

# The Body of Knowledge for Construction Management Doctoral Programs: Starting the Discussion

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Current research indicates that Construction Management doctoral programs are needed in the United States. If this is indeed true, then the next question might be: What is the body of knowledge for Construction Management doctoral programs? Or perhaps, Is there a body of knowledge for Construction Management doctoral programs? Because of a low response rate, the results of an open-ended survey question asked in an effort to answer either of these questions did not yield results that could be generalized or even deemed to be valid qualitative research. But, the results are adequate to initiate discussions on whether or not there is a body of knowledge for Construction Management and if so, what are the parameters and content of that body of knowledge. As Construction Management, whether deemed a discipline or interdisciplinary profession, matures it will be these types of discussions that help raise Construction Management and construction education to a higher level.

**Key Words:** construction management, construction education, doctoral degree, Ph.D. programs

## Introduction

In 2005 an Associated Schools of Construction (ASC) Doctoral Education Task Force and an unpublished dissertation (Gunderson, 2005) reported that only one Ph.D. program existed in the United States which included the word "Construction" in the degree title. The ASC Task Force also reported that there are 29 doctoral degree programs which allowed an emphasis in construction management. In 28 of the doctoral programs the resultant degree is a Ph.D.; in one program the result is a Doctor of Industrial Technology. Construction Management programs are interdisciplinary in their content drawing on engineering, architecture, technology, and business, yet they are a unique discipline or profession. Since the research indicates that Construction Management doctoral programs are needed in the United States, the next question must be: What is the body of knowledge for Construction Management doctoral programs?

During the 2004-2005 school year, 100% of the 32 construction education programs advertising for 38 open positions required (60.5%) or preferred (39.5%) the candidates to have a doctoral degree (Gunderson, 2005, p. 141; Gunderson & Gloeckner, 2006). There seems to be a high demand for faculty members in postsecondary construction education programs because there is the high demand for the undergraduates (Bilbo, Burt, Collins & Waseem, 2007). Anecdotal information from construction practitioners is that there is virtually no demand generated by the construction industry for individuals with a doctoral degree, regardless of the body of knowledge.

### *Demand for Construction Management Undergraduates*

Bilbo, Fetters, Burt, and Avant (2000) reported that "most construction education [undergraduate] programs" in the United States are experiencing a 100% placement rate (p. 78), and the majority of these programs are members of the Associated Schools of Construction (Rosenbaum & Rubin, 2001). Currently the Associated Schools of Construction (ASC) represents 130 post secondary academic institution members that have construction education programs. The majority of these programs result in a Bachelor of Science degree for the graduates. These construction education programs produce graduates with degree titles (majors) such as Construction Management (CM), Construction Engineering, Construction Engineering Management, Construction Engineering Technology, and Construction Management Technology among others (Gunderson, Ra, Schroeder, & Holland, 2002). The most common title for the major is Construction Management used by 51 of the 88 members of the ASC who responded to an Engineering News-Record survey (Rosenbaum & Rubin, 2001).

As reported by Gunderson and Gloeckner (2006, p. 170), the U.S. Department of Labor estimated in May 2004 that more than 500,000 individuals worked as first line supervisors and managers in the construction and extraction industries. Construction companies hire graduates from construction education programs to become some of these managers. Bilbo, Fetters, Burt, and Avant (2000) stated, "Demand for the construction graduate has exceeded the available supply in recent years, and based on the results, this trend will continue" (p. 88). Rosenbaum and Rubin (2001) stated the following in the *Engineering News-Record* special report on construction education:

California State University, Sacramento, offers a glimpse of the promise and pressure in construction education today. "We can't turn out graduates fast enough" says Donald W. Nostrant, a professor of construction management. Entry-level enrollment is up 40% there in the last two years since a program name change from "engineering technology" to "Construction Management." (p. 26)

