

Some Funny Things that Happened at Work

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In the last two months, I have been involved in a strange incident and its aftermath in my job as a Professor in the Informatics department of our Faculty of Technology.

A student complained of failing an exam. He wanted to retake it, which is his right. At the same time, he proceeded with a complaint about my grading to the faculty Examination Committee, which is also his right.

The exam was on my basic introductory lectures on networks. The student's paper clearly showed, to anybody with whom I have discussed the answer in detail, that the student was not aware of basics in any of the three questions (out of three) he attempted to answer.

I had previously discussed the answer to and grading of Question 1 with the Dean of Studies (DoS), to whom the student had complained. I asked the DoS via email exactly what the complaint concerned. He replied that it concerned the grading of Questions 2 and 3. I prepared written material for the Examination Committee meeting, which compared each of the student's answers to Questions 2 and 3 with those of two other students who had also failed the exam, but who had achieved the next higher grade on the question than the complainant, and outlined in yellow the information in the answer, beyond that supplied by the complainant, which had led to the higher grade.

The situation with the written exam for this course had been unusual. I had the usual number of 12-15 people turn up regularly for the lectures, and was expecting the usual increase of about a third more for the exam, so I was expecting up to 20 people. I had 39 turn up. So, of the people taking the exam, only about a third had regularly attended the lectures. And two exam questions of the three were based on material which was discussed in the lectures but not necessarily in the written on-line material for the course (which covers the standard technical material, and not new developments). You can imagine that quite a few exam-takers had problems with the exam. And so it was.

You can also imagine, Dear Reader, that it took me four or five times as long as normal to review the exams and devise a grading scheme. (I have described elsewhere in detail how I did this.)

The fact that such a situation can arise is an artifact of the organisational structure of the university. There is almost no enforced connection over any of the four activities of signing up for a course, attending the lectures, doing the homework exercises, and taking the final exam.

An aside over this lack of connection. This has historical roots in the traditional German "Diplom" course of studies, which gave students enormous freedom over what they studied, how long it took them and when they wanted to be examined. This system benefitted those students lucky enough to get gripped by a certain class of research problems, but it did much less well at giving those who wanted to be allround informaticians the well-rounded skill set which one would have upon graduating from a top U.S. or British university. And comparing the rather small number of professorial positions eventually available to the comparatively larger number of informatics students, one can see that this second, allrounder, group must be in the majority. Also, the usual age for graduating with a Diplom, one's first degree, was 26 or 27, an age at which many capable informaticians in British or U.S. universities could have expected their Ph.D., or to be well on the way to it. It is hard to see how the individual, or German society as a whole, can have benefitted by keeping capable people out of productive work in the wider economy for so long. But this is all a

different topic. Nevertheless, we are only a couple of years into the new regime and vestiges of the old are ever present, as here.

On the one hand, the students value this “freedom”; on the other hand, it makes for administrative chaos and makes it correspondingly difficult to orient a non-compulsory introductory course towards those seriously interested in mastering the material. We could reasonably conclude from the results, for example, that well less than half of the exam-takers had been seriously interested in mastering the material: most of those who had regularly attended the lectures passed the exam easily, and those of the attendees who did not had failed because they had not adequately expressed what they knew (as was clear from the oral retests which I gave; in oral tests, a skilled and empathetic examiner can often elicit the required information by rephrasing and prompting). This phenomenon, that those who attended the lectures generally did very much better on the exam, will surprise no teachers. But the faculty student body (the “Fachschaft”) apparently finds it hard to come to terms with.

I have really no idea why this chaos happened this time around in my networks course. It hadn't happened before. I have attempted to discuss it with representatives of the faculty student body (Fachschaft). The discussions were not helpful – the Fachschaft denigrates my teaching, as below.

One or two students did point to the extensive on-line support material for the course and suggested they were they were thereby encouraged to “try” the course without necessarily attending the lectures. There is indeed extensive on-line material for the course, including two sets of slides and accompanying written material, and exercises, consisting of 8 sets of questions, a set of which has to be handed in every two weeks during the course. This material can give the illusion that the course can be followed as self-study. Indeed, I would be prepared so to offer it, if I could somehow control for the suitability of the participants beforehand. But this is an introductory course, so preselection for suitability somehow defeats the purpose.

