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A Systematic Literature Review on Construction Faculty Research, Teaching, and Service

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Construction educators often come from diverse academic and professional backgrounds, spanning across over multiple disciplines, which is challenging for institutions (Colleges, Schools, and Departments) to develop a systematic metric to evaluate, promote, and tenure (EPT) construction faculty. This study presents a systematic literature review to identify differences in construction faculty research, teaching, and service activities based on department affiliations, i.e., Architecture, Business, Building Science/Construction Management, or Engineering. Using a modified PRISMA methodology, the review draws from publications in the ASC Conference Proceedings, ASC International Journal of Construction Education and Research (IJCER), ASCE Journal of Construction Engineering and Management (JCEM), ASCE Journal of Professional Issues in Engineering Education and Practice (JPIEEP), ASEE Conference Proceedings, and ASEE Journal of Engineering Education (JEE) databases. To strengthen the dataset, additional ASCE journals were incorporated in a second review phase to increase the number of instances. This research is important as Construction Management is just one faculty type that can overlap with social sciences, business, humanities, and engineering. Engineering-based faculty may have a strong research background, while construction-based faculty may not. Therefore, it is impractical to apply the same evaluation criteria. The need to determine applicable metrics to be used is of utmost importance.

Keywords: Faculty, Evaluation, Tenure, Construction

Introduction and Background

Due to the varying nature of Evaluation, Promotion, and Tenure (EPT) for construction faculty, a systematic literature review was performed of the existing literature. The purpose of this research is to identify differences in the Evaluation, Promotion, and Tenure process as it pertains to construction faculty Research, Teaching, and Service. Institutions in higher education have sought to change Carnegie Classifications (2024) by increasing the level of research or adding graduate degree programs. Construction Management programs vary by accreditation and may differ in degree outcomes. Some Construction Management programs have recently moved departments into more technically based groups, which can affect faculty evaluation requirements. This research sought to determine the existing state of Construction Faculty Research, Teaching, and Service as it pertains to Evaluation, Promotion, and Tenure, and what the effects of potential changes are to the faculty themselves.
What is extraordinary and unique about the construction management faculty is the wide variety of backgrounds. There has been an expectation for construction faculty to have an industry-based work history, in addition to advanced degrees (Davis 2008, Hildebrant et al. 2018, McCuen et al. 2019).

Terminal degrees in construction are still limited, so faculty may seek advanced degrees in Architecture (Master's degree plus licensure) or Engineering (Doctorate) (Ciesielski 1997, Davis 2008, Hildebrant et al. 2018). It is partly due to the varied background, which makes the EPT process for construction faculty a necessary and needed research topic.

Degree programs in construction can be housed in various departments or colleges such as Architecture, Business, Engineering, and others. It should also be noted that degree programs can be accredited under different agencies such as the Accreditation Board for Engineering, and Technology (ABET) and the American Council for Construction Education (ACCE). Both ABET and ACCE require their accredited programs to maintain an advisory board consisting of industry professionals as part of the accreditation. ABET (2021) accredits programs in Construction Engineering through the American Society of Civil Engineers (ASCE) and the Engineering Accreditation Commission (EAC). ABET also accredits Construction Engineering Technology through ASCE and the Engineering Technology Accreditation Commission (ETAC), and Construction Management programs through their Applied and Natural Science Accreditation Commission (ANSAC) (ABET 2021). The ACCE accredits programs in Construction Management, Building Science and other similarly named programs (Perry 2011). As the location of construction programs within colleges, and their accreditation varies, it is important to evaluate how these differences affect construction educators and the EPT process.

A comprehensive literature review utilizing the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) was attempted (Page et al. 2021). However, after a review of over ~2,900 papers, there is little research on this topic. Due to the limited number of publications on this topic, a modified approach to the PRISMA method was required. The steps incorporated were 1) Records identified from, 2) Records removed before screening and Records screened, 3) Records not retrieved and Records sought for retrieval, and 4) Records excluded and Records assessed (Page et al. 2021). Using Step 1; Records or Peer-reviewed papers, accessible online, were identified from three major scholarly databases which focus on Construction and Education: the Associated Schools of Construction (ASC), the American Society of Civil Engineers (ASCE), and the American Society for Engineering Education (ASEE) were utilized as a basis for the systematic literature review process.

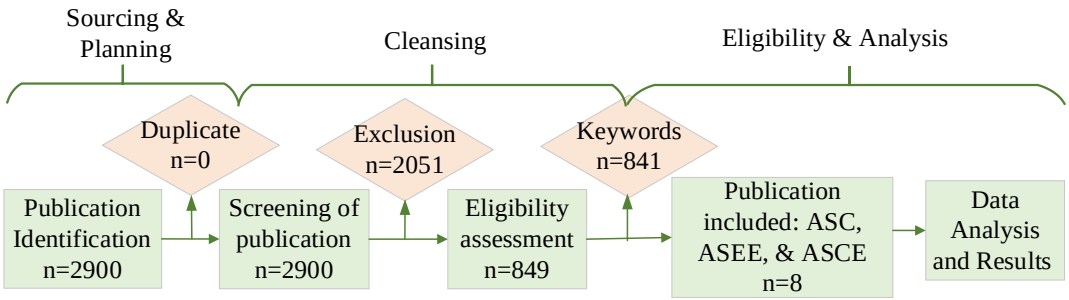

Figure 1. Literature Review Process Framework

The EPT processes of faculty are crucial in academia, ensuring that the institutional standards for teaching, research, and service are met. In construction education, these processes are particularly significant due to the interdisciplinary concept of the field, combining practical industry skills with academic rigor. It is crucial to identify how faculty with different educational backgrounds (architecture, engineering, or construction), and different terminal degrees (Master's plus industry experience, doctorate with industry experience, or doctorate based on research alone) could be

