LEARNING ACADEMIC LABOR

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ABSTRACT

Based on data from a two-year, multi-site study of knowledge production in universities, this paper examines how research training is accomplished within the elite sector of research universities in the United States. This analysis suggests substantial differences across institutional settings by contrasting how graduate students learn academic labor in a high prestige, private research university and in a public doctoral-granting institution with fewer resources. Prevailing conceptions of professional socialization are examined in light of not only disciplinary differences, such as physics and history, but also by local campus settings which are characterized by unequal financial and status resources. Such institutional differences in knowledge production raise further concerns about structurally caused accumulated advantage and disadvantage, particularly the effects of stratification on individuals as well as possible dysfunctions within the academic system.

Research universities in the United States are often thought to be an elite educational milieu, comprising about 3 percent of American higher education institutions, while granting about two-thirds of doctorates and one-half of master's...
degrees annually (Carnegie 1994; NCES 1996). At the doctoral level, one would think there are disciplinary differences in students experiences but minimal institution-related differences. This study on knowledge production not only affirms previously documented disciplinary differences, such as between physics and history, but also demonstrates how disciplinary training is inescapably mediated by resources in local campus settings. Since research universities have unequal financial and status resources, such institutional differences raise critical concerns about the effects of that stratification on individuals as well as possible dysfunctions within the academic system. The implication that develops out of this analysis is to question the widely held meritocratic notions that interpret existing differences as a functional necessity to match variation in student and faculty talent with the stratified academic labor market and national needs for the advancement of knowledge.

The data are drawn from a larger two-year, multi-site study of knowledge production, in which over 150 interviews of students, faculty and administrators were conducted. In this article, my analysis delineates differences in how graduate students learn academic labor at a high prestige, “top ten” campus, and at a less privileged one, ranked about 100 in the pecking order of recipients of federally sponsored research funds. For purposes of contrast and anonymity, I call these campuses Elite University and State University. I consider two departments within them—physics and history—to examine how professional socialization by disciplines is mediated by local campus settings that have unequal financial and status resources.

Using a grounded theory approach to data collection and analysis at these two case study sites (Glaser and Strauss 1967; Vaughn 1992), I found a profound contrast emerged in the interviews about the day-to-day research training in doctoral programs, especially in the ways faculty and students embraced stratified expectations and identities at the two campuses. Simply stated, the elite university trained scientists to be entrepreneurial lab managers and historians to be scholars with a sense of academic and personal entitlement, while the less prestigious university trained skilled technicians and teachers who conveyed a sense of themselves as workers.

CONCEPTUAL ANCHORS AND RESEARCH OBJECTIVES

This line of research seeks to contribute to a conceptual and empirical void in the sociology of higher education by examining processes of professional socialization in research training. Among social scientists studying higher education in the United States in recent years, there has been a surge in interest on knowledge production in research universities (e.g., Leslie and Slaughter 1997; Etzkowitz, Webster, and Healey 1998). Viewing knowledge production as central has indeed opened up a variety of analytical avenues for studying “the institutional fabric” of
research universities (Clark 1983), the emergence of new knowledge and academic vocations (Gumpert 1990a) as well as issues in the management of faculty as knowledge producers (Rhoades 1998). Grounded in social science orientations, these analyses have also served to increase the scholarly legitimacy of studying higher education. Yet, simultaneously these studies may have done a disservice to the policy arena: the conceptual shift to a knowledge-processing system has simultaneously deflected attention away from the people-processing consequences of stratification, leaving unresolved pressing policy issues such as the appropriate mechanisms for the finance of graduate education (Gumpert 1990b).

Thus, this study attempts to shed further light on the people-processing function within knowledge production, by focusing on the processes and social relations within doctoral programs. It is ironic, no doubt, that there is great obsession in the United States over rankings of programs yet minimal understanding of the actual qualitative differences between them. As a corrective, then, this study may also contribute to the literature on elite-level processes at other stages of education (e.g., Kingston and Lewis 1990).

Taking a cross-sectional approach to examine organizational contexts, this study leaves open the empirical and methodological question of determining institutional effects. Admittedly at the outset, one might argue that differences in institutional “product” are grounded, not in institutional effects, but in either universities’ selection of the best students or students’ self-selection to those universities that correspond to their career aspirations. Ideally, in order to isolate the presence of institutional effects, one would document comparable talent or aspirations of incoming students and show systematic or increasingly stratified occupational outcomes, that is, a leveling upward or downward of similar students at different campuses. However, given that doctoral education in the United States has been understudied relative to undergraduate education, a study that characterizes qualitative differences becomes a valuable stepping stone for further empirical work.

In addition, prior scholarly attempts to assess the disparate influences of campus environments have not yielded definitive results. Feldman and Newcomb (1969) and Astin (1977), among others, have grappled with the methodological challenge of controlling for input characteristics of students to identify undergraduate college effects. However, this line of research has produced neither a definitive account of how to isolate institutional effects or how to identify interaction effects between student characteristics and campus contexts, nor a further understanding of why entering students are not randomly distributed or why the presumed meritocratic opportunity structure does not work for students of lower classes and racial minorities.

While the data from this study cannot address those questions (since longitudinal data on incoming characteristics of graduate students were not recorded by campuses), instead this study pursues another avenue to examine the complex socialization dynamics at the doctoral level. That is, the focus turns to how insti-
tutions exacerbate whatever differences that may have pre-existed by communicating to students stratified expectations for subsequent employment, and to create, borrowing Wexler's (1987) term, "stratified identities." This line of inquiry at the graduate level captures a critical dimension of the professional socialization task that disciplines undertake: the process whereby doctoral students acquire a sense of their disciplines and a sense of their subsequent roles as professionals.

Scholarly attention to this process is especially timely given policy concerns over the anticipated shortage of faculty from imminent waves of retirement in the United States. Widely accepted research findings, based on a meta-analysis of aggregated data, reveal that decisions to enter the professoriate occur most frequently during the post-baccalaureate stage, either through a process of "happenstance" or "drift," or through the blossoming of an "intrinsic interest" in one's discipline (Finkelstein 1984, pp. 47-48). A universal disciplinary shaping of the profession is assumed across campuses (Becher 1989). This line of reasoning characterizes the process of doctoral education as a natural unfolding of interest or choice, without explicit regard to the role of stratification in campus settings and in occupational outcomes.

