

## Changing Management and Managing Change (at the ETH!)

***A successful reform agenda starts with a serious look at how we evaluate excellence in research and teaching. Which data can we get? How much data do we need? To what precision can we measure? These are familiar questions to scientists and engineers.***

Peter Chen, President of the ETH Zurich Research Commission

I am the father of two school-aged children, and they will assure you that, of the many things their father seeks to teach them, one of the most often repeated is that they must learn to distinguish between that which is primary, and that which is secondary. In the debate over the present "leadership crisis," as well as the future of reform at the ETH, I would argue for starting with a principled dialog aimed at making just that same distinction between primary and secondary before we sketch out the shape of any new program.

The ETH, with over CHF 1 Mrd annual budget, and 18,000 coworkers and students, needs to be managed. This has always been true, but with the increasing globalization of both education and business, demands from society, and from politics, for a modern, efficient management have grown. The shape and style of the management, however, can become controversial, as we have seen from the recent faculty ouster of the ETH President, Ernst Hafen. With this ouster, fans of rankings can celebrate the ETH's entry into an exclusive club of elite universities worldwide. Harvard's President Lawrence Summers resigned Feb. 15, 2006, after faculty unrest ostensibly beginning over impolitic comments on women in science, but actually drawing momentum from faculty dissatisfaction with his leadership style.<sup>1</sup> A similar faculty revolt is brewing at Oxford. A Proposal by Vice-Chancellor John Hood to replace the university council with separate academic and financial boards, the latter having a majority from outside the university,<sup>2</sup> has been massively rejected in a faculty vote on Nov. 28, 2006.

Part of the tension at the ETH undoubtedly arises from the implementation within an academic institution of management theories emphasizing quantitative metrics. The controversial injection of professional management, be it in the form of ETH2020 or the independent financial board at Oxford, bespeaks the assumption that management by non-professors is not only possible, but, in fact, desirable, given demonstrable successes that quantitative management has produced in the private sector.

The oft-repeated maxim, "You can only manage what you can measure," has been attributed variously to either W. Edward Deming or Peter Drucker, both pioneers in modern management theory. The truism manifests itself in the academic world as an emphasis on university rankings from Shanghai, the ISI impact factors, Nobel Prizes, or other similar indices, but the discussions about these metrics only occur at all because of the tacit assumption that these metrics matter, that they are important for the setting of priorities or the distribution of resources. These latter activities are central to the management of any academic institution. What happens, though, when management based on measured data becomes management based on data that can be measured? One would think that ETH professors would be the biggest fans of quantitative metrics. We are, after all, scientists and engineers, and not shabby ones at that! Why else does McKinsey recruit so many of our science or engineering Ph.D. students for management consulting? Quantitative data are part of our daily lives.

Moreover, shouldn't professors, who complain loudly about the rising administrative workload, welcome a lean, professional management that lets them concentrate on their core

<sup>1</sup> D. Kennedy, "Summers and Harvard," *Science*, **2006**, *311*, 1345.

<sup>2</sup> "Mendicant Scholars," *The Economist*, online publication, 9 November 2006; "Oxford Dons defeat controversial plan," *Daily Telegraph*, Nov. 30, 2006.

business? Obviously, there is a piece missing from this puzzle. It is, however, disingenuous to frame the debate in terms of conservative professors resisting change versus crusading reformers looking towards the future. To frame the debate in such terms is not only factually inaccurate, it is intellectually dishonest demagoguery. Much more needed is a discussion of the fundamentals, the assumptions underlying the proposals, before we embark on another round of new programs with catchy acronyms.

I venture to state that there is no dispute at the ETH that performance should be rewarded and sloth punished. The professors make it their business to evaluate performance. We call it grading. One may disagree with the particular evaluation, but the principle that an evaluation must be made stands without argument.

What is then the problem? Returning to the wisdom I try to impart to my children, we need to focus on the issues of primary importance. The core business of the ETH is teaching and research. The “product” of scholarly activity is primarily knowledge, in the abstract, or the educated student, if one considers that knowledge does not come divorced from its vessel. If we speak of quantifiable metrics and milestones, can I write a “business plan” for a research project wherein it states that, by six months, I will have been brilliant twice, and that by one year, I will have had one more stroke of genius? Can I be creative on schedule, say, on Tuesdays at 14:00? How do we measure creativity?<sup>3</sup> How do we quantify inspiration?

With regard to more concrete manifestations of research productivity, one concedes that commercial applications, patents and licenses, prototypes, third-party funds, or even publications, are all legitimate secondary indicators, somehow related to the generated knowledge, but they are not direct measures of the knowledge or its intrinsic value. Similarly, my late colleague, Vlado Prelog (Nobel Prize 1975) told me in 1995, shortly after my arrival in Zürich, “Education is not about filling empty pots. It is about lighting a fire. We are, however, very good at filling pots!”

