

# Brigham Young University



## *A Learning Environment at BYU*

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When I began my undergraduate engineering studies at BYU nearly thirty years ago I had a teacher who many students agreed was one of the best in the department. His courses were both interesting and challenging. This man was, by nature, rather shy—so shy in fact that my contemporaries and I wondered why he would ever pursue a teaching position. Indeed, he might be quite embarrassed if he knew I was talking about him today. His lectures would probably not be characterized as dynamic or even entertaining. He was not particularly engaging personally outside of the classroom. However, he had the ability to capture my interest in class, making the material relevant. We students found ourselves asking questions both in and out of class, relating what was learned to the world. His examinations always included questions that tested students' ability to apply the material learned to new situations, new scenarios.

In the years since those classes I have drawn some conclusions as to why this man's classes were so memorable. He was such an able teacher because he was continually teaching himself. He was engaged in research before that was the norm in the department. He familiarized himself with the latest instrumentation and the latest experimental and analytical techniques. I remember vividly his purchase of one of the

first programmable calculators on the market. He was like a schoolboy with a new toy. I witnessed repeatedly his delight for new knowledge after I returned from my graduate study, joined the faculty in the department, and had the opportunity to collaborate with him. Even as he drew near retirement, he never stopped studying, reading, analyzing. His appetite went beyond engineering, where he found interest in astronomy, botany, and music. His personality was characterized by curiosity and fascination with everything around him. He delighted to the point of giddiness in new insights or observations. This is true even now, years after his retirement. My conclusion is that this man was a great teacher because he was himself a passionate *learner*. He was able to share with students both his knowledge and his enthusiasm for learning.

As depicted in Fig. 1, there exists a tension between research and teaching at most large universities. The model for faculty attention is viewed by some to be a coin. When the teaching side is up, the research side is down, and vice versa. One often envisions faculty with strong dedication to teaching thronged by stu-

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*Brent W. Webb was associate academic vice president - research & graduate studies when this address was delivered at the BYU Annual University Conference faculty session on 23 August 2005.*



Figure 1. Classical tension between research and teaching. (Original artwork by Gary R. Hooper)

dents after class, in their office, on campus, and in the cafeteria. By contrast, in our mind's eye we see the stereotypical research faculty member retreating from students, hiding in the lab, the studio, or the library. One side of the teaching versus research coin or the other may take center stage depending upon the university, and the interests and needs of its sponsors and stakeholders. Following this model the two sides may compete for equipment, facilities, personnel, resources, etc. The associated conflict in managing time devoted to teaching and research gives rise to the classic faculty lament, "This would be a pretty good place if it weren't for the students." Of course, these words are never uttered here. One often hears categorizations of institutions as either "teaching universities" or "research universities." At BYU we are guided by our mission statement and counsel from the Board of Trustees. We have the task of both responding to a charge to be centered upon undergraduate students and including significant scholarly work in our efforts. We have evolved in a unique way to accomplish this. We lack words to fully explain what we are but "student-focused" helps. We will never retreat from the focus as an institution where the education of students is our highest priority. Given our unique approach, however, perhaps we might see ourselves more as a "learning university." All of our faculty activity is centered on creating an environment where student learning is principal, where an exceptionally well-qualified studentbody is stretched academically beyond what might happen elsewhere. In prin-

ciple, as the faculty embrace impassioned learning, our students will be inspired to do the same. In practice, the scholarly work driven by our appetite for learning provides structure for students to be involved. Research and creative activity thus become integral to such a learning environment, as students partner with faculty in exploring and defining the state-of-the-art in their respective disciplines. There may continue to be a tension in how we spend our time, but our guiding principles will help us appropriately manage our day-to-day activities if our focus is on learning in which students are central. The competition between teaching and scholarly work is thus for the hours in our day, but not for our hearts.

Building BYU as a learning environment is consistent with our mission. In our formal classroom teaching and our scholarly pursuits our focus is on students. In our research endeavors, it might be said that our primary product is our people, not our papers. In saying this, I do not discount the value of the products of our scholarship. The research and creative work of our faculty has bettered the lives of many. This marriage between new discovery and student education lies at the core of our institutional objectives, the second of which is to "Advance truth and knowledge to enhance the education of students, enrich the quality of life and contribute to a resolution of world problems." We have the mandate to engage in scholarly activity that makes a difference, in such a way that the next generation of scholars participates.