By the way, homework on course exercises is hard to enforce. Our university law – and how this all works is a matter of German administrative law - apparently prevents anyone from devising any criterion for satisfactory completion of exercises. A student may get credit only for “participation” in an exercise course, not for any specific level of achievement. It suffices to establish “participation” that some answers to some exercises are handed in, and the answers don't need to have substance to them. We are informed by the university legal department that it suffices to hand in a blank sheet of paper with your name on it! There is now apparently a way around this, which our DoS has recently worked out with the university legal department. However, in this particular course, everybody handed in all the exercises, even though it is plain that not everybody had intellectual command of the material which they were handing in (some people simply wrote up answers given to them by others). Many people were, for example, unable to make use of material from the exercises in their answers to the written exam.

One of my suppositions is that there is too much on-line material backing up the course. I have been teaching this course, in various guises, for well over a decade, and a lot of material has accumulated. If you can read some German, take a look at our lectures support page, <http://www.rvs.uni-bielefeld.de/lectures/> under “Computernetzwerke, Verteilte Systeme, Digitale Kommunikation” and the first four links directly underneath (the links following are to the course announcements for specific semesters in the past). There is a lot of stuff there, in fact far too much for one lecture course.

This material is the result of hard work by many people and continuous development of the course. Consider, for example, the introduction to TCP/IP by Heiko Holtkamp, who worked in my group for a decade. Heiko's slides and text on TCP/IP were for many years the first items which appeared

when one gave “TCP/IP” as a search term to Google. Since TCP/IP are the internet protocols and the concept and notation are pervasive in computer networking, one can conclude that in certain respects we were amongst the pioneers in unrestricted Internet study material for networking. Similarly, the introduction to E-Mail (in German) by Marcel Holtmann, which consisted of a document in slide format for lectures, was for many years the only on-line introduction in German which dealt with E-Mail protocols, as described in the RFCs, in depth. (Unfortunately, Marcel has not maintained the reference to these slides on his WWW site, and we did not retain a local copy.) We have similar introductions to Bluetooth, one by Holtkamp, and slides by Jörn Stuphorn, who repeatedly gave two-lecture Bluetooth introductions from them, but there are now many on-line references as WWW material burgeons. Bluetooth is not part of the standard material in my introductory course, but it is part of the optional material from amongst which I choose selected themes, changing from year to year, in my lectures.

You might conclude from this, Dear Reader, that over the years we have paid quite a lot of attention to the content of the course and to supporting material. I think you would be right. However, the Fachschaft disagrees. They say, on their WWW pages, amongst their reasons for awarding me the “black chalk” for poor teaching this semester, that I “apparently show little interest in improving my teaching.” Further, “talks with students have shown that he does not adequately prepare his lectures.”

I asked the Fachschaft representatives how this could be. I have organised and taught the course for over a decade. The basic material is more or less constant, consisting of intros to the basics of Ethernet, IP and TCP and other material. And I have run my own local area network and internet connections, independent of the faculty facilities, for nearly fifteen years (although for the last number of years I have stepped back and do not participate any more in the technical administration of the system). How could I not be “adequately prepare[d]”? Are they suggesting that maybe I forget the basic details of Ethernet and TCP/IP every year? Or maybe it is that I somehow forget to show the right set of slides during the lecture? The answer was that they don't know what it means.

They did tell me that the major reason for giving me the award for poor teaching was the process with the student who complained about failing the course. So let's look at that.

I went to the Examination Committee meeting with the prepared written material showing why the student had been awarded the failing grade.

The Committee consisted as far as I remember of the DoS, one other professor, two student representatives, and two representatives from the faculty administration (the two people who maintain the student records of achievement, the Examination Department).

I asked the Committee first to consider my prepared material. They declined, multiple times. Instead, they asked me about the design of the exam, how I graded it. I explained this, and ran into a lot of criticism, mostly from the students, but also from the two colleagues. The Committee also wanted to discuss the complainant's accusations that I did not answer emails from him and was not available to speak with during my office hours. The complainant was present for the entire meeting. I did not understand what was going on. I felt quite quickly that this was a kangaroo court but I didn't understand the motivation of any of the participants besides the complainant. Finally, one of my two professorial colleagues swore at me. (I have no idea why, except that he wanted to denigrate me in some way. He declined to discuss it later.) I lost my temper, told him very loudly that I was not going to be treated that way in faculty committees and left.

To see why I think it was a kangaroo court, consider just one of the absurdities of the meeting. I was asked to discuss the complainant's answer to Question 1, despite it not being on the agenda which

was given to me. The Question supposed that you were a consultant to a small company and were to propose a network architecture with Internet connection for the company. The complainant proposed a bus architecture, with stars connected to the nodes on the bus. I said you couldn't build it using available kit. The complainant wanted to know why not.