A complementary perspective lies in conventional ideas about meritocracy, resting on the premise that different paths students undertake are based on individual achievement and demonstrated talent. Crane (1966, p. 713) stated the rationale succinctly: "The best students are selected by the best graduate schools, the best of these are selected for training by the top scientists, and from this highly selected group come the next generation's most productive scientists." From this view, an enduring concentration of student and faculty talent, as well as financial resources, in high prestige institutions is justified as a functional necessity for the advancement of knowledge and for the efficient sorting of talent into subsequent roles in the advancement of knowledge and the stratified labor market. How students actually make their way through this sorting process has been a neglected topic, with exception of "the cooling out function" of community colleges, a concept intended to describe how the meritocracy handles those apparently without merit (Clark 1960).

Marking a distinctive conceptual departure from these two views of graduate education, both the happenstance notion and meritocracy notion are relegated to myth, when attention shifts to the social relations that actually occur in academic settings. Scholars who have examined the enduring concentration of talent and resources in a few universities have linked it to processes of structurally accumulated advantage and disadvantage (Merton 1990; Zuckerman 1977; Cole and Cole 1973). In studying the communication system among academics, for example, it becomes apparent that persistent status differentiation among certain classes of individuals and institutions is due to a latent dynamic—the Matthew Effect—where the elite receive disproportionate credit
and resources, as they are caught in a virtuous cycle of cumulative advantage (e.g., Merton 1968).

Others scholars have attempted to identify and document some negative consequences stemming from this kind of enduring stratification in the higher education system, by pointing out that the stratification in the higher education system renders different activities differently valued, such as research over teaching and sciences over humanities. One line of inquiry has examined the stability of stratification as it is linked to political control by elite and corporate interests and has questioned the appropriateness of the role of universities in economic development (Slaughter 1990). Another angle of critical scholarship has characterized the prevailing conception of talent as a narrow sense of excellence, noting that a tradeoff in the system’s excessive hierarchy as the loss of widespread talent development (Astin 1985). The implication of these studies points to additional negative consequences that may grow out of perpetuating the belief that students and faculty can ascend the hierarchy if they are talented enough or if they try to succeed according to seemingly objective, impersonal standards and academic practices.

In spite of these critical concerns, there remains a conceptual and empirical void regarding how individual students and faculty negotiate status differentiation dynamics that permeate the arena of doctoral training. By focusing on the process of research training in two campus settings, this study contributes to that line of work. In systematically examining the professional socialization settings across disciplines and campuses, I analyzed two mediating factors that emerged as fundamental to the differently stratified contexts: first, the financial resources throughout doctoral study, which has symbolic and substantive value in the amount and stability of what students receive and what in turn is expected of them in terms of time and labor; and second, expectations for students’ subsequent employment, including whether or not and how students will be sponsored by faculty and what students can anticipate doing at what kind of institution, especially the likelihood of engagement in research or teaching activities. Financial support and expectations for employment are the two major factors that I focused upon to frame the analysis of institutional differences in disciplinary socialization.

Within a broader theoretical context, this study may also speak to a tradition of scholarship that critiques the social production of knowledge in higher education, in particular in research universities and in sciences, for being driven by elite interests as mediated by industry, government, foundation agendas (Veblen 1918; Noble 1977; Aronowitz 1988; Dickson 1984), and a tradition that critiques the contemporary nature of academic professionalism (Bledstein 1977; Silva and Slaughter 1984). The implicit conceptual framework situates education at the center of a mix of theoretical and political concerns for the ways in which structural inequalities based on race, class and gender are encouraged by the collective identities that are created and lived out in educational settings (Weis 1985). The premise is that organizational realities are socially constructed and potentially
re-constituted by participants, as seen in such exemplary works in education at the high school level by Willis (1977), Connell and colleagues (1982), Cookson and Persell (1985) and at the community college level by Weis (1985).

The methodological imperative I follow is phenomenological in nature, in order to capture how students and faculty understand what they are doing and the place of knowledge production in their lives. This approach has been less commonly used for the study of educational practice within research universities (both knowledge production and knowledge transmission) and within the sociology of science (although the scientific practices have been examined as site of social relations). While this methodological approach clearly limits generalizability, it does compensate in its portrayal of stratification dynamics by mixing structural realities with identities and voices.

RESEARCH TRAINING ON TWO CAMPUSES

Elite university is a leading private research university in the United States and is internationally known for excellence in its faculty, research, and graduates. It is located on a beautiful suburban campus, with major construction projects under way to expand facilities for the life sciences. An abundance of financial resources along with the sustained institutional will to be the best have provided the organizational and financial means for this achievement. The university annually brings in over $300 million in federal contracts and grants, an increase of 200 percent (in constant dollars) between 1978 and 1988. According to a dean, “The nature of this university has always been entrepreneurial and a fast pace of work… The faculty are driven to do research.”

Sustaining a superior quality doctoral program is seen as vital to the functioning of departments. Faculty conveyed the rationale as being rooted in disciplinary reproduction; talented graduate students are valued by faculty “not only as RAs” and collaborators but also as they will be propagating our ideas,” one professor explained. Faculty decisions about whom to sponsor are taken seriously. As one explained, “These [students] are special people and they know they’re special. You can’t recruit and woo them and treat them all the same. We must advise them in a human way… If I decide I will sponsor someone, that’s the end of it. I’ve made a professional judgment and it’s not questioned.”

