Education and Construction Industry Experience Desired of New Construction Management Faculty

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For attaining accreditation, construction management (CM) programs must hire teaching candidates with the requisite academic, professional and scholarly credentials. Most advertisements for open CM positions require or prefer that candidates possess both a doctoral-level degree and construction industry experience, among other credentials. This is occurring as the number of CM programs engaged in research increases and the focus on professional experience in construction decreases. This paper discusses the minimum and desired qualifications for employment for current open CM positions and compares those to the academic credentials and construction experience of recently hired CM faculty. Several options exist for new faculty to increase the required or preferred education and construction experience desired by CM programs.

Key Words: Faculty qualifications, academic credentials, professional experience, faculty internship

Introduction

CM education at the university level is, by and large, an applied field that focuses on preparing students for careers in the construction industry. As such, programs should have faculty that have experience within the construction industry. The American Council for Construction Education (or ACCE, the accrediting body for CM programs), states that

> …faculty should possess appropriate academic qualifications, professional experience, and pursue scholarly and creative activities essential to the successful conduct of an academic program of construction…Evaluation of faculty competence must recognize appropriate professional experience as being equally as important as formal educational background. Continuing professional growth of the faculty is a prerequisite to effective teaching (ACCE, 2006).

No minimum level of academic degree or professional experience is set. Many CM faculty members have been able to achieve the requisite mix of proper academic and professional experience by combining a masters-level degree with professional experience in the construction industry. Having a master's degree is an acceptable level of education for faculty in many CM programs for continued employment and even promotion and tenure (Ciesielski, 2000).

Many in the CM education field feel that construction industry experience is more important than level of education. The findings by the Doctoral Education Task Force show that many CM faculty believe that construction experience is more valuable than either academic or research experience (ASC 2005).

However, current trends show many programs evolving from primarily providing an undergraduate CM education to programs that offer both an undergraduate and graduate education (Badger, 2002). As such, the faculty members for CM programs are taking on more research roles and the need for a doctoral degree for faculty is increasing. With the focus of CM programs moving toward research, the value of professional construction tends to be regarded with lessening importance (Badger, 2002, Badger & Smith, 2006). Also, the aforementioned Doctoral Education Task Force findings state that faculty with doctoral degrees are viewed to be important in academia (ASC 2005).

Despite this trend, many open positions for CM faculty still require or prefer that candidates have both a doctoral degree and relevant construction industry experience. While it makes sense that programs would hire someone with a doctoral degree and industry experience so that they have the relevant tools to conduct research and teach means and methods of an inherently applied field, finding such candidates may prove to be difficult. The amount of time and effort required to fulfill the requirements for doctoral degree do not necessary lend themselves to the flexibility to simultaneously maintain regular employment in the construction industry. Therefore, it is oftentimes difficult for those with a doctoral degree to gain valuable industry experience, while those gaining industry experiences will find it difficult to find the time to pursue a doctoral degree. And even if such a candidate exists, career opportunities may extend beyond the opportunities presented by academia. And therefore the question becomes, is it realistic for those hiring for open CM positions to expect to have a sizable pool of applicants with a doctoral degree and the requisite experience and be willing to accept an assistant professor position?

The goal of this paper is twofold. First, the author aims to evaluate the requirements of open CM positions and to compare them to the academic and industry qualifications of assistant professors to see if the current crop of people entering into academia is meeting the desired qualifications. Secondly, the paper will present some ways for faculty to gain industry experience while maintaining full time status as professors. In doing so, the paper focuses on Assistant Professors, as their more recent appointments are a better proxy for evaluating current trends in new faculty hiring.

Research Design and Methodology

Sample Description

Two data sets were used for this research. The first were the open faculty opportunities posted to the Associated Schools of Construction website (www.ascweb.org) and the open positions related to construction management or construction engineering posted by the American Society of Civil Engineers (career.asce.org) in the Fall of 2009. All of the open positions were for tenure-track appointments. All told, there were 18 positions available from 16 total programs.

