MOVING FORWARD WITH RESEARCH-ENHANCED TEACHING AND LEARNING: PERCEPTIONS OF UNDERGRADUATE STUDENTS AND ACADEMIC STAFF

Contributor: Brad Wuetherick, Program Director, Gwenna Moss Centre for Teaching Effectiveness (University of Alberta, pre 2010)

Biographical Note

Brad is the Program Director for the Gwenna Moss Centre for Teaching Effectiveness at the University of Saskatchewan, having recently moved from several positions at the University of Alberta. His current research interests focus primarily on the integration of research, teaching and learning, including the impact of research-based teaching and learning on the undergraduate learning environment and the perceptions and experiences of the teaching-research nexus among academic staff. Brad is also involved in several projects related to the role of academic development, the scholarship of teaching and learning, and the use of technology in teaching. Brad has published and presented extensively on these research areas at conferences across Canada, the US, the UK and Australia.

I will discuss four different components in my presentation today: the first is how we might conceptualise the integration of research, teaching and learning. The second and third points relate to student and staff perceptions of how we integrate research, teaching and learning, and the fourth is the influence of practice and policy on how we move forward.

Introduction to the Session

1. Conceptualizing the integration of research, teaching and learning
2. Student perceptions and experiences of research in the learning environment
3. Staff perceptions and experiences of research in the learning environment
4. Influencing practice and policy

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To begin, I will refer to influential quotations that have informed my own work. It is interesting that it has been almost twenty years since Boyer said that it's been a tired old debate of teaching versus research, and if twenty years ago it was tired and old, it must be archaic and dead now. The issue of teaching versus research, however, still comes up regularly regardless of department, institution, or national system. We even heard it yesterday from one of the research council panellists, - that 'we are the research councils and we do not have a mandate at all for education' - so research and teaching are considered completely separate. That is one of the challenges that we need to overcome in order to move forward with research-enhanced teaching and learning. I also firmly agree with Ellis (2006) that every student should have opportunities to engage in research and to create knowledge while they are in their undergraduate programmes.

Introduction to the Session

"The time has come to move beyond the tired old teaching versus research debate."
Boyer (1990)

"I propose that colleges and universities provide an opportunity for all undergraduates to conduct research"
(Ellis 2006)

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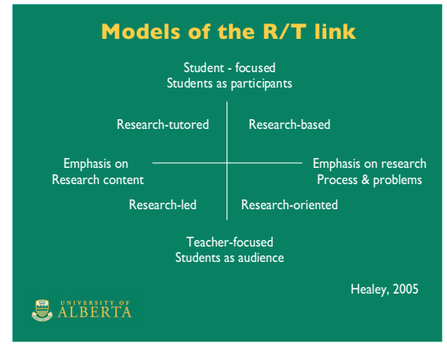
It has been over ten years since Hattie and Marsh did a meta-analysis of fifty-three different studies that looked at traditional measures of teaching excellence (primarily student evaluations of teaching) and research excellence (primarily publication rates and citation indices) and determined that there is essentially no correlation. So it is not good enough to say 'the best researchers are the

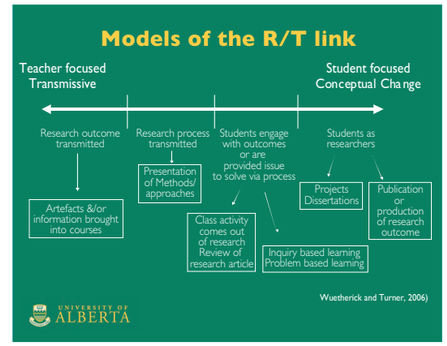
best teachers' or that you need to be a good researcher in order to be a good teacher, which is a comment that we heard yesterday from one of the panellists. The research has instead shown that we have to think actively about how we bring teaching and research together. In other words, how do we structure an educational environment that actively brings research and teaching together in the learning environment? Hattie, speaking at a conference in the UK a couple of years ago, was surprised at how much his study had been used to justify the separation of funding for research and for teaching. This is antithetical to their conclusion that we need to find ways to actively bring these things together.

