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On computable numbers

Recently, a Master student – obviously in his obligations as the head of an organizing committee – mentioned to the senior author of this paper that, in spite of his low publication performance as a director of the Collegium Helveticum, the organizing committee acknowledged a still acceptable h-index and hence expressed the wish to invite him for a lecture.

What had been meant as a compliment sounded at the end rather different. The semantics had been chosen in a strongly “scientific manner”, by invoking quantification (h-index) and publications encompassing “articles in Science”, but it came out somehow annoying. What he should have said, and very probably intended to say, was: “When you took over the new job, your contributions to Chemistry dropped remarkably; still, obviously, some people are interested in your old stuff. That’s interesting, we want to hear something about that.”

Why did he choose this emotionally distant wording? Because it sounded more objective? Because he wanted to be taken seriously as a scientist? Because he was nervous about a steep hierarchy to be expected?

Teaching should be encouraging

Especially the latter is much of a problem from the perspective of a student. Hierarchies are normal and common, simply because of the asymmetries in knowledge and understanding. The “art of teaching” is to handle them in a proper way. If “the egos are sitting in the ranks, and waiting for failures” (quoting a visiting post-doc’s view) all frankness and originality is taken away from the young scientists, as e.g. the courage to ask questions without having them labeled “excellent question, thank you”. They will be streamlining their lectures, preparing sophisticated PowerPoint presentations weeks in advance and hiding some of the most exciting results in their drawers for surprise, instead of discussing them immediately. Of course, good teachers know all about that. So what went wrong that makes the unpleasant cases?

Towards quantification

We think that “massification”, and in its consequence “quantification”, are the causes. Social control seems to work in small groups only and it comes in different flavors (see above). As soon as the lab meetings, the audience in the lectures, or the keynote speeches at a conference exceed a certain amount, numeric measures are often used for assessment. In a competitive environment, e.g. too many PhD students in a research group, the fight for attention ends up in counting the number of experiments rather than the sophistication of a single one, the number of manuscripts submitted instead of the clear thoughts in a single one, the number of credits per time instead of attending a lecture in a far distant field of interest for pure intellectual challenge.

Time and space have to be given to the young researchers. They should be allowed to follow their fascination, without loosing their focus. They should be able to broaden their knowledge, without becoming superficial. Both become impossible when framing research projects into small fragments and trying to publish all of them, without always and repeatedly rethinking the concept of the whole.

Figure 1: The “public life of scientific facts” (certainly not complete) seems to be a rather chaotic. Economic drivers interfere for the good or the bad at nearly every spot.
Economic behavior
As long as institutes or departments will ritualize their individual achievements, e.g. by demanding “x manuscripts accepted” for a PhD, “y papers published” for a habilitation, and “z first-author positions” in these papers, simple economics will come into play and the “Salamis”-strategy will apply: if we need more papers, then we write more papers, hence we will have more journals, that will publish more papers, which will create higher numbers of publications for the individual, whose number of “first” or “last” author positions will increase simply by statistics, and who will eventually as a senior scientist demand more papers from others, which will … and so on.

A university is not an enterprise
Publishers parallel the tendencies by creating more and more journals. The most prestigious ones – by whatever perspective – specialize in a dozen sub-journals, cleverly marketing their “brand” along both ways: attention in the scientific community and market value for the commercial customers. Markets do not come without competition. The journal market, being especially tough is – matter of common knowledge – prone to error, manipulation and fraud. Occasionally it brings forth strange blossoms which could serve as case studies for undergraduate economics: A journal grants bonuses of USD 100 to authors the paper of which gets 20 citations within a year. This hamster wheel has to be stopped. Nobody knows exactly how to do that for the moment, but we need to establish an ongoing discussion about the ideals of higher education and the means to handle them. In contrast to an enterprise, a university can never be run “by numbers” and a university will never “make money”. Too much quantification will on the contrary repel the creative minds, the real talents that we are seeking for.

What sounds very “Schöngeist” is in fact Hollywood’s dream of education. Movies like “A Beautiful Mind” or “The Dead Poets Society” are in praise for fostering the development of individuals to its optimum by intellectual challenge. What their plots have in common is a charismatic and capable mentor who accompanies the students. That is what our students deserve and hopefully expect. That, by the way, is also in terms of economics the best choice a university can make.