Industry Experience: An Important Requirement for Construction Faculty

Tamera L. McCuen, M.S., M.B.A
University of Oklahoma
Norman, Oklahoma

This paper discusses the current trend in construction programs hiring practices for faculty at U.S. universities. The importance of industry experience as a requirement for new faculty is being compromised in lieu of a doctoral degree. An analysis of current and historical data obtained from job announcements for positions at ASC programs substantiates this claim. Recent responses by construction faculty participating in the 2005 survey by the ASC Construction Doctoral Task Force reveal a concern about this trend. This paper addresses cognitive skill development and the role industry experience plays in the development of an individual from novice to expert within a subject domain. Construction education is an applied science discipline in which industry experience is an important requirement for teaching faculty.

Keywords: construction education, construction faculty and industry experience, faculty credentials

Introduction

The trend in hiring new teaching faculty for construction programs at U.S. universities is one towards an increased emphasis on the candidate possessing a doctoral degree and less emphasis on the candidate having professional experience in the construction industry. Discussions about this trend focus more on academia's demand for construction PhD graduates and the validity of this demand given that construction is an applied science. Little attention is given to the experience component in either one of these discussions. A doctoral degree is not equivalent to the expertise gained from industry experience and is not a substitute for professional knowledge. This is reinforced by both ABET and ACCE in their accrediting criteria for construction programs. Accreditation criteria for ABET states that a construction program must include at least one faculty member who has had full-time experience and decision-making responsibilities in the construction industry (ABET, p. 10). The American Council for Construction Education Document 103 states, "Evaluation of faculty competence must recognize appropriate professional experience as being equally as important as formal educational background." (ACCE, p. 24)

Problem Statement

The component of professional experience as related to faculty competence is being compromised by university requirements that faculty have completed a doctoral degree. The doctoral degree is an academic credential in the applied science of construction. The connection of experience to knowledge and expertise in the subject field is critical in teaching the applied

sciences. However, given the current trend in criteria established by universities for hiring new construction faculty, it appears that doctoral degrees and research agendas are replacing the requirement for faculty to have industry experience and expert knowledge in order to teach construction management at U.S. universities. Gunderson & Gloeckner (2006) make the statement that construction [management] is an applied discipline and is similar to medicine and law. They contend that because construction is an applied science then construction education should be similar to medical and law schools wherein most individuals teaching have practiced as a medical doctor or as an attorney (2006). M.M. Khattab former president of ASC, in his discussion about the shortage of qualified individuals to fill faculty positions in construction education bachelor's and master's programs, states that the credentials of someone qualified to teach in a construction management program is someone who possesses a doctoral degree and should have at least 5 years of construction industry work experience. (Gunderson, & Gloeckner, 2006, p. 170) Pat Pannell, Construction Management Program Coordinator at South Dakota State University, argues that construction academia must recruit experienced people from industry and states that the proper credentials in construction management education are a PhD and at least 10 years of [construction] management experience (ASC, 2005, pp. 14- 16). Additional support is provided by Richard Holman of California State University, Chico, who agrees with enforcing an experience requirement for new faculty and adds that their program currently requires 7 years experience (ASC, 2005, p. 15). The problem as presented is that while academia acknowledges the importance of industry experience for teaching faculty, it compromises the importance of the experience component in lieu of a doctoral degree when hiring new teaching faculty for construction programs at U.S. universities.

Objective

The objective of this paper is to confirm the current hiring trend for construction faculty with an analysis of past and current job announcements. This paper will emphasize the importance of industry experience, the importance of the length of that experience, the value of knowledge gained from the industry experience, and the role industry experience has in the applied sciences. The 2005 ASC Task Force report is referenced for comparison of topic related findings discovered in the task force findings. The following areas will be discussed in detail as support for an emphasis on industry experience:

1. Cognitive skill acquisition and development
2. Deliberate practice and expertise
3. Expert knowledge and performance

Definitions

The following definitions are to establish perspective and consistency in this paper.

Construction management, construction science, and construction technology are interchangeable in the context of this paper.

