Motivating all our students?

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ITiCSE 2011 Working Group: Interim report
http://www.iticse2011.tu-darmstadt.de/wgs/wg1
Abstract

Academics expend a large amount of time and effort to sustain and enhance the motivation of undergraduate students. Typically based on a desire to ensure that all students achieve their full potential, approaches are based on an understanding that students who are highly motivated will learn more. Furthermore, institutional rewards accrue from effective use of academics’ time, along with financial benefits associated with high levels of retention and progression.

This working group report, based on practice in Europe, Australasia and North America, builds on previous work. It provides an updated and revised literature review, analyses a larger collection of survey data and has sought to triangulate earlier findings with qualitative data from practitioner interviews.

The report covers established approaches in teaching, support and extra-curricular activities. It tracks emerging practice such as streamed and differentiated teaching, and research based and authentic learning.

It also considers contemporary innovations in student activities. Finally it reports on a repository of tips and techniques which has been established to support faculty wishing to change or review current methods.
Who we are – insert pic

Three continents, ten universities, a diverse range of backgrounds, institutions and perspectives ...
understanding that differences may persist

http://www.iticse2011.tu-darmstadt.de/wgs/wg1
Where we come from

Three continents, ten universities, a diverse range of backgrounds, institutions and perspectives ... understanding that differences may persist
Our Perspectives/Enquiry

The first year experience
Learning to program
2010 -> 2011

**2010**

**Literature review**
- Range of perspectives
  - Strugglers
  - Background narrative
    - methods and education
    - the long view

**2011**

**Extended, revised**

**2010**

Survey (thank you 😊)
- ~80 respondents, ~40 full sets
- Quantitative and (rich) qualitative

**2011**

Further survey data
Triangulation via in-depth interviews

**emerging**
- Streaming and differentiated teaching
- Meeting student expectation and motivations
- Research experiences and authentic learning

**established**
- Paired programming
- Getting to know students
- Collaboration with colleagues
- Student competitions

And more
- Mobile, apps, ++

http://www.iticse2011.tu-darmstadt.de/wgs/wg1
Let’s consider some questions

- What **motivates** our students?
- Why do students **progress** differently?
- How do we obtain **optimal outcomes** for the greatest number?
- What **interventions** do we devise and use?
- What are the range of important factors?
- What important **different perspectives** exist?
Themes and interests

- Peer mentoring
- Differentiated delivery
- Extra curricular activities
- Streaming students
- Instant gratification
- Competitions
- Support
- Research experiences
- Under represented groups
- Peer mentoring
- Self and peer assessment
- Plagiarism and collusion

http://www.iticse2011.tu-darmstadt.de/wgs/wg1
“It was really intense, but great fun”.

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

“Working together was great, everyone worked amazingly well in teams...I felt I learnt an enormous amount from the activity, and I thank you sincerely for making it available to us”.

“Its great – thank you for organizing it”.

http://www.iticse2011.tu-darmstadt.de/wgs/wg1
Considering Motivations

- **Students**
  - diverse backgrounds
  - differing needs
  - differing individual motivations

- **Universities**
  - differing contexts
    - Australasia Europe majors from year 1
    - North American minors and majors

- **Teachers**
  - differing perspectives and objectives

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Why enhancing motivation is crucial

• Students who are well motivated learn more
• We want to ensure that all students achieve their full potential
Mechanisms: pedagogic interventions

- Pedagogic theory
- Evaluations
- Methods
- Group work
- Peer instruction
- Differentiated teaching
- Out of class learning
Repository

Bibliographies

Tips and techniques

Community driven content

resources
Thank You 😊

• Questions? Comments?
• Now, and later
  – Chat with working group members
  – Read our paper(s)
  – Keep an eye out for our repository and future developments

http://www.iticse2011.tu-darmstadt.de/wgs/wg1
ITiCSE 2011 Working Group report
Motivating All Our Students

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Motivating All Our Students?

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http://www.iticse2011.tu-darmstadt.de/wgs/wg1
Last year (for notes/info)

http://eprints.ecs.soton.ac.uk/21328/

• Green background indicates last year’s slide :-)
Introductory Programming

Heterogeneous student profiles
Diverse/divergent prior experience
• Learning to program
• Differentiated teaching
• Motivation

How do we prevent the most able becoming
• De-motivated
• Disillusioned
• Bored
• Lost
Our methods

Literature review

– Range of perspectives
  • Strugglers
  • Background narrative
    – methods and education over time

Survey (thank you 😊)

– ~80 respondents, ~40 full sets
– Quantitative and (rich) qualitative
Survey

• What we do
• Why we do it
Looking for patterns...

Distribution of instruction methods

<table>
<thead>
<tr>
<th>Method</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tbody>
<tr>
<td>Peer support</td>
<td>5</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>Differentiated teaching</td>
<td>4</td>
<td>10</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>17</td>
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<tr>
<td>Slow pace</td>
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<td>17</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>Novelty</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>External motivation</td>
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<tr>
<td>Business as usual</td>
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</table>

ITiCSE 2010 Working Group Report: Motivating our Top Students [http://eprints.ecs.soton.ac.uk/21328/]
Initial Interventions

Struggling -> Coping-> Advanced

<table>
<thead>
<tr>
<th>Intervention method</th>
<th>strugglers</th>
<th>copers</th>
<th>experienced</th>
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<tr>
<td>1) Peer support</td>
<td>5</td>
<td>4</td>
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<td>2) Differentiated teaching</td>
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<td>3) Slow pace</td>
<td>6</td>
<td>1</td>
<td>0</td>
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<tr>
<td>4) Novelty</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5) External motivation</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6) Nothing</td>
<td>14</td>
<td>17</td>
<td>14</td>
</tr>
</tbody>
</table>
Later interventions

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<tr>
<th>Intervention method</th>
<th>Strugglers</th>
<th>Over achievers</th>
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<tbody>
<tr>
<td>1) Peer support</td>
<td>5</td>
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</tr>
<tr>
<td>2) Differentiated teaching</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>3) Extra Help</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td>4) Nothing</td>
<td>9</td>
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</tbody>
</table>
Preferred/predominant approaches

• Paired programming
• Getting to know students
• Collaboration with colleagues
• Student competitions
Emergent approaches/practice

Evolution/extension of existing practice

• includes
  – Streaming /differentiated teaching
  – Meeting student expectations /motivation
  – Research experiences /authentic learning