The second set of data comprised of data gleaned from the faculty webpages of Assistant Professors at ACCE-accredited CM programs in the United States. At the time of the writing of this paper, there were 73 accredited CM programs. The webpage for each program was searched for faculty with their education and professional experience listed. Of the 73 programs, 14 provided the requisite information for a total sample population of 31 assistant professors. The total number of assistant professors at ACCE-accredited programs is unknown because not all programs listed their faculty or had webpages.

Data Analysis

Each of the faculty announcements was reviewed for its content. Data collected included requirements for education, work experience, teaching experience and licensure, as well as requirements for publications and grants. This data was collected for both minimum and preferred qualifications. The data was segregated in a database by the institution offering the position.

A similar database was created to analyze the experience of Assistant Professors. For each professor, their highest awarded degree, professional experience prior their current academic appointment and professional experience acquired after their current academic appointment were collected. Other data, such as teaching experience, publications, licenses, etc. were also collected but not used. The data was segregated by both the individual and their institution of employment.

Due to the small sample size, simple statistical averages and standard deviations were used. While unsophisticated, these methods are capable of analyzing the data for the purposes of this preliminary research.

Qualifications of New Faculty: What Programs are Looking For

As mentioned above, CM programs are looking for a mix of academic and professional industry qualifications, among other items, for new faculty. The following information was collected from advertisements for 18 open CM positions.

Academic Credentials

A quick summary of the 18 current CM openings for assistant professors reveals that the minimum degree qualification is:

- Master's degree: 6
- Terminal degree (e.g. Master's of Architecture or Juris Doctorate): 1
- All but dissertation (finishing a doctorate): 3
- Doctoral degree: 8

Therefore, 11 of the 18 schools (61%) require that candidates for Assistant Professor positions to have or be substantially complete with a doctoral degree. Of the 10 programs not requiring a doctoral degree upon starting an assistant professor position, nine prefer that candidates have doctoral degrees. The lone program that does not prefer that a candidate have a doctoral degree requires its candidates to have completed their doctorate except their dissertation. In total, every program with an open position in construction management requires or prefers candidates to have a doctoral degree.

The 61% figure of schools requiring or being substantially complete with a doctoral degree has climbed significantly over the past few years from an analysis showing only 38% of similar job openings requiring the same level of education in the Fall of 2006 (McCuen 2007).

Professional Construction Experience

The amount of construction industry experience desired by the programs with open positions is more difficult to quantify. Of the 18 open positions, the following minimum levels of professional experience are set:

- Two programs require two years of construction industry experience
- Four programs require three years of construction industry experience
- One program states that it requires "relevant" construction industry experience
- One states that construction industry experience is "desired"

All told, eight of 18 (44%) positions require some level of industry experience as a minimum. This number also varies from McCuen's 2007 study, which showed that 71% of such positions required industry experience in the Fall of 2006.

The amount of professional experience that is preferred is even more vaguely articulated. Of the eight programs that require construction industry experience, two further qualify the experience they desire. One program that stated that three years of construction industry experience is required stated that it preferred those three years to be for a United States-based contractor. Another that set "relevant" experience as a minimum qualification stated that it preferred "significant" experience. Additionally, four schools that stated no industry experience was required as a minimum qualification, one states that construction industry experience is required (with no qualifications for that experience provided), two state that experience is "desired", and the last prefers "significant" experience. All told, of the 18 programs with open assistant professor positions, 12 (or 67%) either require or prefer that candidates have some level of construction industry experience.

Experience of Assistant Professors in CM Programs

With the majority of CM programs with open assistant professor positions requiring or desiring candidates to have both a doctoral degree and relevant industry experience, those tasked with filling open CM positions should hope that the majority of candidates have construction industry experience. Of the 31 assistant professors analyzed as part of this research, 21 (or 68%) had construction industry experience prior to starting their current positions. For those 21 faculty members:

- The average construction industry experience is 7.80 years
- The standard deviation of years of construction industry experience is 7.84 years
- The maximum construction industry experience is 30 years
- The minimum construction industry experience is 0.25 years

However, analyzing the data further by segregating the faculty by their academic credentials reveals very interesting results. For the nine assistant professors that have attained a masters-level or other non-doctoral terminal degree as their highest academic credential,

