

Some Causes of Deterioration in Education

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(Every new president vows to take good care of education. Taking “Good Care of Education” generally means emphasis on the Elementary to High School education and a promise to make it easier to get the College Education. While setting standards of performance for High School graduates, our educationists and our politicians often forget to look into the agencies that produce teachers; the teachers whose charges have the most abysmal performance in the world. I wrote a part of the following piece, a long time ago, under the title of “Some mothers do have them”. I hope it does indicate that, at least at some small colleges, all is not well. I have also pointed out some other problem areas. My suggested “solutions” may be a bit naïve but I hope they might start a dialogue.)

You must have noticed that on the web sites of certain departments some faculty members indicate where they got their doctorates from and some do not. Usually, those who do are the ones who got their doctorates from top-notch universities. Now the question is, is it really a matter of pride to have gotten your Ph D from a big school? Well in a way it is, if you have proved yourself worthy of the degree. That is, if you establish yourself at a comparable school and/or produce something extraordinary, you can proudly say that you got good education.

If on the other hand you got your Ph D from a big school, published a paper or two from your thesis in a good journal and then you went to seed and came up with some truly insignificant work, then you should think twice before bragging. This is especially a good piece of advice for those geniuses that end up teaching at a small school, after a while. Usually this happens when their first employer denies them tenure because they could not meet the expectations. This very often means that the guy is neither a good researcher nor is he a good teacher. **Only a very stupid university would let go of a good teacher (prejudiced comes under stupid).**

Often smaller universities are on the lookout for graduates from top-notch universities, because they at least have the “qualifications” (good for accreditation!) and it is always a hope that they might bring some funds, through their contacts if not through their research. At least they could land an associate editorship with a journal of some repute. Now these guys, if

they could not do research then, they cannot do research now and their papers that had appeared in top journals (often thanks to an unhealthy buddy system called intellectual nepotism) do not quite cut it, and they stagnate. But hey, they are otherwise clever and of course they have got to live. So they adopt a system. The system is something like this: (1) I cannot do research alone, so there must be someone to do research with. (2) We must teach courses comparable to standard courses. (3) We must produce PhD's and of course the most qualified people should teach graduate level courses.

The result is that more of the same type cluster in a place and the people who hired them fade into the background teaching courses the most qualified guys would not want to touch. These guys are left alone to perpetuate what they did for their doctorates. But the trouble is that they do not even know what they think they are most qualified to teach, for if they knew, they would be doing research in it. So they produce a couple of dud PhD's, or DA's, if they can, and then go for administrative positions; if they are sufficiently articulate and have the sense of when to wear what kind of tie.

Now you may ask if they are not good teachers how do they get past teaching evaluations. One nice approach: the students are not good enough. (All the good students are supposed to go to top universities.) So if the student evaluations of a "highly qualified person" do not turn out to be satisfactory it is the students' fault and someone should do something about it.

One sign of such a situation is that the school/department under the clutches of most qualified guys would not use independent handling of teaching evaluations. So the result is, everyone in the school knows that so and so is a terrible teacher but that so and so keeps on getting promotions. Of course there have been examples of extremely good researchers who had trouble explaining things but such people soon get recognized and get whisked away to organizations that can benefit from their services. That is, if they are in an applied field.

Another sign of course is that the departments under this kind of influence are terribly imbalanced. As I know more about what happens at such Mathematics departments I will take my example from there. A lot of such departments look like departments of Mathematical Analysis, or like department of Differential Geometry etc. The unimportant things such as Combinatorics, and other forms of harder applied Mathematics are often left to the adjuncts.

Such departments often lack even a good Statistician. The reason is apparent, there is a bigger demand for good Statisticians and small schools do not have a lot of money. Now people can stay for less money if there is respect, but if you expect respect from most qualified people you just are too naïve. Besides who needs Statisticians anyway? Long live the system! The students are there to take the blame for the incompetence of their teachers.

Yet another sign, of a Mathematics department in the clutches of the most qualified, is the antagonism between the Mathematics Department and the departments that rely on the services of the Mathematics Department. The Engineers and the Physicists, being the heavy users of Mathematics, very often have a pretty good idea of the kind of courses their students should have, but the most qualified folks do not understand that. They have their set ideas and huge egos. The result is that a lot of Mathematics courses for Engineers and Physicists have prerequisites that are not in the plan of Physics Department or of the College of Engineering and Technology. I have seen students being shuttle-cocked from one department to the other department before the start of such courses. But again, long live the system! Only the students suffer and who cares about the students. If they were any good they would have gone to better schools. Indeed, there could be some “highly qualified” people in other departments too.

