Research Directions for Understanding Human Resources in Broad-Access Higher Education Institutions

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INTRODUCTION

Broad-access higher education institutions play a large and growing role in American human capital development, yet research describing how these institutions function and identifying the key elements of institutional effectiveness is sparse. Research focused on elementary and secondary education consistently demonstrates the significance of human resources – particularly teachers and school leaders - in educational production. Successfully recruiting, retaining, assigning, and developing effective instructors requires understanding the instructors themselves, and the administrators who both manage personnel practices and can have direct influence on student outcomes outside the classroom. The importance of these educators for student learning and educational attainment is particularly large when we restrict attention to inputs that institutions and policy makers can use as levers for change. Yet, like most topics discussed in this series, very little of the research on educators is set in higher education institutions and even less in broad-access higher education institutions. Given this lack of information on higher education personnel, the goal of this paper is to identify lines of research related to instructors and managers that are likely to be productive both for understanding the effectiveness of broad-access institutions and for identifying useful avenues for improvement.

Higher education institutions pursue multiple goals. Human capital development, most notably through classroom instruction for students, is clearly one of those goals. Providing additional services to aid students in their development of human capital – through such mechanisms as tutoring, mentoring, child care, thoughtful scheduling, etc. – also can support this goal. Many institutions also provide services to the local community and many have knowledge production goals through faculty research programs. In this paper we focus exclusively on the first goal, human capital production, and the role of instructors and managers in achieving this goal. Yet even within this narrower definition of the goal of broad-access institutions, the meaning of success or effectiveness is difficult to define or measure.

In what follows, we use extant research and some descriptive data to identify promising areas of research for understanding human resources in broad-access institutions. We focus primarily on the recruitment, use, development, and retention of instructors and the role of managers in these processes. Differentiating and assessing personnel and personnel practices is easier when we share an understanding of instructor effectiveness. As such, we begin in the next section with a discussion about the variation and distribution of instructor effectiveness, highlighting issues both in definition of effectiveness and in measurement. Next, we address personnel practices and policies – in particular the recruitment and selection, use, development, and retention of instructors. Third, we attend to the role of leaders or managers in these personnel practices, as well as the systems and workforce dynamics that likely influence the quality of management in these organizations. We conclude with an overview of our main points, recognizing that while we choose to focus on one set of dimensions in this paper, there are many more influences and inputs into successful student outcomes.

MEASURING INSTRUCTIONAL EFFECTIVENESS

A central feature of many human resource questions, including those we discuss in this paper, is information on employee and organizational performance. Effectiveness measures are inputs to the processes we discuss below, but can also serve as outcome measures in many
instances. Thus a first order area of research is: *What measures of instructional effectiveness are feasible, reliable and valid; and what is the distribution of effectiveness within and across broad access higher education institutions?*

A logical definition of instructor effectiveness is the extent to which the instructor helps students reach the goals for which the institution exists – for our purposes, human capital development. Unfortunately from the perspective of the researcher, each institution’s human capital goals are multi-dimension, changing, different across students, and often difficult to measure, particularly at the time of accumulation. As such, proxies are often necessary to measure instructor effectiveness. We briefly discuss four approaches to approximating instructional effectiveness for the purpose of understanding instructional effectiveness per se and the distribution of this effectiveness both within and between institutions: the direct measurement of student outcomes, judgments based on observed performance, observable characteristics of instructors, and inference from labor supply.

Over the past decade substantial research effort has been devoted to measuring the variation in teachers’ ability to promote student test score growth; empirical estimates of that variation are generally large and consistent (Hanushek and Rivkin (2010) provide a review).1,2 While the extant estimates come largely from elementary and middle school settings, it is not unreasonable to expect similar variation in broad-access college instruction. On most dimensions college and elementary schooling are very different, but the key instructional practices are far more similar: planning lessons, lecturing, asking questions, responding to confusion, managing time, etc. And work by Carrell and West (2010) studying early college math classes, albeit at a highly selective institution, does find instructor variation similar to elementary teachers.

Moreover, while work in K-12 settings has generally been confined to student scores on standardized tests,3 the college setting permits a wider set of student outcomes. Persistence, graduation, and choice of major field are important, quantifiable outcomes at least partly a function of the quality of instruction students receive (for an example see Bettinger and Long (2010)). Labor market outcomes are also far more proximate and empirically tractable in this setting. Correlating measures of instructional quality that use different student outcomes should provide even more valuable information. Thus, while the goals of higher education institutions are more varied than the goals of K-12 schooling, the outcome measures of interest may be more proximate and thus some direct measures of instructors’ contribution to student development as measures of effectiveness are likely to be useful.

Directly observing employee behavior is a second approach to measuring instructional quality. While this approach has long been practiced in the education sector, in recent years

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1 Early empirical work in this area dates back three to four decades to Murnane and Phillips (1981), and Hanushek (1971).
2 These student-test-score-based measures, often called value-added measures, are not without open methodological concerns (Rothstein 2010, Todd and Wolpin 2003). Indeed, concerns about the non-random selection of students into particular schools and classrooms may be more salient in a college setting. Thus, the methods of such measurement are themselves an important area of research in broad access higher education.
3 Exceptions include Chetty et al. 2010 and Dynarski et al. 2011 who study the college and career effects of students’ earliest school teachers.
research has demonstrated that observation-based assessments of performance can predict more objective measures of student success like those discussed above. A result that holds when the assessments are formal (Kane et al., 2011; Grossman et al., 2010) or more subjective (Jacob and Lefgren, 2008; Rockoff and Speroni, 2010; Rockoff et al., forthcoming). Students’ assessments of teachers also predict student learning in some cases (Gates Foundation, 2010; Hoffman and Oreopoulos, 2007). Extending this kind of analysis to broad-access settings and instructors may be as useful because they can be applied across a wide range of classes and because they provide information on what it means to be a good instructor. Of course, not all observational measures are useful. Observer bias, in particular, is a concern. Principals, for example, may favor some teachers over others (Jacob and Lefgren, 2008). Student evaluations have been shown to favor teachers who give good grades over teachers who contribute to students’ later success in the field (Carrel and West, 2010).

