The Students Conference–A Hands–on Experience in Research, Technical Writing, and Presentation

Final project report-HSV 149/97

Jürgen Börstler
Department of Computing Science,
Umeå University, Sweden
jubo@cs.umu.se

1   Introduction

One of the main goals of this project was to improve our students' communication skills. Computer science programs, as well as other technical programs, pay little attention to the development of communication skills. The effects of doing so become most obvious, when students present their theses. In many curricula this is the first time a student makes an oral presentation and writes a significant report.

Although many courses comprise communication elements, these are not taken seriously by the students and lecturers as well. A correct solution is often accepted, even when accompanied by a badly written report or documentation. We therefore needed a course to prepare students for their final theses and their professional careers.

We decided to organise the course as a conference for several reasons.

- Communication skills can not be taught by means traditional lectures. Training and practical experience are necessary to acquire such skills.

- Oral presentations and written communication can both be addressed in the same course and integrated in a natural way.

- To introduce students to research and make them interested in an university career.

- Further important questions, like for example scientific character and ethics fit very well in this set-up.

- To go away from traditional and boring courses on technical writing.

The whole course is more or less organised like any "real" conference. We have a call for papers, a submission process, a program committee that evaluates the submissions, and the conference itself, where all accepted papers are presented. Furthermore we publish a conference proceeding with all accepted contributions.

Entry requirements for the conference course are quite low to make it possible for students from other programs to participate.

Since the working language in computing science is English, we decided to run the course in English, i.e. all papers and presentations must be in English. To provide high quality education for this part of the course we hired a teacher from the English department.

2 Conference Course Outline

The following outline describes the spring 2000 offering of our conference course. The design and the schedule have evolved during three earlier offerings of the course. After each offering we made a course evaluation. The latest offering was evaluated very thoroughly (see [4]). The changes we made compared to earlier versions of the course are discussed in section 3.

The course runs for about 18 to 19 calendar weeks and can be roughly divided into seven phases.

During **phase one** (four weeks) the students are given time to select a topic for their research and search for literature on this topic. Topic proposals are reviewed and must be approved by the lecturers. We provide a few topics for students that have difficulties selecting an appropriate topic.

At the end of **phase two** (two weeks) students submit an outline of a report together with an annotated bibliography. By means of the annotated bibliography we can check, if the students are going to work with appropriate references.

The program committee evaluates and comments all contributions within a few days.

Phase three (seven weeks) is the main part of the course starts. The students prepare a full paper according to predefined formatting guidelines. During this phase of the course the students attend lectures in technical writing and peer review meetings. The technical writing lectures are taught by a teacher from the English department. For the peer review meetings we divide the students into groups with similar topics. During the group meetings students present, discuss, and solve specific writing and presentation problems in collaboration with their fellow students. Each group has assigned a lecturer as a mentor who guides the discussion according to a predefined format.

When the full papers are submitted the program committee immediately starts reviewing them contributions according to predefined criteria. Each contribution is at least reviewed twice. The review process has to be finished in at most a week.

All accepted contributions will be presented at the conference. Rejected contributions can be resubmitted to a later deadline.

In **phase four** (two weeks) the students rework their papers according to the reviewers' comments. At the end of phase four the students deliver their final paper, or a resubmission.

All final papers are then reviewed one more time by the English teacher within one week.

In **phase five** (a few days) the students do a final editing of their work and submit their papers for printing.

In **phase six** (two weeks) the students prepare their presentations. Depending on the quality of their contribution the students will either have a talk or a poster presentation. A rehearsal, under supervision of the English teacher, is done just before the conference.

Phase seven is the actual conference with an invited talk, several paper sessions, and a poster session.

The presentations are mainly graded according to their structure and comprehensibility, the design of the overheads, and the presentation style.

The preparation of the presentations (phase six) can partly be done in parallell with phases four and five.