Being the best is something they talk about. In the words of an advanced doctoral student: “Nothing beats having great people around you. To do your best work, you need to be surrounded with the best people. It’s daunting yet exhilarating.” Since this university actually helps define what counts as the best in the country, doctoral students are encouraged to be innovative and to take intellectual risks in their original research. “They want to be famous, but they hate to be wrong,” conveyed one department chair about his observations of how students interact with each other through internal peer review activities.
Graduate education is financed across all departments in the university. There are various combinations from the following sources: government or industry research grants, foundation grants or fellowships, state funding through teaching assistantships, and some university-based funds. There is variation across departments, with some contributing little or no resources while other departments contribute greatly, particularly those in the sciences with more sponsored research projects. The usual package for incoming doctoral students is to expect some funds for tuition and a stipend from the university, while they also get some funding from government loans; however, some students are entirely supported by an external grant or fellowship.

On campus, it is commonly acknowledged that the best students are able to secure four years of support, and even into the fifth year and beyond through prestigious national competitions by foundations and government agencies, such as the National Science Foundation. Since financial support is also leveraged from faculty research grants, science departments provide their doctoral students with a higher stipend, with 12 months rather than nine months of funds and sometimes as much as $4,000/year greater than stipends in the nonscience departments. The general policy is for a department to admit only the number of doctoral students that can be funded. As an exceptional case, some students do not have financial aid and are admitted if they pay their own way, usually not more than 5 percent in any department.

The abundance of resources for graduate education and research provides a psychological cushion and structural vehicle for completing both. There seems to be an abundance of things people value most—time to do research, research facilities, and student-faculty interaction. "The ability to get funds builds on itself. It's easier to get funds here due to a supportive infrastructure already in place," said a scientist of his decade of success in obtaining a constant flow of research grants.

Students and faculty at Elite University convey that beginning graduate school seems to be like beginning their professional lives, as opposed to simply an extension of their undergraduate education. The message is clear in this milieu that the aim of doctoral education is to train researchers and scholars, not teachers. Since they have good funding arrangements, the time to degree completion is under the national averages across disciplines. Upon completing doctoral degrees "almost all of them find good academic jobs," an assessment shared by all department chairs I interviewed and affirmed by anecdotal data within the departments. As one department chair explained, usually the positions are "one notch down"; it is rare to find a first job in the tier of top ten universities. I was told that some students choose to take a longer time to complete their programs, not due to financial pressure that required part-time work, but in order to wait in the queue for the most attractive post-doctoral position or assistant professor position that becomes available.

Overall, at Elite University doctoral education encourages development of substantive analytical skills if not self-expression, where students also develop a
sense of academic and personal entitlement. As one professor surmised, “The students here are savvy—some more so than others. They learn they have to be; they must learn to be aware of implications because there are lots of choices to be made.” The faculty conveyed their sense that their doctoral students go through the program, perceiving it less as an obstacle course of hurdles to be endured and overcome, and more of searching for signs of validation as a potential contributor to the academy.

By contrast, State University is less competitive and smaller in scale, trying to be academically distinctive in a few pockets of excellence. Founded as a land grant institution, the tone on campus is tense, as the university faces impending state cutbacks that will affect both undergraduate teaching and research. The campus has had a long period of deferred maintenance, which is evident in the decaying physical plant. As one faculty member said, “It’s not terrible. It just doesn’t make you happy to be here.” Unlike Elite University, this campus has no construction in progress, which is a tangible sign of scarce resources and suffering from the downside of the Matthew Effect’s institutional version where the poorer places get poorer.

Most people conveyed a sense that the finance of graduate education is unstable and faces an uncertain future, since most funding comes in the form of state-supported teaching assistantships and financial cutbacks are imminent given a state budget deficit. Some externally sponsored research grants enable faculty to support research assistants, close to $50 million annually, but most of it is in experimental physics. Over two-thirds of the graduate students are part-time; and for those who receive stipends, the amount ranges from $3,000 to $7,000 for nine months. Time to doctoral degree completion is longer than national averages, since students need to work off-campus (as teachers, or even waiters) in order to afford basic living expenses. According to an upper-level administrator, the campus is known for producing Ph.D. “graduates of less quality (than the faculty) who rarely move up a notch in job placement, if they even find an academic job.”

The university policy is not to exceed three years of a teaching assistantship, a policy that is supposed to function “as an incentive to finish.” But TAs convey that the labor-intensive “TA work” is problematic. On the one hand, they convey that they are “lucky” to even get a TAship. They explained that “the best chance to get a TAship is right when you first come in, but it’s tough to crack into … a semester or two after you’ve been here.” “TAing teaches you how to teach,” which means “getting essential classroom training” and “an opportunity to master the material in an intense way.” Thus, TAing provides preparation for subsequent job placement, as over half the non-science Ph.D.s become teachers in high schools, liberal arts, or state colleges. On the other hand, it is common knowledge among students and faculty that “TAing slows you down.” As one faculty member criticized, “The TA component goes beyond a training component to exploitation and subsidizing research of faculty members. It’s hyper-developed.”
Students spend anywhere from 20 to 50 hours per week as TAs if they are "lucky" to be one, or they may work off campus the same amount of time as part-time teachers or waiters. An empathetic faculty member said that students "live like dogs, not like decent human beings," since they need second and third part-time jobs to meet living expenses. The barriers to degree completion are thus structural: "It takes time, and ... the clock is always ticking." According to students and faculty alike, doctoral students may flounder for years especially after completing coursework and may only be able to write a dissertation chapter each summer or worse yet never finish.

In a recent campus survey on the financial and working conditions of graduate students with TAs and RAs, the results reflected complaints by students across disciplines about being overworked and underpaid. They stated that the departmental TA requirements are "unfair," not only because they "compromise the quality of undergraduate education," but they also "compromise graduate work" since there is "not time to get another job though I need one to pay my bills," according to one student. Although "many respondents like teaching and enjoy being with undergraduates," the report stated, "They are exhausted." Wrote one TA: "I teach three sections of (the same freshman course). I have 20 students per section, 60 students in all each semester. I read 40 papers a week, hold two office hours, and attend a course director's meeting each week." In addition to studying for her own three courses, she adds to her response, "I'd go into more detail, but I don't have time."