The ease with which we bring research and teaching together varies greatly and reflects how different people conceptualise research. Much research has shown that if you believe scholarship to be truly just discovery disciplinary research, and if you think of research as being the creation of knowledge that is new, then it is more difficult to imagine how undergraduate students might be involved. Whereas if you have a conception of scholarship and a conception of research that is more like Boyer's four scholarships – discovery, integration, application, and teaching – then it is easier to think about how students can be involved. Conceptions of teaching are also important. There has been a lot of work carried out on teacher-centred versus student-centred approaches to learning, and the place of power between these two approaches. In particular, the distinction has been between a teacher-centred approach, where the power is with the instructor as the teaching expert, versus a student-centred approach, where the power is held by the student and the student drives the learning forward.

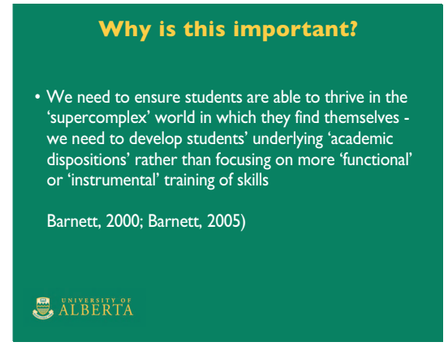
There is also some work that shows that there are important variations in integration that depend on the type of institution. Research-intensive institutions have different challenges to teaching-intensive institutions. There is also a lot of variability by discipline and department. Evidence shows that the ease of integrating research and teaching is influenced by whether a discipline is low-consensus or high-consensus. The Higher Education Academy UK guides by Healey and Jenkins (2005, 2007) discuss how different disciplinary cultures impact on the way of conceptualising the linking of research and teaching. National systems impact on the ease of linking research and teaching. For example, in North America there is a long history of research councils funding undergraduate research and facilitating undergraduates to be actively engaged as research assistants with academic staff. Contrast that example with national systems (e.g. in Australia or the UK) where academic staff are not allowed to add undergraduate research assistants to research grants submitted to the research councils.

This slide shows Healey's (2005) model of how links between research and teaching can be conceptualised. I quite like what he has done with this conceptual model, except for a small concern in one quadrant: research-tutored. The emphasis with research-tutored is on both the research content and being student focused. The example he used in talking about this quadrant was the 'Oxbridge' tutorial model (pairing students one-on-one or two-on-one with an academic staff member), which in reality no other institution can replicate. So it is difficult to think sometimes about an aspect of the model where only a few institutions in the world can use that type of activity (though it is important to acknowledge that recent attempts have been made to explore other examples for this quadrant in HEA publications, as well as in some research emerging from the Netherlands). But the other three quadrants are key to how we conceptualise the integration of research and teaching. 'Research-led' refers to the content of your research or the research of others informing the classroom lecture materials; 'research-oriented' refers to teaching students about the process/methodologies of research; and 'research-based' refers to students actually being engaged in enquiry learning. One of the other ways of conceptualising research-teaching linkages that Healey does not include in this model is the scholarship of teaching and learning.



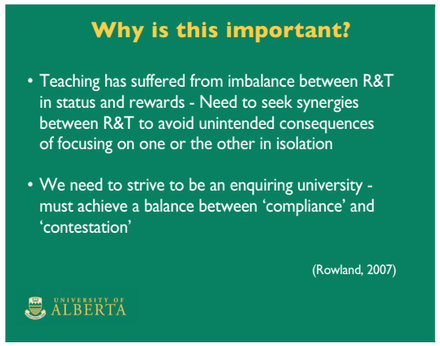


Nancy Turner (RHUL, now at University of the Arts, London) and I came up with a similar way of thinking about this issue. This was developed based on the results of qualitative comments on a student survey that we carried out at both institutions. Interestingly we came up with the same type of conceptual categories. The students themselves identified research outcomes being transmitted in the classroom; they identified research process being transmitted to them (many of them made quite tongue-and-cheek comments about the fact that they learned research methods by sitting in lecture halls); they identified engaging with the outcomes of research or research processes, including enquiry-based learning or problem-based learning; and lastly they identified students as researchers. Healey (2005), however, would combine the latter two under research-based learning in his model. We purposely separated them because the students themselves seemed to distinguish between using the research process to explore a topic that had already been researched in the discipline, compared to them working on the discovery of new knowledge.