When more direct measures of instructor effectiveness are unavailable or when their imprecision and potential biases can be mitigated by supplementing or supplanting them with other measures, managers and researchers often turn to observable characteristics of instructors which are correlated with performance. The history of research in K-12 settings is that the intuitive proxies are not necessarily useful proxies, and thus evaluating potential proxy measures is an appropriate investment of research effort (Hanushek 1986, 1997, Jacob 2007, Rockoff et al. 2008).

Two frequent and contrasting examples from the K-12 literature are education degrees and experience. At the K-12 level there appears to be little difference in the instructional effectiveness of a teacher with a master’s degree instead of a bachelor’s degree (Hanushek 1986). Research may similarly find no difference between broad access college instructors with a doctoral instead of a master’s degree, or between faculty and graduate students in their instructional effectiveness. In contrast to graduate degrees, teaching experience is generally viewed as a valuable proxy for instructional effectiveness at the K-12 level. Consistent evidence shows that novice teachers are meaningfully less effective than their colleagues with a few years of experience (Kruger, 1999; Rockoff, 2004; Chetty et al., 2010), and the gains from experience may continue later into teacher careers (Papay and Kraft, 2010; Wiswall, 2011). Carrell and West (2009) find more complex results for experience effects in one selective higher education setting. Students assigned to less-experienced instructors for a first calculus course scored higher on the course exam than their peers taught by more-experienced instructors. But by the end of the second calculus course the students assigned to more-experienced instructors in the first course were scoring higher.

Extant research also provides some evidence that content knowledge, pedagogical content knowledge, and pre-service teacher preparation contribute to effectiveness in the K-12 setting (Rockoff, Jacob, Kane and Staiger, 2008; Boyd et al., 2009; Ronfeldt, forthcoming). Content knowledge, in particular, has implications for higher education as it appears to be more important in middle and high schools than in elementary schools and could be even more important at the college level where the content is more specialized. Understanding the distribution and importance pedagogical content knowledge and preparation in higher education may be less at the forefront of current thinking about higher-education instruction as less effort has gone into developing understanding of the teaching skills higher-education instructors need to be effective. However, even in higher education, the technology of teaching is operationalized
in programs to train teaching assistants and in university programs (e.g. teaching centers) that aim to support instructors’ pedagogy.

A number of other instructor characteristics are good candidates for research in the college setting both because they are readily observable and because they lend themselves to reform; that is, they can be easily manipulated for the purpose of improvement. Bettinger and Long (2010) found that students taught by adjunct instructors in a particular subject were somewhat more likely to continue studying the subject, especially in professional fields like education and engineering. Hoffman and Oreopoulos (2007) found minimal differences in student achievement between tenure-track and non-tenure-track instructors.

A final measure of instructional quality is likely less intuitive but can still be useful. At any given point in time, the faculty of an institution is, at least in part, a reflection of the labor supply available to that institution. Institutions with a better supply of instructors interested in working there are likely to have a higher quality workforce, unless they specifically choose less effective workers out of the pool available to them. A large applicant pool may signal an appealing job. Similarly, high turnover rates may signal a lower quality workforce, not only because turnover is disruptive but because such turnover indicates a less appealing job for workers. As a result, even if a measure, such as the competitiveness of the undergraduate institution from which instructors obtained their degrees, is not a good direct measure of instructional effectiveness, to the extent that differences in the measure captures differences in the opportunities workers have in alternative jobs, it may measure the quality of the workforce if the skills needed in other jobs are similar to those needed as an instructor in these institutions. These measures of labor supply may be particularly useful for measuring quality when comparing across large groups of instructors such as over time, across institutions, across fields, or among large geographic areas. In the absence of direct measures of performance researchers can use these supply measures as proxies for the quality of instructors.

This section has highlighted the importance of defining instructional goals as a step towards understanding instructional (and institutional) effectiveness. As noted, even with the definition of effectiveness clear, no measure of effectiveness will perfectly capture all the valued goals. The four approaches that we have described vary in their precision, in their cost and feasibility, and, likely, in their biases. While direct measures of productivity may be more accurate than measures of observable characteristics, by knowing which observable characteristics predict productivity we can more effectively select instructors upfront. Similarly, when aiming to identify the most troubled institutions we can use measures of instructor turnover instead of undertaking costly measurement of each instructor’s effectiveness. A research agenda for broad-access higher-education institutions that seeks to (a) develop alternative measures, (b) understand the advantages and disadvantages of these measures, and (c) describe observed characteristics of individuals, institutions and areas associated with these measures would provide substantially more direction for reform than is currently available. It is also a first step for understanding institutional processes and, in particular, the role of leaders and managers in these institutions.

MANAGING THE INSTRUCTOR WORKFORCE

The ability to identify highly effective instructors or highly effective instruction is a far step from creating an institution composed of such instructors and instruction. Research in K-12
education has highlighted the important role of both school leadership in general, and personnel practices in particular (Loeb, Kalogrides, & Béteille, Forthcoming; Grissom and Loeb, 2011; Horng, Klasik and Loeb, 2010).

In this section we identify four elements of human resource management that are likely to be important for higher education institutions: (1) recruitment and selection of instructors, (2) assignment or use of instructors across courses, (3) development of instructional skills, and (4) retention, particularly of highly effective of workers. For each of these elements, we discuss likely variation in the processes, the collection and use of information for informing the processes, the use of incentives, and the success of the approach in improving student outcomes. As above, we draw on relevant research across education.