**PHYSICS**

Looking more closely at the disciplinary differences on each campus, at Elite University the aim of doctoral education in physics is to produce "independent research scientists, not just people proficient in technique," said a senior faculty member. However, within a competitive context of sponsored research funding where universities have unabashedly become modern research complexes, timeliness is at a premium and mistakes are costly. Doctoral training is inescapably instrumental, for research skills are developed and performed at the precise time and place they are needed. One professor described his sense of his role, "I'm sometimes a sounding board where I try to let them make their own decisions, but if it's stupid I tell them."

These messages are internalized by students who see themselves as moving efficiently within the lab hierarchy. A third-year student explained, "All of my lab work is geared toward my own research. Any repetitive mundane work is a distraction—that's what the technician is here for.... My research is actually part of the p.i.'s whole project and when I finish I may even try to stay on here as a post-doc."
From the first day they enter graduate school, physics students learn how a lab will be their home base. In the first year they rotate through a few labs and then they choose one to their liking. The selection of a lab actually reflects a mutual agreement, as one faculty member explained, “I agreed to take on five new students this year. When you take on students, they are literally months to feed. I see them through the Ph.D., their first jobs as post-docs and sometimes beyond that.”

Thus, a major impetus for faculty to get funding is to pay for salaries in the lab. And given the funding system, faculty assume an aggressive posture. Said one, “I fire proposals anywhere and everywhere. It’s no longer getting funding for the best projects; it’s only half the best projects get funded.” The same professor added: “I haven’t been turned down much. If I did lose one or two of my grants, it’d be a major hardship…. A one million dollar grant would be ideal. At a university like this you can have a large group and build an empire. You share some equipment but you have separate labs. When a group is large—around 10—you become an administrator…. It means you must be aggressive all the way.”

The department also uses its discretionary funds (derived from research grant overhead and sale of old equipment) in order to supplement students’ stipends so that for 12 months of lab work a year they get approximately $12,000. In this context, students convey having learned the role of sponsorship: “You mainly need an advisor to run a lab, to keep the grant money coming in and to tell you what’s worth doing and what’s already been done, what’s easy enough that you can do it and hard enough that someone else won’t do it first…. And to help you get connected in the job market.”

The anticipated career path for physics graduates from Elite University is to get one (or more) post-doc positions and then to become managers of labs like their mentors—whether in academia or in industry, a distinction which itself is blurring. Faculty expect their students will internalize the entrepreneurial, grant-seeking orientation that they model so consistently.

As an exception to students following the fast track trajectory, a fifth-year theoretical physicist confessed having had an interest in seeking a teaching position at a liberal arts college: “Faculty see their own teaching as a necessary nuisance and they see it as a consolation prize for their own students. I’m more interested in teaching—probably at a liberal arts college. You can’t say that too loudly around here. They look down their noses at you. I don’t know what I’ll do about it.”

In contrast to Elite University, physics at State University is an enterprise that has fewer research resources; fewer faculty seek grants and then have less success getting them. There are severe consequences for doctoral education, as a professor lamented: “Without external funds, I can’t do research. I grew up in a system that taught me to ask. If you don’t ask, you won’t get anything. There are months to feed. And it’s tough.”

Doctoral students in the department have been unevenly supported. One student that I interviewed was an RA for five years. Another was a TA off and on for four
years. Regarding this latter student’s unstable financial support, a peer of hers told me: “Students are treated unevenly. (Pause.) But sometimes it’s the student’s fault. She chose the wrong p.i.”

With small labs, work relations are more horizontal than the more hierarchical chain of command in the large labs (p.i., postdocs, advanced doctoral students, new doctoral students, technicians). Due to limited research funds and hence limited and unstable funds for salaries, postdocs are rare as are technicians. As a faculty member with a small grant preferred, “I’d rather use the few resources to train a graduate student.” With this arrangement, students perform a wider range of lab work “tasks,” as he explained “graduate students work side by side, perhaps doing the same techniques on different apparatus or vice versa.”

Although physics students and faculty both report having frequent (daily) interaction in the lab, as they did at Elite University, students at this campus complain about a lack of attention that they call “mentoring,” which is a vague label for something they are unable to articulate more precisely. As one said, “Graduate students make this place tick, and there’s hardly any mentoring although we have contact every day.” My impression is that the complaint of a lack of mentoring is actually a complaint about lack of commitment for ongoing sponsorship, both in terms of expectations to develop an intellectual agenda and in terms of job market connections.

The kind of interaction they do experience is directive and oriented to training in skills. A professor described the training, “In physics we teach that there are certain techniques of instrumentation, of measurement style, of design that take several years to master. We have staff and support from our machinists, who build the metal apparatus, much like a glassblower would be for chemists. The students learn how to work with it, though.” Students view this lab work as the core of their doctoral programs, as one remembered, “I was eager to get in the lab. It’s where you really learn, where you get the tools, where I learned how to twiddle the knobs, to take data, to work up shop drawings for machinists.”

The fact that this department has few resources is crucial to the unidirectional nature of student-faculty relations. A senior professor explained quite candidly, “Given today’s funding picture, there’s no way to proceed slowly. Funding would dry up completely.... The price has been independent thinking and autonomy which were more pronounced 20 years ago. We can’t give them as much leeway or rope.” Similar to the views expressed at Elite University although more extreme on this campus, he stated, “Time is a problem. You can’t afford to let students make mistakes.” Another faculty member used similar language: “The funding is a tricky balancing act when you’re training graduate students. You have to give them leeway to make mistakes; yet unless you make progress in the lab, there’s no funding. In recent years the funding is tighter so you have to keep students on a tighter leash. This is bad for their education but you live with it.”

From the students’ perspective, this context encourages their sense of being workers: “I feel like an employee, but I like it ... an employee on a long leash.”
Or, as another stated, “You don’t work with a faculty member. It’s more you work and they evaluate.”

