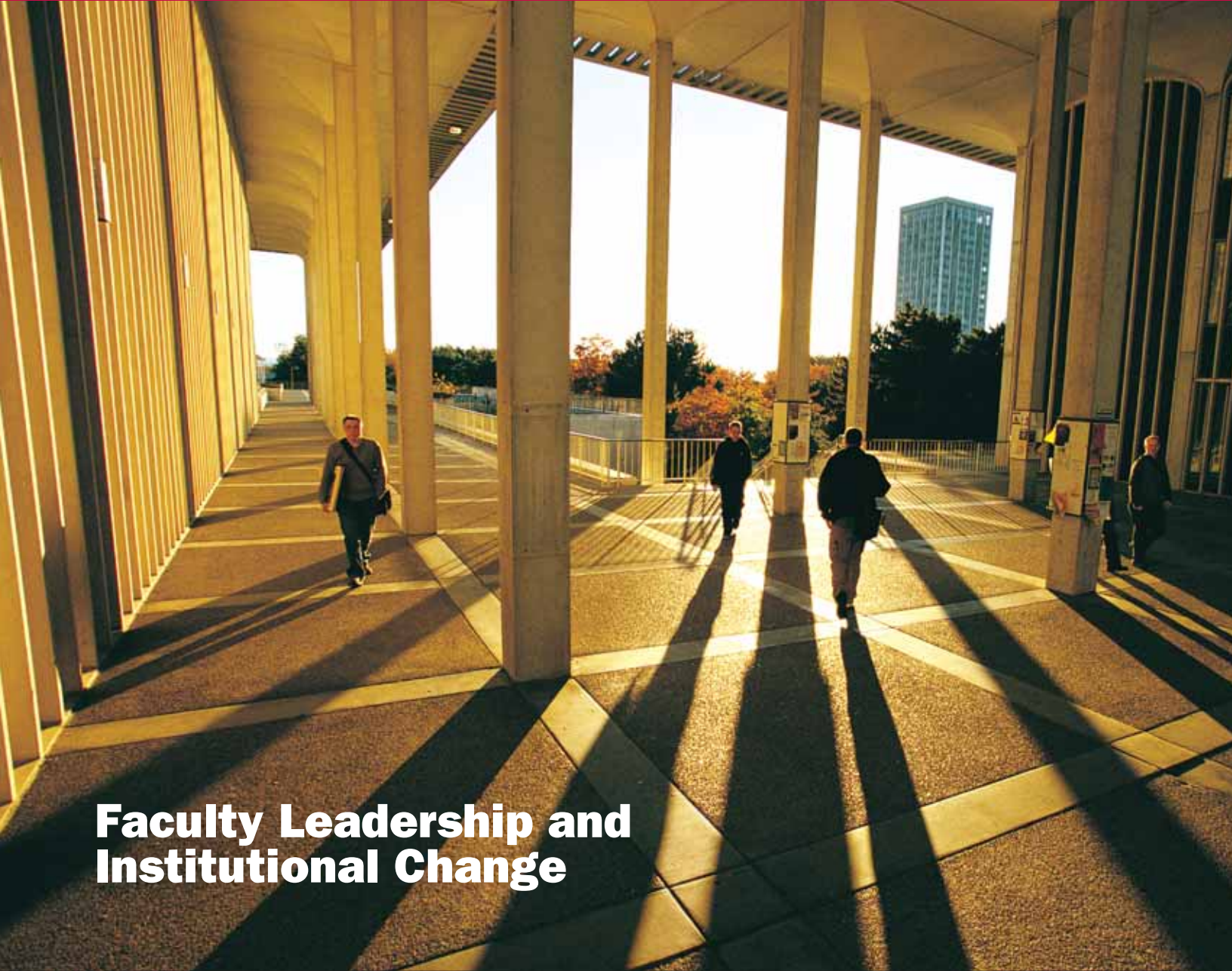


Liberal Education

ASSOCIATION OF AMERICAN COLLEGES AND UNIVERSITIES



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GEORGE D. KUH, DANIEL CHEN,
AND THOMAS F. NELSON LAIRD

Why Teacher-Scholars Matter

Some Insights from FSSE and NSSE

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The key to educational excellence lies not in the memorization of vast amounts of information, but rather in fostering habits of mind that enable students to continue their learning, engage new questions, and reach informed judgments.