- The average construction industry experience is 12.44 years
- The standard deviation of years of construction industry experience is 9.32 years
- The maximum construction industry experience is 30 years
- The minimum construction industry experience is 6 years

For the 22 assistant professors that have attained a doctoral degree as their highest academic credential,

- The average construction industry experience is 2.35 years
- The standard deviation of years of construction industry experience is 3.76 years
- The maximum construction industry experience is 16 years
- The minimum construction industry experience is 0 years

These numbers would be further skewed downward if the one assistant professor with a doctoral degree and 16 years of construction industry experience was removed from the sample. If this were the case, the average amount of construction experience would decrease to 1.70 years.

Even more telling, the 10 assistant professors with no construction industry experience had doctoral degrees. Taken as a whole, the vast majority of construction industry experience held by assistant professors in CM programs is possessed by those with masters-level degrees. This infers that many candidates do not meet the required or preferred qualifications that have been set for current assistant professor CM openings.

Not all professional experience is developed prior to entering academia. Some faculty members continue to work in industry in some capacity after their appointments. ACCE states "a clearly defined program of professional development is required to maintain a high level of professional competence (ACCE, 2006)." Of the 31 assistant professors analyzed for this research, only five (or 16%) had gained professional experience in the construction industry after their current appointment, where:

- The average construction industry experience gained after current appointment is 1.75 years
- The standard deviation of years of experience gained after current appointment is 1.32 years
- The maximum experience gained after current appointment is 3 years
- The minimum experience gained after current appointment is 0.25 years

Two of the five assistant professors that have gained professional experience after attaining their current positions had three and five years of prior experience, respectively. Therefore, very few assistant professors are using the opportunity of post-appointment construction employment to increase their amount of industry experience from zero.

Some find this trend for greater requirements for academic credentials and lesser ones for professional industry experience troubling and surmise that it will compromise faculty competence (McCuen 2007). While it is unclear that faculty competence will be compromised by higher academic credentials, one of two outcomes is likely to occur: 1) If the current trends in minimum academic credential being a doctoral degree and programs continue to require relevant industry experience, then the pool of qualified applicants for academic positions is likely to fall, or 2) the professional experience requirement for academic positions will have to be reduced or eliminated. This second scenario will likely inflame the attitudes reported by the ASC Doctoral Education Task Force. The process for conducting a faculty search is often challenging for CM program leadership (Rebholz 2000). These challenges will only grow if the qualified pool of applicants is shrinking. One option that can alleviate this problem is to increase each professor's level of professional experience after the academic position has been awarded.

Improving Faculty Qualifications

If a doctoral degree and relevant construction experience are increasingly becoming the new benchmarks for employment as a CM faculty member, there must be reasonable ways for potential candidates to achieve those criteria. For the education portion, more CM programs are offering graduate degrees. It has been revealed in surveys that the number of Ph.D.-granting CM programs must increase in order to satisfy the current need for CM faculty (Badger, 2002). Even if the number of Ph.D.-granting programs increases, doctoral students must focus on finishing their degrees as close as possible to the time of their appointment. Of the three open positions that will consider "all but dissertation" (or ABD) candidates, each has a time limit as to how long the candidate can be employed before their doctoral degree must be attained (either within one year of the planned appointment date or prior to tenure and promotion).

Doctoral degrees, whether in CM or other fields, generally infer that the candidate for the degree has attained a mastery of the academics and practice of the field of study. However, as suggested by Pace and Danali (2002), a Ph.D. program in CM should be built around the following tenants:

1. Education in the various fields of CM,
2. Detailed knowledge of a specialty or research concentration, and
3. A significant original contribution to the field.

While professional construction experience may be helpful in achieving the above items, it is not explicitly required. Therefore, it is possible (and as the data above demonstrate, quite likely), that many candidates for CM faculty positions may not have any, let alone enough, requisite construction industry experience.

There are also methods for assistant professor candidates to increase their amount of professional construction industry experience. While it is not the goal of this paper to present an exhaustive list of these potential opportunities, analysis and empirical observation of the presented data identified four opportunities for increasing CM faculty ties to industry and provide experience in the field of CM.