In this lab context, the development of a dissertation seems to reflect that faculty expect less originality from the student and that students expect to be directed. A fourth-year student exemplified this kind of pattern, when he responded to my query about how he developed a dissertation when he was supposed to be working on the p.i.’s project: “The two things actually run together. The dissertation idea came from him. I would’ve had a hard time if he hadn’t suggested it. He does that with all his students. He was pretty specific in suggesting an experiment. He said ‘Gee, this’d be interesting to use this technique.’ Anything sounded good to me at the time. I just wanted a project that’d be my own. But it’s actually part of the bigger project.”

Students conveyed that they lived with a sense that it is possible to “invest a lot of time and not get through. The master’s degree is a consolation here.” Faculty conveyed that the doctoral program “aims to put people in faculty positions,” that as graduates from this university “they are not necessarily out of the running for a good job.” But, as the department chair suggested, “This is a tough choice for them…. It’s a lot of work for not much pay.” A fifth-year student explained his reluctance for the academic path: “I have a lot of resistance to the postdoc track. A job in industry is a more attractive option. Do I want to beat my head against the wall for six years at a mediocre research university with difficulties getting financial support and only a modest salary or go into industry with no tenure barrier and with equipment and science that’s interesting? Why not? It’s a viable option. The only person I need to satisfy is myself. I don’t think the ivory tower is so sacred.”

Other students talked about different possible career paths, mostly for “a good job,” which stands in contrast to the Elite University graduates on the fast track. One student reflected ambivalence about his likely future: “I might stay another year here or go teach in a four-year college, or maybe try to find a postdoc for two or three years which might lead to a faculty position in a research university. Don’t know yet what I might find.”

Another student who had TA’d for a few years reflected on his path toward finding “a good teaching job”: “I think it helped my development. It certainly slowed me down, but in the end it was worth the time. It matters what you’re preparing yourself for. And since I’ve been here I know now I want to teach.” Faculty convey a similar instrumental justification regarding those who spend most of their time TAing in physics. As a theoretical physicist (with no sponsored research grants) explained, this arrangement is actually advantageous to the students, “Most of my students TA all the way through. These students have as much time for real work as the other students who are RAs. And more theorists have a second job option of teaching at a small college. So the TAing is good preparation for their careers. I suspect it slows them down somewhat, but I’m not convinced of that. If they did research full-time, they’d just do calculations all day and end
up fuzzyheaded.” How it is that his students even have the first option, academic research, given their lack of research training remained a puzzle to me.

Overall, the physics department at State University focuses on the development of technical skills. Both students and faculty put a premium on having students learn the mechanics of techniques. While this undoubtedly is also a component to the doctoral training at Elite University, the thrust here is learning to reproduce and to extend “follow-up research rather than contributing discovery research.” Students who make it through the program develop a sense they will be proficient in techniques or will most likely become teachers if in the academy at all. Thus the expectations for the good students are to take positions as marginal workers in an academic labor market where the bulk of the resources go to the few in the upper strata. The departmental culture ends up validating a differential valuing of research and teaching as well as limiting a sense of options.

HISTORY

Moving from physics to history, we see parallel differences between the stratified expectations associated with Elite University and State University. Rather than the patterns of producing managers versus technicians that emerged in physics, history suggests a distinction between two other different and differently privileged paths—that of scholars versus teachers.

At Elite University, historians are devoted to scholarship and the training of future generations of scholars. Faculty convey that to be a historian is to be a lone scholar, ideally with “time off, which is a synonym for doing my own work.” Contemplative images of academic work come to mind, much like the all-consuming individualism exuded by Rodin’s sculpture of “The Thinker.”

Many faculty articulate their deliberate efforts to be this kind of role model: “I try to indoctrinate students to see that the faculty role is a privilege in the classical sense of a university professor as a lone scholar who sits on high with high standards.” In the words of another faculty member, “The practice of history is a solitary endeavor. It takes a long time in terms of gestation and production. That’s how we do it. We replicate that practice in training graduate students. We give them an assignment to go off and do on their own. I don’t hire them to do work or pay for their time.”

In the history department at Elite University “almost all students seek academic positions,” said a senior professor, “but they are all realistic. Maybe they won’t be at the most prestigious institution, but they will go to a decent one. Besides people have gone to Harvard and Yale before as first jobs, but they were all terminal since neither place promotes anyone from assistant professor. If they like you, at best you’ll get an untenured associate.”

Students also convey expectations that they will be scholars, that they will get good if not great academic jobs. They rely on faculty for substantive advice on
developing their research agendas. One faculty member was bemused by this:
"Students feel lost and want to know what are the hot topics and what is market-
able. How grateful they are when told what to do.... But I generally don't."

Having solid financial support and good success in national fellowship com-
petitions removes financial pressure from these students. There are no formal work
expectations except to TA for one quarter. Some students decide to work in addi-
tion to their stipend, but the nature of the work is library reference or computer
consulting. One student actually complained to me about the lack of teaching
opportunities while a doctoral student: "We're not trained as teachers but as
scholars. We're not given a chance to teach much and certainly not our own
course. It's bad because most of the jobs entail teaching. But somehow we seem
to get the jobs anyway." There are a handful of RA positions in the department,
funded by foundation grants, yet students said those are "closed. The system has
a momentum of its own. The faculty don't advertise the RA positions—they ask
the current RAs who to hire."

For the most part, the thrust of the training in this department is for indepen-
dence. According to one professor, "We want students to take control of their
lives, not do our work.... We want them to learn how to read books, how to criti-
cize them, how to construct their own questions, how to consider what's profes-
sionally worthwhile.... I won't tell a student what to work on. If they won't take
responsibility to come up with a topic they're interested in, then I won't work with
them.... One lives with that decision for about ten years, 3-5-7 doing the disserta-
tion and another 3 making it a book."

How people in the department talked about the aim of becoming independent
scholars reminded me of talk about the personal discipline and arduous work
entailed in cultivating artistic sensibility, religious formation, and mastering legal
canons. As articulated by one faculty member, "It's all a process of self-discipline
and self-inquiry. No one can teach you that.... It's a highly personal thing."
Another was a little more specific about the aim of training: "We're trying to train
them to think. We train them to know what sources are available and what are
their limitations, where to find them and how to manipulate them.... We give
them a dose of substance so they have a common base of knowledge.... We give
them a dose of methodology, which is basically a discussion of how to marshal
evidence. They are taught that they can't be definitive, but they can be persuasive
in arguing with their peers."

