

Current State of Construction Management Faculty Searches in the United States

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Postsecondary construction management (CM) education is an applied profession. CM education is interdisciplinary, drawing from disciplines such as architecture, engineering and business coupled with CM core content such as materials and methods, estimating, scheduling, and cost control. The applied nature of CM education makes it important for many of the faculty teaching in these programs to have significant industry experience prior to accepting a faculty position. Many universities are now requiring CM faculty to produce published research, and preferably funded research. Demonstration of the ability to do research is the attainment of a doctoral degree, often a PhD which is considered a research degree. The Sequential Explanatory research design for this project was intended to identify how CM programs across the United States are meeting the need for faculty to have industry experience and also for faculty to have a doctoral degree with a research agenda. The results indicate that many CM Programs have two tracks. One is the tenure track position in which the candidate having experience is nice, but the position requires or prefers the candidates to have a PhD. The second track is non-tenure teaching position with job titles such as clinical professor, professor of practice, or instructor.

Introduction

There are approximately 160 institutional members of the Associated Schools of Construction (ASC). All of these institutional members have a construction education emphasis. Some offer degree titles such as Construction Management, Construction Science, or Construction Engineering for example. Virtually all of these construction education programs are experiencing high demand for their graduates. The high demand for graduates leads to a high demand for faculty teaching in these programs. The researchers were looking for experience and/or education trends in the 668 advertisements for open faculty positions at ASC member institutions between 2007 and 2018, but were unable to identify any trends in these data. The researchers decided to conduct recorded telephone interviews with the chairs or heads of construction education programs or departments to find out more about the desired education and experience qualifications of faculty candidates that do not seem to be represented in the advertisements.

Construction management (CM) is an applied discipline similar to medicine or law, unlike architecture or other design disciplines which are theory based (Gunderson & Gloeckner, 2006). Teaching in theory-based disciplines does not require faculty have industry experience, whereas teaching an applied science does require faculty have industry experience so that actual experiences can be utilized to reinforce the concepts being taught in the classroom. In contrast to architecture, some researchers present engineering as an applied design discipline. For example, van Barneveld & Strobel (2017) stated that because the work/practical experience criteria for the Professional Engineer (P.E.) licensure is 48 months and the P.E. is consistently identified as a condition of employment that must be in-hand or attained within 2 years of an engineering faculty's appointment date, engineering is an applied discipline and teaching engineering requires significant industry experience. The difference between engineering and CM faculty is the necessity for CM faculty to maintain a relationship with the industry, (i.e., contractors and associations), to make sure that things being taught in CM programs are aligned with current construction practice, materials, and methods (Gunderson & Gloeckner 2006).

According to McCuen (2007), an *applied science* requires the application of knowledge from one or more natural scientific fields to practical problems. In other words, efforts are made by faculty in applied disciplines to promote

the practical application of scientific principles. These scientific principles are based on natural sciences that deal with the rational study of the universe via rules, or laws of natural order, such as chemistry and physics. The science of management and decision making may also be included in applied disciplines. According to Burgett, Smith, & Lavang (2017), real-world experience is essential in teaching the applied sciences, but due to increased pressure from universities for faculty to build more robust research agendas and an increase in number of graduate programs, CM programs are consistently giving priority to faculty candidates with terminal degrees in addition to industry experience. In the past, CM programs treated the master's degree as a terminal degree and placed a high value on construction industry experience when seeking tenure-track faculty. That standard has changed, and most tenure-track faculty position listings today require a PhD in Construction Science or a related field (Holliday, Robson, & Reyes, 2014).

Construction education is complex and accrediting bodies have begun to emphasize *engagement* and *impact* as goals for academic programs (Gasper & Lipinski, 2016). These goals require faculty to go beyond classic teaching methods and move emphasis to connecting students with industry by using applied projects and assignments. This can be done by providing the experiential learning technique. Experiential education is a process through which a learner constructs knowledge, value, and skill from direct experience. The professor is responsible for presenting opportunities for experiences, establishing the learning environment, sharing necessary information, and facilitating learning. Project-based learning is a student-centered educational approach in which the focus shifts from a method of instruction that is teacher-driven and led to one where the student is empowered to conduct self-directed learning. It is task oriented and a project is often set by an instructor or facilitator. Students integrate what is learned and produce a solution to solve an ill-defined problem (Leite, 2016). Ultimately, this teaching style is best suited for an applied discipline.

