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INTRODUCTION: UNPACKING THE RESEARCH ENCYCLOPEDIA

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SCHOLARSHIP – THE FOUNDATION OF HIGHER EDUCATION

Ernest Boyer’s work is the touchstone for most contemporary discussions about research and scholarship and is as pertinent to undergraduate research as to the professional research of faculty. This introduction will begin with Boyer so that his definitions and philosophies may inform additional discussions concerning the epistemologies, methodologies, and hierarchies embedded within the creative human pursuits we call research and scholarship. Boyer’s work may be valued as much for the vocabulary it endows upon this conversation as for its impact on the values and purposes of higher education. His articulation of terminology for a range of creative pursuits under the umbrella of scholarship was brilliant in its timing and effects. In 1990, a decade of discontent and reflection culminated in the publication of Boyer’s *Scholarship Reconsidered: Priorities of the Professoriate* by The Carnegie Foundation for the Advancement of Teaching. In this short volume, Boyer addressed his conviction that “scholarship is at the core of academic life” (Boyer, 1990, p. 1) and that the vitality of the academic professions required an expanded notion of this crucial element. Reflecting on the history of educational commitments as well as years of observation, data from faculty, and conversation with other educational leaders, he formulated a definition that encompasses four functions of scholarship and that is responsive to both academic and community purposes.

Boyer reminds educators that *research*, the function of scholarship he designates *scholarship of discovery*, is a relatively new and comparatively narrow aspect of the range of activities of those we call *scholars*. For several generations it has been the most highly valued work of the university. Conceived primarily as an individual activity where breakthroughs are achieved or innovative models are developed, the scholarship of discovery advances new knowledge that transforms disciplines and, quite often, even our lives.

By naming three additional functions of scholarship, *Scholarship Reconsidered* expands the legitimacy of faculty work, and thus of academic experience, to three additional areas. The *scholarship of integration* is work valued for its ability to “give meaning to isolated facts, putting them in perspective . . . making connections across the disciplines, placing the specialties in larger context, illuminating data in a revealing way, . . . [through] critical analysis, interpretation,” and so on (Boyer, 1990, pp. 18, 19). The work of integration often stretches inquiry across disciplinary boundaries in search of explanatory models, and can lead, according to Boyer, “from information to knowledge and even, perhaps, to wisdom” (Boyer, 1990, p. 20). If laboratory science is the paradigmatic case of discovery, scholarship in literature or philosophy might provide the paradigm for integration. These distinctions may be vital in understanding why scholars in the humanities and arts respond less frequently to a call for proposals on “Undergraduate Research” than their colleagues in the sciences.

The third function of scholarship is *application*. This function is most often observed in scholarly work where knowledge is created through solving actual problems experienced in communities. The scholarship of application may not look familiar because it transcends the

walls of the classroom and even of the university. It may be accomplished by individual scholars or by teams, and the reciprocal relationships of community engagement will lead some to confuse this function of scholarship with community service. The paradigm of bioengineering (or medicine in general) might be a helpful model. It is only through a reciprocal relationship with actual persons needing artificial joints that scholars may learn enough to develop a useful apparatus. Physician and writer Atul Gawande writes eloquently about “The Learning Curve” of physicians, especially surgeons, where the application of scholarship is necessary to the process of gaining expertise and then further advancing knowledge of how to help people live longer, healthier lives. Gawande’s contributions to the scholarship of the health professions are similar to the humanities in that they integrate and interpret practices in the field with their effects on the profession and on the community in a reflective narrative mode including personal experience and case histories.