**Recruitment and Selection**

Underlying the effectiveness of broad-access institutions and the managers of these institutions is their ability to attract instructors who can motivate and support student learning. In K-12 schooling, and likely in the broad-access higher education sector as well, institutions vary in their ability to attract workers. Part of this variation is due to factors outside of the control of the institution such as its geographic location and the needs and characteristics of the students that it serves. However, managers can improve the pool of instructors available to the institution both through direct recruitment and by affecting the appeal of the jobs (e.g. by increasing salaries or improving working conditions).

A number of lessons emerge from research on K-12 schools regarding the role of recruitment and selection policies in promoting student learning. First, recruitment processes matter. Aggressive recruitment strategies enable school districts to attract a larger pool of candidates, and early offers increase a district’s ability to hire the most effective teachers within that pool (Levin and Quinn 2003; Boyd et. al. 2008). In K-12 schools, recruitment strategies may target the obvious candidates (i.e., individuals enrolled in a teacher preparation program) but, increasingly, they also target candidates who had not originally considered becoming teachers to enter the profession. Although the effectiveness of candidates recruited through these alternative routes varies, their recruitment substantially increases the pool of applicants, and hence enables districts to be more selective (Boyd, Grossman, Lankford, Loeb and Wyckoff 2006; Raymond, Fletcher and Luque 2001; Laczko-Kerr and Berliner 2002; Decker, Mayer and Glazerman 2004; Darling-Hammond, Holtzman, Gatlin and Heilig 2005). While no research that we know of has addressed the recruitment and selection process in broad-access higher education institutions, such research could shed light on the processes underlying the ability of these institutions to attract high-quality instructors as well as on variation across the institutions.

Second, salaries affect who is attracted into teaching (Figlio 2002; Guarino, Santibanez, Daley and Brewer 2006; Manski, 1987; Loeb and Page, 2000). What matters is not the absolute level of salaries, but how they compare to the alternative salaries that potential and actual applicants could have if they pursued a teaching job at another institution, or a non-teaching job altogether. While elementary and secondary schools are largely constrained in their ability to offer different salaries to different applicants, broad-access higher education institutions are likely to have more flexibility. Institutions may vary in the quality of instruction because of the salaries they pay and the extent to which the salaries they offer take into account the job alternatives of potential and actual candidates. For example, institutions that have enough
flexibility to make special offers to particularly promising candidates, or that provide competitive salaries for subjects where potential candidates have a range of attractive job alternatives outside teaching (e.g., math, physics, chemistry, engineering) may be more successful at recruiting effective instructors.

Third, non-salary benefits and working conditions also affect recruitment. Teachers in K-12 education, for example, demonstrate preferences for schools with higher-achieving students; white teachers tend to prefer schools with a larger proportion of white students; and teachers in general prefer to work in schools that are located close to where they live or where they were raised (Scafidi, Stinebrickner, and Sjoquist 2003; Hanushek, Kain and Rivkin 2004; Boyd, Lankford, Loeb and Wyckoff 2005a, 2005b; Loeb, Darling-Hammond and Luczak 2005). School characteristics, particularly the quality of school leadership, also affect teachers’ career decisions in K-12 schooling (Boyd et al., 2011; Ladd, 2011; Grissom, forthcoming). These and other factors might play a role in individual decisions on whether (and where) to teach at the higher education level. For example, applicants might be less worried about working “close to home,” but more worried about the job prospects of spouses if they move to a new area, or the prestige of the institution. Or they might be more worried than K-12 teachers about the availability of specific resources such as libraries, academic and professional workshops, or opportunities for regular interaction with local businesses and policymakers. In addition, both the stability and the flexibility of a job might affect the extent to which an individual is attracted to it. On one hand, tenure-track positions might be more attractive than non-tenure-track ones, because of the stability that they confer. On the other hand, some highly qualified individuals might prefer to complement teaching with other non-academic activities, and might value contracts that give them the flexibility to engage in those activities. Attracting individuals who are interested in non-academic activities might be relevant to some higher education programs (e.g., technical/vocational programs, professional degree programs) more than to others.

In addition to salaries and working conditions, other incentives can be used to attract individuals into the teaching profession, such as housing subsidies, the assumption of education loans, food and transportation subsidies, holiday bonuses, or other types of incentives. In elementary and secondary education, incentives have become a popular mechanism for attracting teachers into hard-to-staff schools or into subjects that face a critical shortage of staff, but there is not much research that assesses how these incentives affect the ability of schools to attract a large pool of applicants and select effective teachers. It is important to understand the relative importance of incentives within the compensation packages offered by broad-access higher education institutions, and whether and what types of incentives are most effective to attract a large pool of applicants and, ultimately, recruit effective instructors. Understanding the role played by incentives is useful for identifying strategies to attract individuals into shortage subject areas or attract underrepresented groups such as female instructors in math and the natural sciences.

Using data from the Integrated Postsecondary Education Data System (IPEDS) for the period 2002-2009, we compare broad-access higher education institutions instructors to those at more competitive higher education institutions. As shown in Figure 1, in the public sector approximately 40.6 percent of full-time-equivalent students attend two year colleges, while 14.2 percent attend less competitive colleges, 23.9 percent attend competitive colleges and 21.4 percent attend more competitive colleges. For the purpose of this paper, we consider all of these
institutions accept more competitive colleges as broad-access institutions. While far more than half of public higher education students attend broad-access institutions (78.6 percent), fewer than half of full-time-equivalent instructors teach at these schools (46.6 percent). This uneven distribution of students and instructional faculty is not as pronounced in the private sector.

In both the public and for-profit private sectors the proportions of tenured and full-time adjunct professors among less competitive 4-year colleges are greater than the corresponding proportions among more competitive colleges, while the proportion of part-time adjunct faculty is lower. This pattern is consistent throughout the period of analysis (see Figure 2), and may be relevant in light of research that suggests that tenured and full-time instructors can be more effective than non-tenured and part-time faculty (Bettinger and Long 2004, 2010; Ehrenberg and Zhang 2005). Still, tenured faculty at less-competitive institutions are likely to differ meaningfully from tenured faculty at competitive or more competitive institutions. In particular, research productivity is likely to be more of a factor in tenure in more competitive institutions. The research comparing tenure-track to non-tenure-track faculty has made the comparison within institutions.