Professional Internships

One direct method for obtaining industry experience is for CM faculty to seek employment directly with a construction company. Such arrangements, sometimes referred to as professional internships, are often beneficial not only to the faculty member, but also to the company hiring the faculty member (Baha & Glon 1988, Hynds 2000). Professional internships can be tailored so that the faculty member is able to learn a specific skill set that they may not have possessed prior to the internship but is necessary for teaching particular courses. The experience also exposes the faculty member to the daily rigors of working in the construction industry, which will help them to convey what will be expected of students once they enter the workforce. This will improve teaching and will ensure that the course subject matter is relevant to employment in the construction industry.

Professional internships are also beneficial to employers for several reasons. First, they receive temporary help on projects without committing to a full time permanent employee. Secondly, learning is a two way street. While the

faculty member is learning specific skills important for teaching the developing generation of construction professionals, they can also distribute best practices and critical information to their industry employer gained through research. Lastly, by supporting a faculty member, construction companies have the opportunity to build a company advocate who is familiar with the students within a particular CM program. The faculty member will likely speak positively of the company if their work experience was pleasant, which can improve the recruitment process for the hiring company. Overall, these types of arrangements lead to a positive relationship between academic and industry (Baha & Glon 1988). These arrangements are not always straight forward. They may require a major commitment by both the faculty member and the industry employer, for which there is a real cost. Also, a question that is apropos to this research is will the industry hire and instructor in an area in which he or she has no experience (Johnston 1990)?

Due to flexibility in the summer months, faculty members have a unique opportunity to pursue immersed employment with a construction company that will likely not interfere with their teaching schedule. During the data collection process for this paper, it was found that at least two universities have formalized a process for aiding faculty in finding industry internships. Some companies have also formalized a process for hiring faculty. In studying the professional backgrounds of CM faculty, it was discovered that one major general contracting company has hired multiple faculty members in the summer months.

Consulting

Providing consulting services is another way to become, and stay, involved in the construction industry. Many CM professors, due to their deep knowledge in a particular aspect of construction, can oftentimes find work as subject matter experts, expert witnesses, etc. Because a deep knowledge in a specific aspect of construction is often required to perform consulting, this is an option that many times better suits people that have had the opportunity to build that expertise, such as senior faculty members. However, two of the assistant professors examined during the course of this research had consulting practices that they were maintaining while teaching full course loads.

Coaching Student Competition Teams

Coaching teams for student competitions, such as those sponsored by Associated Schools of Construction, is another way for faculty to get introduced to the construction industry. While not paid positions, such as working in the construction as an employee or consultant are, coaching teams can allow faculty to collaborate with members of the construction industry. Many teams have industry coaches that work with faculty to prepare the student teams to present a proposal for a project that was actually completed to a panel of industry professionals. The goal is to teach the team of students how such projects are estimated, scheduled, and built in the professional world. Such coaching from members of industry not only prepares students for careers in the construction industry, but can also demonstrate to faculty tools and techniques employed in industry.

Research

Research projects, particularly those sponsored by companies in the construction industry, also have the potential to provide experiential construction industry exposure. While research does not provide the same level of responsibility of actually delivering a project (as an employee of a construction company would have) or consulting engagement (as an industry consultant would have), projects involving field observations and measurements nonetheless provide exposure to construction industry means and methods. Because of the increase in research activity among CM programs that are offering graduate degrees, many new faculty members will find this as their easiest path into the construction industry. Empirical studies of research methods, such as the action research technique, have demonstrated the potential to increase collaboration between academic researchers and industry practitioners (Azhar 2007).

Next Steps for the Research

The research presented in this paper has many shortcomings. First, the data was collected from viewing resumes or curricula vitae of assistant faculty members posted on the internet. Since many such faculty members do not post such information online, the sample size is rather small compared to the total number of assistant professors of CM in the United States. As such, not enough data was collected to conduct a rigorous statistical analysis of the data.

Going forward, the author hopes to increase the scope of the research and broaden the data collection process to include more faculty members. To achieve the former, other measures of faculty qualifications to teach CM, such as research publications, research grant awarded, and industry licenses obtained will be considered. Each of these aspects was consistently mentioned in the advertisements for open CM faculty positions.