As more students enroll in construction education programs in the United States, the demand for qualified faculty increases. Some of these positions were unfilled with the teaching being done by adjunct faculty usually from the construction industry. Rosenbaum and Rubin (2001) stated, "Teaching assistants, part-time faculty and lecturers, as well as crossover candidates from other engineering disciplines, fill current faculty gaps" (p. 31). Badger (2002) found the same to be true, stating:

Samples of some of the ACCE [American Council of Construction Education] findings regarding weaknesses in personnel, funding, and developmental funding for faculty members [at accredited CM programs] were: 1. Lack of sufficient number of faculty to meet teaching demand and research expectations. 2. Lack of support from the University to hire qualified faculty. (p. 117)

### *The Need for Construction Management Doctoral Degree Programs*

Gunderson (2005) concluded that there is a shortage of qualified individuals to teach in construction education programs. In most cases, qualifications for faculty members in these programs included having a doctoral degree, having experience in the construction industry, the ability to become a good teacher, and at some institutions professional registration or certification. Individuals with construction experience and a doctoral degree in engineering, architecture, technology, education, or other disciplines could fill open faculty positions. If there were several doctoral degree programs focused on construction management and/or construction education, graduates from those programs would be available to fill open faculty positions in construction education programs.

The apparent need for Construction Management doctoral degree programs in the United States leads to the research question: What is the body of knowledge for students enrolled in a Construction Management doctoral degree program?

### *Research Methodology*

The original research (Gunderson, 2005) was done to determine if there is a need for Construction Management doctoral degree programs in the United States was a sequential exploratory mixed methods research design which was implemented in two phases. The first part of the Phase I data collection was document analysis. The classified advertisements posted on the ASC web site were analyzed with respect to the number of vacant construction education faculty positions from the middle of August 2004 through the end of May 2005. The second part of the first phase of this research design were interviews with CM department heads.

The second phase of this research design was a questionnaire sent to all 402 faculty members teaching in ACCE accredited programs during the 2004-2005 school year. Following describes the Phase II participants, the Phase II data collection, and data analysis procedures. A goal of this multi-phase research design is to provide triangulation which is utilizing more than one strategy "for providing validity and reliability" (Merriam, 2002, p. 31).

An open-ended question in Phase II of data collection was included in the survey with the intent to help identify the body of knowledge for Construction Management doctoral programs.

### *Phase II Participants*

The target population for the quantitative phase of the research was the 402 faculty members in ACCE accredited Construction Management programs. The list of individual faculty members in these ACCE accredited programs was developed by going through the self-reported data on the ASC web site and cross checking the information by going to the web site of each of the CM programs and the link with their faculty members. The sample selected to receive a survey was the entire target population.

### *A Tangential Open-Ended Question*

The survey also included an open-ended question: “If you had a Construction Management doctoral program in your department, who are the top three authors that would be required reading?” The responses to this question provided the data around which this discussion is initiated.

## **Results**

Thirty-four participants responded to the open-ended question, “If you had a Construction Management doctoral program in your department, who are the top three authors that would be required reading?” This question yielded a response rate of 8.46%. Since this is such a low response rate, the results are not presented as generalizable to a larger population, but as an initiator of future discussions.

### *Authors who would be Required Reading in a Construction Management Doctoral Program*

There was not any consensus about which authors should be required reading in a Construction Management doctoral program. Table 1 includes the authors listed by more than one participant and a sample some of the authors’ published books.