To describe the educational backgrounds of higher education instructors, we used data from the March Supplement of the Current Population Survey (CPS), which enables us to identify a nationally representative sample of higher education instructors. The CPS data also allow us to separate instructors by whether they worked in a college or university, or a technical/vocational school; and whether they worked in the public or private sector. We find that, on average for the period 1990-2010, 18 percent of post-secondary teachers had at most a Bachelor’s degree, 32 percent had a master’s degree, 6 percent had a professional degree (e.g. in Law, Public Policy, or Medicine), and only 35 percent had a doctoral degree. Moreover, 9 percent had less than a Bachelor’s degree. The distributions are relatively similar across the public and private sectors, but, perhaps expectedly, the proportion of teachers without a Bachelor’s degree was much larger among post-secondary teachers in technical/vocational schools than among those working in colleges and universities. The difference could reflect differential management preferences and understandings of what are the most important characteristics of an effective teacher.

The CPS data also allow us to look at salaries and benefits. For this analysis, we also identified all workers with a doctoral degree and all secondary education teachers for comparison. Salary and non-salary compensation levels over the period 1989-2009 are reported in Figure 3. We report averages over the entire period because, as shown in Figure 4, there were few significant changes over the period of analysis. The mean annual earnings from teaching among those whose main job in a given year was as post-secondary teachers was $47.5K in 2010 dollars. This was somewhat above the earnings of secondary education teachers ($44.8K) but considerably below the earnings of workers with doctoral degrees ($95.6K). This result provides some evidence that post-secondary teachers who hold doctoral degrees may have attractive alternatives besides working in the higher education industry, though, of course these analysis do not separate by field of specialization or skill level.

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4 Higher education instructors correspond to employed individuals who report that they work as “post-secondary teachers” in one of the following industries: “colleges and universities, including junior colleges”, “vocational schools”, or “business, technical, and trade schools and training”.
5 All reported differences are statistically significant at the p<.05 level or below.
This blunt analysis also suggests that the salary and benefits are quite similar between public and private sector schools but that instructors at technical and vocational institutions have lower compensation. Comparing public and private sector workers, we find that post-secondary teachers in the private sector earn only a little more, on average, than those in the public sectors ($49.4K vs. $46.5K), but that those working in colleges and universities earn considerably more than those in technical or vocational schools ($47.7K vs. $38.6K). The data show that the gap between salaries in the private and public sectors increased a little over time, in line with findings reported by prior literature (King Alexander 2001; Ehrenberg 2002). In particular, in 1990 higher education teachers in the public and private sectors earned similar amounts (slightly above $46K at 2010 dollars), but by 2009 private sector instructors were earnings 12 percent more than public sector ones ($52.3K vs. $46.6K). On the other hand, as shown in Figure 3, post-secondary teachers in the private sector are less likely to receive pension and/or health benefits from their employer than those in the private sector, albeit just a little less likely. On average, 74.1 percent of private sector instructors receive some type of benefit, compared to 78.2 percent of teachers in the public sector. Instructors in technical and vocational schools, in addition to receiving lower salaries, are also far less likely to have pension or health benefits, only 45.9 percent.

The discussion so far presumes that institutions will be able to identify the best candidates from within the pool of applicants, but this is not at all obvious. The process through which managers choose from among competing candidates, the type of information and criteria they rely on to make this decision, and whether they revise their hiring strategies based on lessons from past hiring experiences can all affect selection. As discussed in the previous section, managers can rely on observable characteristics such as the educational attainment of candidates and their academic (including teaching) and non-academic work experience. They can also obtain information about their expertise in a specific subject or a specific area within a subject, and their connections to the local business community. Moreover, they can rely on references to assess a candidate’s interpersonal skills, ability and willingness to engage with students, and motivation to teach and they can try to “guess” the extent to which a particular candidate will be good fit for the institution and its culture. We know very little about what characteristics of candidates are valued by hiring authorities in higher education institutions in general, and in broad-access ones in particular.

The preceding discussion suggests at least four areas for further research that seem promising in helping us understand the role of human resource policies in broad-access higher education institutions: What are the recruitment strategies used by these institutions in order to attract a large pool of candidates into teaching? What processes, information and criteria are used in order to choose among these candidates? To what extent are the different kinds of benefits offered by these institutions (salaries, non-salary benefits, working conditions, job stability and flexibility, other incentives) effective in terms of matching the preferences of candidates and attracting effective teachers? Are particular recruitment strategies pursued, and particular benefits offered, in order to attract individuals into subjects that face a critical shortage of qualified staff?
**Job Assignment**

Beyond hiring and recruitment, broad-access institutions must also decide how to allocate their faculty—with varying qualifications, experience, and skill—to different departments, courses, and sections. In K-12 settings teacher effectiveness is often not equally distributed across schools (Boyd et al. 2009, Hanushek 1986), nor equally distributed within schools between different classes (Kalogrides, Loeb, & Béteille, 2011; Clotfelter, Ladd, and Vigdor, 2005, 2006). Moreover, more effective teachers (as measured directly or by proxies like experience) are generally assigned to schools and classes where students are furthest behind their grade level, strongly suggesting that such decisions are not optimal for equitable student outcomes.

Figure 5 provides evidence from one setting, Ohio’s public four-year colleges and universities, that job assignment decisions are likely also a salient human resource decision for leaders at broad-access institutions. Figure 5 shows the proportion of courses, weighted by enrollment, taught by instructors of different appointment types: tenured or tenure-track, graduate students, part-time adjunct, and full-time adjunct. We compare the relative proportions at more and less competitive institutions, and for introductory and advanced courses. Across all courses (the leftmost panel), competitive and less competitive institutions staff courses with more tenure track and fewer graduate students than does the flagship institution. Less competitive institutions use more part-time adjuncts and fewer full-time adjuncts than their more-competitive counterparts, though the proportions of tenure-track faculty are similar.