Our curriculum comprises mainly courses at half pace (20h of effective study time per week) for about 10-11 calendar weeks. Courses that run longer and on a lesser pace do not fit very well in this system. The conference course requires much more than 11 weeks, since the

students need some time for researching and understanding a topic, before they can start writing about it.

Unfortunately, our curriculum does not allow to extend the schedule to a complete quarter pace course that runs over 20 calendar weeks.

We therefore decided to divide the course into two parts. The first part of the course runs for about 6 weeks and covers phases one and two of the schedule described in section 2. This part runs at a very low pace, so that it does not conflict with the courses the students read in parallell (typically two more courses run in parallell). During this phase the students prepare for their writing. After these six weeks the course is delayed for about two weeks, so students can prepare for the exams in the courses that run in paralell. The second part of the course runs as usual, i.e. 10-11 weeks in half pace and covers phases three to seven of the schedule as described in section 2.

All papers must have single authors. Grading is done on the scale not passed (U), passed (3), good (4), and passed with distinction (5). Usually only papers that are presented in a talk can reach grade five. Resubmitted papers can at most get graded by a three.

3 Course Evolution

A first version of this course was offered in spring 1997. The course was very well accepted from the very beginning by the students. All students agreed that the course fills a hole in the curricula. A more detailed evaluation of the latest offering (spring 1999) can be found in the next section. Experiences from our first offering (spring 1997) are discussed in more detail in reference [1].

3.1 Main Schedule

The first offering was designed as a typical half pace course, that means 10-11 calendar weeks together with another course in parallell. Students as well as lecturers were not at all satisfied with such a short time frame. There was too little time to research a topic and to discuss and correct problems. For the next offering (spring 1998) we extended the total time frame to 18-19 weeks. This worked very well and the quality of the submissions improved. For the spring 1998 and spring 1999 offerings we tried different schedules for the seven phases described in the previous section. The results of the latest course evaluation (see [4]) lead us to the schedule described in the previous section.

3.2 Student Guidance

From the begining we had only lectures, hand−outs, web pages, and individual supervision to teach the students and guide them through the course. Furthermore we had introduced one preliminary submission in week four to check, if students are "on track."

Our experience shows that students need strong guidance during this course. To ensure high quality submissions more guidance/ support was needed. We therefore prepared further hand−outs, style sheets, formatting guidelines and templates, and improved our web pages. The current on−line course information and support materials evolved over the years and is maintained regularily. Furthermore we evaluated several textbooks and selected one that is especially written for computer scientists ([5]).

But providing (static) information is not enough. Most students need individual help to improve their writing.

We therefore introduced the following additional elements.

- Further **deliverables** to keep students "on track," as described in section 2.
- **Peer review groups** to engage the students in discussions about their writing.
- Specific **language lectures** and exercises to improve the students' English.

All three elements worked very well and contributed to an improvement in the quality of the submission.

4   Evaluation of the Spring 1999 Offering

The spring 1999 offering of the conference course was subject to a detailed evaluation done by an pedagogik consultant from the universities' teaching center. He made interviews with 10 participants of the course. In addition to that we did a traditional course evaluation. The results of the traditional evaluation where handed over to the teaching center to cross check with the interview results. The overall results of the course evaluation are summarised in a separate report ([4]).

The spring 1999 offering had 27 registered students. Of these 15 students actively participated throughout the course. Twelve students did not finish the course for different reasons. The most prominent reasons were two errors in the course's announcement. Of the 15 final paper submissions we selected nine for an oral presentation and four for a poster presentation. Two papers were rejected. Fourteen out of fifteen students passed the course (one of them after resubmitting the paper).

The general evaluation of the course can be summarised by "instructive and useful," but "hard work." Even the students that did not finish the course thought that the course is worth taking. One student suggested that the course should be made obligatory, because it was so useful.

During the evaluation we received many suggestions for improvements, which were grouped into six areas.

- Advance course information.
- Course outline and organisation.
- English lectures.
- Support for participants.
- Peer review groups.
- Miscelanneous.