Besides my anecdotal experience as an undergraduate student related earlier, there is hard evidence suggesting that faculty who are passionate learners themselves communicate and inspire the same ideal in the classroom. In short, there is a clear correlation between excellence in scholarship and excellence in teaching. Each year the university recognizes outstanding scholarly activity in its faculty through the Maeser Research and Creative Arts Award. If one subscribes to the two-sided coin model of activity, the faculty so recognized for superior research might be expected to be less dedicated to their teaching. However, the data suggest oth-

erwise. Consider the 49 recipients of the Maeser Research and Creative Arts Awards of the past fifteen years. A review of their teaching evaluations for last year, 2004 (or the most recent year for which data are available) reveals that over 80% of the Research and Creative Arts Award recipients have teaching evaluations which are above the corresponding college average for the same period. Their evaluations are higher by an average of 6/10 point on the new online evaluation scale. This is not insignificant, given that our faculty as a whole have a tradition of fine teaching. Our history thus suggests that outstanding scholars are, as a rule, also strong teachers.

What of our colleagues whom we know to be exceptional teachers? Do those dedicated to outstanding teaching feel less inclined toward personal scholarship? The university recognizes superior teaching among its faculty through the Maeser Excellence in Teaching Award. Of the 52 recipients of the Maeser Teaching Award of the past fifteen years, information available to us indicates that all but three have published or presented the products of their scholarly work in peer-reviewed or juried forums. Although more difficult to quantify, the vast majority of the 52 have published or presented extensively, multiple times each year. It is further noted that over half of the Maeser Teaching Award recipients during this fifteen-year period—virtually all of the award recipients who are in disciplines where external funding is traditionally sought to support creative activities—have successfully proposed for and directed externally funded research. Many in the university community know that exposing one's ideas to scrutiny outside the university in the form of a proposal for external funding results in a roughly 1 in 10 success rate. These data seem to indicate that our colleagues who are recognized as superior teachers are also actively engaged in creative work.

Like my mentor as an undergraduate engineering student at BYU, there is a strong suggestion that faculty who are good teachers, and those who are productive scholars, are really energetic learners. They create a learning environment

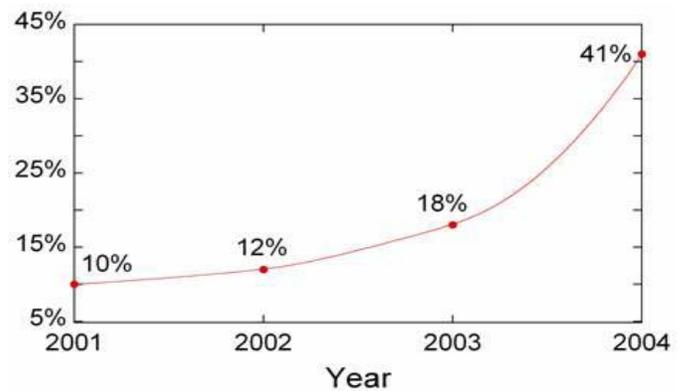


Figure 2. Graduating BYU seniors' response to questions related to having done research with faculty.

where they are passionate about discovery, and they invite and expect their students to be the same. Drawing students into the learning environment is increasingly the mode at the university. Over the past few years we have seen an increase in the number of students engaged in research with faculty outside of the classroom. Figure 2 illustrates the results of a national survey of senior students in which BYU participates, with the percentage who indicated they had had, or would soon have research/creative work experiences with faculty outside of the classroom. The fraction of students engaged in some sort of independent creative activity at BYU number has climbed dramatically in the past five years. Last year's BYU student research participation of 41% is some twelve percentage points above the corresponding fraction for so-called research universities. I recently had a conversation with a BYU colleague who has had a distinguished career and enjoys an international reputation. He has held faculty appointments at several prestigious universities. He shared with me that for the first time this year, he has given full project responsibility on a critical funded research grant to undergraduate students, rather than graduate students. Our faculty are inviting undergraduate students into their learning circles—the laboratory, the studio, the theatre, the library—to work with them and, where appropriate, with graduate students on scholarly work of rigor and substance.