The American Council for Construction Education (ACCE) accreditation includes criteria to evaluate a CM degree program's faculty. The criterion is listed in Document 103 (2018) and states, "The faculty shall possess appropriate academic qualifications, professional experience, and where applicable pursue scholarly and creative activities essential to the successful conduct of an academic degree program of construction, and in compliance with the regional accreditation organizations" (p. 12). ACCE also recognizes professional experience in its statement "Evaluation of faculty competence shall recognize appropriate professional experience as being equally as important as formal educational background" (p. 12). The Accreditation Board for Engineering and Technology (ABET) accreditation criteria for university CM programs also requires that a program have at least one faculty member who has had full-time experience and decision-making responsibilities in the construction industry (McCuen, 2007).

Through interviews with CM department heads, the survey responses from CM faculties, and the document analysis of advertisements for faculty positions posted on the ASC web site, researchers previously identified the required qualifications of CM faculty classified into four basic categories: earned academic degree, industry experience, the ability to be a good teacher, and the ability to do research. In most cases a faculty member needs to have a doctoral degree to be hired into a tenure-track position. The need of construction experience is another required or preferred criteria in a candidate for CM faculty positions. It is also important that faculty be a good teacher for which the qualities include: having construction experience, being entertaining, having energy, being organized and conscientious. The ability to do research has a connection with a doctoral degree, as doing Ph.D. requires to do research and dissertation. Another preferred qualification of a faculty candidate that was specified in the advertisements was professional registration or certification (Gunderson & Gloeckner, 2006).

Construction Management programs are being pressured to require both advanced education and construction experience in faculty. As more construction programs require faculty to hold a PhD, it is becoming increasingly difficult to find tenure-track faculty applicants with both a PhD and industry experience (Holliday, Robson, & Reyes, 2014). The path to a PhD does not leave room for significant construction industry experience. The shortest path to a PhD is continuous education from undergraduate through graduate school. Once a person leaves the education path and enters industry it is often hard to leave industry for full-time studies, which leads to a gap in prospective construction educators. As a result, the component of professional experience as related to faculty competence is being compromised by university requirements that faculty have completed a doctoral degree (McCuen, 2007). According to Gasper & Lipinski (2016), while the academy is more inclined toward the creation of theory and publishing journal articles, programs could benefit greatly by providing faculty with opportunities to gain direct experience in industry. Few programs have formal programs in place to facilitate such interaction, but there are examples of successful university-industry partnerships. The summer internships for faculty is a program

sponsored by the Associated General Contractors of America (AGC) to increase faculty industry experience, which is structured by a three-party agreement between AGC, the sponsoring university, and a local contractor (Holliday, Robson, & Reyes, 2014).

Previous research on the topic of CM faculty education credentials and industry experience exposed gaps between the two requirements. The purpose of this research was to identify education and experience requirements for applicants seeking a full-time position in Construction Management programs in the United States. The objectives of this study were 1) to determine the relationship between advertised faculty positions and the highest degree required for applicants, 2) to explore construction experience as a consideration in the evaluation of candidates for a faculty position, and 3) to identify the extent of the university's influence on stated requirements for the faculty position. This study was designed to collect and analyze data in two phases.

Methodology

The research methodology utilized was an explanatory sequential mixed method, using both quantitative and qualitative data to meet the research objectives (Creswell, 2013). The first research phase was to analyze quantitative data which were 11 years of job announcements advertised through the Associated Schools of Construction (ASC) list serve and posted on the ASC website. The quantitative data and results provided a general picture of the research problem. The second phase was qualitative data gathered through recorded telephone interviews with Construction Management (CM) program chairs. The qualitative data was collected to help explain the quantitative results.

Delimitations and Limitations

One delimitation to this study is the population, which included the approximate 160 institutional members of ASC in the United States. The interview participants were delimited to CM program chairs and did not include faculty with experience on search committees or other related positions in the program. The limitations to this study included the small sample of interview participants (14) with the majority (85.7%) at public postsecondary universities. Another limitation was the lack of participation from CM programs in each of the U.S. geographic regions.