Why is the integration of research and teaching important? One reason is that we are preparing students to move forward into what Ron Barnett (2000, 2005) has called a *"supercomplex"* society. So we are moving to a point where it is not good enough to produce graduates that are only experts in their discipline. They have to understand how to move forward in an interdisciplinary sense, recognising that there are multiple perspectives and ways of knowing, and multiple ways to solve problems. In other words, they will need to succeed in addressing the 'great

issues of the day'. Barnett argues that we require *"not that students become masters of bodies of thought, but that they are enabled to begin to experience a space and challenge of open critical enquiry"*. In order to succeed in preparing our students for those challenges, he argues that we need to focus on developing students' underlying academic dispositions - what Bourdieu called the *"habitus"*. Habitus is defined as the set of dispositions distinguishing one group of people from another; in other words the ways in which students understand the world, knowledge, learning as based on their discipline, rather than focusing on instrumental or functional training of skills. What Barnett and others argue in favour of is an enquiry learning environment to enable students to develop these conceptions of themselves as learners, of the nature of knowledge, and of the world.

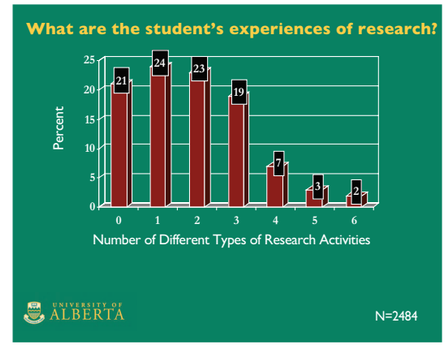


It is important to acknowledge here that there has been an historical imbalance between teaching and research, creating a status issue. The integration of research and teaching allows synergies between the two to be recognised and the avoidance of the unintended consequences of focusing exclusively on one or the other.
There are many cases - the Boyer Commission in the United States being an example - where students are promised access to researchers if they come to university; then they spend their four years in an undergraduate programme and rarely encounter researchers in the classroom, primarily because individual researchers avoid teaching entirely or only teach postgraduates. It is critical that we keep this type of unintended consequence in mind.

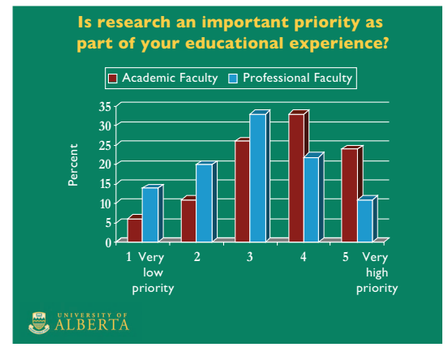
It is also important to think about how to become an enquiring university. Rowland (2007) describes a critical component of what we ought to be doing - we should inspire *"both a love of learning and a love of our discipline"* in the students with whom we interact; we should learn disciplinary norms and ways of thinking and practicing (an aspect of what Rowland called *"compliance"*); and we ought to learn to challenge the frontiers of knowledge in our discipline (an aspect of what Rowland called *"contestation"*). If you think about what made you love your own discipline and encouraged you to continue learning at the postgraduate level, the chances are that it was as a result of being involved in exploring your discipline, which raises the question about how we replicate that with our students.