The emphasis in the latter quotation on manipulating sources in order to craft
persuasive arguments is shared by others in the department. One faculty explained
that "Historians learn how to do research by reading other historians doing his-
tory. It's largely trial and error by imitation." Yet, from several students' perspec-
tive, this imitation entails an antagonistic critical stance to which they must grow
accustomed: "It's learning how to tear history to shreds in order to be impressive
in class." Another student explained that they are encouraged to be aggressive, "to
pick apart arguments, to be impressive with other graduate students." Feeling
humbled and "like a small fish," this student recalled her first two years in the pro-
gram: "It was massive catching up and covering up. I had had a naive sense of
what history was. I was used to analyzing primary documents and memorizing.
This was completely different…. And now I feel like an apprentice but I don't
know to whom—maybe to the field of history…. We used to joke about it as it's
just do-it-yourself graduate school."

Within this context, students perceive that sponsorship is essential and that fac-
ulty are selective about who they take on. Faculty confirm this perception. When
faculty get funds it enables them to have time off, to travel to archives or to write.
They tend to guard their time. As one explained: "The greatest tension in our lives
is between teaching and research. If we're conscientious about graduate educa-
tion, then we have less time to devote to our scholarship. I try to protect myself
from being overloaded with students." When they decide to work with a student,
they generally have determined the student is worth it. A professor told me: "Only
the best students are quick enough and competent enough to make their own
way." This is different from when he was in graduate school, "What it means to
be a historian has expanded since the 1950s. There's more published and the num-
ber of problems and subspecialties has increased. So there's more to know about.
It's a good thing, but it results in a deeper obscurity for training. And only the best
can make it."

Student-faculty interaction in the construction of a dissertation exemplifies
these elements—the faculty decision to give time and attention, the student trying
to make sense of a kind of obscurity that requires self-discipline and self-inquiry.
As students describe it, "The contact we have is all at my initiative. The shaping I
got is after I've done the work. They tell you what's wrong and possible ways to
fix it." A faculty member described the kind of feedback he gives on dissertations
and conference papers that spin off from that: "It's mostly editorial in nature.
They need someone to say to leave out all that good stuff and how to sharpen it."

History at Elite University produces scholars more than teachers. The message
for those in the elite track is that teaching is second-class labor, to be thought of
as more of a burden or necessary obligation than a reward. Within this context,
those students who may want to be teachers either develop an oppositional con-
sciousness or think of themselves as failures. It is possible that faculty feel a sense
of loss, too, as they tend to lose those students as colleagues in the field. Most stu-
dents want to get good, if not the great, academic jobs. Some even delay submit-
ting the dissertation until a prime opportunity arises.

In contrast to Elite University, history at State University is an entirely different
enterprise. Overshadowed by very low morale and unstable funds for graduate
education, the program was virtually disbanded in the mid-1970s to mid-1980s.
By the time I arrived in the late 1980s, things were up and running again, as a
surge in undergraduate enrollments justified a significant increase in faculty
teaching and in TA allocations.
Faculty spend their time overloaded with teaching responsibilities. The standard is four courses a semester, teach undergraduates, and half teach graduate students. One doctoral student complained, "The faculty are too busy teaching to be good advisors. You have to be forceful to see them. They also say to us don't come in unless you have something down on paper." Faculty also have insufficient resources to do research. They have a certainty that they cannot get grant money, so they do not bother to apply. As one expressed: "The subject matter won't attract grant money and a single scholar digging in the archives doesn't generate interest.... We need less money (than in science) but that doesn't mean we need no money." This attitude sharply contrasts with the confidence expressed by Elite University historians, who feel they deserve to be supported with outside funds and institutional release time from teaching, while at State University faculty are teachers primarily; and, as such, they are teaching role models for doctoral students.

With no funds to support their own research, let alone funds to support graduate students, the finance of graduate education is solely through TAships. If a student is "lucky enough to get one," they get paid $4,500/year. A student explained how she was among the lucky: "At more prestigious places to TA is a consolation prize. But here the incentive is to be a TA. Without it you're a nonentity, no office, or tuition waiver. Even the few students on full fellowships don't get an office. But as TAs we are peons. We're just doing time. The faculty don't see us as colleagues, even the younger ones. But it's not at all a drag because it helps me plug some holes in my own knowledge for the teaching I'll do when I leave here. It keeps me from doing the dissertation, though. It's this nagging thing in the back of my mind. Am I going to do a good dissertation? Am I going to get a good job? I wish I had some assurance."

Without a TAship, a doctoral student is invisible in the department. According to a department chair: "They're just out there, nonpeople, outsiders." Beyond providing a structural link with others in the department, faculty justify the TA work as suitable training: "As a TA they go to classes and see what I'm trying to convey. Doing lectures is tough work and they get to see just how tough."

Faculty and students face daily reminders of a lack of resources and of not being at "a first-line institution." One senior professor stated, "The best departments in the country are rich and the students get a different sense of the field—the art and craft of history. Money makes a big difference. How they spend their time. And where.... And the library resources at those places far outweigh what's here." As the chair said, "We struggle against a long history of not being a nationally recognized university.... We've been able to increase the size of the program since the number of TAs have gone up with undergrad enrollments, but the stipends remain too low. There are lots of actors in the political process who keep us from accumulating resources. They say, why train graduate historians if we can't place them."
Expectations for employment are that, if students are lucky, they'll finish. The long time to complete (averaging eight years) itself can yield diminishing returns. As the chair noted, "It's infantalizing and bad for their self-esteem." In spite of being in his sixth year, one student was able to gain confidence in himself for teaching: "I've had a good experience teaching part-time (at a local state college). It's a strain on my time but at least I'm the boss."

