Changing to a Student-Centred Paradigm: The Why, What and How

Mike Murphy
Technological University Dublin, mike.murphy@tudublin.ie

Follow this and additional works at: https://arrow.tudublin.ie/engineducpres

Part of the Engineering Commons

Recommended Citation
https://arrow.tudublin.ie/engineducpres/7

This work is licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 License
Changing to a Student-Centred Paradigm:
The Why, What and How

Mike Murphy
10 May, 2005
Outline

- Welcome
- Why the need for Change?
- What has to Change?
- How should we Change?
<table>
<thead>
<tr>
<th>Time</th>
<th>Theme</th>
<th>Speaker</th>
<th>Format</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.30</td>
<td>Opening DIT Strategic Plan &amp; Theme 1 Faculty Policy</td>
<td>Mike Murphy Director</td>
<td></td>
<td>Modularisation Semesterisation Widening Access Retention</td>
</tr>
<tr>
<td>11.00</td>
<td>Coffee</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.30</td>
<td>What exactly has to change? Programme and Module Learning outcomes written in compliance with DIT QA and IEI requirements.</td>
<td>Brian Bowe &amp; LTC Team</td>
<td>Short presentation followed by Workshops in various rooms of Bolton St building</td>
<td>Lecturers will be facilitated to write learning outcomes for their module descriptors.</td>
</tr>
<tr>
<td>13.15</td>
<td>Lunch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.30</td>
<td>Assessment for learning outcomes and the new paradigm</td>
<td>Brian Bowe &amp; LTC Team</td>
<td>Short presentation followed by Workshops in various rooms of Bolton St building</td>
<td>Programme teams will be facilitated to align assessment methods to learning outcomes.</td>
</tr>
<tr>
<td>16.15</td>
<td>Plenary session</td>
<td>Chaired by Director</td>
<td>Questions/comments from floor</td>
<td>Are we over assessing? Are the views of all stakeholders taken on board? Can we draw conclusions? Suggestions for next seminar in Sept?</td>
</tr>
<tr>
<td>17.00</td>
<td>Close</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Wake-up Issue

Ireland must change from an investment-driven economy to a knowledge-based economy

Implications:

- Continuous learning and re-learning
  - 40-year engineer, not a 4-year engineer
  - distinction between part-time and full-time students

- Blurred boundaries between technical disciplines
  - e.g., product vs. service vs. packaged solution

- The need for the *Entrepreneurial Engineer*

New challenges for engineering educators
The Faculty of Engineering is committed to excellence in the provision of accessible, multi-level education and training [business] so as to benefit our students and staff, enterprise and society [purpose]. The Faculty achieves this though a student-centered ethos within a culture of lifelong learning supported by the highest standards in teaching, scholarship & research. [values]
Engineering @ DIT: Challenging, Fun & Rewarding

DIT Strategic Plan 2000-2015 *

- Multi-level, learner-centred environment.
- Allied with and responsive to industry.
- Strong Postgraduate/Research.
- Reputation for excellence.
- Flexible leading-edge electronic capabilities.
- Supportive and caring ethos.
- Entrepreneurial institution.

* Adopted by Governing Body, 14 March 2001
Multi-Level, Learner Centred Environment

... enhance ... DIT as a multi-level, technological institution offering programmes ... in a learner-centred environment and which includes ... responsiveness to society’s lifelong learning needs. An underlying theme is the promotion of the capacity to learn and to reason ....

- Respond flexibly to the needs of students
- Evolve and adapt the nature of programmes, embracing a changing environment
- Promote new learning experiences, including project elements, etc.
- Develop new learning paradigm with a focus on problem-based and student group self-learning
- Develop new interdisciplinary courses
Strong Postgraduate and Research Arms

... expand the capacity of DIT in response to a knowledge-based environment, and foster a culture of scholarship and research ...

- Enhance postgraduate numbers with focus on research students
- Develop multi-disciplinary niche research areas
- Establish international links for all schools
Strategic Plan – Theme 3

Closely Allied with and Responsive to Industry

... enhance collaboration with industry with a view to the employability of DIT graduates ...

- Deliver programmes geared to industry’s needs
- Attract industry funding
Reputation for Excellence

... strengthen feedback in support of improvements to programme development and delivery, to enhance the quality of staff and to promote a culture of excellence

- Periodically review the performance and operation of faculties/ schools
- Attract and retain high quality staff to the Institute
- Continue to improve staff development
- Enhance and strengthen quality assurance
Flexible Leading-Edge Electronic Capabilities

... position DIT as a state-of-the-art institution with the capacity to deliver programmes flexibly, effectively and to the highest standards ...

- Implement course modularisation, credit transfer
- Develop modularised e-learning programmes as a feature of a rapid, flexible and cost-effective response capability
- Develop flexible web-based course delivery mechanisms for rapid response to changing needs
Supportive and Caring Ethos

... ensure that DIT operates as a supportive, welcoming institution, internally for staff and students and in its external face with the community.

- Foster a caring and supportive environment
- Provide a learning environment of the highest quality
- Provide retention support for students at risk of drop-out
- Develop an effective mentor system
Entrepreneurial Culture

... creation of an environment and operational structures and practices which facilitate and enhance dynamic and participatory management, while fostering a culture of creativity, innovation, adaptability and autonomy.