My institution – which is a top-tier research university - is co-located with several teaching-only institutions that do not have graduate programmes or established research records. Students and media, and in particular public relations campaigns by the other institutions, have been questioning why students would want to attend a research university. They perpetuate the stereotype that research universities are impersonal and that students cannot interact with staff. Our institution has thrown down the gauntlet rather provocatively to say that learning in a research-intensive environment ought to be qualitatively different than learning in a non-research-intensive environment. We have been explicit that students themselves are our primary vehicles for taking the University of Alberta's research and scholarship into our local, national and international communities. I would not necessarily say our institution has thought through exactly what this means yet but it is an interesting challenge, forcing people to think about the question: 'Why would you want to learn in a research-intensive institution like the University of Alberta rather than going across the river to Grant MacEwan University?' (one of our teaching-only institutional neighbours located just across the river). The answer to that question should not be: 'We, at the University of Alberta, have larger classes than they do'. Unfortunately, in some cases, that is the answer that people have actually given to this question. But the reality is that the University of Alberta has capital infrastructure that the other institution is never going to replicate. The University of Alberta has people who are internationally renowned, and who should be in front of students inspiring them to be, as one example, the next postgraduate students. The question remains: how do we actually ensure that learning in a research-intensive environment matters? How do we ensure students experience the people and infrastructure that comes with a research-intensive environment? How do we structure that experience effectively?

We at the University of Alberta, in trying to answer some of these questions, felt it important to discover what our students' perceptions were of what we do. We undertook three separate studies; two of our studies were undertaken in collaboration with our Students' Union, who were equal partners in the research process. They helped develop questions and assisted in crafting the study itself. Having undergraduate students participate in this research was an interesting process.



The first study we did (which was a paper-based survey distributed in specifically targeted classes) had 2,484 students respondents. It was balanced across all four years of undergraduate study and responses were proportional to the size of each faculty. In that study, 31% of respondents had three or more research experiences. Questions included: have you had professors talk about their own research in their class? have you had a research methodology course? have you had opportunities to engage in enquiry learning or to do an independent project? have you actually presented at an undergraduate research conference? have you been an undergraduate research assistant? There were several students who reported no research experiences; however, as students progressed with their studies (from year one to year four) the reported number of experiences increased significantly. So final year students were more likely to have several experiences compared to first year students.



However when we asked: is research a priority for you as part of your education?, generally, the responses were fairly neutral. When we looked at the data by faculty or discipline, we found that in the faculties of Arts and Science for example, students were significantly more likely to say that research was a priority than the professional schools were. So Engineering, Education, Nursing, Pharmacy were significantly more likely to say, 'No, research is not important; it is the actual practical skills of how I

engage as a professional that are important'.

In the second survey which was emailed to a random student sample, distributed across years of study and degree program (collecting over 1200 responses) we asked 'from your perspective, what were the overall priorities for your education in terms of a quality education?' The top two responses were good teachers, or instructors who care about student learning. The next two responses had an explicit career focus. When considering 'the opportunity to do research', 44% of respondents said that was an important priority for them.

What are the most important priorities in a quality education?

Instructors who are good teachers	98%
Instructors who care about students' learning	95%
Degree program prepares you for a future career	92%
Individual classes are relevant to your future career	92%

Research-related items:

Opportunities to do research	44%
Being taught primarily by tenure-track faculty	36%

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N=1304

As we looked at those people who said research was a high priority in comparison to those who did not, an interesting trend develops. Research-oriented students were more likely to think that the items relating to student engagement were of importance to them. They were more likely to assign importance, in terms of the learning environment, to extra-curricular activities, the reputation of the university, and the quality of educational and classroom experiences. Thus if we could raise student awareness about research as part of their learning environment, it might have an impact on their overall quality of experience.

The Research-Oriented Student: A Profile

- Students who perceived research as higher priority in quality education significantly more likely to be:
  - Age 18-21, >30
  - Non-transfer
  - Urban origin
  - Enrolled in academic faculties (Arts, Science)
  - Enrolled in academic specialized programs (i.e., honours or specialization)

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In terms of the demographics of our students, the ones who are more likely to say research was important were aged between eighteen and twenty-one, or over thirty. So students returning to university after a number of years, or those straight out of secondary school, were more likely to think research opportunities were important than students between twenty-two to twenty-nine where the credential or career connection was most important. Students for whom research was a priority were more likely to be non-transferring. Many Canadian community colleges offer one or two years of study followed by the possibility of transfer into other universities. Students who took that route into university were less likely to think that research was important. So, again people that came straight to us out of high school were more likely to think research was important. Urban location appears to be a factor. For example, respondents from Edmonton who had repeatedly seen local press reports about research at the university tended to be more supportive of research being an important part of their learning environment.