In designating *teaching* as the fourth function of scholarship, Ernest Boyer draws upon the history of educational institutions in this country. Until well into the nineteenth century, teaching was of paramount importance and was accorded the highest respect. The focus was on students and their “intellectual, moral, and spiritual development” (Boyer, 1990, p. 4). The shift from teaching to research came as the nation struggled to develop industrial and economic mastery in the world of the nineteenth century. The scholarship of teaching, which includes “transforming and extending knowledge,” is the only guarantee of the “continuity of knowledge” (Boyer, 1990, p. 24). Our focus at the Schreyer National Conference and in this publication upon pedagogy and strategies for enhanced student learning through research is a contemporary commitment to this same principle. Scholars in this volume ask questions about how undergraduate research and scholarship enhance the learning of students and enhance education as a cultural resource, and ultimately, about how these commitments contribute to communities.

In addition to articulating the categories of scholarship that have had such a profound impact on education in the ensuing decade, Boyer infused education with two additional values: a recommitment to engaged education and the motivation to create strategies to document and evaluate scholarship as he defined it.

Ernest Boyer died in December of 1995. His final work of scholarship was published in the first issue of the *Journal of Public Service & Outreach* in 1996. In “The Scholarship of Engagement,” Boyer reiterated the value of all four functions of scholarship, especially in view of the tendency for funding and other resources to be allocated disproportionately to the scholarship of discovery. He urged universities and colleges to “become more vigorous partner[s] in the search for answers to our most pressing social, civic, economic, and moral problems” (Boyer, 1996, p. 11) and to recognize the need “not just [for] more programs, but a larger purpose, a larger sense of mission, a larger clarity of direction . . . [and for] creating a special climate in which the academic and civic cultures communicate more continuously and more creatively with each other” (Boyer, 1996, p. 20).

RESEARCH ON UNDERGRADUATE RESEARCH

A commission named for Ernest Boyer and headed by Shirley Strum Kenney issued a series of recommendations in 1998 (*Reinventing Undergraduate Education: A Blueprint for America’s Research Universities*), one of which emphasized the value of engaging undergraduate students in research as a strategy for learning. Now, three years later, many universities are taking these recommendations seriously as reported in a follow-up study noted in

The Chronicle of Higher Education in March 2002. All of the universities that were surveyed reported having opportunities for undergraduates to engage in research, especially in “laboratory-science research, including in biochemistry and psychology, and in engineering” (Wilson, 2002, p. A12). The Boyer Commission Report also served as a catalyst to create a national organization, The Reinvention Center at Stony Brook, which focuses exclusively on the undergraduate experience at research universities. This group recently focused its attention on one of the elements in the Boyer Commission Report—integration of research into undergraduate education. In her opening remarks to the Reinvention Center’s “Spotlight on Undergraduate Research,” Nancy Weiss Malkeil states, “No matter how the opportunity is packaged - the senior thesis at Princeton, undergraduate research opportunities at MIT or Stanford, or any of the many modes at other colleges and universities - the research experience challenges and stretches students in ways that cannot be replicated even in the most rigorous and demanding course work.”

Many scholars have taken up the challenges Ernest Boyer brought to public attention. For example, Kerry J. Strand discusses “Community-Based Research as Pedagogy” in the Fall 2000 issue of the *Michigan Journal of Community Service Learning*. Responding to Boyer’s call for scholarship that responds to community needs, Strand defines community-based research as “collaboration between trained researchers and community members in the design and implementation of research projects aimed at meeting community-identified needs” (Strand, p. 85). If community leaders can present scholarship that systematically documents a lack of, for example, retail stores selling nutritious foods at reasonable prices compared with suburban neighborhoods, then perhaps agencies can be persuaded to offer incentives to attract a more adequate grocery store to the neighborhood. The same holds for community-based research on transportation, housing, education, childcare, and additional contributing factors to the conglomerate of conditions called urban poverty. Strand, like Boyer, suggests that engaged scholarship is a fruitful learning laboratory for students. Strand is explicit about the added possibilities for student learning in the two fundamental areas of methodology and epistemology.