Research Results

Quantitative Results

A total of 668 job announcements were distributed through the ASC list serve and/or posted to the website between fall 2007 and spring 2018, which was 11 academic years. During that time period there were 100 advertisements for positions in administration, such as department chair or college dean, which were excluded from this study. The resulting sample of 568 job announcements for faculty positions included 378 tenure track positions and 190 non-tenure positions. It is important to note that each time a job announcement was distributed it was recorded as a unique instance, therefore the number of announcements in the total and in each category may include duplicates. Descriptive statistics were used and quantitative data was analyzed to determine the relationship between each faculty position and the highest degree required for applicants. An Excel™ workbook to record the data was created that included: worksheet for each academic year; worksheet with yearly totals; and summary sheet. The summary sheet included two tables with sorted data by academic year, tenure/non-tenure position, and Ph.D. required/Ph.D. preferred. The raw data is displayed in Figure 1.

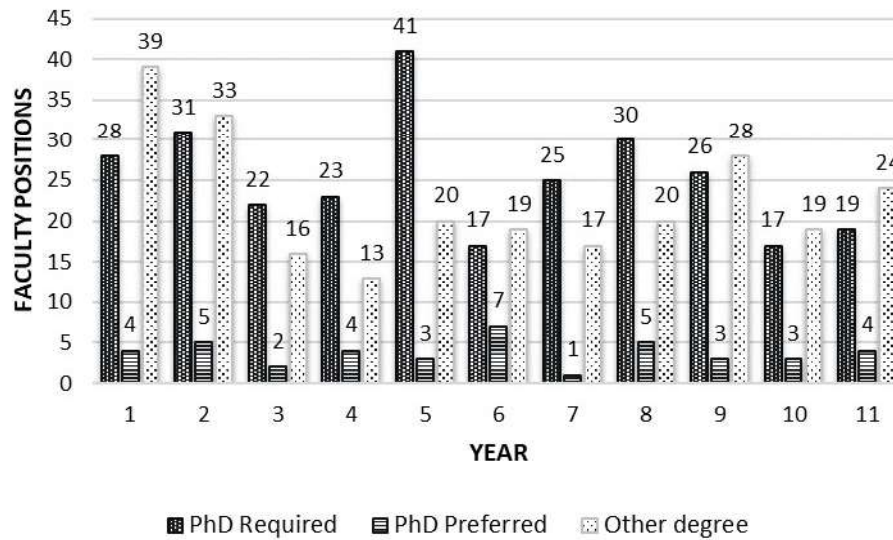


Figure 1 Faculty Positions and Academic Degree Requirement

Of the 378 tenure-track/tenured positions, 57% (215) required a Ph.D. and 8% (31) preferred a Ph.D., which meant 35% of tenure positions would accept a Master's degree as the highest academic degree. In contrast, of the 190 non-tenure positions 34% (64) required a Ph.D. and 5% (10) preferred a Ph.D., thus a Master's degree was the highest degree required for 61% of the non-tenure positions in the data set. The data was further analyzed by academic degree requirement and revealed 56% (320) of all faculty positions either required or preferred a Ph.D., while 44% (248) did not require or prefer a Ph.D.

Qualitative Results

Results from the quantitative data were used to generate questions for the qualitative data collection and provide context for the qualitative analysis. A stratified purposeful sampling approach was used to select participants for interviews from a mix of research intensive and teaching intensive CM programs. Identification of a program as research or teaching intensive was based on the institution's website. Nine questions were written in an attempt to gather answers that would explain the role of construction experience and the extent of influence the university has on hiring CM faculty.

A personalized email was sent to twenty program chairs with an invitation to participate in a semi-structured interview. Ten were at research intensive universities as determined by the researchers, and 10 were from teaching intensive universities. Fourteen (70%) of the 20 program chairs agreed to be interviewed, split evenly with seven participants at research universities and seven at teaching intensive universities across 14 states. Thirteen of the participants were from public universities and only one from a private university. In addition to inviting participants from different categories of universities, the researchers purposefully identified CM programs from six of the seven ASC regions in the U.S. The sample of 14 participants was geographically dispersed with representation from Regions 2, 3, 4, 5, 6, and 7. The sample was further diversified with representation of programs located in various colleges, such as Architecture, Engineering, and Business.