In fact, he already knew why not. We had had this very conversation a number of weeks before, in my office. He knew the answer. I had repeated it with DoS some days later. Here it came up a third time. There were at least three people in the room, namely myself, the DoS, and the complainant himself, who knew the answer. Namely that you haven't been able to buy the equipment for bus-type Ethernet LANs for well over a decade, since they are outmoded. Had the complainant attended the lecture in which I passed around the old HW and this was discussed, he would have known this. None of the people who attended that lecture had proposed a bus-backbone architecture in their answers to Question 1. Had the complainant read the material on Ethernet in the main reference text, Tanenbaum's network book, where it is explained in detail exactly how and why it is no longer used, he would have known it also. I had indeed brought along a copy of the relevant pages in Tanenbaum to show the Committee (who, as I said, declined to look at any of my accompanying material). When I had talked with the complainant in my office about the exam, he didn't know the designations for the various different Ethernet variants (in particular he would have had to know at least "10 Base 2", and "10 Base T" or "100 Base T" or better, to propose his architecture to the fictitious company, as the question asked him to do).

So I pointed out, again, to the Committee what was wrong with the complainant's answer. None of the Committee members would substantiate my reply. That is, I was facing six people inquiring about answers to networking exam questions, none of whom knew, or would admit to knowing, that 10 Base 2 Ethernet kit is outmoded. Or who would look at my copy of the relevant pages from Tanenbaum to verify. I suggested that they might call someone from the faculty network administration who would verify it.

This is just one example of how the meeting proceeded.

The Examination Committee apparently formally decided that I had not justified the grade that I had given to the complainant, and officially awarded him a pass.

This is just incredible behavior. I tried to talk to my two professorial colleagues about it afterwards. Both of them declined to discuss it.

Apart from the appalling behavior of the Committee members, there are two things formally wrong with this process. First, I have by the administrative law governing assessment the right to devise my assessment and its criteria "independently of any third-party requirement" (my translation). So the Committee, in spending a lot of time criticising my design of exam and grading criteria, may have been properly construed to have been giving me their (inexpert) opinion on it, but this was not properly part of their task: their task was to see if I could justify the grade I had given the complainant, on **my** exam using **my** criteria, whether they understood the exam and criteria or not. Second, the Committee is required by the administrative law to take into account all the relevant material presented for its consideration. Whereas it declined to look at any of the material I prepared.

Third, I have not been provided with a copy of the minutes of the meeting. Neither as far as I know have the minutes been prepared, despite the import, unique in the history of my faculty, of changing a grade contrary to the judgement of the professor charged with the assessment.

So much for the claim that people in Germany like to do things properly. This has all the

characteristics of some sort of witch hunt. The Fachschaft says something about my “poor” teaching on its WWW pages. They substantiate this with a number of falsehoods. And one colleague swears at me during my attempt at cooperation with a faculty committee that was oriented from the start towards critique of my course and grading.

What is going on here? I do know that this is not the first time I have been discriminated against concerning matters of my teaching, or indeed my research achievements and general contribution to the faculty. But I deal with that elsewhere.

Maybe I can get a hint from the students complaints about me on their WWW site? Not really. A lot of what they say, and almost all of what they hint at, is either untrue or implausible. Rather than helping with an explanation, this represents yet another thing to explain.

There has to be a reason why colleagues should decide to run a kangaroo court to criticise my exam grading, rather than to hold an appropriate inquiry into grading after a complaint. There has to be a reason why students want to denigrate my teaching, especially since they have to lie about it to do so. Further, this is just the latest glitch. There have to be reasons why I, alone amongst any colleagues I know about in German universities, did not have access to faculty secretarial services or faculty computer-network support for a decade, and why I had to take the university to court to obtain enough faculty resources to be able actually to teach the courses to which I was committed. What can these reasons be?

Here is a possibly relevant observation, which I have made elsewhere. English and U.S. university informatics departments are full of foreign-born lecturers and professors. In contrast, German university informatics departments are full of Germans. I am the only foreign professor in mine. Also, English universities get their students from all over Britain and the better ones often have large contingents of foreign students who pay substantial amounts of money, and in the U.S. it is even more so. In contrast, our students in Bielefeld come predominantly from the region around Bielefeld (well over 80%). There is, as a colleague in another faculty observed, a “culture clash”.

Granted this, are all university “cultures” somehow “equal”. Certainly not in all respects, as follows.

