Linking discipline-based research and teaching to benefit student learning

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“... universities should treat learning as not yet wholly solved problems and hence always in research mode”
(Humboldt 1810, translated 1970, quoted by Elton 2005, 110)
Brief Biography

- HE Consultant and Researcher
- Economic geographer and Director Centre for Active Learning
- Director HE Academy projects on ‘Undergraduate research’ and ‘Honours and Capstone Projects’
- Ex-VP for Europe International Society for Scholarship of Teaching and Learning
- National Teaching Fellow and Senior Fellow HE Academy
- Advisor to National Academy for Integration of Research, Teaching and Learning (Ireland) (2007-11)
- Advisor to Australian Learning and Teaching Council Project on the ‘Teaching-research nexus’ (2006-08) and ‘Undergraduate research’ (2009-10)
- Advisor to League of European Research Universities on research-based teaching (2009)
- International advisor to Department of Science Education, University of Copenhagen
- Honorary Professor University of Queensland; Visiting Professor Edinburgh Napier and University of Wales Newport
- Research interests: scholarship of teaching; linking research and teaching; active learning; developing an inclusive curriculum for disabled students
Linking research and teaching

1. Putting research-based teaching into context
2. Different views on linking research and teaching
3. Disciplinary perspectives
4. Departmental perspectives
5. Conclusion
Student research at ANU

http://www.youtube.com/watch?v=9wHreVKgOT4
The developmental journey of the student

<table>
<thead>
<tr>
<th>Paradigm</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching</td>
<td>Telling students what they need to know</td>
</tr>
<tr>
<td>Learning</td>
<td>Engaging students in learning how to learn; emphasis on learning what they need to know</td>
</tr>
<tr>
<td>Discovery</td>
<td>Encouraging students to seek and discover new knowledge</td>
</tr>
</tbody>
</table>

Source: Hodge et al. (2007, 3)

See Table 6 p6 for application of Baxter Magolda’s ideas to Miami, Ohio
Linking research and teaching: Line-up

I want you to position yourself on a line according to the extent to which you agree or disagree with the following statements.

Talk to the person next to you about why you have positioned yourself where you have and as a consequence you may need to ‘move’.
Linking research and teaching: Line-up

It is essential that undergraduate students are aware of the research which goes on in their departments

Strongly agree --------------------------------- Strongly disagree
I believe that my teaching and my research are strongly linked

Strongly agree ------------------------------ Strongly disagree
Linking research and teaching: different views

- Topic on linking research and teaching has generated much debate, some of it fairly emotive and polarised (Table 1, p1)
- Many people hold the view that a key characteristic of universities is where research and teaching are brought together
- Some claim that the best researchers are usually the best teachers (e.g. Cooke, 1998)
- Others dispute this claim (e.g. Jenkins, 2000); many refer to examples of excellent researchers who are poor teachers and vice versa
Linking research and teaching: different conceptions of research

<table>
<thead>
<tr>
<th>Research is oriented towards:</th>
<th>Research aims to:</th>
<th>The researcher is present to, or the focus of, awareness</th>
<th>The researcher is absent from, or incidental to, awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External products</strong></td>
<td>Produce an outcome</td>
<td>Trading view</td>
<td>Domino view</td>
</tr>
<tr>
<td><strong>Internal processes</strong></td>
<td>Understand</td>
<td>Journey view</td>
<td>Layer view</td>
</tr>
</tbody>
</table>

Fig. 1. Relationships between conceptions of research.

Source: Brew (2003, 6)
Linking research and teaching: different conceptions of teaching

Information transfer / teacher focused approach

Conceptual change / student focused approach

Prosser and Trigwell (1999)
Linking research and teaching: Conceptual compatibilities

Trading view of research and information transmission approach to teaching

Journey view of research and conceptual change approach to teaching

Trowler and Wareham (2007)
Curriculum design and the research-teaching nexus (based on Healey, 2005, 70)
Different ways of linking R&T: disciplinary and departmental perspectives

A key issue:
How may the linkages between research and teaching be developed to enhance the benefit for student learning?

In pairs each skim read the abstracts for ONE different group of DISCIPLINES (pp.5-26). Discuss whether any of the ideas may be amended for application in your context

5 minutes
## Students experience of learning in a research environment: Physics

<table>
<thead>
<tr>
<th><strong>What is research?</strong></th>
<th>Breaking new ground; moving forward; exploration and discovery</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>How visible is it?</strong></td>
<td>Laboratories and machinery (ie tools) but often behind closed doors</td>
</tr>
<tr>
<td><strong>Where is it located?</strong></td>
<td>Out there; at a higher level</td>
</tr>
<tr>
<td><strong>Who does it?</strong></td>
<td>Lecturers</td>
</tr>
</tbody>
</table>

Source: Robertson and Blackler (2006)
### Students experience of learning in a research environment: Geography

<table>
<thead>
<tr>
<th>What is research?</th>
<th>Gathering information in the world; answering a question</th>
</tr>
</thead>
<tbody>
<tr>
<td>How visible is it?</td>
<td>Most visible in the field</td>
</tr>
<tr>
<td>Where is it located?</td>
<td>Out there in the field</td>
</tr>
<tr>
<td>Who does it?</td>
<td>Lecturers and (increasingly over time) students</td>
</tr>
</tbody>
</table>

Source: Robertson and Blackler (2006)
# Students experience of learning in a research environment: English