Experience is defined as "1 a : direct observation of or participation in events as a basis of knowledge b : the fact or state of having been affected by or gained knowledge through direct observation or participation 2 a : practical knowledge, skill, or practice derived from direct observation of or participation in events or in a particular activity b : the length of such participation <has 10 years' experience in the job> 3 a : the conscious events that make up an individual life b : the events that make up the conscious past of a community or nation or humankind generally 4 : something personally encountered, undergone, or lived through 5 : the act or process of directly perceiving events or reality." (Merriam-Webster, 2006)

Expert is defined as "one with the special skill or knowledge representing mastery of a particular subject." (Merriam-Webster, 2006)

Expertise is defined as "1: expert opinion or commentary 2: the skill of an expert refers to the mechanisms underlying the superior achievement of an expert." (Merriam-Webster, 2006) The term expert is used to describe highly experienced professionals

Applied Science is defined as the exact science of applying knowledge from one or more natural scientific fields to practical problems." (Wikipedia 2006) In the applied sciences, efforts are made to promote practical application of scientific principles. The natural sciences are the basis for these scientific principles. Natural sciences are those sciences that deal with the rational study of the universe via rules, or laws, of natural order, such as chemistry and physics. (Wikipedia, 2006)

Research Method

Sample Description

Two populations of data were analyzed for this paper. The first were faculty job announcements posted to the ASC website in the fall of 2006 at http://www.ascweb.org. The second population of data came from hard copies of job announcements from the years 1992 and 1994. Both populations represent ASC construction programs and include both tenure and non-tenure track positions.

Fall 2006 job announcements totaled 37 from 29 programs. Job announcements from 1992 and 1994 combine for a total of 7 from 6 programs.

Sample Data Analysis

Each job announcement was reviewed and a content analysis of each was performed. A spreadsheet was set up to include a subsequent listing of institution, program name, program location within the university, position, tenure or non-tenure, education credentials required and preferred, industry experience required or preferred, and teaching experience required or preferred.

Results

Analysis of the job announcements from 1992 and 1994 concluded that 71% of that sample set required industry experience and none of the announcements listed a PhD or Doctorate as a required credential. Analysis of the job announcements posted in fall 2006 revealed a decline in the experience requirement with only 60% of new faculty positions requiring industry experience of any length of time. Furthermore, of the 37 job announcements from the fall of 2006, 14 or 38% required either a PhD or Doctorate. Even more significant is that of those 14 programs, which required a doctoral degree, only 3, or 21%, required any industry experience in addition to the PhD or Doctorate degree. These results support the reported trend that industry experience is disappearing as a requirement for construction faculty in lieu of a doctoral degree.

3.8 years was the average length of industry experience required of candidates for the faculty positions posted. This average is based only on those announcements specifying length of industry experience required for the position. An average of 3.8 years is inconsistent with scientific research about the length of time required for knowledge compilation and its conversion to expertise in a given subject domain. It is also inconsistent with responses from current teaching faculty at ASC construction programs as reported in the 2005 ASC Task Force report.

Related Task Force Findings

The ASC Construction Doctoral Education Task Force sent a survey to all ASC faculty members requesting information concerning post-masters graduate studies within the ASC program membership (ASC, p. 48). For purposes of this paper, only those responses as related to appropriate industry experience requirements for teaching faculty are addressed. Results included are those of the total population of respondents, with no subsequent distinction of respondents' profiles.

On page 53 of the Task Force report the topic of industry experience requirements for faculty is addressed with a question asked about the importance of employee experience to employer success. Options are given for respondents to rank their answer on a scale of 0 to 5, with 0 being "no value" and 5 being "high value". The question was asked: "Would Academia value an employee with: no experience? academic experience? construction experience? research experience? Construction experience received the highest rating of 4.07 as the most important factor for success in construction academia. This reveals the importance current faculty place on industry experience in construction education.

An attitude survey was included as well. Below are statements and responses as related to the topic of industry experience. First the statement is listed, then the value and differential of responses. Responses are scored on a scale of 1 to 5, with 1 being "strongly disagree" and 5 "strongly agree".

