

**Southern Region Academic Programs and
Experiment Station Directors Joint Meeting**

Atlanta, GA

September 18-19, 2012

An Academic Perspective of the Teaching-Research Nexus

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I am pleased to provide some brief comments on the interrelationships between teaching and research or what has been termed in the literature as the “Teaching-Research Nexus.” This past spring the University of Georgia devoted its annual faculty symposium to this particular topic. The proceedings of that symposium and many of the comments I will make in my presentation can be found at <http://teachingacademy.uga.edu/2012-academic-affairs-faculty-symposium/>. Perhaps, the most striking feature of the symposium was an open conversation between our vice-president for research, vice president for instruction and our provost.

The essence of the symposium and my comments today will address the Teaching-Research Nexus or how can research universities build more effective bridges between research and the teaching and learning process. I know this sound like a luxury car or fancy shampoo, but there is more. The term Nexus derives from the Latin term **nectere**, which means **to bind**. Other definitions include:

- *an important connection between the parts of a system or a group of things*
- *a means of connection; tie; link*
- *a connected series or group*
- *the core or center, as of a matter or situation*
- *a specialized area of the cell membrane involved in intercellular communication and adhesion*

For this meeting the question we are asking is, “How can our very best teachers and researchers work together to advance the mission of our colleges and universities.” Our first task is to explore and move beyond the construct that we often hear on our research campuses: the Teaching - Research dilemma. Or, that teaching and research are mutually exclusive and that we are involved in a zero-sum game. Clearly, academic resources are limited and we face academic trade-offs. Instead of pitting one activity against the other, we should explore areas where teaching can benefit from good research and where research can benefit from good teaching. At the college level, how can we better integrate or translate our research activities into the teaching-learning process. At the university level, what can our colleges offer and add value to the students’ education that is unique to our colleges. At the industry level, how can we use research to add value to our undergraduate and graduate degrees. Some of these topics will be examined in more detail later in our meeting but I wanted to provide a broader context for the Teaching-Research Nexus.

As former graduate students, many of us were inspired by or attracted to university life because of a particular class or a professor that impacted our lives. Many of us were drawn to the teaching mission of the university. We soon discover that teaching is but one part of a research university and while one of the most important parts, we must balance our professional

activities across several missions of the university, teaching, research, service and others. Very quickly, we discover that these activities compete for our time and we gravitate toward the activity that gives us the greatest chances of survival. Often, this means an emphasis on research and away from teaching. Yet in the process of segmenting research from teaching, is something lost in the process? In the context of this introduction, I would like to focus on the Teaching-Research Nexus for our respective colleges of agricultural and related sciences. In particular, I would like to address some of the unique challenges and opportunities associated with our colleges

1. The importance of research to the land-grant mission

Question: If we did not have experiments today, would we invest in them? Probably not. The capital outlays for building experiment stations today would be prohibitive. And yet, we have, perhaps, the best system of applied research sites and facilities, anywhere in the world. The challenge, of course, is that they are expensive to maintain, lack reliable revenue streams and are not well-understood by the larger university or by our increasing urban politicians. The non-proprietary or the public goods nature of our research creates special problems for funding. Some would argue that this funding mechanism, inevitably leads to under-investments and funding of agricultural research and education to the detriment of the larger society.

Still, the advances in agricultural research and the contributions to the economic prosperity and quality of life cannot be denied. Experiment stations and their capacity for conducting applied research has been and will continue to be one of the jewels in the land-grant model. As an academic dean, I value the importance of research within the larger land-grant mission and its contributions to the teaching mission.

2. The value of experiment station research in teaching (undergraduates and graduates).

No where on the land-grant campus is the teaching-research nexus more viable than in college of agriculture and related sciences. Faculty have joint appointments in teaching and research (service). For the most part, the research appointments are in the experiment station which, I believe, is distinct from having an academic research appointment. Faculty are engaged in research which can be used to support their teaching efforts. Or, as David Lee, our Vice President for Instruction, describes as research-informed instruction. While not all researchers are good teachers, the researcher that can share his/her enthusiasm and intellectual curiosity with students can be a tremendous asset to our teaching programs.

Research-informed teaching and the opportunity for our students to work on our experiment stations benefit both undergraduate and graduate students. At the undergraduate level, research adds value to the educational experience that motivates and prepares students for advanced education (graduate or professional). Prospective employers value applied research that teaches essential skills such as project planning, time management, critical thinking and communication. Researchers can have a tremendous influence on our undergraduates and their career aspirations. In this regard, I am impressed by the creativity that many of our researchers and the opportunities they bring to the classroom. In particular, our junior level class in poultry science that allows undergraduates to perform surgery on chickens.

At the graduate level, students are more fully integrated into experiment station research as graduate research assistants. We are fortunate at UGA to have an abundance of state funded assistantships that allow a level of academic freedom and discovery that may not be the case of grant funded research. In working with graduate students, I suspect that many do not have exposure or appreciation of the larger land grant mission. I believe it is important for graduate students at our institutions to have teaching experience and the opportunity for service learning. With this in mind, we found evidence that graduate students often receive teacher ratings equal to that of faculty. Where faculty may have more teaching experience, graduate students often have more enthusiasm for teaching.

Yet, there is often resistance to pull graduate students away from their research activities to assist in teaching. Major professors view this as a loss in research productivity, while undergraduates and parents, view graduate students as apprentice teachers. Still, research by Feldon, et. al. found that graduate teaching experiences improve their methodological research skills. In other words, the skills acquired in teaching compliment the research efforts. This suggests that graduate teaching opportunities may enhance the overall productivity of the experiment station.