To obtain more data, a survey will be created and sent to a broader data population of CM professors. The goal of the survey is to obtain more detailed and specific information than that typically included in an online resume or curricula vitae. It will also allow the author to reach a sample population much greater than the number of assistant CM professors that post professional information online.

The goal of the continued research, similar to that of this paper, is to determine the qualification of CM faculty and how those qualifications are changing over time. However, it will be more in depth and will allow for a more rigorous statistical analysis.

Conclusions

Judging from current advertisements for CM faculty, it is important for the hiring CM programs that candidates have a combination of academic degree credentials and construction industry experience. The amount of both, either required or preferred, exceeds that of most of the recently hired assistant professors. This research finds that most newly hired assistant professors have doctoral degrees. However, these new hires tend to have less industry experience than is typically desired of new faculty. On the flip side, new hires with master's-level degrees tend to have significantly more industry experience than their doctoral counterparts, but are nonetheless missing the highest degree desired for most positions. Therefore, in order for candidates to meet the expectations set forth by hiring programs, they must either gain a higher degree and/or obtain more construction industry experience. Higher degrees are becoming more readily available as more CM programs are offering graduate degrees, including doctoral degrees. Direct construction industry experience can also be gained by faculty by means of industry internships or consulting. However, the data reveal that few assistant professors are taking advantage of such opportunities.

References

American Council for Construction Education (2006). *Document 103: Standards and Criteria for Accreditation of Postsecondary Construction Degree Programs.* [WWW document]. URL http://www.acce-hq.org/documents/DOCUMENT103REVISIONDRAFT090909.pdf

Associated Schools of Construction Doctoral Education Task Force (2005). *Investigating ASC Member's Construction Doctoral Degrees and Related Program Efforts*. [WWW document]. URL http://ascweb.org/announcements/The_ASC_Doctoral_Task_Force.pdf

Azhar, S. (2007). Improving Collaboration between Researchers and Practitioners in Construction Research and Practitioners in Construction Research Projects using Action Research Technique. *Associated Schools of Construction International Proceedings of the 43rd Annual Conference*. Flagstaff, AZ, April 2007.

Badger, W. W. (2002). The CM Faculty Pipeline Needs Renovating. *Associated Schools of Construction Proceedings of the 38th Annual Conference.* Virginia Polytechnic Institute and State University – Blacksburg, VA, April 11-13, 2002, pp. 115-126.

Badger, W. W. & Smith, J. C. (2006). Profiling Faculty Candidates: The Reality of Unofficial Rankings in Recruiting. *Associated Schools of Construction Proceedings of the 42nd Annual Conference*. Colorado State University – Fort Collins, CO, April 20-22.

Baha, Z. & Glon, P. L. (1988). Faculty Industry Internship as an Important Priority in Construction Education. *Associated Schools of Construction Proceedings of the 24th Annual Conference.* San Luis Obispo, CA, April, 1988, pp 83-87.

Ciesielski, C. A. (2000). Tenure And Promotion: A Comparison Between Construction Management and Civil Engineering. *Journal of Construction Education, 5* (1), 64-77.

Hynds, T. (2000). Professional Development/Internship Opportunities for Construction Faculty: A Win/Win Outcome. *Journal of Construction Education, 5* (2), 7-103.

Johnston, H. (1990). The Industry and the Universities: Partners for Better Construction Education. *Associated Schools of Construction Proceedings of the 26th Annual Conference*. Clemson, SC, April 8-11, 1990, pp 59-66.

McCuen, T. L. (2007). Industry Experience: An Important Requirement for Construction Faculty. *Associated Schools of Construction International Proceedings of the 43rd Annual Conference*. Flagstaff, AZ, April 2007.

Pace, C. B. & Danali, S. Construction Ph.D. Level Education. *Journal of Construction Education, 7* (1), 6-15.

Rebholz, F. E. (2000). Searching for Faculty – The Mundane and the Controversy. *Journal of Construction Education, 5* (2), 134-141.