Ernest Boyer’s work has been extended into the critical areas of documentation and evaluation by his colleagues at the Carnegie Foundation. Charles Glassick, Mary Taylor Huber, and Gene I. Maeroff published *Scholarship Assessed: Evaluation of the Professoriate* in 1997 to assist universities in efforts to incorporate Boyer’s earlier work on the legitimate functions of scholarship beyond discovery. Glassick has argued more recently that “It’s one thing to give scholarship a larger meaning, but the real issue revolves around assessment” (Glassick, 2001, p. 24). Glassick, Huber, and Maeroff tapped into discussions on faculty performance and evaluation as well as on the alignment of the process of faculty review with institutional goals. They sought to extract a consistent set of qualities or criteria that would apply to scholarship of all forms and functions and help institutions articulate standards and maintain rigor. They discovered six features that could be applied across all disciplines and endeavors: clear goals, adequate preparation, appropriate methods, significant results, effective presentation, and reflective critique. The set is flexible enough to admit discipline-specific criteria in each category and simple enough for even novice scholars to apply and gradually learn to use with greater sophistication. *Scholarship Assessed* provides sub-questions in each category to guide an initial attempt to use this standard for evaluation, and Glassick comments that documentation should follow the six criteria to record evidence of achievement in each category.

UNDERGRADUATE RESEARCH – DOES ONE SIZE FIT ALL?

Alan Jenkins of Oxford Brookes University in the United Kingdom takes up another issue raised by Ernest Boyer and thinks it through to his own conclusions in this volume. Boyer suggested that all teachers should be engaged in scholarly work, and Jenkins refines the question to ask whether there is a direct benefit to student learning when their teachers are also engaged in the scholarship of discovery, more commonly called *research*. Jenkins begins by answering his own question in the negative because research is often limited to a select elite faculty within particular types of universities and because mentoring student research is a very time-intensive endeavor, further limiting the numbers of participants who might benefit. Through the course of his article in this volume, however, Jenkins reasons to a nuanced conclusion that under certain conditions, students can, indeed, benefit from carefully constructed programs where research-based learning is successful. He issues many cautions, and ends with an exhortation to consider how “these programs can become what all students . . . experience” (Jenkins, p. 21). Jenkins concurs with Strand and others in urging faculty to use research to enhance student learning about methodology and epistemology in the process.

Strand, Jenkins, and many others, including Barry Checkoway at the University of Michigan, have raised issues of methodology and epistemology in any number of contexts related to the academic “pursuit” of knowledge. These issues cannot be separated from issues of ethics. From the perspective of a faculty member teaching social science methodology, Strand questions the model of the “expert” as one who always has the exact right answers, solutions, and strategies. She encourages students to approach community-based research with openness to learning from relatively unstructured methods such as focus groups and to collaborate with community members on the design of research, on what kinds of knowing will be surveyed, and on the forms and means of disseminating the knowledge gained. She wants her students to understand standard and alternative methodologies and to appreciate “social research not just as a collection of methods and strategies, but also as the way that knowledge about the social world is produced” (Strand, 2000, p. 87).

Through her course, Strand also invites students to examine critically the epistemological assumptions that underlie scholarship. She challenges the notion that knowledge is “value free” and engages students in contemplating questions such as these: “For what purpose do we produce social scientific knowledge? Who controls the production of knowledge and who owns—or ought to own—the knowledge that is produced? What are some consequences of that control?” (Strand, 2000, p. 90) Implicit in Boyer’s appeal for more engaged scholarship like that of Strand’s students is a call for scholars to raise more ethical issues around research. We are being asked not merely to question a hierarchy of knowledge that favors the function of discovery scholarship over other functions, but also to ask that the values and assumptions behind a broader range of activities generally called “research” be explored. Strand culls five features that seem to be common to an enhanced ethical approach: “Value of research rests on potential for positive social change; Research methods are sensitive to particular people and situations; Experiential knowledge is given legitimacy; Power and control over research process is shared; Knowledge is collectively owned by participants and researcher” (Strand, 2000, p. 92).