The third study we did was in conjunction with Royal Holloway and the University of Gloucestershire in the UK where we surveyed final year students to see how we compared in relation to these institutions. On the whole the students at the more research-intensive institutions –Alberta and Royal Holloway – were far more likely to be aware of research on campus and to have experienced research, than an undergraduate focused institution – Gloucestershire. They were also more likely to recognise both the positive and negative impacts that academic staff engaging in research had on their learning environment.

Very few respondents from all three institutions reported experiences of developing research techniques over the course of their studies. This was a troubling finding at the University of Alberta. As a follow up to this result, we carried out an evaluation of all our undergraduate degree programs. This evaluation showed that every undergraduate degree programme on campus had a research methods course, and that those research methods courses were usually taken in second or third year, yet the respondents still did not report the development of research techniques.

Our survey showed that more undergraduate students in the University of Alberta are engaged as researchers (particularly on nationally funded summer research assistantships) than in the participating UK universities. We also facilitate a lot more undergraduate research conferences in Alberta where students get a chance to present or publish their own research.

As part of our joint project, we also explored whether students agreed or disagreed with certain types of statements. We found that students at the University of Alberta were significantly more likely to agree that instructors not involved in research spend more time helping students. But interestingly, in all three institutions, students felt that instructors involved in research are more enthusiastic about the subject, regardless of type of institution. In all three institutions students reported that they learned best when undertaking their own research project and the most effective teaching is when students are involved in the research process.

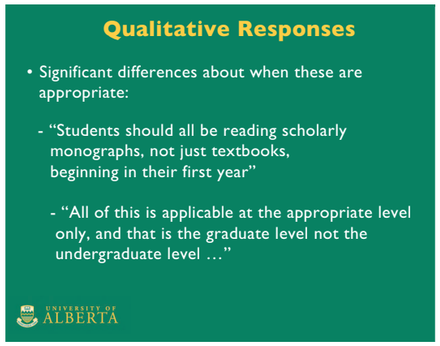
As we progressed with this project, I presented it to a number of different departments at the University of Alberta. Academic staff responded in ways that would suggest a disconnect between what staff thought students were experiencing versus what the students reported. We surveyed some of our academic staff to ask 'What do you think the students are experiencing?', which we then compared to the students from those same departments. We began to realise that staff were more likely to think that students underestimated the research awareness on our campus (Table 1).

Table 1: Staff Perception of Students' Awareness of Research

	U of A Staff	U of A Students
Research seminars	46%	75%
Books, articles or other research output	46%	68%
Notice boards advertising research opportunities	23%	59%
Existence of Research Centre or Institute	18%	72%
Areas with national or international reputations	18%	60%
Faculty are writing for publication	73%	79%
Faculty are supervising research students	46%	81%
Faculty are undertaking funded research	36%	77%

They, in turn, overestimated the experiences that students were having with research. When asked what the typical fourth (or final) year student had experienced, staff were also more likely to overestimate the positive impact of research that students would report and were more likely to underestimate the negative impact of research.

We asked for qualitative responses as part of the study and academic staff reported some really innovative things that they were doing in the classroom to integrate teaching and research. But arguably, when they submitted comments about this, they were still thinking in a more transmissive teacher-centred way. When asked about the most important way in which they conceptualise teaching and research, over half the respondents said that 'Research informs my teaching materials'. Less than 10% reported that 'students engaged as researchers' was the way to think about this.