I mentioned departments where pursuit of external funding for support of scholarly research is the disciplinary norm. Yet another indicator of BYU faculty creating a learning environment with integral participation of students is the fact that the largest single research-related direct expenditure of extramural funding is the support of students. Further, we see that increasingly, our faculty are budgeting funds in proposals for support of undergraduate student involvement in the research, in addition to the traditional funding for graduate education. Although

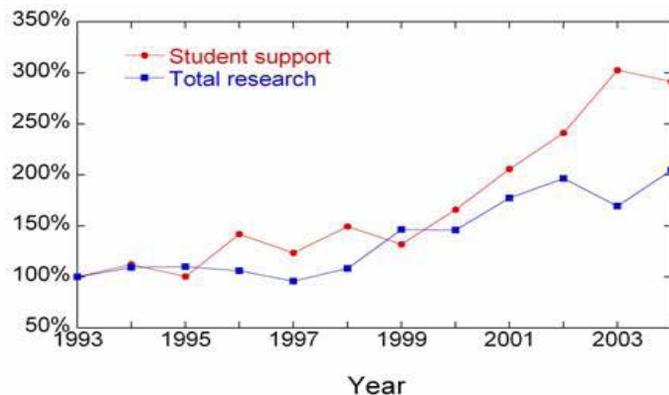


Figure 3. Increases in total research expenditures and student support since 1993, referenced to 1993 data.

Brigham Young University	25%
Arizona State University	5%
University of Montana	6%
Colorado State University	7%

Table 1. Comparison of universities' expenditures on student salaries, wages & support as a percentage of total research expenditures. (compiled February 2005)

BYU's level of external research funding is significantly lower than that of other universities of the same student and faculty population, the data of Table 1 indicate that, expressed as a fraction of total research expenditures, we at BYU support students at a level four to five times that of our peers.

It is also interesting that the externally funded financial support for students at BYU has grown more rapidly than total research support. If we look back a few years we see that faculty have energetically responded to opportunities to support students on external grants and contracts. Figure 3 shows increases in total research expenditures and student support, referenced to 1993 levels. The data reveal a 300% growth in student support from 1993 to 2004, compared to a 200% growth in total research funding over that same twelve-year period.

Of course, any discussion of student involvement in scholarly work would not be complete without mention of the generous institutional support through College support funds, capital equipment, ORCA scholarships, Mentoring En-

vironment Grants, and so on. Our colleagues at other universities are astonished to learn of broad undergraduate access to supercomputing capability, advanced instrumentation and diagnostic equipment, and unparalleled library research tools at BYU. Combined university resources directly supporting student involvement in scholarly activity exceeds several million dollars each year.

I have intended to be affirming in my remarks today, but collectively we have room for improvement in the quest to be greater learners. The scholarly productivity index is defined as the fraction of faculty members contributing at least one peer-reviewed or juried product during the year. The historical data shown in Fig. 4 indicates that the faculty activity index has for the past several years hovered around 60%. We

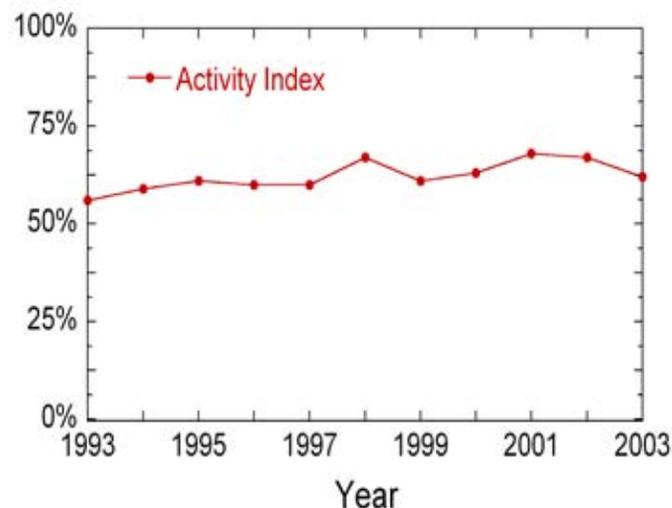


Figure 4. History of university faculty scholarly activity index.

can do better. We faculty have the opportunity and the responsibility to be learners equal to the upper-percentile studentbody at BYU.

I conclude by expressing an aspiration that we continue a quest to be one of the great, perhaps *the* great learning university in the world, where faculty/student teams cultivate the same passion for discovery and creation. Such is my hope, in the name of Jesus Christ, amen.