Table 1

*Responses to the question: “If you had a Construction Management doctoral program in your department, who are the top three authors that would be required reading?”*

<i>Authors</i>	<i>Authors’ Representative Publications</i>	<i>Number of Respondents</i>
Boyd Paulson (and Donald Barrie)	<i>Professional Construction Management: Including Contracting C M, Design-Construct, and General Contracting;</i>	4
Jim Collins (and Jerry Porras)	<i>Built to Last; Good to Great</i>	4
Greg Howell	<i>Productivity Improvement in Construction</i> and many articles on Lean Construction	3
Edward Fisk	<i>Construction Project Administration</i> (8 editions)	3
Robert Peuifoy	<i>Construction Planning, Equipment, and Methods</i> (7 editions); <i>Formwork for Concrete Structures; Estimating Construction Costs</i>	2
Clifford Schexnayder (and Richard Mayo)	<i>Construction Management Fundamentals</i>	2
Richard Clough	<i>Construction Contracting; Construction Project Management</i>	2
Justin Sweet	<i>Legal Aspects of Architecture, Engineering and the Construction Process</i> (7 editions)	2
<b>Charles Kibert</b>	<i>Sustainable Construction: Green Building Design and Delivery; Reshaping the Built Environment; Construction Ecology: Nature as a Basis for Green Buildings</i>	2

Some of the respondents to the open-ended question, “If you had a Construction Management doctoral program in your department, who are the top three authors that would be required reading?” did not consider the question to be

relevant or appropriate and did not list any authors or content areas. One participant stated, “It would not be program dependent. It would be course dependent and varied.” Another participant stated, “I do not understand what you mean by the question. It would depend on the topic of the dissertation or the courses.” Another responded, “I do not understand the question. The focus of a doctoral program would be in the discipline specific emphasis. Thus, the recommendation should help the candidate focus their research subject area. The subjects could be as wide ranging as statistics and philosophy.”

Another participant represented a group of individuals who did not list any authors but were content specific stating, “I don’t think that authors are as important as content areas. Those areas would be more in the business strategy area, construction law, and financial decision making side.” This response was representative of the vast majority of respondents who chose to list authors whose published work focused on the business of Construction Management or general business.

Only one author listed by more than one participant wrote in a subject area other than the business of Construction Management or general business. Charles Kibert authors books about sustainability in the built environment. Thirty-seven authors were listed by only one of the respondents. Of these 37 authors, at least 23 (62.2%) published in the business of Construction Management or general business content area. Some of the authors listed by one respondent are presented in Table 2. Because most participants listed only the last names of the authors, it was not possible in all cases to find the published works for these authors.

Table 2

*Recommended reading with a business or construction emphasis for a Construction Management doctoral program, only one respondent for each author*

<i>Authors</i>	<i>Authors’ Representative Publications</i>
Tom Peters	<i>Leadership; The Circle of Innovation: you can Shrink Yourself to Greatness; Reimagine!: Business Excellence in a Destructive Age</i>
Joseph M. Juran	<i>Juran’s Quality Handbook; Juran, Quality, and a Century of Improvement; Juran on Quality by Design: The New Steps for Planning Quality into Goods and Services; The Juran Prescription: Clinical Quality Management</i>
Jack Welch	<i>Winning; Jack: Straight from the Gut; The Jack Welch Lexican of Leadership</i>
Larry Bossidy	<i>Execution: The Discipline of Getting Things Done; Confronting Reality: Doing What Matters to get Things Right</i>
Peter Drucker	<i>The Essential Drucker: The Best of Sixty Years of Peter Drucker’s Essential Writings on Management; The Effective Executive: The Definitive Guide to Getting the Right Things Done; managing Oneself; The Daily Drucker; Management; Inovation and Entrepreneurship; Managing for the Future; Managing Challenges for the 21st Century</i>
Steven Covey	<i>Seven Habits of Highly Effective People; Principle-Centered Leadership</i>
William Ury	<i>The Power of a Positive No; Getting to Yes: Negotiating Agreement Without Giving In; Getting Past No: Negotiating in Difficult Situations</i>
Andrew Civitello	<i>Construction Operations Manual of Policies and Procedures; Construction Safety and Loss Control Program Manual; Builder’s and Contractor’s Yearbook; Complete Contracting: A to Z Guide to Controlling Projects</i>
Keith Molenaar	<i>Alternative Project Delivery, Procurement, and Contracting for Highways</i>
Stephen Schuette	<i>Construction Estimating</i>
Raymond Levit	<i>Construction Safety Management</i>
Daniel W. Halpin	<i>Construction Management; Financial and Cost Concept for Construction Management; Planning and Analysis of Construction Operations</i>
Jimmie Hinze	<i>Construction Planning and Scheduling; Construction Safety and Health Management; Construction Contracts</i>
<b>Tom Schleifer</b>	<b>Construction Contractors’ Survival Guide</b>