Some comments were of a more negative nature regarding the link between research and teaching:

> *"Research need not distort a class but it has that potential. Often the problem is one of time – publishing priorities come before class time."*

> *"I am not sure what the 'link' intended is, but what I research is too esoteric to have much influence on undergraduate teaching. They are not in a position to understand."*

The theme attracting the most comments– the core purpose of higher education – shows that staff view universities as fundamentally about both teaching and research. The University of Alberta has started to describe itself as a teaching and research intensive university and that the education students receive ought to reflect that.

A few secondary themes emerged from the qualitative responses, which included the importance of academic staff as research-active:

> *"Only research-active scholars can communicate the most recent results of research along with practical knowledge of how to do research. Scholars who do not pursue scholarship/research themselves or at least keep up with their fields in an active way will soon be teaching in a way that reflects a past version of the discipline …"*

I do know, anecdotally, that there are people who would not be considered research-active in a traditional discovery-research sense, who keep more up-to-date with the current literature in their field than do some of the research-active staff who are focused on a really narrow field. So it is important to think about how 'research-active' is defined. The research assessment exercise in the UK, for example, has imposed a definition of what research-active is that creates problems about how we then think about the integration of research and teaching.

Another secondary theme that emerged related to student progression to postgraduate studies. This has been emphasised on many research-intensive campuses; a focus on research as part of the teaching and learning environment at the undergraduate level helps meet institutional aspirations in the area of postgraduate study, including an awareness of what research does and does not do, and the importance of developing a research ethic in our students in order to prepare them for advanced study.

I turn finally to policy and practice in the integration of research and teaching. It is important to remember that one size does not fit all at every institution, or in every discipline, or in every national context. It is important to consider a particular context when moving forward; there are policy levers at all levels that can significantly influence individual academic practice and the experiences of undergraduate students.

Here are some examples of different policy levers at the national level that can influence practice in the area of research-based or research-enhanced teaching and learning. Undergraduate Quality Assurance is one of the areas that can negatively impact the integration of research, teaching and learning probably more easily than it can positively impact it; however how this is framed is important. For example, the Scottish Quality Assurance Agency frames undergraduate quality assurance conversation in a way that allows thinking about research-enhanced teaching and learning in the context of developing students' graduate attributes. That framework seems to be really positive in terms of how we might move forward. National opportunities, rather than just institutional or departmental opportunities, for undergraduates to be involved in research activities are also important. For example, undergraduate research journals are becoming more common. We should not underestimate the importance of facilitating conversations between academic staff, university administrators, and policy makers at the national level.

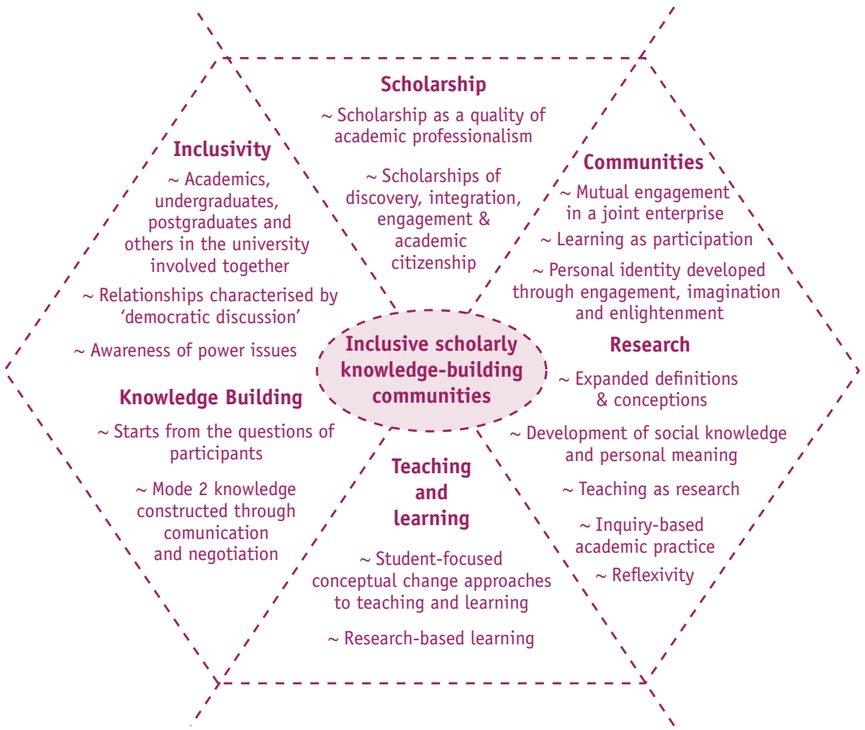
The staff evaluation processes are also relevant, and the Centre for Teaching and Learning at each institution can facilitate institutional conversations in this area. In particular, graduate certificate programs for postgraduate students or new faculty should include aspects of research-enhanced teaching and learning as key components in their programs.