—ASSOCIATION OF AMERICAN COLLEGES
AND UNIVERSITIES, *College Learning for the
New Global Century*

This study confirms that student participation in research has an overall positive effect on student outcomes

THROUGH ITS Liberal Education and America's Promise initiative, the Association of American Colleges and Universities (AAC&U) boldly declares that, in the twenty-first century, all students must master the arts of inquiry and innovation. Essential to this task are faculty members who work with students to help them acquire such requisite skills and competencies as identifying and analyzing problems, finding and evaluating evidence, and developing and weighing competing interpretations and conclusions. Toward this end, AAC&U recommends that institutions increase the number of opportunities for students to work with faculty members and others on research. When they collaborate with faculty on research, students learn firsthand how experts think about and solve practical problems; their teachers become role models, mentors, and guides for continuous, lifelong learning. The model for such collaboration has long been the teacher-scholar (American Council of Learned Societies 2007).

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Teacher-scholars are committed to high-quality undergraduate education, pursue an active program of research and scholarship, and are presumed to enliven and enrich their teaching and the student experience by incorporating insights from their own research into their instructional activities, student advising, and related work. Teacher-scholars are also expected to promote deep approaches to learning through activities that encourage students to process information in ways that help them make qualitative distinctions about the merits of data-based claims or the persuasiveness of logic-based arguments. Contrasted with “surface-level processing,” which emphasizes rote learning and memorization techniques, “deep-level processing” focuses on both substance and the underlying meaning of the information (Biggs 1989; Marton and Säljö 1976; Ramsden 2003). Also characteristic of deep learning are the integration and synthesis of information with prior learning in ways that become part of one's thinking and approaching new phenomena and efforts to see things from different perspectives. As Tagg (2003, 70) puts it, “deep learning is learning that takes root in our apparatus of understanding, in the embedded meanings that define us and that we use to define the world.”

The teacher-scholar model is conceptually appealing. But does the presence of such faculty match the rhetoric of the model? That is, at institutions where faculty members report participating in activities characteristic of the teacher-scholar model, are students more engaged overall, do they more frequently work with faculty members on research, and are they more involved in educationally purposeful activities? Or is such thinking primarily a



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widely held article of faith that lacks an empirical foundation? We sought to answer these questions by analyzing information from faculty members and students about relevant activities and experiences.

The study: Data sources, guiding questions, and analysis

The data come from 29,444 faculty members and 65,633 randomly sampled senior students at the 209 four-year colleges and universities in the United States that administered both the Faculty Survey of Student Engagement (FSSE) and the National Survey of Student Engagement (NSSE) in either 2005 or 2006. In addition to student reports about the time and energy they devote to educationally purposeful activities measured by the annual survey, NSSE also includes a set of items that serve as a proxy for deep learning. Introduced in 2004, FSSE helps us better understand the role faculty members play in fostering student engagement through the teaching approaches they use. Taken together, the results from the two surveys demonstrate positive relationships between faculty emphasis on educationally purposeful activities and student engagement in those activities as well as between student engagement and such desired outcomes as critical thinking, grades, and deep learning (Kuh, Nelson Laird, and Umbach 2004; Nelson Laird, Shoup, and Kuh 2006; Pike 2006; Umbach and Wawrzynski 2005). Most important to this study, FSSE and NSSE data from the same schools allow us to estimate whether student engagement at institutions where faculty reported behaviors consistent with the teacher-scholar model differ from those of their counterparts at other schools.

In addition to descriptive statistics, the primary analytical method used in this study was Hierarchical Linear Modeling (HLM), which allows for the appropriate control of student background characteristics and institutional factors while protecting against problems of correlated error terms associated with using a conventional regression model for analyzing multi-level data (Raudenbush and Bryk 2002).