#3 states: My program prefers to have faculty with practical experience in the construction industry. Response value was 4.56, strongly agree.

#13 states: A qualification to teach in a construction education program should be a minimum of 5 years of construction experience. Response value was 3.83, agree.

Construction industry experience of respondents to the survey averages 15.1 years of U.S. and/or international experience. Respondents were given an opportunity to comment on the task force's work. (ASC, p. 59) Within those comments were several made with regards to the importance of industry experience. The following is a brief list of comments and is in no way inclusive of all comments made as related to this topic in the survey.

"…More hiring needs to be done based on industry experience. Teaching and mentoring come natural to good leaders in the industry."

"…faculty with industry experience and MS degrees are much more important for our students and industry than PhD's performing research."

"…In order to teach young men and women, you need years of real world experience…need to get at least 10 years of experience and come back to teach when [they] are prepared."

Discussion

The departure of experience as a required credential for new construction faculty is counterintuitive because it removes the expert industry knowledge from the classroom in an applied science discipline. Results from Leinhardt & Greeno's examination of expert-novice differences in teaching concluded that teaching is a complex cognitive skill and it "requires the construction of plans and the making of rapid on-line decisions" in a "relatively ill-structured dynamic environment." (1986) Experience is the method by which cognitive skills evolve from novice to expert level status. This link of experience to expert to teaching is important in educating construction students.

Cognitive Skill Acquisition

John R. Anderson (1982) classifies cognitive skill acquisition into three stages. The first stage is the declarative stage. At this stage, an individual receives instruction and information about a skill, which is encoded by that individual as a set of facts about the skill. Facts about the newly acquired skill are rehearsed in working memory for interpretive procedures. This stage is equivalent to a student of the subject matter. At this stage, the individual is considered a novice in the subject domain. With practice, the new knowledge is converted in the second stage through knowledge compilation. This knowledge compilation is the effect of acquiring experience in the subject area. With deliberate practice and continuous compilation, an individual converts from novice to expert. Anderson labels this expert stage as the procedural stage. The procedural stage is the point at which an individual is highly experienced and requires little attention or cognitive resources to perform a skill in the subject matter. (Anderson, 1982)

Deliberate Practice and Expertise

This expert level of cognitive skill is important in all applied sciences. An expert brings to the classroom a working knowledge that facilitates critical thinking and decision making given alternative courses of action. A closer look at the difference between experts and less skilled subjects focuses on the fact that the difference is not merely a matter of the amount and complexity of the accumulated knowledge, but there are also qualitative differences in the organization of knowledge and its representation. The expert's mental representation of subject knowledge allows for rapid adaptation and facilitates the expert's ability to monitor and evaluate their own performance so they can have ongoing improvement by designing their own training and assimilating new knowledge. (Ericsson, 2000)

Through his research into cognitive skill acquisition, KA Ericsson concludes that elite performers across domains require about 10 years of intense experience and deliberate practice. (1994) "Deliberate practice differs from other domain-related activities because it provides optimal opportunities for learning and skill acquisition." (Ericsson & Charness, 1994, p. 739) The importance of experience and practice serves to reinforce the idea that medical professionals must succeed at extended deliberate practice and why physicians cannot "Just Do It" but rather must translate research into practice. (Green & Seifert, 2005) Therefore, given that construction management is classified as an applied science, the same holds true for cognitive skill acquisition and expert level status in the construction domain.

At this point, some vocational psychologist might argue that while it is all well and good to discuss expertise in the context of industrial-organizational psychology or perhaps gifted education, it is not relevant for career development for the general population. (Carson, 2002) Carson (2002) assumes Ericsson's theory is correct on expertise and contends that this research on development of expertise is relevant to all people because the same learning mechanisms operate across all stages from novice to expert.

