the wall, and maybe too much to add to a *basic* curriculum, but I think American students should be able to get by conversationally in at least one other language. Kids who speak Spanish at home should be pretty fluent in English, and kids in places like My Old Home Town should be able to hold

a basic conversation in Spanish, and kids in Maine should be able to get by in French. Wouldn't hurt to have at least "a little Latin and less Greek" and I'd love to see kids exposed to Chinese and Sanskrit.

8 Attracting Skilled Teachers

Of course, when you look at this curriculum list, you have to wonder "who is going to teach this stuff?" This is likely to be at least a little bit of an issue, since we're starting from a population of potential teachers who haven't been educated very well either.

On the other hand, go back and look at the potential salaries we could offer in a CORS school *without increasing the budgets*: offer Harvard grads \$200,000 out of school and they'll be lining up to take the jobs. That's better than a new Harvard Law grad can expect.

I don't know if we could find enough teachers to change over to this plan nationally, or even for all the students in New York City. But I bet we'd have plenty of resumes to consider.

9 The Problem of Administration

In all of this budgeting, though, I haven't included any costs for administration. Of course a real one room school didn't really *have* much in the way of administration. The teacher got paid, the Board of Education in the town paid for the building, books, and materials — and families in the area contributed, or boarded the schoolmarm, or gave the school books for the library — and that pretty well completed the administration of the school.

This isn't the way it is today. I've *heard* that the New York City Public Schools have as many non-teaching employees as teachers. I tried to confirm this, and at least with the resources I could reach from Google, I have found it difficult to get an answer. Surprisingly difficult: the NYC Department of Education site certainly didn't lead me to any consolidated balance sheet or income statement.

10 Conclusions

So what's the point of all this?

One point is the really overt one: I think this could actually work, and it ought to be tried. Set up a one-room school like I describe, make it a "charter school" perhaps, and go ahead and pay teachers a fifth of a million per year, conditional on their students' parents' continued approval of the students progress. No

tenure, one year contracts with an option to renew. Populate the experimental schools with kids randomly chosen from the incoming students to the public school system, and see what happens. I'm willing to bet that there would be an embarrassing difference in the results.

There are a lot of practical issues, however, not the least of them being the educational system's bureaucratic immune system. Could we *hire* a Harvard grad who hadn't had the required number of "education" credits? If not, could we manage to provide some kind of apprenticeship for these Harvard grads to give them the needed credits through working with a successful teacher? (Or could we find an old-fashioned teacher who could be our experimental schoolmarm for four times the common salary?)

This is really meant as a "modest proposal": the real question, as a very close friend said when I described this to her, is "where the *bleep* is the money going?"

Wouldn't it be nice if *someone* were to seriously answer?

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Charlie Martin, Science and Technology Editor, PajamasMedia.com