Let me first give a general impression. When I came back to Europe in the early 1990's, I came from a computer science culture in which almost everyone was a fluent typist. And not just of words in essays or papers. I had regularly encountered programmers who wrote programs on the screen about as fast as I type essays (but let's not necessarily inquire too deeply into the quality of many of those programs :-). I came into a culture, in Germany, in which I met more informatics professors than not who didn't use a computer for any serious work, writing or programming. Not even writing e-mail. One had secretaries and graduate students to do all that. I found this odd. One of the reasons I came to Bielefeld was that the hiring-committee chairman actually corresponded by e-mail in what was to me the “usual” manner (another was the comparative informality on show at my interview, although as I found out later that was not a reliable indicator of attitudes). Now, I am a firm believer in use-it-or-lose-it, having gained and lost skills at playing the piano, skiing, recorder playing, fiddle playing, mathematics and mathematical logic, algebraic logic, practical computer networking, and writing poetry, and regained lost skills in fiddle playing, tin-whistle- and flute playing, during my lifetime. (Sudoku, especially the arithmetic variant unfortunately named “killer”, nowadays satisfies my mathematical yearnings somewhat.) So that lack of computer use amongst colleagues suggested to me that many had “lost touch” in a way in which U.S. colleagues had not. And I don't believe that one can have all the brilliant ideas in one's armchair and hand them off to graduate students for execution: I think in intellectual matters one can only lead from the front.

Now for how that intuition pans out. In 2002, and again in 2005, I surveyed citation counts for informaticians using *citeseer*. I discovered that there were inaccuracies in *citeseer*'s data summaries, so went back and did my own data mining from *citeseer*'s raw citation-correlation entries. There were two things I discovered. First, using some rough economic estimates, I found that achieving a well-cited piece of informatics research cost Germany somewhere between 15 and 50 times what it cost the U.S. Now, one can quibble about the estimates, but it is pretty clear that compared with the resources put in, the intellectual reward in German informatics is correspondingly much lower than in the U.S. So, if cost-benefit concerns you, this is one indication that cultures are not “equal.”

Another indication is as follows. If one looks at the winners of the ACM Turing Award in computing, popularly supposed to represent the “Nobel Prize” of informatics, one sees that much of the work cited in the awards was performed by the recipients as professors, sometimes quite well-established professors (as the fable goes, you need tenure to be able to do something really novel). Whereas surveying the citations of my colleagues in Bielefeld in December 2005 (related to some discussion in the court case), I saw that most of their cited work was performed *before* they had become professors at Bielefeld. Indeed, had been performed some 15 years or more previously. (One younger colleague was a most obvious exception to this pattern, and continues to be an exception. We have recently hired another young colleague who is likely also an exception, but I have not done any citation data-mining since 2005). My work in 2002 had indicated that this is not an exceptional situation for informaticians in German universities. Use it or lose it.

(Unfortunately, I myself also fit this trend. My most-cited paper is from 1994, and my last well-cited paper from 1999. My excuse is that since the mid-1990's I have been working primarily in system safety and accident analysis, an interdisciplinary area which is peripheral to established fields of publication in informatics, and where I have had difficulty finding suitable traditional vehicles for publication. I spend a lot of time talking to traditional engineers, pilots – and lawyers. Whereas I would argue that my colleagues continue their efforts in the subjects on which they had published. Blunting my excuse somewhat, I do have one international colleague who does similar work and continues to be well-cited. However, my colleague believes strongly in traditional media, whereas I write essays to some archived e-mailing lists, as well as on my WWW site, and believe this has impact, but of a different sort, on the audience I wish to address.)

That has changed, of course. My more recent colleagues use e-mail routinely for communication, and some of them are continuing to perform research and publishing it.

Now, granted, my two observations about successful “culture” concern research, not teaching. But many believe, with reason, that the two are intimately connected. I do, too. Two of the universities I have taught at, and two I have studied at, are in the top ten. I don't know any other faculty colleagues who have attended or taught at top ten universities, although a couple have been at ETH Zürich, which is up there with the best. The relative monoculture in informatics shows its differences. No German universities are in the top fifty of the world rankings and Bielefeld is not in the top hundred, despite drawing quite a lot of discretionary funding for its “Centres of Excellence”, Institutes and Robotics Lab. One could imagine that, without fundamental changes in the teaching “culture”, such as that led to my experience with the Examination Committee - or teaching politics as one might prefer to call it - the ranking may very well stay much the way it is.

Time for discussion, surely?