Three questions guided our analysis. First, what institutional factors and faculty characteristics are associated with faculty members spending time on research and valuing undergraduate research? To answer this question, three FSSE items were used as dependent variables:

- How important is it to you that undergraduates at your institution work on a research project with a faculty member outside of course or program requirements?
- About how many hours do you spend in a typical seven-day week doing research and scholarly activities?
- About how many hours do you spend in a typical seven-day week working with undergraduates on research?

In addition, our analysis was guided by a second question: what institutional factors and student characteristics are associated with student participation with faculty in research? In particular, does the amount of time faculty spend on research affect the likelihood that undergraduate students participate in research? Again using HLM, the dependent variable this time was senior student responses to the NSSE question, Have you worked on a research project with a faculty member outside of a course or program requirements?

Finally, our analysis was guided by a third question: do those faculty who do research and involve students in research exhibit different patterns of instructional activities and—if so—what are the effects (if any) on student engagement and self-reported outcomes? Two separate HLM analyses were needed to answer this question. The first determined whether the emphasis faculty members place on using effective educational practices in their classes varies by the amount of time they devote to research and scholarly activities and work with students on research. The dependent variable was faculty members' emphasis on deep learning activities. In the second HLM analysis, three student self-reported gains associated with college attendance were the dependent variables: gains in general education, gains in personal and social development, and gains in practical competence.

When reviewing the results, keep in mind that the data are aggregated at the institutional level and do not link the responses of faculty members with students they have taught or worked with directly on research projects. It also is possible that the findings are biased in some ways by, for example, faculty members who are actively engaged in research, teaching, and working with undergraduates on research projects being too busy to respond to the survey. Accordingly, some caution is advised when interpreting the findings.

Results

On average, faculty members spend nine hours per week on research and scholarly activities and about 2.5 hours per week working with undergraduates on research. Faculty members at doctorate-granting universities devote about twice as much time to research activities as their counterparts at baccalaureate colleges and master's colleges and universities. But even though they spend more time doing research, the amount of time faculty at doctorate-granting universities spend working with undergraduates on research is about the same as faculty at other types of institutions (see fig. 1).

Although full professors spend more time on research than their colleagues at the assistant or associate rank, the extent to which faculty value undergraduate engagement in research and the amount of time faculty spend working with undergraduates on research are unrelated to professorial rank. After controlling for discipline, we found that male faculty members and those with fewer years of teaching experience devote more time to research. Faculty members in the biological sciences, in contrast with business and other fields, are more involved with undergraduates on research and

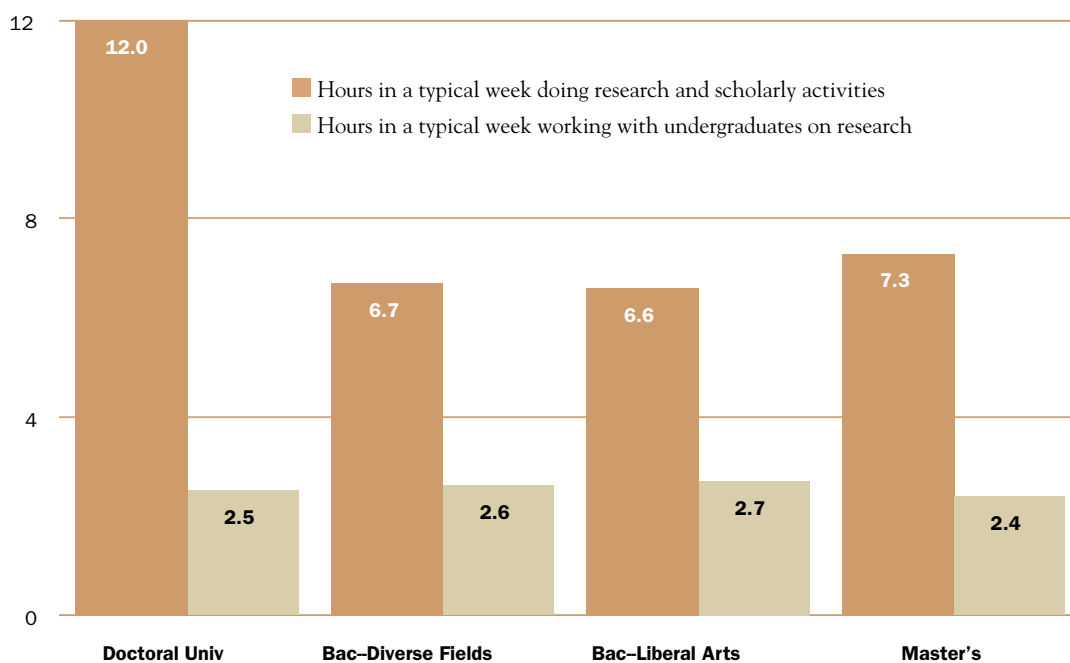
At institutions where faculty do not place much emphasis on deep learning, the effect of participating in research is actually negative