<table>
<thead>
<tr>
<th>What is research?</th>
<th>Looking into; gathering; putting it together; a focus of interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>How visible is it?</td>
<td>Not tangibly visible but apparent in the dialogue</td>
</tr>
<tr>
<td>Where is it located?</td>
<td>In the library; in the head</td>
</tr>
<tr>
<td>Who does it?</td>
<td>Lecturers and students</td>
</tr>
</tbody>
</table>

Source: Robertson and Blackler (2006)
Alternative or additional projects, many of which may be employment or community-based, are required to meet the needs of all students regardless of background, discipline or life goals.

http://insight.glos.ac.uk/tli/activities/ntf/creativehops/pages/default.aspx
Developing Creative Honours and Capstone Projects

In groups of **FOUR** identify an example of a capstone project in which *innovative ways* of engaging students in research, inquiry and consultancy are used, especially in projects which are employment and community related.
Different ways of linking R&T: disciplinary and departmental perspectives

A key issue:
How may the linkages between research and teaching be developed to enhance the benefit for student learning?

In pairs each skim read the abstracts for ONE different group of DEPARTMENTS (pp.26-36). Discuss whether any of the ideas may be amended for application in your context

5 minutes
Linking research and teaching: issues in developing R&T nexus

• How much do your u/g students know about the research which goes on in your department?

• What opportunities are there for students to present / publish / celebrate their research?

• Is research-based learning primarily for honours and graduate students?

• Is research-based learning for all students or a highly selected group?
Students’ perceptions of research

A comparison of over 500 final year students’ perceptions of research in three universities CanRI; UKRI; and UKLRRI (Table 5):

• Students agreed that staff being involved in research activities is beneficial

• Students do not perceive the development of their research skills

• Communication is one of the issues that we need to address – language used can exclude
Students’ perceptions of research:

- About three-quarters of the items followed our hypothesis (particularly about the awareness of research)
- Those where the hypothesis did not hold up were mainly in the experiences with doing research, where there were no significant differences
- Regardless of institution, there is the perception amongst students that learning in an inquiry or research-based mode is beneficial
## Students’ awareness of research

<table>
<thead>
<tr>
<th></th>
<th>U of A History Faculty</th>
<th>U of A Student Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research seminars</td>
<td>46%</td>
<td>75%</td>
</tr>
<tr>
<td>Books, articles or other research output</td>
<td>46%</td>
<td>68%</td>
</tr>
<tr>
<td>Notice boards advertising research opportunities</td>
<td>23%</td>
<td>59%</td>
</tr>
<tr>
<td>Existence of Research Centre or Institute</td>
<td>18%</td>
<td>72%</td>
</tr>
<tr>
<td>Areas with national or international reputations</td>
<td>18%</td>
<td>60%</td>
</tr>
<tr>
<td>Faculty are writing for publication</td>
<td>73%</td>
<td>79%</td>
</tr>
<tr>
<td>Faculty are supervising research students</td>
<td>46%</td>
<td>81%</td>
</tr>
<tr>
<td>Faculty are undertaking funded research</td>
<td>36%</td>
<td>77%</td>
</tr>
<tr>
<td>Faculty are supervising UG research assistants</td>
<td>18%</td>
<td>60%</td>
</tr>
</tbody>
</table>
## Students' experiences with research

<table>
<thead>
<tr>
<th>Activity</th>
<th>U of A History Faculty</th>
<th>U of A Student Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff discuss research</td>
<td>96%</td>
<td>85%</td>
</tr>
<tr>
<td>Reading research paper by staff</td>
<td>86%</td>
<td>60%</td>
</tr>
<tr>
<td>Undertaking independent project as part of course</td>
<td>77%</td>
<td>43%</td>
</tr>
<tr>
<td>Undertaking undergraduate dissertations</td>
<td>59%*</td>
<td>7%</td>
</tr>
<tr>
<td>Being subject of research</td>
<td>23%</td>
<td>47%</td>
</tr>
<tr>
<td>Development of research techniques</td>
<td>59%</td>
<td>27%</td>
</tr>
<tr>
<td>Attending research seminar</td>
<td>32%</td>
<td>27%</td>
</tr>
<tr>
<td>Contributing to research project outside of class</td>
<td>14%</td>
<td>17%</td>
</tr>
<tr>
<td>Attending research conference</td>
<td>27%</td>
<td>19%</td>
</tr>
</tbody>
</table>
Strategies for linking research and teaching

At your tables identify ONE possible strategy or practice that you would like to implement in your department / faculty / university.

Be ready in 10 mins for one of you to outline your idea in no more than ONE minute to the rest of us.
Linking research and teaching: Conclusions

• Nature of the linkage between teaching and research is complex and contested
• Barnett (2003: 157) suggests that there are many pressures that are pulling research and teaching apart:

  “The twentieth century saw the university change from a site in which teaching and research stood in a reasonably comfortable relationship with each other to one in which they became mutually antagonistic”
Linking research and teaching: Conclusions

• Adopting a broader definition of research than is currently common is a way forward (Boyer et al.), which should benefit the learning of students in institutions with a range of different missions.

• Putting greater emphasis on actively engaging students with research, suitably adapted to recognise the variation and complexity of constructing knowledge in different disciplines, is one way of re-linking them in the twenty-first century.
If an undergraduate research and inquiry strategy is to become commonplace in higher education generally then the nature of higher education itself will need to be reconceptualised so that staff and students work together in what Brew (2003, 12) calls “academic communities of practice”. This she argues:

“means sharing power and it means being open to challenge” (p.16)

There is a need to do more thinking ‘outside the box’.
Linking discipline-based research and teaching to benefit student learning

THE END

Thank You