Interviews were conducted over the phone, recorded with permission, and transcribed for analysis. Each participant was treated as an individual case for the purpose of this study. Transcriptions were coded using open and axial coding in a deductive framework while being open to themes which might emerge. Patton (2002) indicates that in qualitative data analysis, inductive and deductive approaches "are often combined" (p. 56). Patton goes on to state, "Discovery and verification means moving back and forth between induction and deduction, between experience and reflection on experience" (p. 67). These data were organized into four categories: 1) university and program characteristics, 2) importance of industry experience, 3) university influence on hiring, and 4) adapting to a new reality. Within each of the categories the researchers identified emergent themes.

Category 1: University and CM program focus

Participants were first asked to self-identify their university as research or teaching intensive. Seven identified their university as research intensive; four as teaching intensive; and three as their university having a balanced emphasis on teaching and research. Participants were also asked to self-identify their CM program using the same criteria. Three participants identified as research intensive, six as teaching intensive, and five as having a balanced focus on research and teaching.

Emergent Theme: A CM program may not be aligned with the university when self-identifying as research intensive or teaching intensive. For example, a university may have a Carnegie research rating of “Doctoral Universities: Highest Research Activity” yet the CM program/department may be more teaching intensive.

One participant in this situation stated, “[We’re] extremely teaching intensive, very little research. At the university level, I’d say more research focused.”

Category 2: Importance of industry experience

Participants were asked to describe the importance of industry experience from the perspective of the program, advisory board, and university. From the program’s perspective, 10 participants indicated a high importance placed on industry experience while four responded with ‘it depends on the position.’ In contrast only four participants indicated the university places some level of importance on experience, while 10 indicated their university places no level of importance on experience. As expected, all 14 participants reported a high level of importance is placed on a candidate’s industry experience by their advisory board.

Emergent Theme: Two separate faculty tracks. This theme emerged as participants described their experiences with failed faculty searches, differences in faculty positions, and identifying a fit for the department. The most dominant theme to emerge was focused on the different positions. There are tenure track positions that in general require or prefer a doctoral degree and a research agenda. Then there are positions with titles such as clinical professor, instructor, professor of practice, and others, which require significant industry experience, and the doctoral degree is not as important. Most of these positions require a Master’s degree.

One participant’s response when asked about the current focus of their faculty stated, “*While our focus area is balanced on teaching, research and service, our numbers would dictate that we definitely need to make sure we’re taking care of those thousand undergrads. [Therefore] we are slightly majority [greater] on industry instructional faculty versus tenure, tenure track.*”

Another participant stated, “*We have two different tracks. We have the tenure line track, and in that one we prefer construction experience but it’s not required. We require a Ph.D., because we’re a research centered university. The second track is the special appointment faculty, which require five or more years of construction experience in industry for a special appointment faculty member.*”

Emergent Theme: Importance of Industry Experience. CM programs and their advisory boards consider experience in industry to be extremely important. This theme emerged from responses like the following:

One participant’s response described the expectations for industry experiences as “*there is a disconnect between the expectations and needs and desires of the advisory board and those of the university, ...it’s just exacerbated in this field because this is a very applied field.*”

Another participant’s response reflected a real concern by the program chair at a research intensive university, “*Well the advisory board has a high level of importance on experience, but at the end of the day we have to have the proper mix of faculty in all ranks and so we also have to [ensure] if we hire tenure track faculty we have to make sure they can get tenure.*”

Emergent Theme: The university does not consider industry experience to be important. This theme emerged from statements such as, "I have no tangible proof that our university thinks it's important that people have industry experience."

Category 3: University influence on hiring

In this category participants were asked to describe their university's influence on hiring faculty. Responses revealed that only two universities do not influence hiring, whereas six participants reported limited influence and the remaining six reported a high influence. Participants whose response indicated limited influence qualified their answers in relationship to equal opportunity and diversity requirements for hiring. Other than the reference to industry experience in the theme included above in Category 2, no other themes emerged.

Category 4: Adapting to a new reality

While coding data, the researchers discovered an emerging theme in which program chairs admit the new reality is the pool of candidates for CM faculty has changed. The purpose of this study was to identify *current education and experience requirements* for CM faculty, the discovery of this emerging category is a result of participants explaining their approach to the faculty search process.