The advance course information was critisised a lot, mainly because some of it was wrong. There is a lot of information available on the course, but this material is not very well structured. Students also responded that it is very important to make clear from the very beginning that this course is "different." By different they meant that the course cannot be passively attended, but requires active participants. The goals of the course should be described more clearly. Even though it is clearly stated that the conference language is English, several students where surpised by that.

There were several comments on the course credits, schedule, and entry requirements. Many students suggested that the course should be given more credits than other courses,

since this course requires more time than the average course. Problems with the schedule were mainly due to problems with the advanced course information which resulted in scheduling problems with parallell courses. It was also suggested to have even lower entry requirements than currently and place the course earlier in our curriculum.

The English lectures were valued very high. A few students responded that they took the course mainly because of these lectures. A problem with the English lectures was that there were not "in phase" with the course. The students could therefore not use their own material for the exercises during the English lectures.

General support for the participants was good. The lectures at the beginning of the course contained all necessary information about the course. The review reports were critised, because different reviews of the same paper were sometimes quite different.

The value of the peer review groups was also valued high. Unfortunately they did not always work as expected, since students did not prepare for the meetings or did not show up at the meetings. Students (and lecturers as well) therefore suggested to make participation in these groups obligatory. It was noted that peer review groups are a good exercise for constructively critisising material written by fellow students.

5 Budget

The following table is a budget summary for grant HSV 149/97. All figures are in SEK. Detailed figures can be found in enclosure 1. The difference of SEK 1 is due to rounding errors.

Grant total HSV 149/97	206737	
Interest	2640	
Salary (project leader)		64278
Salaries (lecturers)		54399
English lectures		50000
Presentation equipment		6801
Books etc.		218
Conference dinner		911
Proceedings		10656
Rooms		7956
Local salary increase		1661
University extra charge (omkostnadsavgift)	12498	
TOTAL	209377	209378

6 Conclusions and Future Work

Most students need help to narrow their their topic and to structure their presentation. On the other hand we also received a few papers with too narrow a subject by students who wrote on their own ideas or developments. We also observed that students have difficulties in presenting the context of their work and focus on technical details instead.

Apart from these general problems there are two very specific problems that need to be discussed repeatedly during the writing process. The usage of references and citations and the

meaning of "scientific character." Both can, after an introduction, be reinforced very well during the peer review meetings.

As a long−term goal we have planned to open the course for post−graduate students and students from other departments and faculties. We will then apply different admission procedures for the course part and the actual conference. This will allow students to submit papers and register for the conference without the necessity of registering for the complete course (lectures and conference).

The next conference course will commence in January 2000, the actual conference is scheduled for May 31st, 2000. As suggested by the students we have planned to restructure the course's web pages to improve their usability.

7   Further Results

Besides the results presented in this paper there are further noteworthy results.

The conference course received wide attention and results were presented locally, nationally, as well as internationally (see [1]). Many The author was contacted by several national and international institutions who requested further information about our experiences and/ or followed our ideas (see for example [3]).

Furthermore we would like to note that the author received the pedagogical price of the Faculty of Science and Technology of Umeå University for the year 1998. The price committee especially mentioned the conference course in its justification.

References

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2. Hafen, M., Developing Writing Skills in Computer Science Students, *Proceedings of the 25th SIGCSE Technical Symposium on Computer Science Education (SIGCSE'94)*, Phoenix, AZ, USA, Mar 1994, 268−270.

3. Nawrocki, J. R., Towards educating Leaders of Software Teams: A New Software Engineering Programme at PUT, *Proceedings of the Software Engineering Education Symposium (SEE '98)*, Poznan, Poland, Nov 1998, 149-157.

4. Wedman, N.−E., "Konferenskursen"-En kurs väl värd att ge och utveckla, Internal Report, Umeå University, in Swedish, Dec 1999.

5. Zobel, J., *Writing for Computer Science*, Springer, 1997.