more likely to value its importance. These faculty characteristics show similar patterns in terms of working with undergraduates on research and valuing the importance of undergraduates doing research, though the strength of the relationships is not as strong.

Overall, about one in five senior students (19 percent) works on a research project with a faculty member outside of course or program requirements at some point during his or her undergraduate studies. Male students (21 percent) are more likely than female students (19 percent) to do research with a faculty member; students majoring in biological sciences, physical sciences, social sciences, and engineering are more likely than students in other disciplines to do research with a faculty member. For example, 39 percent of seniors in biological sciences work on a research project with a faculty member, which contrasts with much lower percentages of seniors in business, education, and professional fields.

Faculty practices also affect undergraduates' participation in research. The average amount of time faculty spend working on research with undergraduates, and the average consensus among faculty members regarding the

Figure 1. **Average Weekly Research Hours by Institutional Type**



importance of undergraduates working on research, are two institutional factors that have a positive effect on student research (see figs. 2 and 3). In contrast, the average amount of time faculty members spend on research and scholarship has no apparent effect on students' participation in research.

Teacher-scholar behavior and student development

Our study also sought to discover the effects on student engagement and self-reported outcomes of faculty who do research, involve students in research, and employ different patterns

of instructional activities. All three faculty research measures are associated with the emphasis faculty place on deep approaches to learning (listed below in order of the strength of their relationship):

- faculty views about the importance of undergraduates' participation in faculty research
- the amount of time faculty spend in working with undergraduates on research
- the amount of time faculty spend on research and scholarship

This pattern of findings is an empirical profile of the teacher-scholar model—faculty who are actively engaged in research, place value on undergraduates doing research, and take a “deeper” approach to their teaching.

At the institutional level, the average value faculty place on research with undergraduates is also a critical factor for student outcomes. At institutions where faculty value undergraduate participation in research, students tend to report greater gains across various areas. That is, when faculty believe it is important for students at their institution to engage in research as part of their undergraduate program, it is more likely that students at those schools do so and report making progress in desired areas. On the other hand, after controlling for the effect of the average value faculty place on undergraduate research, the average amount of time faculty spend on research and scholarship has small but statistically significant negative effects on students' self-reported general education and personal and social development outcomes. Finally, at institutions where faculty emphasize doing research with students and use effective educational practices in their classes, students are more likely to make greater progress in key learning outcomes, especially in the area of general education.

This study confirms that student participation in research has an overall positive effect on student outcomes. Of special note is the finding that at institutions where faculty do not place much emphasis on deep learning, the effect of participating in research is actually negative, while it is positive at institutions where deep learning is emphasized a great deal.

Figure 2.
Probability of Undergraduate Research
Relationship between Faculty's Time on Research with Undergraduates and the Probability of Undergraduates' Participation in Research