The successful path—and "the best students"—end up at liberal arts colleges, state colleges, and high schools, while only a handful have ever gone on to research university positions. One student reflected on trying to make sense of this: "I always thought I'd go to a good place. I got a one-time fellowship offered from here in the first year so I came. I felt the burden of proof was then on me to convince my family that I made the right decision not to go to a top school. Next year I'm on the job market and it's all coming up again. It's a worry.... I TA'd for three years and this semester I'm teaching a course of my own. It's been a struggle for me. Among the grad students here there's a certain teaching ethic, a mission to like it, and I wanted to be like that, too.... I've always wanted to like it because it felt like that's where I was headed professionally.... Also, I always thought a good job was at a liberal arts college. Now they tell me a good job is at a research university because you get to teach less."

Along similar lines, a faculty member explained to me the likely futures of even their best students: "Like us, our graduates struggle themselves for space in the field.... Every once in a while a space is open to become successful. It's a flower that exists in a hostile environment.... The only places who'll take them are the liberal arts colleges—not the research universities where the disciplines are tight and the people are uptight. Those departments don't want them and won't hire them."

Given these labor market considerations, there is also an explicit vocational component for others trained in this doctoral program. The chair explained: "We give students training for all the areas where historians practice outside the academy, including museum interpretation, archival management, historical agency development, editing and publishing in publishing houses and government.... So there's an explicit vocational component to it."

**SUMMARY AND IMPLICATIONS**

This study examined the elite sector of research universities in the United States and presented an analysis that suggests profoundly different patterns in the learning of academic labor between the highest prestige of the elite (top 10) and the bottom (ranked about 100) in the institutional pecking order. While the data clearly do not warrant definitive generalization, they do suggest that this is a rich arena for further study. And, in illuminating the structural features embedded in doctoral programs, the analysis does challenge, at least anecdotally, conventional
ideas about meritocracy that assert differentiation of research training is due to quality—of faculty and student talent—and individual choice. The portrayal is one of quite different local contexts in which students and faculty re-create academic stratification into research and teaching labor as well as into more and less privileged campus settings. In addition, I used the case study data to consider how Elite University trains entrepreneurial science managers and scholars with a sense of academic and personal entitlement, while State University trains technicians and teachers with a sense of themselves as workers. I have also suggested that some of the consequences of this latent dynamic are the differential valuing of research and teaching activities gets perpetuated, and the academic labor market sustains if not further a segmentation of privilege.

One might argue that the division of labor among research universities to reproduce stratified expectations and identities is actually quite functional. That is, different kinds of universities produce workers (with the workers' consent) who have skills that correspond to their likely positions in the segmented academic labor force.

However, many questions remain. It should also be noted that the open-ended interview protocol did not yield any specific comments about the relevance of class, race, or gender, as either structurally ascribed or culturally salient. Thus, future studies could fruitfully examine how, if they are present in the academy at all, working class, and/or people of color, and/or women tend to remain concentrated in marginal (nontenure line and often part-time) academic positions at less privileged campuses as well as underrepresented at elite campuses. Age is an additional dimension worthy of consideration. In this study, students at State were older on average and were less likely to move geographically to attend graduate school.

Alternatively, an analytical avenue for exploring this terrain is to argue that the current division of labor among research universities is actually not functional at all, and that it serves neither those in doctoral programs nor the academic system as a whole. In support of this perspective, there is some evidence that current arrangements are breaking down or showing signs of strain (Gumpert 1999). These signs of strain are worthy of further analysis, particularly since they may suggest that knowledge production could be accomplished with greater flexibility in non-academic settings, a judgment that would threaten universities' competitive position within the capital-intensive arenas of knowledge production. As dynamics of knowledge production develop to reflect new patterns of competition and collaboration, the R&D capacity of research universities will increasingly be challenged to respond swiftly, creatively, and collaboratively with those in nonacademic settings in order to keep pace with the changing knowledge needs of society.

As a first step in exploring this question in the context of the case study data at hand, I consider the implications of the Ph.D. programs at these two universities for the likely paths that their graduates will take. At the risk of oversimplification,
four paths seem likely: entrepreneurial lab managers, privileged scholars, science technicians, and history teachers, respectively. For each path, I consider how the current division of academic labor may be dysfunctional and work against itself. Regardless of whether or not individual faculty intend to reproduce the kind of system they experienced, and regardless of whether they intend to benefit the agenda of economic development or educational goals of the wider democracy, the sources of strain undermine the long-range viability of each path as it is presently constituted.

At Elite University, the science faculty model for their students the highest entrepreneurial ideals as lab managers. In a system that is increasingly driven by external research agendas, students observe faculty p.i.s increasingly selling the soul of their professional academic mandates, losing autonomy in order to be responsive to federal government/industry/foundation agendas, rather than to more pure intellectual or less economically valued social needs agendas. Furthermore, as faculty p.i.s become proficient administrators of growing labs (managing budgets, equipment, grant applications, lab workers), they move farther from doing research and thus minimize their own role as scientists and hands-on research mentors.

Moreover, the research training assumes an instrumental rather than an educational process, as faculty admitted, “We try to keep the best students on our research because we want it done quickly. You can’t put a weak student on that because we’d end up brushing the student aside and doing it ourselves.” The result is a further differentiation even within this department, such that the strongest performers become those most heavily sponsored who in turn create their own empires. Yet this trajectory actually works against the production of physicists qua scientists with both autonomous intellectual agendas and research skills. All of this occurs within the context of a wider organizational strain, due to the fact that Ph.D. programs are usually housed in departments, while the site of research training on these campuses is more frequently found in organized research units (which are often interdisciplinary and/or applied and are increasingly funded by industry).

Similarly, for the historians from Elite University, faculty model a devotion to scholarship, where work is for the most part solitary contemplation aimed at persuading a community of peers. At least two kinds of strain are apparent here. First, history faculty try to protect themselves (actually, their time) from students, yet they need students in order to propagate their ideas and become future colleagues who will comprise their national networks. Second, graduates of this institution are trained to want academic and personal entitlement, yet they come up in a system that has fewer and fewer places of such privilege. Since it is increasingly difficult to find a great job, only those most heavily sponsored achieve the ideal of their mentors. Since they have probably internalized the differential valuing of research over teaching, they may become miserable and think they are too good for the position they are able to get, that is, too good for the institution where they
end up located. As one said, "For faculty who are locked into a narrow view of professional advancement and publication, it's a real problem." Others may have accepted or at least resigned themselves to being "a notch down"; as one freshly minted historian characterized the second-class teaching status of her recently acquired community college faculty position, "You have to feel it's really meaningful to you, otherwise it's not professionally worthwhile."