Expert Knowledge and Performance

Results from research on experience as it relates to job performance indicates that the correlation between experience and performance is positive. (McDaniel, Schmidt, & Hunter, 1988) Therefore as an individual's industry experience increases so does their performance level and expertise. Ericsson and Charness (1994) dispel the belief that expert performance reflects innate abilities and capacities, but rather show that recent research in different domains of expertise indicate that expert performance is predominantly mediated by acquired complex skills. (Ericsson & Charness, 1994) In construction education as with other applied sciences, complex skills and industry knowledge are acquired from extended professional experience.

Conclusion

As evident in the data analysis of current and past job announcements, the industry experience requirement is diminishing and is being compromised for a doctoral degree. The length of industry experience currently required is well below the level at which scientific research shows

as adequate to support expert knowledge in a subject field. This trend reveals inconsistencies between the classification of construction management as an applied science and the hiring practice of construction management programs based on professional expertise.

The intrinsic value of industry experience as a construction professional is disappearing as higher education emphasizes the requirement of a doctoral degree for new faculty in lieu of industry experience. This diminished expectation of field experience in the applied science of construction management indicates a trend toward a curriculum of theory based education. Without substantial practical experience faculty will be unable to teach construction management as an applied science. Ultimately, the students suffer in learning the practical applications required in the construction industry.

Brian More, PhD., Southern Polytechnic State University provides a fitting analogy for the current trend in his statement that "When universities threw experience out of the equation, it stepped over a 5-dollar bill to pick up a dime…" (ASC, 2005, p. 27)

References

Accreditation Board for Engineering and Technology (ABET) (2006). Engineering Accreditation Commission, *Criteria for Accrediting Engineering Programs, Effective for Evaluations during the 2007-2008 Accreditation Cycle.* Retrieved December 18, 2006 from http://www.abet.org

American Council for Construction Education (ACCE). (2000). *Document 103: Standards and Criteria for Accreditation of Postsecondary Construction Education Degree Programs.* Retrieved December 18, 2006 from http://www.acce-hq.org/documents.htm

Anderson, John R., (1982). Acquisition of Cognitive Skill. *Psychological Review, 89, 4,* 369-406. Retrieved December 28, 2006, from EBSCOHost research database.

ASC Construction Doctoral Education Task Force, Report to the Board of Directors (2005). *Investigating ASC Member's Construction Doctoral Degrees and Related Program Efforts.* Retrieved November 15, 2006 from www.ascweb.org

Carson, Andrew D., (2002). *Expertise and Career Development.* Retrieved December 28, 2006, from http://vocationalpsychology.com/expertise.htm

Ericsson KA., & Charness, N. (1994) Expert performance: its structure and acquisition. *American Psychologist, 49,* 725-47. Retrieved December 28, 2006 from EBSCOHost research database.

Ericsson, KA., (2000). *Expert Performance and Deliberate Practice. An updated excerpt from Ericsson.* Retrieved December 28, 2006, from http://www.psy.fsu.edu/faculty/ericsson/ericsson.exp.perf.html

Green, Lee A., & Seifert, Colleen M. (2005). Translation of Research Into Practice: Why We Can't "Just Do It". *Journal of American Board Family Practice, 18,* 541-545. Retrieved December 28, 2006 from EBSCOHost research database.

Gunderson, David E., & Gloeckner, Gene W. (2006). Needs Assessment: Construction Management Doctoral Programs in the United States. *International Journal of CONSTRUCTION EDUCATION AND RESEARCH, 2, 3,* 169-180.

Leinhardt, G., & Greeno, J.G. (1986). The cognitive skill of teaching. *Journal of Educational Psychology, 78,* 75-95. Retrieved December 28, 2006 from EBSCOHost research database.

McDaniel, Michael A., & Schmidt, Frank L., & Hunter, John E. (1988). Job Experience Correlates of Job Performance. *Journal of Applied Psychology, 73, 2,* 327-330. Retrieved December 28, 2006 from EBSCOHost research database.

Merriam-Webster OnLine Search. Retrieved December 8, 2006, from http://www.m-w.com.

Wikipedia, The free encyclopedia. Retrieved December 8, 2006, from http://en.wikepedia.org/wiki/Applied_science