The patterns are somewhat different when we compare introductory versus advanced courses. Across all types of institutions, introductory courses (the middle panel) are more likely to be taught by adjunct faculty, and less likely to be taught by tenured or tenure-track faculty than are advanced courses. However, the composition of instructor appointments varies across types of institutions: in broad-access institutions, more introductory courses are taught by adjuncts than at more competitive institutions. A second noticeable difference, likely owing to their availability, is that graduate students crowd out tenure-track faculty at more competitive institutions, especially at the flagship camps. In advanced courses (the rightmost panel) the pattern is reversed. Across institution types advanced courses are mostly taught by tenure-track faculty, at very similar rates. And graduate students crowd out the adjunct positions at the flagship.

The evidence in Figure 5 points to substantial sorting of instructors across courses, even within institutions. This particular analysis may not shed light on inequities in access to high quality instruction, as many students take both introductory and advanced courses. If graduate students and adjuncts are relatively better at introductory courses, then the patterns could reflect an efficient use of instructional resources. However, the patterns may be driven by preferences of full time tenure-track faculty to teach advanced courses and it may not be efficient. Similarly, while the current analysis is limited to introductory and advanced courses, a parallel analysis

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7 Competitiveness measured by Barron’s selectivity rankings. More competitive includes Barron’s “Competitive” or higher, and less competitive is Barron’s “Less Competitive” or lower. We also show the flagship institution, Ohio State, separately.

8 Introductory courses are courses where 75 percent of students are in their first year of college. Advanced courses are courses where 75 percent of students are in their third or fourth years.
could look at differences across students and patterns there would have more implications for equity in access to quality.

These data from Ohio are, of course, just one brief example of status quo assignment patterns. But whatever the assignment patterns the decisions are likely to be consequential for student outcomes. Bettinger and Long (2010) find evidence that exposure to part-time adjunct instructors can influence students’ decisions about what future courses to take and which major to choose. Borjas (2000) found that the undergraduate students of foreign-born graduate students had poorer outcomes in introductory economics classes, though results from other settings are mixed (Jacobs and Friedman 1988, Norris 1991, Fleisher, Hashimoto, and Weinberg 2002). Ehrenberg and Zhang (2006) report some evidence of lower graduation rates at institutions that use more non-tenured faculty.

The research to date and the data presented suggest several research questions: How do leaders in broad access institutions decide which and what kind of faculty will teach different courses and sections, what are leaders’ objectives or goals in these decisions? What information do leaders use to make these decisions? What is the effect of these decisions on student success?

One hypothesis for the sorting of teachers at the K-12 level is that a fixed salary scheduled incentivizes teachers to find easier teaching assignments as a way to increase their effective compensation. To the extent colleges have and exercise greater flexibility in compensation other patterns may emerge in broad access institutions. The role of compensation and incentives then is one likely mechanism worth exploring. Other dimensions that make assignments more or less preferable are also likely mechanisms: location, hours, class size, student level. In the previous section we briefly discussed the use of recruitment strategies to attract individuals to teach subjects that face a critical shortage of staff, but shortages may play an important role here as well.

Development and Supports

As described above, teachers, at least teachers in elementary and secondary schools, tend to improve with experience at the beginning of their careers (e.g. Rockoff, 2004) and perhaps later in their careers as well (e.g., Papay and Kraft 2010). Recent research also provides evidence that teachers’ improvement varies depending on the quality of their peers and the quality of the school in which they teach (Bruegmann & Jackson 2009; Loeb, Kalogrides, & Béteille forthcoming). There is some recent evidence that evaluation systems that include individualized feedback based on observed practice lead to improved teacher effectiveness among mid-career teachers (Taylor and Tyler 2011). Moreover, some intensive and sustained professional development programs have demonstrated substantial effects both on teaching and on student learning (Yoon, et. al. 2007). All this evidence points to the potential for institutions to improve the effectiveness of current instructors. On the other hand, much professional development, even well touted programs, has shown little effect (see for example, Garet et.al. 2010 or Glazerman et. al. 2009). The ability of an institution to improve its instructional workforce is likely to vary and is also likely to be consequential for overall institutional effectiveness. Moreover, the ability of an institution to target its professional development resources effectively also has consequences for institutional efficiency.
To our knowledge, there is no research that systematically describes professional development in higher education – either instructional improvement or the programs and policies aimed at this improvement. A first order question in understanding instructor development is: To what extent do instructors improve over time and how does this improvement vary across institutions, programs within institutions, and individuals? Answering this question is a step in understanding the effective approaches to development. If instructors in some contexts improve while those in other contexts do not, then the existing variation may shed light on useful approaches.

Professional development can take many forms including formal coursework or degrees at universities, programs for individual instructors, programs for instructional groups (e.g. all instructors in a department), paid meeting time for instructors to work together, paid planning time for instructors to develop or refine courses, mentoring or coaching programs, individualized performance feedback, and a variety of other approaches. Within each of the broad categories, there are a multitude of different types that vary by such things as duration, intensity and content focus. While it is tempting to jump to which professional development programs are effective, there is such a range of approaches to professional development – both formal and informal – that the effectiveness of a single program would likely tell us little about best practices or even the relative effects of that program.