Removing potential policy barriers is important, and this is one of the areas at the University of Alberta that had the most impact on practice. We used to have a lot of examples where the Human and Animal Research Ethics Boards were so slow in getting approvals that if an instructor wanted to do a research project with their students, by the time they got approval the semester was over. We purposely built-in a research ethics model that allows the instructor to apply for a blanket ethics approval before the semester begins and students can submit an ethics proposal for assessment. Since the instructor already received blanket approval for the class s/he can progress with the project, using a simplified ethics process as a learning tool. We also found several of our research policies had defined who was allowed to be a scholar on our campus. Undergraduate students were never part of that definition so we have attempted to broaden the definition of 'scholar'. For example, undergraduate students were not allowed to submit their own ethics for approval on our campus. If they wanted to do a study on their own it had to go through an academic staff member. Now students are allowed to propose their own ethical statements.

A small amount of money can significantly provide an incentive for people to do things to integrate research and teaching. Our university is actually taking this a step further. Every year we have CAD $800,000 that we give out in research-enhanced teaching and learning grants to support faculty members who are doing innovative projects related to research-enhanced teaching and learning. The grants range in size from CAD $20,000 to CAD $250,000 (with the larger grants spanning two or three years). To put this in perspective, the University of Alberta grants are potentially larger than the Canadian Research Council grants for educational research projects. Most importantly we began to celebrate the undergraduate research and communicating the achievements to broader audiences.

I wanted to end with a discussion about what Angela Brew calls *"Inclusive Scholarly Knowledge-building Communities"* (Figure 1).

Figure 1: Inclusive Scholarly Knowledge-Building Communities (Brew, 2006)



If we begin to think about how we progress with the integration of research and teaching, and the creation of an environment where students are considered partners in the scholarly community, and if we are inclusive about allowing students to be part of what we are doing in research, then we begin to create a different type of learning environment. There are few cases where this has been implemented effectively, but if we can start to think about creating a more inclusive, scholarly community, from first year undergraduate students through to senior professors, then we will have reached where we want to go in terms of research-enhanced teaching and learning (or at least be well on the way to getting there).

I will end with a quotation from our university president at the University of Alberta about involving students in discovery. If this is truly the type of learning environment that we create for our students, then we will have been successful at integrating research and teaching across our campus.

Inclusive, scholarly knowledge-building community

- To implement an inclusive, knowledge-building scholarly community we need to engage at the level of programs to plan appropriate in-class curriculum and out-of class learning opportunities
- Need to get away from an isolated, individual approach to teaching
- Most importantly, we need to ensure that the policy framework and the faculty evaluation framework facilitate, support, and reward these activities

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> *"We must integrate discovery into all aspects of learning. The "Great University" of the twenty-first century must involve students in exploring our grand challenges. … Our students, graduate and undergraduate, must acquire a capacity for creativity and social ingenuity by tackling questions like these. …. For while it is true that intellectual mastery begins with the rigorous exploration of a subject in the classroom, it must be extended in the laboratories of life through research projects and internships throughout the world"* (Samarasekera, 2005).

This challenge is something that society needs universities to take up. Thank you for inviting me to be here, and congratulations on a great conference.