- Dynamic, facilitative leadership, pursuing the Institute’s vision and strategic objectives
- Devolve decision-making to the maximum extent
- Train staff generally in change management and entrepreneurial culture
Reasons to Study Engineering *

<table>
<thead>
<tr>
<th>Reason</th>
<th>Number</th>
<th>2004 %</th>
<th>2003 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was always interested in how things work</td>
<td>190</td>
<td>43%</td>
<td>52%</td>
</tr>
<tr>
<td>Engineering is a good career</td>
<td>158</td>
<td>35%</td>
<td>29%</td>
</tr>
<tr>
<td>I am interested in designing things</td>
<td>142</td>
<td>32%</td>
<td>28%</td>
</tr>
<tr>
<td>I want to build things</td>
<td>110</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Engineers are well paid</td>
<td>68</td>
<td>15%</td>
<td>15%</td>
</tr>
</tbody>
</table>

* 2005 survey of 446 DIT 1st year engineering students
# DIT Retention Rates *

<table>
<thead>
<tr>
<th></th>
<th>2002-2003</th>
<th>2003-2004</th>
<th>Δ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Arts</td>
<td>73%</td>
<td>78%</td>
<td>+ 5%</td>
</tr>
<tr>
<td>Business</td>
<td>77%</td>
<td>78%</td>
<td>+ 1%</td>
</tr>
<tr>
<td>Built Env.</td>
<td>73%</td>
<td>78%</td>
<td>+ 5%</td>
</tr>
<tr>
<td>Engineering</td>
<td>57%</td>
<td>70%</td>
<td>+ 13%</td>
</tr>
<tr>
<td>Science</td>
<td>71%</td>
<td>73%</td>
<td>+ 2%</td>
</tr>
<tr>
<td>Trsm &amp; Food</td>
<td>65%</td>
<td>64%</td>
<td>- 1%</td>
</tr>
<tr>
<td>DIT</td>
<td>69%</td>
<td>74%</td>
<td>+ 5%</td>
</tr>
</tbody>
</table>

* Rates for 1st year students eligible for 2nd year
# Some Data for Faculty

<table>
<thead>
<tr>
<th>Student Measures</th>
<th>Number</th>
<th>% of WT Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access (LEAP)</td>
<td>43</td>
<td>2%</td>
</tr>
<tr>
<td>Women</td>
<td>141</td>
<td>7%</td>
</tr>
<tr>
<td>Non-EU</td>
<td>141</td>
<td>7%</td>
</tr>
<tr>
<td>Mature (enrolled in WT programmes)</td>
<td>109</td>
<td>5%</td>
</tr>
</tbody>
</table>
Part-Time Number Trends

Analysis of DIT part-Time Enrolments 2000-2003 - By Faculty

<table>
<thead>
<tr>
<th>Faculty</th>
<th>2000/01</th>
<th>2001/02</th>
<th>2002/03</th>
<th>2003/04</th>
<th>% Change since 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>App. Arts</td>
<td>2133</td>
<td>1794</td>
<td>1806</td>
<td>1275</td>
<td>-40%</td>
</tr>
<tr>
<td>Built Env.</td>
<td>474</td>
<td>481</td>
<td>463</td>
<td>443</td>
<td>-6%</td>
</tr>
<tr>
<td>Business</td>
<td>1735</td>
<td>1822</td>
<td>1335</td>
<td>1151</td>
<td>-34%</td>
</tr>
<tr>
<td>Engineering</td>
<td>1711</td>
<td>1638</td>
<td>1353</td>
<td>988</td>
<td>-42%</td>
</tr>
<tr>
<td>Science</td>
<td>352</td>
<td>364</td>
<td>386</td>
<td>369</td>
<td>+5%</td>
</tr>
<tr>
<td>Tourism &amp; Food</td>
<td>608</td>
<td>906</td>
<td>862</td>
<td>507</td>
<td>-17%</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>7013</strong></td>
<td><strong>7005</strong></td>
<td><strong>6205</strong></td>
<td><strong>4733</strong></td>
<td><strong>-32</strong></td>
</tr>
</tbody>
</table>
Programmes must enable graduates to demonstrate:

a) The ability to derive and apply solutions from a knowledge of sciences, engineering sciences, technology and mathematics;

b) The ability to identify, formulate, analyse and solve engineering problems;

c) The ability to design a system, component or process to meet specified needs, to design and conduct experiments and to analyse and interpret data;

d) An understanding of the need for high ethical standards in the practice of engineering, including the responsibilities of the engineering profession towards people and the environment;

e) The ability to work effectively as an individual, in teams and in multi-disciplinary settings together with the capacity to undertake lifelong learning;

f) The ability to communicate effectively with the engineering community and with society at large.
A wide range of skills must be measured — virtually impossible via an exam-only assessment method.
Why Modularisation?

- Unlock synergies first and foremost
  - E.g., 13 Electrical/Electronic courses in 1st Year of our BEngTech programmes
  - Rapidly design and implement new programmes, particularly inter and multi-disciplinary programmes
  - Need for a standard Module

- What about putting 300 in a classroom?
  - Assessment (e.g., should 1st year be all formative assessment?)
  - Learning approach

- What about cost cutting?
Staff Development

The Faculty will continue to support and facilitate staff to:

- Improve their academic qualifications
- Advance their research interests
- Progress their teaching and assessment skills
- Develop their knowledge of best practice work related skills
How should we design 21st Century Engineering Education?

- Learner-centred: students learn *how to learn*
- Modular, *to allow synergies* in use of resources
- Programmes enriched with *hands-on and team-based learning*
- Blurring of part-time and full-time students
- *Flexible delivery and assessment*
- *Accredited!*
Vision for the Faculty

DIT is recognised as the best multi-level engineering institution in Ireland.

It will take all of us to make this vision real.