One participant stated, *"...it puzzles me that there's still sort of this thinking out of a hundred or so accredited programs that there's just this great pool of talented middle-aged people, whatever, that have all this experience and have a doctorate degree and want to teach construction."*

Another participant stated, *"So we realize that it's very hard to find people with ten years of experience and a Ph.D. and some form of a research agenda and are excellent teachers."*

Similar responses were made by several participants and included one that was particularly revealing about the current reality of hiring CM faculty, *"...the reality is that higher education in the U.S. appears to be valuing the credential of doctorate degree, the terminal degree, in spite of what might be considered best in the classroom, specifically for construction management programs."*

Other participants expressed the need for alternative models to hiring faculty. For example, one participant stated, *"I'd love to find a model that says a department has to deliver on service, teaching and research, but it doesn't have to be the embodiment of every single faculty member...not have this 'everybody's got to be everything.'"*

Perhaps the most revealing response in support of this emerging category was from one participant who simply stated, *"We don't always get what we want with Ph.D. and experience."*

Discussion

The current state of Construction Management faculty searches appears to be a balancing act between a program's 'want' to hire faculty with industry experience and the 'need' to hire faculty with a Ph.D. who bring a research agenda and the potential for external funding. Expectations are the challenge to find this balance will become more salient for construction educators as universities raise the level of importance for funded research. Two of the participants in this study who identified as a teaching intensive university reported their university is in transition from a focus on teaching to a research intensive university. Both universities are public universities with graduate programs in place or in development to support the transition.

Although this study included an equal number of interviews with CM program chairs from both research and teaching universities, 10 of the 14 participants revealed unique strategies they have developed to ensure their faculty bring industry experience to the classroom and research to the university. Strategies included two distinct approaches: 1) program level and 2) individual level.

At the program level, chairs continue to search for faculty with construction work experience who will concentrate on teaching. Geographic location, type of appointment (adjunct, lecturer, etc.), and salary were a few of the common topics discussed by participants. One participant's program resides at a research intensive university where state funding only goes to tenure/tenure track lines that requires candidates have a Ph.D., therefore the program was forced to find an alternative funding source to hire faculty who have industry experience but not the Ph.D. credential. As a result, the program formulated a strategy to hire faculty in a special appointment position funded entirely by its industry advisory board. The program chair described the importance of experience to the advisory board as *"...it's critical because one of the things we talk about in our advisory board is the quality of the program, and everybody in the program and our advisory board agree that having construction experience in the classroom is critical."*

Other participants reported strategies that are tailored at the individual level to provide faculty with experience while working at the university. One participant's stated approach was *"What we do is try to figure out ways to do faculty work experiences in conjunction with industry partners during the summers."*

While ASC and the Association for General Contractors (AGC) have partnered to support programs and faculty with this effort, other programs have strategies that partner directly with industry. One participant described their program's strategy based on the value it places on construction experience as *"...we also have mechanisms in place to gain work experience for any faculty member through engagement with our industry partners."* While another participant described their program's strategy as *"We do internships for the tenure track faculty so they go work with industry...they build up their experience that way...[through] our own program."*

Conclusion

As previously stated, construction is an applied science and interdisciplinary profession for which no one profile exists to reflect the competencies and attributes necessary for CM faculty. At any point the faculty positions posted on the ASC website will include openings for faculty with a specialized background, such as civil, residential, or sustainable construction. Expectations are that the faculty who fill a specialized position will have industry experience in that sector of construction, along with a focused educational background. The amount and format of industry experience required will vary.

The value placed on industry experience for CM faculty stems from the situational characteristic of construction. Each project is unique in its design, location, resources, and organization, which results in unique problems that must be solved by the Construction Manager. Although CM professionals will often obtain credentials to signify their expertise in a specialized area of construction, such as the CPC (Certified Professional Constructor) or the CCM (Certified Construction Manager), expectations are that only through experience on the job can a CM transfer knowledge from one situation to another for the purpose of overcoming challenges on a project.

As a consequence, CM program chairs have a new reality and they must adapt with strategies to balance industry experience with university requirements. While this is not a new issue in construction education, it has risen to the point where program chairs are being creative and taking action in their response. One participant explained their program's view of experience and included *"We also know that people who do applied research in the industry oftentimes are exposed to much of the industry practices, so they gain their experience through the applied research endeavors."*

The results from this study revealed the challenge persists to find CM faculty with construction experience and the requisite educational degree. Perhaps the need for action was best articulated by one participant's statement, *"I think we need to have a national agenda for getting more industry members into the classrooms and recognizing construction education as a professional program."* Exactly how that will be achieved is yet to be defined, but there is no doubt it can be accomplished with solutions that support both the program and faculty development.

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