Another sign of the presence of highly qualified persons at a Mathematics Department is that the courses look very standard; the choice of books is impeccable but for every next course the students do not seem to be prepared. Now the business must go on, so watered down courses are taught. But when it comes to the really advanced courses it turns out to be the students’ fault that they do not seem to know anything. Let me take an example. A gentleman who teaches Analysis chooses a very standard book because this book is being taught at a top-notch university. Now this book presumes a thorough knowledge of sequences and series, which are seldom covered properly in the calculus sequence because of the time constraints and because of the “student unprepared-ness”. Then the learned teacher tells the students that Analysis is a very difficult subject, so try to concentrate on the statements of definitions and theorems, you would understand their meanings in the next course and for the next course there would be a new book and a new teacher. The new book, which is, again, a very standard book, talks about continuity in the most advanced fashion (topology way) and at that time the learned teacher thinks of giving his students practice in

the epsilon delta definition of continuity. (According to the usual course plans the students should have had an idea of the epsilon delta definition from ordinary Calculus. They could be given the practice of using epsilon delta definition of continuity in the first Analysis course, and the topological connection could be explained at the start of the second course.) Again the students fail to capture the topic and prove the well-articulated “fact” that they are not good enough.

One method of finding out whether a school has such an infected department of Mathematics is to see the grades given to students, and compare them with the stories of student incompetence. People who do not do a good job at teaching know it and often give lavish grades to cover their behinds. Yet, at the same time they keep telling the stories of student incompetence, which are often true because that is their own doing. The students on the other hand, quite oblivious of what is good for them, find ways of “excelling” without having to work too much.

Of course I have a chip on my shoulder, the size of the state of Texas, about some inefficient guys with doctorates from top notch universities, but that is not, entirely, why I am writing this. My reason for writing this stems from the fact that their example corrupts the system. Of course they are not the only ones who corrupt the system. The fact that colleges are run like businesses could also corrupt. Allowing in students with weaker backgrounds, very low SAT scores, and insisting on teaching them with the crowd can also lower the standards.

Finding out ways of weeding out the low performers can create a lot of problems. I once had to flunk a student, in basic math, who was about to graduate. My question: was that Math course necessary for the degree which he had almost earned with quite good grades? A department chairman once explained to me the merits of a book by saying that he was worried that too many students were passing in a certain Statistics course, so he opted for a particular book which was written in a style that was hard to understand. He probably was under pressure from the departments who had recruited indiscriminately and now wanted to use the Mathematics Department to do their dirty job.

The publishers add to the confusion by pushing substandard textbooks, which are often full of errors. In their effort to maximize their profits, they ignore the very important steps of adequate refereeing. The usual procedure

seems to be: Send a fat manuscript to a very busy professor, with the offer of a couple of hundred dollars and with the request for a report within a few weeks. The professor, who is very busy, looks up the book at a few places and writes the review, which is usually positive, in addition to pointing out some errors that the professor noted and presto the book is ready to go to the printer, modulo the changes the professor mentioned. Once the book is in print, a strong team of representatives and advertisers touts the book to various schools. The pricing is such that in a year or so the publisher makes a profit. If it turns out that the book is a dog the publisher has made a profit and there are many more manuscripts to publish, too bad if some students got confused.

Now to this point I have only mentioned problems and offered no solutions. To look for ultimate solutions, even a team of experts may need some time. I would only point to some methods that might curb some of the tendencies.

I think the graduates from top universities should be given preference in the beginning. But if they do not show sufficient promise in their early years as teachers and researchers they should not be given preference over their colleagues whose only weak point is their doctorates from lesser schools. One way of doing that is making a rule that if a professor has not published for three years in some journal of repute, his teaching load will be increased. I have seen it used in some schools to good effect. The other solution to the professor problem is completely independent handling of the teaching evaluations. Making a standardized test, such as GRE, compulsory for every graduating student could do wonders for the students' responsible behavior.

It may be extremely hard to stop our colleges from being run as businesses, in this day and age. The best we can do is to use some tricks to stop them from filling our streets with failures. For instance we can make sure that they do not recruit high school dropouts and low performers to courses that need better background. Allowing slow performing and/or self supporting students to take longer to graduate might also help.

The publisher problem is really hard, because there is big money involved and the publishers may get help at most unlikely places, thanks to limited scope of voicing concern. I recently reviewed a book that was written by someone who had not only problems with English but also serious problems with the subject matter, and apparently the book was not refereed or was refereed by someone who did not care. I wrote a longish review pointing out

a lot of errors. I wrote such a review to make sure that the buyer knew what the problems were with the book. But my review was curtailed by an editor on the grounds that it was too long. The book is, probably, still being touted as the best thing that happened to the academic world.

My solution for the publisher problem is that the publisher should be made to indicate the names of people who were involved in the refereeing process. If that means paying more, or maybe allocating a share in the royalties, to the referees, and allocating more time for the refereeing job then so be it.

To end it all, teaching and learning is a sublime activity and demands complete honesty on the part of the teacher and the taught. If we cannot bring back honesty we will have to bring in methods that curb abuse. Finally I would like to note that Mathematics is the backbone of the industrial civilization. Let us not use it as a tool for spreading fear and discontent among our future generations.