Even though Strand’s model is based on social science research, some of the same principles and certainly the intent can be carried across disciplinary boundaries. Geographers Jones, et al., articulate a similar commitment in a discussion of feminist methodology in geography: “knowledge born of the research process is a joint, yet always unequal, creation of

both the researcher and the research subjects . . . [and] investigators [must be] sensitive to the ways that the unequal power relations between researcher and researched can influence knowledge creation” (Jones, 1997, p.122). Barry Checkoway discusses strategies for faculty, students, and universities to “challenge the prevailing positivist paradigm” of research by “reconceptualizing research in [a] way [that] raises methodological and epistemological issues” (Checkoway, 2002, p. 13).

In a recent issue of *The Chronicle of Higher Education*, faculty members in medicine and law also raised similar issues in a *Point of View* article on “Doing Research Well by Doing Right.” Jeffrey Kahn and Anna Mastroianni comment that research ethics demand far more than just meeting the standards of regulatory compliance in effect at most universities. They cite the “significant differences in power, understanding, and potential profit” between the researchers and subjects as compelling reasons why researchers must take responsibility for protecting subjects over and above compliance standards. These researchers claim that “ethical commitments [are] at the core of research” (B24).

Thus far, we have observed that ethics and common criteria for evaluation may transcend the disciplines and functions of scholarship. Scholars in all disciplines can also draw attention, as Checkoway, Strand, and others do, to the methodologies and epistemological assumptions that are often taken for granted in their disciplines. Those are substantial and profound similarities across functions and disciplines, but somehow the *differences* in scholarship from discipline to discipline are most often what we hear about. Ernest Boyer endeavored to describe a model of scholarship that would encompass all disciplines in its breadth. It should be possible for each discipline to include all four functions, but Boyer recognized that the hierarchy of value surrounding the functions has a historical correlation to the disciplinary structures of knowledge within the academy.

One way to track the value associated with areas of scholarship might be to look at research funds from government and business awarded to scholars in different disciplines. It is possible, but very difficult to map the functions of scholarship onto the departments and colleges of a university structure because specific departments may have “pure science” specialties within a college that focuses on the application of discovery knowledge, and vice versa. However, we might make a few general correlations and thus see how research dollars may indicate the value that certain sectors of society place on each type of scholarship. The figures used here are for The Pennsylvania State University in the year 2001 (*Annual Report of Research Activity 2001*).

| | |
|---|----------------|
| College of Science (Discovery) | \$65.3 Million |
| College of Engineering (Application) | 71.5 Million |
| College of the Liberal Arts (Integration) | 17.7 Million |
| College of Education (Teaching) | 7.8 Million |

Any mapping is likely to be misleading because many funding agencies, particularly the National Science Foundation, have expectations of discovery, application, and education interwoven in the funding of a single proposal. Consider the highly successful Research Experiences for Undergraduates Program at NSF in which students engage in a variety of research experiences that are integrated with seminars, instruction in research methods, laboratory and communication skill development, as well as exposure to applications. Nevertheless, certain disciplines lend themselves to certain scholarship paths. It is the integration

and extension of findings into the areas of scholarship that allow the advances to have an even greater impact.

The drastic difference in levels of funding corresponds to a broad context within which knowledge is generated and disseminated, including political and economic agendas, attitudes, and policies concerning research and scholarship. Additionally, the expense associated with laboratory-intensive activities and constant reinvestment in updating technology can be overwhelming to those doing interpretation and analysis activities which require less space, fewer utilities, and less complex (costly) equipment. Applied scholarship is closest to the opportunity for a return on investment through commodification. Still, the paradigm of discovery research is the standard recognized and publicized most broadly. Social science research might be the second most recognized model, while students in the humanities are often quite puzzled by the challenge of doing “research” in their own fields given these two prevalent models. Part of the problem may be that faculty sometimes speak of “research” without qualifying what the term means within their own discipline, assuming that students will have absorbed this knowledge through their coursework. Boyer’s articulations of the functions of scholarship have not fully infiltrated the professional literature in the disciplines, so the term “research” is often used for all types of scholarly work, with the possible exceptions of creative work in the arts and of some innovative forms of technological production. One practical strategy might be for all disciplines to offer methodology courses for both graduate students and undergraduate students and to begin with a broad overview of paradigms of scholarship including Boyer’s.