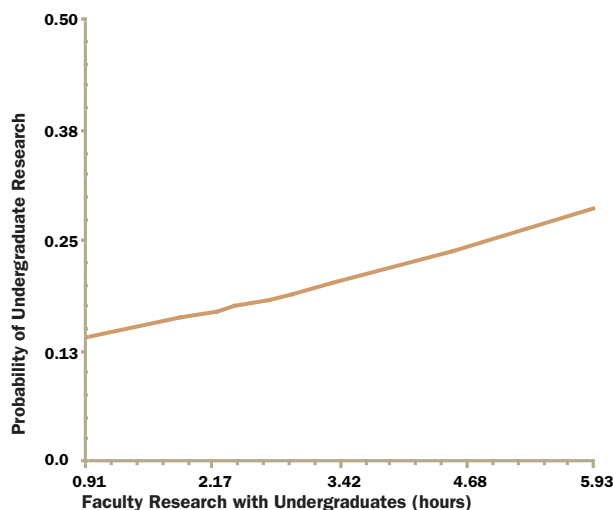
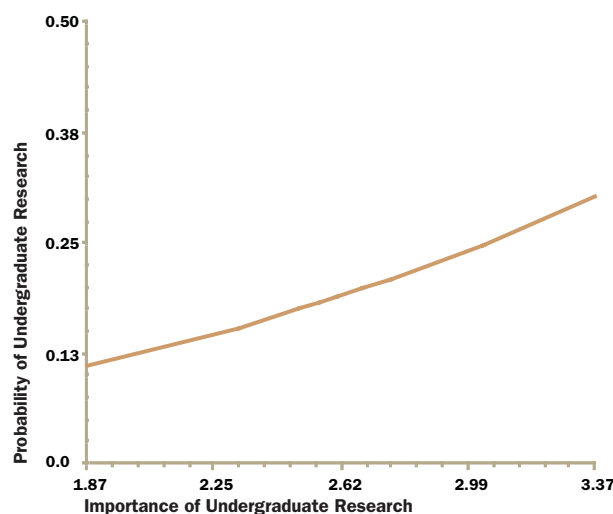


Figure 3.
Importance of Undergraduate Research
Relationship between Faculty's Perception on the Importance of Research with Undergraduates and the Probability of Undergraduates' Participation in Research



NOTE: For a description of the items that make up the deep learning scale and a detailed explanation of the analytical methods used in this study, see “Student Learning and Faculty Research: Connecting Teaching and Scholarship” (American Council of Learned Societies 2007).

What to make of this

Undergraduate involvement in research is sometimes thought to be a byproduct of institutions where faculty members are actively

involved in research. The results of this study suggest, however, that it is not enough for faculty members to spend time on research and scholarly activities or simply to encourage faculty to do more research. In order for students to get involved in research, the faculty members on a campus must make a conscious effort to involve undergraduates in their research activities and believe that such involvement is important. They also must take the time to work with undergraduates directly and emphasize deep approaches to learning in the classroom.

Interestingly, the amount of time faculty members spend on research activities with undergraduates does not vary much by institutional type, even though the total amount of time spent on research does. Faculty members at baccalaureate institutions spend a greater proportion of their research time with undergraduates than faculty at master's or doctoral institutions. While this result matches the undergraduate focus of baccalaureate institutions, it is also the case that these institutions have few if any graduate students to assist faculty with research activities. Thus, the pool of potential research assistants is essentially made up of undergraduates. This provides an additional incentive at baccalaureate institutions to get students involved in research. Increasing the number of undergraduates doing research at doctoral and master's institutions will require incentives that go beyond arguing for the educational benefits derived by undergraduates through their participation in research. Certainly, hiring faculty members who are predisposed to such collaborations is a good first step.

Of course, the institutional and educational benefits of the teacher-scholar model are not limited to involving students in research activities. It is encouraging that there is a positive relationship between the amount of time faculty spend on research, particularly research with undergraduates, and the emphasis on deep approaches to learning in their courses. In fact, the strongest positive relationship is between the importance faculty place on research with undergraduates and the emphasis on deep learning. This latter result suggests that it is critical to promote among faculty members the value of connecting research and teaching, especially since—at the institutional level, at least—this will have an impact on student outcomes.

FSSE and NSSE data do not allow us to connect student information to the faculty members from which those students took classes, which would allow us to examine whether students with greater exposure to teacher-scholars learn more and derive greater educational benefits compared to students with less exposure. At the same time, the findings suggest that increasing the value placed and the time spent on research with undergraduates, and increasing faculty emphasis on deep approaches to learning, result in increases in the amount students feel they gain from their college experience—particularly with regard to general educational skills and knowledge. □

To respond to this article, e-mail liberaled@aacu.org, with the authors' names on the subject line.

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