Teaching and Research Comments, with References

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At the October meeting of University Council, I made comments about teaching and research as well as comments about the scholarship of teaching and learning. I received a question about references, but forgot having received this question until it was raised again at the November meeting of University Council. At the November meeting, it was suggested that I provide the Teaching and Learning Committee with material to document my comments and support them with references. This brief is intended to serve in that capacity. I’ve limited references to a manageable few rather than the thousands that are available on any particular topic.

There are three main comments I have made repeatedly since arriving, all of which relate to the interactions of teaching and research:

*Teaching and research are not independent – they are flip sides of the same coin.*

This comment stems from a personal observation. Research requires crafting a hypothesis, studying a matter to determine whether that hypothesis is correct, and then communicating the results in some form (book, paper or talk). At universities, the bulk of this work normally is carried out by graduate students and postdoctoral fellows working in partnership with an academic advisor. In essence, the process of doing research is a means of teaching graduate students and postdoctoral fellows how one conducts research of the highest caliber. It is, in my opinion, teaching that is dissimilar to undergraduate or classroom teaching only in that it has a stronger one-to-one relationship. Further, describing the work and its conclusions, an imperative for universities in order to share results with a community of scholars, is a form of teaching as well. It differs from classroom teaching, but the intention is to provide information to anyone interested in the field so that they may learn from the work and build upon it. Thus, research contains many aspects of teaching. Similarly, I note that research is able to inform and influence teaching. Through research on the scholarship of teaching and learning we learn what pedagogical methods are best suited to produce desired learning outcomes. Also, the introduction of new discoveries into classroom material can add a sense of relevance and excitement that engages students.

There is a rich body of literature on the role of engagement in producing desirable student learning outcomes. Indeed, the National Survey of Student Engagement (NSSE) is predicated on the hypothesis that student engagement is a proxy for student learning. A few key papers are the following:


There are also many centers that focus on student learning and engagement, including the Indiana University Center for Postsecondary Research and the Centre for Student Engagement and Learning Innovation at Thompson Rivers University.

**Research methods are related to best teaching practices.**

In 1998 the Boyer Commission on Educating Undergraduates in the Research University produced a report entitled *Reinventing Undergraduate Education: A Blueprint for America’s Research Universities*. This report contains a full review of the literature available and makes the case for changing undergraduate teaching methods to take advantage of research approaches.

While the Boyer Commission report sparked a great deal of conversation about research methods adapted for teaching, the use of pedagogies based on research methods predates this report. The impact of research on undergraduate learning has been studied by Healey and Jenkins (in the UK) more than any other team to date. A key study is M. Healey and A. Jenkins, *Developing Undergraduate Research and Inquiry*, HE Academy, York, 2009.

In particular, Problem-Based Learning (PBL) was developed at a medical school (which one is a matter of some debate) and has become recognized as a best practice in teaching so that students learn. There are thousands of publications on PBL. A few that are useful summaries are the following:

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4. [http://sundog.usask.ca/record=b2261322~S3](http://sundog.usask.ca/record=b2261322~S3).


3. K. Hoffman, M. Hosokawa, R. Blake, Jr., *Problem-based learning outcomes: ten years of experience at the University of Missouri-Columbia School of Medicine*, Academic Medicine, 81(7), 617 (2006).8


In addition to PBL, inquiry approaches and experiential learning are recognized widely as best practices. Again, there are many, many papers on the value of such approaches. A personal favorite summarizing various approaches as they relate to engineering education is the following book: S. D. Sheppard, K. Macatangay, A. Colby, W. M. Sullivan, L. S. Schulman, *Educating Engineers: Designing for the Future of the Field*, Carnegie Foundation for the Advancement of Teaching, Jossey-Bass, San Francisco, CA, 2008.10

**Spending time on research does not compromise teaching quality.**

The intersection between teaching and research is a topic of considerable interest. There are certainly people, myself included, who would like to have evidence that research and teaching are positively correlated. Others argue that teaching and research must be negatively correlated – that time spent on research necessarily means that there is less time available for a focus on high quality teaching. The reality, according to the literature, is that neither view is supported.

There are a very large number of articles on the relationship between teaching and research. Indeed, there are several meta-analyses of the literature on this topic. Among these meta-analyses, one of the best regarded is J. Hattie

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6 http://preview.tinyurl.com/ad5e8gr (this will show the original long URL and redirect you to the OvidSP legacy database; once there, give the document time to load, as it is a scanned version of the original article).


8 http://preview.tinyurl.com/brjyd9d (this will show the original long URL and redirect you to the OvidSP database).

9 http://www.worldcat.org/oclc/45394360.

10 http://sundog.usask.ca/record=b3109156~S8

This analysis showed that there is, at the individual level, neither a positive nor a negative correlation between traditional measures of research excellence and teaching excellence.

A meta-analysis of the many meta-analyses on the teaching and learning can be found in J. Halliwell, *The Nexus of Teaching and Research: Evidence and Insights from the Literature*, HEQCO, Toronto, 2008. This much more recent publication supports the earlier report by Hattie and Marsh.12

There are also a number of studies of student interactions with research and how it changes learning perceptions. The work in this area suggests that students who engage with research perceive an increase in their learning outcomes. However, it is not clear how this relates to the specific question of teaching quality and research quality combining in an individual.

The bottom line at this date seems to be that there is no support for a suggestion that research excellence leads to teaching excellence in an individual; nor that research excellence precludes teaching excellence in a person. From the perspective of U of S, this means that we should not anticipate that our teaching will change for the worse as we push for greater research intensity; it may well change for the better.

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12 [http://sundog.usask.ca/record=b3206675--S8](http://sundog.usask.ca/record=b3206675--S8).