Graduates from the less prestigious university end up reflecting a strain in the system in a different but equally straightforward way. As we saw at State University, scientists were trained to be technicians not autonomous thinkers. While they may subsequently assume positions in labs, they would be "skilled but in a limited context," proficient in a technique but not likely to launch a research agenda. As one faculty member described, "You get plugged into a particular project because you are proficient at a technique, really skilled but in a limited context, like a super-robot who needs to be pointed in a direction. It's a career built on graduate lab work, and the person is hired to do it again and again as a postdoc and after. It's not an intellectual agenda."

For some faculty and new Ph.D. graduates, a lack of grant money may not stop them from doing research, or from wanting to do research. But it does stop them from financially supporting the research training of the next generation of physicists. For doctoral students this means they will increasingly need to get temporary jobs, while carrying their coursework or dissertation, or "stopping out" to work in industry. As an under-funded student at State said, "We're slowed down considerably. The money is a big factor. We're virtually working all the time. No one has ever gotten through here fast. We can't." Furthermore, if these students are hired into teaching positions, they may inadvertently convey to their students a sense of what physics is—and what it is to be a physicist—that is either outmoded or incredibly narrow.

Similarly, the historians from State University, if they are lucky, they will complete their programs and will acquire full-time teaching jobs. Otherwise, they will "string together" one or more part-time jobs, with heavy work loads in institutions where they will not be supported by teaching assistants. Thus, the conditions will be even more exploitative than was modeled for them in their doctoral programs. Since these people will be in marginal academic positions—and they tend to be women, minorities, and working class academics—there is a certain irony to the kind of history they may in turn teach. While for the most part they may teach the history they learned in graduate school, there is potential to teach to less mainstream student interests if their students bring a progressive or even radical sensibility generated out of their own lower socioeconomic status positions.

Unlike those from elite campuses who emerge from radical self-doubt with the Cartesian certainty that "I think therefore I am" for the historian, or "I do sponsored research therefore I am" for the physicist, those from less privileged campuses have acquired a sense of themselves as workers and have come to recognize their work as labor. They have learned that, in this system, you don't get what you
deserve, you get what you negotiate—which means that they may be more likely to unionize, to generate a collective momentum, and to thereby resist elite values about who and what is worth more.

All of these dynamics, of course, are related to the broader context of knowledge production and the question of whether the diverse group of research university campuses that presently exists can each retain their competitive position, produce state-of-the-art research, and function as educational settings that warrant national pride. In the United States over the past decade, research universities themselves have brought increased attention and resources to undergraduate education, primarily in response to widespread criticism that the emphasis on research has had a cost for the undergraduate level. While some campuses have proclaimed their new-found identity as a "student-centered research university," it remains to be seen whether this theme will retain its momentum or whether it is largely symbolic, with few or no consequences for the organization of doctoral education.

NOTES

1. The Carnegie Classification of Institutions of Higher Education has become the most widely used typology for describing the size and complexity of the United States system. The 1994 version is the most recent version, although revisions of the classification are underway for 2000 and for 2005. Over the past 30 years, the Carnegie Classification has not only described the structural contours of the educational system (as its designers intended), but it has been used by others as a shorthand to signify the strata of the system, such that the categories signal not only different levels but differently valued levels of the system. The criteria for designation in one category or another pertain to highest level of degree, number of degrees produced, breadth of degree offerings, and federal research funds received. Of approximately 3,600 colleges and universities, there are 125 research universities, 111 doctoral universities, 529 master’s colleges and universities, 637 baccalaureate colleges, 1,471 associate of arts colleges (also known as community colleges), and 722 specialized institutions. About 44 percent of the institutions are public, while about 80 percent of the student enrollment is in public institutions.

2. Supported by the Spencer Foundation, this study was part of a cross-national study of graduate education and research conducted with my colleagues Burton R. Clark, Tony Becher, Maurice Kogan, and Guy Neave between 1987 and 1990. As the researcher in charge of the United States’ piece of the study, I first gathered relevant documentation and historical observations through interviews with national representatives of funding agencies, research councils and higher education lobbying associations. Second, I conducted case studies, first pilot work as a medium-ranked research university and then at four universities representative of the stratification in the U.S. system (stratified by different levels of federally sponsored research activity and by levels of doctoral production). Four case studies included over 150 campus interviews with administrators, faculty and graduate students in four disciplines (physics, history, economics, and biological sciences, the latter due to heavy national investment in biomedical research). Sources that would reveal the identity of informants and institutional locations were omitted in the writing up of the analysis. All interviews were taped and transcribed verbatim. Interviews and documents from the campuses were coded according to categories in the conceptual framework as well as categories that emerged in the process of reflecting upon the data. The data were also examined for examples that would refute the patterns that emerged from the analysis. For a comprehensive overview of the results of this study, see Clark 1995 and Clark 1993.
3. A note on terminology: In the United States it is common to refer to a research assistantship as an RAship and a teaching assistantship as a TAship, to refer to the role as RA and TA (or in the plural), and more active gerund form as RAing and TAing.

4. I was given access to the completed surveys, which included verbatim, handwritten responses to the survey's open-ended questions.

5. "p.i." stands for principal investigator.

6. The 1986 Tax Reform Act marked a federal initiative to reduce the national deficit by taxing graduate students' stipends associated with research and teaching assistantships; previously they were excluded from income tax. In addition to technical changes entailed in the administration of graduate student financial aid, the policy change signified that fellowships were excluded (since they were part of the educational program) while research and teaching assistantships were a form of labor, at least from the perspective of the national government.

REFERENCES

Learning Academic Labor