We want to evaluate teaching, and we typically measure how many pots we have filled. How do we measure the passion for science that we instill in students? Teaching and research take place in the context of personal relationships, and it is notoriously hard to measure passion or a shared commitment in a relationship. Reducing passion and commitment to rankings and impact factors is like reducing a marriage to net added economic value and divorce rates. One can scurrilously imagine all kinds of secondary indicators for passion in a marriage, and blind application of measures aimed at boosting such a scurrilous quantitative metric can produce perverse results inimical to a healthy relationship. We must consider that a concentration on secondary indicators in the academic world can also lead to perversions.

To take one illustrative case, a colleague of mine at a public university in the United States reported to me that the teaching load was made dependent on a numerical metric which classified the professors as “research-active” or “research-inactive,” based largely on the impact factors of published, peer-reviewed papers. To maximize cumulative impact factors, some faculty started cross-listing each other on papers as authors. The practice, unethical by any more-than-cursory examination, was countered by normalizing the impact factor according to the number of principal authors. The net result was that all genuinely collaborative, interdisciplinary research was penalized, and hence, strongly discouraged.

The artificial and inappropriate incentive system is a direct result of making policy decisions on the basis of a secondary indicator. There are many other examples. Nevertheless, I do not want to be misunderstood. Commercial applications of research are important, especially given that we are largely state-funded. Patents and licenses, prototypes, third-party funds, and publications are all good things, but they are clearly secondary indicators. Even in teaching, it is good to count how many pots we fill. We have the mandate as a public institution to educate large numbers of students, and resources need to be allocated commensurate to the task

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<sup>3</sup> G. Schatz, *FEBS Letters*, **2003**, 553, 1.

In response to the above-mentioned maxim, “You can only manage what you can measure,” I would throw out for everyone’s consideration a quotation attributed to one of our more illustrious alumni and a former colleague, Albert Einstein. He said, “Not everything that can be counted counts, and not everything that counts can be counted.” I would note that W. Edward Deming listed, as number five out of the “seven deadly diseases” of management, “Use of visible figures only for management, with little or no consideration of figures that are unknown or unknowable.”<sup>4</sup> I believe that a great deal of the unease percolating through the ETH community in the recent past comes from the gut feeling that we are being pushed to conform to standards that neither capture nor reward our primary activity, at least to a great part.

Returning to the exclusive club in which we share with Harvard and Oxford similar leadership crises, perhaps it should be worth noting that the exclusive membership does not mean that controversial management methods have been implemented only at these high-profile institutions. I would rather believe that the faculties of these august institutions possess sufficient self-consciousness, sufficient self-confidence, and sufficient muscle to force departure of an unwanted administration when the administration doesn’t listen to the best advice of a constituency which also has the best interests of the institution at heart. The elite institutions aspire to the highest quality in their core mission of teaching and research. I believe that these institutions will also look good by any fair evaluation of secondary indicators, but evaluation only by secondary indicators may obscure rather than identify excellence. Accordingly, I would plead that the reform process at the ETH should begin with a principled study of how we evaluate ourselves. I do not accept the model implicit in ETH2020. I would venture to predict that the evaluation procedures will differ from department to department; there will be no “one-size-fits-all” solution for the ETH. This is no cause for concern; it simply recognizes that different fields have different cultures, and that these cultures are different for non-trivial reasons. It also likely reflects the different developmental stages in which the departments find themselves.

More important than the specific list of metrics, or any particular procedure by which “softer” (but no less legitimate) measures are counted, is the mutual agreement of each Department and the Managing Board of the ETH on a verifiable set of goals for each budget period. In the last five years, each Department became formally autonomous, even if this autonomy is neither exercised nor respected in a consistent fashion in the ETH Zürich today. Even in this short time, autonomy has become precious to us. Departmental autonomy means that the budgeting and the evaluation is supposed to be done at one and the same administrative level. It means that a budget is granted for a package of services and goals, formalized in a negotiated agreement. An administrative unit which repeatedly and consistently misses targets to which it had agreed could and should lose its autonomy. An administrative unit which sets targets too low does not deserve autonomy. The prized autonomy of the faculty is the reward for performance. Each Department knows its peer organizations, and we consciously or unconsciously evaluate ourselves against our peers every day. This is part of our business. Should we not orient ourselves to the best of the best? In each Department, we know who they are.

The ETH has built its reputation over more than a century. There are many things we have done right. We need to proceed with the self-consciousness that we have earned a high position, the self-confidence that we can effect change ourselves to grow further, and the muscle to make it happen.

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<sup>4</sup> W. E. Deming, *Out of Crisis*, pp. 97-98.