Other authors listed by participants not writing in the areas of the business of Construction Management or general business were writing about construction materials and methods. Authors include Kibert, Olin (*Olin's Construction: Principles, Materials, and Methods*), and Adam Neville (*Concrete: Neville's Issues and Insights; Properties of Concrete: Neville on Concrete: An Examination of Issues in Practice*).

One participant focused on the research aspect of a doctoral degree when listing Walter Borg and Meredith Gall (*Educational Research: An Introduction; Applying Educational Research*). This opinion was articulated by another respondent stating, "I honestly have no idea. Since learning to research and write is the critical element, I'd have to say the best authors in qualitative and quantitative research whomever they are, and then a pot pourri of leading business thinkers either management and leadership or things such as vision like Collins and Porras etc."

Another participant focused on the importance of cognition and thinking skills, listing John Anderson (*The Architecture of Cognition; Atomic Components of Thought; Cognitive Psychology and its Implications; Cognitive Skills and Their Acquisition; Learning and Memory: An Integrated Approach*). One participant either wanted doctoral students to be well rounded or was expressing frustration with the question when listing Tom Clancy, Leon Uris, and Frank McCourt as authors who should be required reading. Two of these authors write novels and the other writes about his past experiences none of which were involved in construction or doctoral education.

## Discussion

Since the open-ended question was tangential to the primary focus of the survey, the majority of participants (62.4%) did not respond to the question, or responded with "Unknown" or "No favorites". It is assumed that the majority of the participants considered the question to be poorly written and I believe it was not properly introduced. Further research utilizing another survey which would generate more data might provide validity to some of the themes that have emerged from the responses of the 34 respondents.

Construction Management, as an interdisciplinary profession, draws upon the several disciplines for its body of knowledge. Yet in the past 10-20 years there have been many hundreds of books and articles published on the business of Construction Management. Many of these books and articles were written by authors listed by participants as required reading.

It was surprising more participants didn't list authors who focus their writing on research methodology since a Ph.D. is generally considered to be a research degree. Since the author tends to gravitate toward Mixed Methods research methodologies to answer research questions, authors such as John Creswell (*Designing and Conducting Mixed Methods Research; Research Design: Qualitative, Quantitative, and Mixed Methods Approaches; Qualitative Inquiry and Research Design: Choosing Among Five Approaches*) Abbas Tashakori, Charles Teddlie, Jennefer Greene, or Alan Bryman might be recommended. Anyone writing and administering surveys could also read works by Don Dillman (*Mail and Internet Surveys*). Anyone focused on the business of construction research might read *Business Research Methods* (8 editions) by Donald Cooper and Pamela Schindler. Authors such as Creswell also focus on education research which may be helpful to some researchers in construction education. Other researchers may benefit from publications focused on program evaluation by authors such as Peter Rossi, Howard Freeman, and Mark Lipsey (*Evaluation: A Systematic Approach*).

Some participants responded with comments similar to the following: "None of the texts are particularly desirable. The textbook situation could use a little work." This may indicate that as a relatively new discipline with very few doctoral degree programs with the word "construction" in the degree title, the content areas for the Construction Management body of knowledge has not yet been written or fully explored. It may be doctoral candidates whose dissertations open the doors to deeper thinking in Construction Management content areas. These doctoral candidates will be the individuals who write the textbooks which take Construction Management and construction education to a higher academic and practical level.

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