Many scholars of the culture of Higher Education have considered these issues. In conjunction with the National Humanities Alliance and the Association of Research Libraries, the Knight Higher Education Collaborative sponsored a Roundtable on Scholarly Communication in the Humanities and Social Sciences in March of 2001. The assembled scholars reflected on the issues and problems generated by the “tendency throughout the latter half of the twentieth century . . . to value the practical advances in science, medicine, and technology over scholarship in literature, languages, history, philosophy, politics, and art” (NHA, p. 3). The work of scholarship in the humanities is often reflective and interpretive work conducted by individual scholars who “develop, extend, or refine the state of thinking in a particular subject” (NHA, p. 3). A key problem is that this work may seem “insular,” especially if scholars do not make determined efforts to reach broad audiences outside specific disciplinary societies.

CLOSING COMMENTS

The recent attention given to undergraduate research by the sample of scholars cited in this paper is indicative of the increased value placed on life-long learning and inquiry. In the preface of a recent publication (*At the Interface of Scholarship and Teaching: How to Administer Institutional Undergraduate Research Programs*), Larry Wilson states, “When this objective [independent learning] is coupled with the goal of providing students the ability to make original contributions to the knowledge of their fields, the stage is set for an active learning environment that is at the core of the undergraduate research and investigative studies movement (Hakim, 2000).”

Beyond the personal advances in understanding and the dissemination opportunities for students, the real benefit is realized because of the integrative nature of research. Yes, research is focused and involves deeper insights, deeper learning, and understanding of more complex relationships, but done well, it also requires the researcher to consider the bigger picture, how the

new understanding will advance policy, or what the implications of a new material may be on the environment. Furthermore, the bigger picture aspects cut across disciplinary boundaries. In an essay on “Globalizing Literary Study” in a recent edition of *PMLA (Publications of the Modern Language Association of America)* Edward Said, past president of MLA and noted scholar and public intellectual, comments on the challenge facing the humanities and social sciences to create new means of scholarly work that more immediately addresses a world of vast wealth and starvation where sanctioned or ignored mass killings are commonplace. Said notes the “fragmentation and self-cancellation of the humanities as incapable, unwilling, to offer . . . resistance” to these circumstances despite many books debating the discourse in which they may be discussed (Said, pp. 64-68). Said traces a key component of the problem to the view in western culture that science (the pursuit of truth) and the humanities (in pursuit of beauty or the “good”) are separate and unequal. “This split . . . produced the images of the value-free researcher in one area and . . . the detached humanist in the other” (Said, p. 67). Said clearly finds both approaches to be lacking in local grounded engagement with the circumstances of persons struggling through specific upheavals. He asks for a renewed commitment by intellectuals to be aware, not only of their area of expertise, but also of how it connects to the big picture “of collective human history [and] global patterns of dependence and interdependence” (Said, p. 68).

Edward Said calls for scholars in the humanities to integrate their work with the actions and contexts of real people inhabiting the earth. This resonates with Boyer’s call for a renewed civic purpose in all of the functions of scholarship. It is scarcely possible to read any general discussions about education, research, or scholarship without encountering these calls to engagement and a renewed civic mission. Environmental concerns, starvation, poverty, disease, genocide, war, and even something so trivial by comparison as increasing levels of stress all point to the need for a concerted effort on the part of all scholars to articulate purposes in terms that can be easily understood by undergraduates and the general population. The research mission of our great universities must be accessible to all as a sustainable public resource.

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