Leaders of broad-access higher education institutions, like school leaders in the K-12 sector, can influence professional development opportunities for their instructors along at least four dimensions. First, they can influence the extent to which the professional development addresses the needs of the instructors it targets. A productive research line could assess the alignment between instructors’ needs and their opportunities for improvement. Second, institutional leaders can influence the extent to which professional development opportunities make use of high quality approaches for addressing instructors’ needs. Even if an institution is good at identifying instructors’ needs – e.g. by allowing those instructors to choose the areas for which they need to improve – they may provide low-quality professional development opportunities. A mentoring approach to professional development, for example, may be beneficial if the mentors are skilled, but may not be if the mentors themselves don’t have the knowledge to help mentees improve. Third, leaders can affect instructional improvement by incentivizing instructors to improve. If instructors are required to sit in classes, for example, they may have no incentive to learn the material covered. However, if they are evaluated on the extent to which they learn, they may be more inclined to learn. The performance improvements seen resulting from evaluation systems (Taylor and Tyler 2011) may stem from the incentives imbedded in the evaluation system, even if those incentives are not strong or not monetary. Finally, institutional leaders can influence professional development by varying resources devoted to instructional improvement.

In keeping with these broad dimensions for the influence of institutional leaders on instructional improvement, research on professional development could productively shed light on four sets of questions. First, what are common areas of weakness for instructors at broad-access higher education institutions, how do these needs vary, and how well are these needs targeted by current resources for improvement? Second, to what extent are broad-access higher education institutions making use of high-quality options for instructional improvement? Research can also shed light on which options are high quality. Third, to what extent are
instructors incentivized to improve – for example, are they assessed on their effectiveness and are they rewarded for improvement? Fourth, how much do institutions spend on employee development and do they measure the returns to that investment.

Retention and turnover

While recruiting effective teachers and providing opportunities and incentives for improvement are two mechanisms for creating high-quality instruction for students, efforts to retain effective teachers are also an important aspect of ensuring high-quality instruction. Institutions are likely to invest not only in recruiting, but also in improving the skills of their existing staff. Such investments will only pay off to the extent that, once identified and supported, these teachers will stay in the institution.

Using CPS data for the period 1990-2010, we estimated the proportion of individuals who were post-secondary teachers in the calendar year before the survey who were no longer post-secondary teachers when the survey was conducted. The estimates, which are reported in Figure 6, provide a sense of the prevalence of year-to-year turnover from the post-secondary teaching profession. We find that, on average for the whole period, 13 percent of post-secondary teachers left teaching each year. This rate is similar to the annual industry turnover rate among all workers who hold a doctoral degree (13.2 percent) and to the proportion of secondary education teachers who leave teaching each year (11.1 percent). Turnover rates among public-sector higher education teachers (13 percent) are similar to those of private-sector higher education teachers (12.9 percent).

The similarity in the turnover rates of higher education and secondary education teachers raises the question of whether turnover is predicted by similar factors in both sectors. There is a substantial amount of research on the determinants of turnover among K-12 teachers. The literature suggests that elementary and secondary education teachers are more likely to remain in the profession when they work in schools with high performing students and students whose race is the same as theirs (Scafidi, Stinebrickner, and Sjoquist 2003; Hanushek, Kain and Rivkin 2004; Boyd, Lankford, Loeb and Wyckoff 2005a). As described above, they are also more likely to stay in teaching when they perceive they are supported by their school leaders (Boyd et al., 2011; Ladd, 2011; Grissom, forthcoming; Ingersoll, 2001).

Compensation also affects K-12 teachers’ decisions to stay in the profession, with lower turnover among teachers who earn higher salaries and those who receive pension benefits from their employer (Baugh and Stone, 1982; Murnane and Olsen, 1989; Hanushek, Kain and Rivkin, 2004; Harris and Adams, 2007). Ehrenberg, Kasper and Rees (1991) report similar findings for higher education teachers. Using institutional level data collected by the American Association of University Professors for the period 1971-1989, they find that higher levels of compensation appear to increase retention rates, particularly for assistant and associate professors, although not for full professors. They also find that the importance of salaries for retaining teachers is lower for institutions with graduate programs than it is for 4-year undergraduate institutions and it is lower for these institutions than for 2-year colleges.

Observable teacher characteristics also predict retention in K-12 schools. In particular, the least experienced are most likely to leave, and the most experienced teachers also leave at high rates due to retirement. In addition, and of importance for managing instructional quality,
while both more effective and less effective teachers choose to leave, less effective teachers are more likely to leave, particularly during their first few years of teaching (Boyd et al., 2009; Goldhaber, Gross and Player, 2007; Hanushek, Kain, O’Brien and Rivkin, 2005).

The evidence on K-12 schooling, perhaps not surprisingly, suggests that many of the factors that are likely to attract individuals into teaching (e.g., salaries, non-salary benefits, working conditions) are also likely to affect retention. However, the features that make teaching more appealing can make it more appealing for both effective and ineffective teachers. Much current debate in elementary and secondary education concerns school leaders’ ability to dismiss ineffective teachers. Both legal and cultural factors hinder dismissal in K-12 schools and similar issues may (or may not) hold in higher education institutions. As shown in Figure 1, the proportion of tenured teachers in less selective higher education institutions is high. There is no research that we know of that assesses the effects of tenure laws per se on instructional quality in either K-12 or higher education. Still institutional features such as tenure do play a role in staffing decisions, if only by constraining those decisions, and may be a lever for productive reform.

Overall, this discussion suggests at least five promising areas for research in broad-access higher education: What is the level of teacher turnover among broad-access higher education institutions? What characteristics of teachers, their jobs, and the institutions in which they work are associated with a higher (lower) probability of retaining teachers? How does turnover affect student learning? To what extent are managers able to dismiss ineffective teachers and retain the most effective teachers? How do managers themselves affect turnover?

MANAGERS’ WORK AND WORKFORCE

Much of this paper is premised on the importance of personnel practices for managers and leaders in broad-access higher education institutions as they aim to improve the quality of instruction at their institution and educational outcomes for their students. However, the paper would be incomplete without recognizing at least three additional factors concerning higher education managers and their effects on students. First, managers can affect students’ human capital development through mechanism unrelated to classroom instruction. Second, managers vary in the skills and dispositions they bring to their work and these differences may affect their ability to productively manage. And, third, managers themselves are workers and much of the same workforce dynamics that affect instructors affect managers.

