Educational Matters

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Unfortunately, the *Educational Matters Column* in this volume of the *Bulletin* is bound to be shorter than usually because of two reasons. On one hand, I have not got any contribution for it. On the other hand, I have been fighting for two weeks against a pollen allergy on the loosing side. As a consequence, my work plan is totally spoiled. In particular, this column consits only of two short items.

The first item reminds of the Education Day of AMAST '93 by the respective part of the preliminary programme.

Further information can be obtained from the AMAST '93 Secretariat

or from me.

The second item had been planned as a position paper preparing myself for the role of the Education Day Chairman I accepted to play at AMAST '93. But what you can find is not more than a skeleton of it.

Five preliminary thoughts on teaching computer science

1.   Most of the students of today will be among the scientists, engineers, technologists, managers, teachers, politicians, etc. of the next 30 to 40 years. Hence teaching in universities in general and teaching computer science in particular are challenging tasks with high responsibility. What students learn, know and think and how they deal with it may form them to a good part and, in this way, may influence the future of science, technology, economy, politics, society, etc. I fear that not all university teachers are aware of this responsibility.

2.   Teaching can be a hard job, in particular, if the teacher stands in front of an audience of 50, 100 or 500 students and has got only a vague idea of the levels of knowledge, motivation, interest and ability present. Frustration is not surprising under such circumstances, and enthusiasm seems to be wasted. Although the situation of teaching in universities needs a revision (at least in Germany), there is still the chance of success from time to time because students acknowledge the effort of teachers as far as I can see. Teachers must try.

3.   Clearly, teaching is much more than the repetition of knowledge found in books. Knowledge is only the basic material that needs proper combination, interpretation, cross references and, above all, the teacher's personal comments and views. The aim of teaching is not just to lecture on important matters to passive listeners, but to raise the students' interest, motivation and ability to play with, to work on, to think about and to understand the matter at hand actively and in their own fashion. University teachers must be good scientists and good animators.

4.   Computer science is an engineering and scientific field in an embryonic state that is rooted in mathematics and electrical engineering. It is assumed to provide key technologies for the future development of economy and society (at least in the well-developed countries). The outcome of computer science is changing the work and life of many people. Hence teaching computer science must reflect the whole spectrum of relevant aspects from mathematics to social sciences. But how can this be achieved in an undeveloped field? A balance seems necessary between the well-understood basic matters of mathematics, engineering and social science useful in computer science and the urgent and actual questions that have got so weak and shallow answers up to now. But what is sufficient?

5.   The trouble with teaching theoretical computer science is a bit different. There is the wealth of mathematics one can employ. There are already some fairly well-developed theories on basic objects of interest in computer science. But most of the students (at least those I know) do not enjoy mathematics, are not able to understand it properly or do not try hard enough. Hence motivation is mandatory. Unfortunately, a successful motivation is not very helpful if students understand the value of theoretical computer science, but are still not able to understand the matter itself.

That's all for this column. Contributions for the next issues are welcome and necessary because I am not able to run the column without the help of the readers. The contributions should be sent to

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