

# A DISCIPLINARY COMMONS FOR DATABASE TEACHING

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## ABSTRACT

*This paper discusses the experience of taking part in a disciplinary commons devoted to the teaching of database systems. It will discuss the structure of a disciplinary commons and our experience of the database version.*

### Keywords

*disciplinary commons, teaching practice.*

## 1. INTRODUCTION

A Disciplinary Commons is an attempt by teaching professionals to come together and share teaching practice and experience. This is achieved through a series of monthly meetings in which all aspects of teaching one particular course is analysed from the context of the course thorough to evaluation. By picking one course, the participant can reflect on how the teaching is organised, what is taught and how effective it seems to be. It is clearly useful as a means of developing teaching skills, but can also be useful for documenting practice.

The Disciplinary Commons [1, 2] initiative is led by Josh Tenenberg in the USA and Sally Fincher in the UK and takes a group of participants by focussing at each meeting on one aspect of the course: the teacher; the context in which the course operates; the content of the course; the instructional design of the course; the way the students are assessed; how we evaluate the success or otherwise of the course; and how the course is delivered.

The structure involves a great deal of peer evaluation. This includes paired observation of teaching – for instance giving a lecture or a tutorial; comment on the aspects of the portfolio as it is developed; and general discussion of each issue. The outcome is a portfolio which includes course artefacts and commentary from the individual [3].

In the UK, successful disciplinary commons have been run for introductory programming [4] and HCI (both accessible from [1]) and this year we have run one for the teaching of database systems. The paper describes the structure and then the experience of the database commons.

## 2. THE STRUCTURE OF A DISCIPLINARY COMMONS

A disciplinary commons starts by attracting a group of individuals interested in exploring their teaching practice in a particular area. In the area of database, this was somewhat made easier by the pre-existence of such a group – the participants of previous TLAD workshops.

The work consists of attending nine monthly meetings as follows:

1. An introductory meeting in which participants get to know each other, describing how they got involved in teaching and their teaching ethos. Pairs for the observation of teaching practice are set up.
2. A meeting which discusses the context of the course being documented – i.e. how it fits into the overall programmes to which it contributes, the nature of the students and the departmental teaching ethos.

3. The third meeting discusses content. The material used, textbooks recommended and the aspects of the discipline which make up the syllabus are all under discussion at this meeting.
4. Instructional design is the topic of the fourth meeting. This involves the balance of lectures and labs, which material is taught by what method as well as which tasks the students are set.
5. There then follows a discussion of assessments – exams or coursework and the mapping of intended learning outcomes to assessment methods.
6. The sixth meeting has course evaluation as its focus. How do we determine whether the course has been successful? Student feedback and student results are the main mechanisms of course, but the meeting also looks at how the institution values and makes use of any evaluation.
7. Delivery mechanisms are the basis of the seventh meeting, but by now focus should be shifting to the portfolio being developed. At this stage, mutual assessment of the material being developed for the portfolio should be beginning to take place. A series of pairings to give feedback on the material are started about now.
8. At this meeting, a draft portfolio should be available and this is discussed with an observing partner.
9. At the final meeting, participants get to display their portfolios and get final feedback.

### **3. THE EXPERIENCE OF THE DATABASE COMMONS**

The commons was advertised firstly through TLAD and BNCOD in July 2009 and also through the HEA mailing lists. About twenty people expressed interest, but after checks with commitments, the number stabilised at fourteen. It was decided early on to make this a peripatetic enterprise. Whereas both the programming and HCI commons had run in London, we decided to share the hosting (and the travelling), particularly important as six of the fourteen were from Scotland or the North-East and only three were in the South East. In the event, a severe winter hampered travel in the middle of the year, but even so no-one failed to make more than two meetings and so the three-strikes and you're out rule was not needed.

We started and ended with a meeting in Glasgow. The introductory meeting had each of us introduce ourselves and this was very illuminating because none of us had taken the school – university – research – lecturer role. Rather, we had mostly had previous jobs outside the University sector and then moved into non-lecturing jobs before evolving into lecturers, each in our own way. This set the tone for a high degree of communality for the year, despite the wide variety of institutions involved from Russell group universities to an FE college.