Direct effects

Even in K-12 schools, school leaders can affect students in ways unrelated to the quality of instruction – by interacting with them in hallways, by providing access to support services such as tutoring, by enhancing parent engagement, and in a range of other ways. In higher education institutions the importance of these non-classroom resources and the importance of the institution in providing these resources are likely to have at least as much effect on student learning. The availability child-care, the clarity of financial aid options, the timing of classes, library resources, writing centers, and counseling may all affect students’ human capital accumulation. As an example a recent paper, Bettinger and Baker (2011), finds that students who were randomly assigned to participate in a student coaching service were more likely to persist during the treatment period and were more likely to be attending the university one year
after the coaching had ended. Similarly Webber and Ehrenberg (2009) find that student service expenditures affect graduation and first-year persistence rates.

In K-12 schools most students attend schools during the same hours and days and few students have substantially responsibilities outside of school during typical class hours. Post-secondary institutions serve students with meaningfully different responsibilities. Moreover, higher education students are more specialized and require a range of course sequences. As a result the timing of courses affects students’ progression through school and, likely, the courses that they ultimately take. School managers who effectively support student learning and educational attainment are likely to use their available resources to better match students’ needs in terms of timing and more general availability.

**Skills, Dispositions and Their Use**

Managers and leaders of higher education institutions fill a diverse set of roles – presidents, vice presidents (e.g. of student affairs or advancement), chief financial officers, chief information officers, deans and associate deans, admissions directors, and many more. It is far beyond the scope of this paper (and the expertise of the authors) to differentiate these roles and the skills and behaviors needed to perform them well. Quite a few studies address the organizational structures in higher education institutions and higher education governance, more generally (e.g. Birnbaum, 1988; Altbach, 2005). In comparison, the research on the effectiveness of higher education leaders and, particularly, on the middle-management of higher education appears to be even sparser than the research on higher education instructors. In a rare exception, Goodall (2008) finds that the research quality of higher education institutions improve, on average, when better scholars are appointed as leaders, but this result sheds no light on broad-access institutions and the goal of student learning. A mapping of typical management and/or leadership roles in these institutions linked with their potential effects on students would be a starting place for more directly and coherently tackling the question of the role of managers in student outcomes that we address here. With this mapping could come a better understanding of the skills, dispositions and behaviors needed to perform effectively.

**Workforce dynamics**

The discussion of instructors’ career paths in the prior section highlights the importance of both workforce dynamics (e.g. workers’ preference for higher compensation) and institutional structures and behaviors (e.g. administrator support and direct recruitment efforts) for developing an effective instructor workforce. The same factors hold true for managers. Research in K-12 schools shows that school leaders (principals) are as influenced by school characteristic, such as the achievement and poverty level of students, as are teachers. It also shows that incentives and policies can overcome these preferences and draw high-quality workers to seemingly less appealing positions (Loeb, Kalogrides and Horng, 2010).

We were unable to find research that describes the career paths to leadership roles in open access institutions. Three features of career paths documented in K-12 education provide an initial focus for understanding the leadership workforce in these institutions: recruitment; advancement opportunities; and differential quality. First, until recently, there has been very little effort at direct recruitment of school leaders for elementary and secondary schools. Instead, leaders came from the set of teachers who volunteer to take administration training courses.
because they are interested or because they were “tapped” informally by current leaders (Myung, Loeb, and Horng, 2011). Informal processes emerged which may be inefficient for the organizations. For example, homophily in the form of principals tapping or encouraging teachers of their own race to become principals is evident, at least in some areas (Myung, Loeb, and Horng, 2011). Second, and in keeping with this lack of recruitment, the organizational structures of elementary and secondary schools provide few opportunities for potential leaders to practice or demonstrate the skills they need to be successful leaders. The vast majority of school principals were teachers (often a requirement). Yet teaching is quite different from school leadership and good teachers may not make good principals. Third, the school leaders in low income elementary and secondary schools are measurably different, on average, from those in schools serving higher income students, with less leadership experience, a higher probability of interim or temporary status, and college degrees from less competitive institutions (Loeb, Kalogrides and Horng, 2010).

This section argues for at least five productive research paths. (1) What are the non-classroom features of higher education institutions that impact student human capital accumulation and how do managers differ in their choice and implementation of these features. (2) How do different institutions vary in the timing and selection of courses; how do these differences affect students’ progression; and to what extent can good leaders optimize these offering. (3) What are typical leadership roles within broad-access higher education institutions that influence student learning; what tasks do these leaders perform; and what skills and behaviors are necessary to perform these tasks effectively. (4) What are the typical paths to leadership roles; is there direct recruitment for these roles; and do potential leaders have opportunities to develop and demonstrate the skills they need to fill these roles. Alternatively, are some potentially excellent leaders excluded or hindered from the path to leadership roles. (5) What is the distribution of effective school leaders across and within institutions and what institutional factors (e.g. salaries, prestige, location, management) support or mitigate these differences?

CONCLUSION

The goal of this paper is to identify research topics related to instructors and managers in broad-access higher education institutions that are likely to be productive both for understanding the effectiveness of these institutions and for identifying useful levers for reform. Research in K-12 schools points to the importance of teachers and school leaders for student success. While teachers directly affect students in classrooms, school leaders form the teacher workforce through recruitment, assignment, development and retention of teachers. In this paper we focus primarily, though not exclusively, on the role of managers in these human resource dynamics. These are clearly not the only important roles for leaders of these institutions, but it is the focus here. To accomplish the paper’s goal, we draw on research examples from K-12 education, both because there is far more research at this level and because we are more familiar with this literature. We also draw on the relevant research from higher education, where available, and we briefly explore data from IPEDS, the CPS, and higher education institutions in Ohio.