3. The growth of societal impact statements in grant proposals

Research-informed teaching has implications for research grants and extra-mural funding. Until recently, the teaching mission was unique to state funded education. Increasingly, grant funded research has taken on a larger educational imperative. Grants applications to the National Science Foundation (NSF), National Institutes of Health (NIH) and the Howard Hugh Medical Institute (HHMI) require broader societal impact statements. These impact statements were summarized by David Lee as follows (p. 4):

Among the NSF's Broader Impacts criteria that applicants must address are:

- *How well does the proposed activity advance discovery and understanding while promoting teaching, training and learning?*
- *To what extent will the proposed activity enhance the infrastructure for research AND education, such as facilities, instrumentation, networks and partnerships?*

Examples of activities that address NSF's Broader Impacts criteria include

- *Helping to integrate research activities into the teaching of science, math and engineering at ALL educational levels, from kindergarten through graduate school, and at the college level for both undergraduate science and non-science majors.*
- *Engaging students as participants in the proposed activities as appropriate*
- *Developing research-based educational material or contributing to databases useful in kindergarten through college teaching.*

In my experience, our top researchers are not well-versed in designing and incorporating Broader Impacts activities into their research proposals. Here is where the academic deans can offer assistance to research directors. We can assist in designing and developing research and service learning activities and experiences for undergraduates and pre-collegiate students. At

UGA, we use our Young Scholars Program and our Emerging Scholars Program to provide summer research experiences for prospective undergraduate and graduate students.

4. Regional opportunities for graduate education.

The Teaching-Research Nexus that benefits from experiment station research, also suffers with cuts in research budgets. Researchers with teaching appointments play a vital role in our undergraduate and graduate teaching programs. As their ranks are reduced, the remaining teaching funds are inadequate to fill the faculty ranks. Consequently, our capacity to train graduate students in our respective disciplines is severely diminished. In response to this trend, several of our southern institutions established AG*IDEA, or the Agricultural Interactive Distance Education Alliance. This effort was made possible with a Higher Education Challenge Grant to the University of Georgia, NC State and Auburn.

AG*IDEA was designed to expand graduate programs and courses from the institutional setting to the region, if not the nation. Modeled after the Great Plains IDEA and the Human Sciences, AG*IDEA served to address the fire-walls and silos that exist between state lines. While research and researchers are not limited by state lines, teachers operate within such confines. Teachers and students must deal with in-state and out-of-state tuition, transcripts, transfer credits, accreditation issues and State Authorization and Title IX issues. Ironically, the recognition and respect that is afforded researchers across state lines is not recognized when that same researcher elects to teach students across state lines. The levels of faculty and program credentialing can be overwhelming and serve as a disincentive to inter-regional collaboration on teaching. AG*IDEA was developed to meet these challenges and to develop the concept of an inter-regional university that mirrors disciplinary expertise.

I believe that AG*IDEA is a great concept and a great platform for our colleges entering into on-line education. Despite its potential, AG*IDEA is a new concept and is not readily understood or accepted by faculty, administrators and regulators of higher education. Just this past week, a group of southern academic deans (myself, Ken Esbenshade, Paul Patterson and Ted Whitwell) meet with the SACSCOC President, Belle Wheelan and her staff to discuss faculty credentialing and re-accreditation issues. While we made some progress in recognizing faculty credentials across state lines, challenges for re-accreditation remain. I understand there are but two buckets for which course work is classified: transcribed courses (taken at the institution) and transferred courses (taken at another institution). Currently, there are no provisions for on-line or hybrid courses that blend the expertise of instructors across institutions or state lines. Feudalism in higher education, prevails.

5. Core mission issues and credit hour generation

From my perspective as an academic dean and my experience at UGA, I have noticed the definition of the University's core mission shifts with the budget climate. As university budgets are cut, the core mission tends to narrow to resident instruction on the central campus. Hence, teaching programs are seen as essential and other land grant missions are secondary. While Extension or public service have been the first to be cut and the hardest hit, research that does not include instruction has been second on the hit list. This has been contrary to the Teaching-

Research Nexus in our colleges. That is, researchers play a strategic role in our teaching programs. In our last and pending rounds of budget cuts, the Provost indicated cuts should be directed at those activities that do not harm students. All other activities were subject to cuts.

From a strategic planning perspective, experiment stations should explore ways to better integrate their research into the university's teaching mission. In addition to publications, grants and contracts, research programs are being means-tested by their contribution to teaching, credit hour generation, graduation rates, time to graduation and minimum class sizes and numbers of majors.

6. Conclusions

The Teaching-Research Nexus is alive and well in our colleges of agriculture and related sciences. We have the capacity for research-informed instruction that rivals all other colleges on our campuses and across institutions of higher education. Still, the experiment stations that have been the comparative advantage of our teaching programs have been expensive to maintain and not always appreciated by those that benefit from our research and teaching. The potential for inter-regional collaboration in teaching can greatly increase our capacity to train graduate students to maintain research capacity in the face of diminished resources. While tuition funds may not be accessible or sufficient to support our experiment stations, we need to better integrate our research efforts into the teaching mission of our universities. I believe the integration of teaching and research and its implications for undergraduate and graduate education are worthy of a national conversation by our academic deans and experiment station directors.

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