The next two meetings in Greenwich and Abertay concentrated on the context and content of the course. Here it was clearly that there were wide differences both in the classes we were teaching and the expected content. There were first year courses, later undergraduate courses and courses for Masters students – often introductory courses for "generalist" programmes. We drew context maps to show how the course fitted within the overall programme(s) that the students were taking. Many of us were teaching, either in the same course or more likely a different one, some form of internet programming. This in turn influenced the context of the course and the degree to which basic theory could be covered.

There were consequently differences in content from very basic database design / SQL querying, through to more thorough treatment of database principles. There was much debate at Abertay about how to teach normalisation and relational algebra or whether it is possible to do so. It had been our intention to pull together our opinions on the usefulness of various course materials, such as textbooks, but this was never achieved due to time pressure.

One of the most significant findings of the disciplinary commons was how the database curriculum has been gradually and systematically eroded at all levels in order to accommodate various external factors, such as the lack of teaching resources and the pressure to keep up-to-date with new technological developments.

Database modules at many universities have been squeezed in with other topics such as Web programming, human computer interaction, systems design, and even computer graphics. As a result, teaching has generally been limited to basic database design and SQL

programming skills with little or no theoretical foundation. The absence of theoretical concepts and mathematical formalisms is a cause for concern because their absence in formative years will eventually have an adverse effect not only on the development of sound database systems but also on the database research in the future. A similar viewpoint was expressed in [5] which warns about the negative consequences of a recipe-oriented approach to module design and learning without a sound theoretical framework and argues that the module placement in the programmes is key for creating the space that is needed for covering core database concepts.

We then turned to instructional design at Leeds in January. Whereas most of us used the traditional mix of lectures and labs, there was some difference in the degree of support and the balance, with one institution now using no lectures at all.

Assessment by coursework and exam, also discussed in Leeds at the next meeting, was carried out in the usual way, but some courses were assessed purely by coursework and there was considerable debate between those who felt that the basic concepts of database management could only be genuinely assessed away from the support environment of the DBMS and those who felt that the practical use of a DBMS is what was the most important thing to teach and so coursework was sufficient to assess this.

The ways we evaluated were discussed in Southampton and what we had achieved again used much the same mechanisms – student feedback through questionnaire, staff student meetings etc. - to tell us what the students think. Assessment results tell us how well they actually absorbed the material. Personal reflection and preparation of the same material for next year leads to ways of doing things differently, hopefully better.

Another aspect of this was the expected formal evaluation required by the institution, discussed back in Greenwich. Most had some form of reporting mechanism, but this could range from a short report given to the programme director (what had changed, did it go well, do the marks need moderation, etc.) to central university driven reports whose ultimate use could only be guessed at. One pairing threw up the contrast between one institution preparing a narrative about their course independently of any other, from another in which the report is in the context of the programme as a whole.

The portfolios were developed much more slowly than is really desirable and the penultimate meeting in Sunderland mostly discussed plans for the final portfolio. The impact of other work, notably exam preparation and coursework and exam marking, made the time when this work should be achieved disappear all too easily. A few people did good early work, but many had still not produced much of a portfolio for the eighth meeting, although AI had achieved a virtually complete portfolio of high quality by that time as had some others, while most had much less to show. This has been written between the eighth and ninth meeting and it is expected that everyone will have a complete portfolio by the final meeting.

#### **4. SUMMARY**

We have all found the exercise very successful and valuable, each in our own way. The enterprise is certainly a stressful addition to an already busy working life and few of us managed a timely development of our portfolios. This, in turn, reduced the amount (and therefore the value) of peer evaluation, although there was enough of this that we all felt that this was the most important benefit of the exercise.

From our discussions, we did share many techniques and tricks used by others which we found to be valuable in our own teaching. Among these from significant technological tools, such as the use of Peerwise [6] to test students by seeing if they could formulate interesting quiz questions, to Richard's adopting Charles demonstration of the need to master four different languages to create a dynamic web page by juggling an increasing number of balls, although he feels he did this in a more authentic manner (a) because he can't juggle, and (b) because he used four completely different objects.

We also found, as we probably expected, the challenges, and the ways we deal with them, to be very similar whatever the institution and cohort being taught. Furthermore, the ability to step outside of our usual mechanisms for self-evaluation was of immense benefit. Whereas, formal university evaluation mechanisms specify what is to be evaluated and how, the commons allowed us to interpret our practice as we found helpful and relevant and enabled us to explore aspects that we might not otherwise have been considered.

Our web site can be found from <http://www.cs.kent.ac.uk/people/staff/saf/dbdc/>.

## References

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