The most evident result from this undertaking is that surprisingly little research has examined the instructor workforce in higher education institutions. As an example, the work on measurement or definition of instructional effectiveness is sparse, though some studies – primarily in highly competitive institutions – have looked at whether female instructors are more
effective for female teachers, whether more experienced instructors are more effective and whether adjunct or tenure-track instructors are more effective. Similarly little research has described the characteristics of instructors, how these vary across institutions, or how institutional or manager characteristics predict to this distribution. In contrast, there is a large literature in both these areas for K-12 schooling.

The studies that we reviewed suggest several potentially productive research areas, highlighting seven in particular. The first would generate a better understanding of instructional effectiveness, asking questions such as: what measures of instructional effectiveness are feasible, reliable and valid; and how is effectiveness distributed within and across broad access higher education institutions? A second productive area would address the recruitment of instructors, identifying processes as well malleable (e.g. salary or recruitment) and non-malleable (e.g. location or students) characteristics of the institution that affect the supply of high quality instructors. A third, perhaps smaller, research agenda would seek to understand how leaders decide which faculty teach which courses and the effects of these choices on student success. Fourth, our understanding of instructional quality at higher education institutions and the role of managers in this quality would benefit from a better understanding of instructor development: identifying typical areas of weakness as well as high quality options for improvement, resources spent, and incentives for instructors aligned with improvement. A fifth research area would explore instructor turnover and the role of the institution in this turnover, specifically differentiating the turnover of more and less effective instructors. A sixth, somewhat vast, research line would map the diverse leadership roles in these institutions and potential mechanisms by which these leaders might influence student learning and progression. Eventually, this line would also include an analysis of the leadership or management skills needed in order for these mechanisms to run smoothly. This agenda would provide insights into the influence of leadership in student learning that does not flow through classroom instruction. A seventh and final research goal would be to better understand the career paths of leaders themselves, identifying their preferences as well as the institutional features that promote or hinder the recruitment, development and retention of good leaders.
Figure 1. Relative importance of types of instructor across different types of higher education institutions, 2002-2009

Note: Author's calculations of IPEDS 2002-2009. All calculations based on full-time equivalents: part-time students counted 1/2; part-time instructor positions counted 1/2 and joint research-teaching positions counted 1/2. Barron's competitiveness rankings.
Distribution of Instructor Types
Private For-profit Institutions

Share of Private For-profit Sector

2-year
Less-Comptv
Comptv
More-Comptv

Distribution of Type Within Level

Note: Author’s calculations of IPEDS 2002-2009. All calculations based on full-time equivalents: part-time students counted 1/2; part-time instructor positions counted 1/2 and joint research-teaching positions counted 1/2. Barron’s competitiveness rankings.
Figure 2. Proportion of adjunct faculty over time, by type of institution, 2002-2009

Proportion Adjunct Faculty Over Time

- Public
- Private Non-Profit
- Private For-Profit

Year:
- 2002
- 2004
- 2006
- 2008
- 2010

Percentage Instruction Employees:
- 0
- 20
- 40
- 60
- 80
- 100

Note: Author's calculations of IPEDS 2002-2009. All calculations based on full-time equivalents: part-time instructor positions counted 1/2 and joint research-teaching positions counted 1/2. Barron's 2009 competitiveness rankings.
Figure 3. Average salary and non-salary benefits of higher education teachers by type of institution (1989-2009)

Salary and non-salary benefits, 1989-2009

Higher education teachers
Private sector higher education teachers
Public sector higher education teachers
College and university teachers
Technical-vocational teachers
Secondary education teachers
All Ph.D. workers

Note: Authors' calculations based on CPS surveys of 1990-2010. Annual earnings correspond to the total earnings from an individual’s main job in the calendar year before the survey, among individuals who reported that their main job in that year was as higher education teachers (or the other professions included). Pension and health benefits are also reported for the calendar year before the survey.
Figure 4. Evolution of salary and non-salary benefits over time, 1989-2009

Note: Authors' calculations based on CPS surveys of 1990-2010. Annual earnings correspond to the total earnings from an individual's main job in the calendar year before the survey, among individuals who reported that their main job in that year was as higher education teachers (or the other professions included). Pension and health benefits are also reported for the calendar year before the survey.
Figure 5. Distribution of instructor types by type of institution and type of course taught

Note: Fall 98 and fall 99 first-time freshman cohorts at public four-year institutions in Ohio. Competitiveness based on Barron’s measure. ‘Less’ is Barron’s less, ‘More’ is all higher rankings.
Figure 6. Average annual turnover from higher education teaching (1990-2010)

Note: Authors' calculations based on CPS surveys of 1990-2010.
References


Table 1. Average earnings, non-salary benefits, annual turnover, and proportion of workers with professional or doctoral degrees

<table>
<thead>
<tr>
<th></th>
<th>Annual earnings (in thousands, at 2010 dollars)</th>
<th>% of workers who receive pension and/or health benefits</th>
<th>Annual turnover</th>
<th>% of workers with professional or doctoral degrees</th>
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<tr>
<td><strong>Teachers</strong></td>
<td></td>
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<tr>
<td>Higher education teachers</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Private sector higher education teachers</td>
<td>47.5</td>
<td>76.5</td>
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<td>40.7</td>
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<td>74.1</td>
<td>12.9</td>
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<tr>
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<td>78.2</td>
<td>13</td>
<td>39.3</td>
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<td>Technical-vocational teachers</td>
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<td>77</td>
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<td>41.1</td>
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<td>Secondary education teachers</td>
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<td>45.9</td>
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<td>4.3</td>
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<tr>
<td><strong>Managers</strong></td>
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<tr>
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<td>88.7</td>
<td>17.7</td>
<td>17.2</td>
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<tr>
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<td>91.8</td>
<td>12.4</td>
<td>11</td>
</tr>
<tr>
<td><strong>All Ph.D. workers</strong></td>
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<td>82.1</td>
<td>13.2</td>
<td>100</td>
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</tbody>
</table>

Source: Authors’ calculations based on the CPS.