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Teaching Over-Performing Students – TOPS



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First year programming ...

... is problematic

- some students can
- some students can't

... what do we do

- try to motivate them all?
- teach to the middle?
- provide extra support for the strugglers?

... what about our best programmers?

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TOP students

We *all* have top students

- obviously find the work easy
 - programmed before
 - pick it up quickly
- find lectures too simple and slow
- get bored with mundane exercises

We all have strategies to cope with our students

Ours include:

- CSCS
- Rocket scientists
- If you have some to share let us know
 - 1-day TOPS event

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The project

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Over
Performing
Students

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The project

The project was designed to incorporate ...

- sharing of current practice
- peer observations across universities
- collaborative problem setting
- intra-university programming competition

... as a means of extending the most able students in programming classes

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Peer observation

Share current practice

Obtain a 'sense of place'

- Meet academics to find out:
 - what they do
 - more about their students
 - the problems they encounter
 - how they want to stretch their students

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Competition ...

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Existing competitions

The IBM student competition
<http://www.developer.ibm.com/university/students/contests/>

The international imagine cup
<http://imaginecup.com/>

The ACM student research competition
sponsored by Microsoft <http://www.acm.org/src/>

BCS competition
<http://www.bcs.org/>

Topcoder collegiate challenge
<http://www.topcoder.com/>

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Existing competitions

Good points

- Motivate good students
- Are only for the best
- Look good on the CV

Bad points

- Not linked to the curriculum
- Students don't always want extra learning
- International competitions lean towards US cc2001

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Our competition

Based upon our curricula

- Using only what we expect our students to know
- Set a collaborative challenge
- Be more immediate and relevant

Look good on the CV

Motivate our top students

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Our challenges

How many students?

- Determined by funding and rail fares

What will the students do?

- Write code
- Present their work
- Must fit with all 4 syllabuses
- Must be interesting/relevant

When will it happen?

Sponsorship?

- Venue
- Prizes

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Our challenges - sponsorship

Sun Microsystems provided

- Venue
- Catering
- Some prizes

This fixed a date for the competition

- 14th March 2007

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Our challenges – what will the students do

Scenario

- Something relevant to a group of students attending a tech conference in London

Setting a challenge task

- Students to set tasks
 - Manageable in 1-hour by 2 students pair-programming
 - Uses their ideas – motivating
- Prize for best challenge
 - Motivating
 - Challenges more likely to be suitable

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Involving the students ...

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Choose the team

Each institution chose its team in whatever way was appropriate to them

- Team size
 - 8 students
 - 6 students going to London
- some students participated who otherwise couldn't
- back-up in case anybody dropped out

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How we did it ...

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Leeds



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Durham



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14th March ...

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The day itself

- The students' first taste of such an event
 - Most students attended James Gosling's keynote
 - They had the opportunity to attend talks and browse stalls
 - All properly registered with delegate badges
- Competition was not hidden
 - On the programme
 - On direction boards
 - Proper sign on the door
 - Assigned a conference staff helper
- Sun allowed us to use their logo on certificates

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The day itself

- Timetable:

1030 – 1045	Introduction
1045 – 1145	Challenge 1
1200 – 1300	Challenge 2
1300 – 1400	Lunch
1400 – 1500	Challenge 3
1500 – 1600	Judging
1600 – 1630	Prize giving

Challenge	Team			
	Durham	Kent	Leeds	Soton
1	K	L	S	D
2	L	S	D	K
3	S	D	K	L

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The day itself



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Winners – best programming pair



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Winners – best challenge



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Student feedback

Working together was great. Everyone worked amazingly well in teams.

I liked that we were supposed to work at our natural pace and that we had to think.

Making the challenge idea was easy, but the wording and the mark scheme weren't.

It was really intense, but great fun.

It's great – thank you for organizing it.

We've got a proper sign on the door like all the other rooms.

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We intend to run this again

- The students enjoyed it
- The students benefitted from it

Next year

- Probably teams of 5
- with 4 students going to London

Does anybody want to join us?

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