evaluated based on one standard. Figure 1 illustrates the framework used for a modified systematic literature review for construction faculty EPT criteria.

Methodology

A modified systematic review of the literature was conducted, focusing on peer-reviewed papers accessible online, and utilizing multiple search terms and dates to minimize the risk of replication. An index will return records that represent articles, 10 results (records) correspond to 10 peer-reviewed articles. Scopus allows for searches within a list of journals known as a 'journal index' or 'bibliographic database'. A traditional search engine like Google Scholar, will return results for every instance of a search term being identified. For an article to be searchable in an index, the journal or proceedings publisher must provide records and enter a contract with the database. This modified systematic review was completed in five stages.

Table 1. Initial Search Terms and Results: By Journals or Proceedings Names

Title Search Term	ASEE Proceedings	Journal of Eng. Ed.	ASC Proceedings	IJCER	JPIEEP	JCEM
Tenure Promotion Evaluation 2004-2024	1596	155	121	26	62	84
Building Science	7	0	0	21	0	1
Building Technology	4	0	0	26	1	2
Construction Education	22	0	0	26	3	6
Construction Faculty	7	0	0	19	0	2
Construction Management	77	1	3	25	12	43
Construction Engineering	71	1	0	26	12	84
Construction Engineering Technology	7	0	0	26	1	0
Subtotals	1855	184	161	195	213	280

Stage 1 Publication Identification. Using a modified PRISMA method, databases were chosen. In this case the databases were chosen on a basis of their focus on Construction and Education. Included are publications which emphasize keywords (tenure, promotion, and faculty evaluation) published between 2004 and 2024. Only peer-reviewed articles published in English from the ASC Conference Proceedings, ASC International Journal of Construction Education and Research (IJCER), ASCE Journal of Construction Engineering and Management (JCEM), ASCE Journal of Professional Issues in Engineering Education and Practice (JPIEEP), ASEE Conference Proceedings, and ASEE Journal of Engineering Education (JEE) databases were selected, and no restriction was placed on the subject area at this stage. The aim is to identify publications for tenure and promotion for construction faculty members across institutions in the United States. Google Scholar was checked for similar search terms and no additional publications were found for the search terms used. The outcome of the review of the literature was insightful for benchmarking and providing guidance for this study. This search

generated ~2,900 peer-reviewed publication results; the full search information is illustrated in Table 1. The title search terms are listed in the left column of Table 1.

Stage 2 Screening of Publication. Using the modified Prisma and applying Step 2, Records were removed before screening and/or records screened was performed at this stage. To further screen the articles, the use of the search term "or" was added. A further criterion was applied to exclude papers that did not focus on construction to help better align with the research objective. The title, abstract, and keywords were screened using search terms tenure, promotion, and evaluation. This initial set of screening terms was paired with building science OR building technology OR construction education OR construction faculty OR construction management OR construction engineering OR construction engineering technology. For example, the term tenure was paired with building science to identify publications within a journal or proceedings. The screening further reduced the publication to 849; the remaining articles were considered relevant after the exclusion criteria were included for eligibility assessment.

Stage 3 Eligibility Assessment. At this stage, records were either not retrieved or records were sought for retrieval. This stage utilized additional screening terms teaching, research, scholar, and service keywords, which are used as a basis for promotion and tenure requirements. A total of 841 papers were excluded due to the inability to meet the required benchmark employed for this study. The remaining publication 8 was included in the study analysis and guided the concept for the framework development. After identifying just 8 articles that were considered eligible for this study, a second round of systematic review was done only through the IJCER database to help justify the data collection. The review returned 150 journal articles using the study keywords, none of the articles were construction faculty focused. This step further verifies the research data adopted for systematic analysis.

Stage 4 Publications Identified. Lastly in Stage 4, additional records were excluded, and records were fully assessed. Included are a total of 8 publications in the review to develop a systematic literature review for this study. The objective of this is to categorize the publication into specific themes, identifying factors identified as requirements for the EPT process. A content analysis of the selected systematic review publication was used to extract and organize the data from the publications into categories. According to Ayodele et al. (2019), a content analysis establishes an inductive analysis method of organized data by extracting and organizing text data from publications to categorize the data into groups using emerging patterns. The study extracted some keywords in stages two and three from the publication to map with the design of the proposed study framework. The data extracted from the publication are described in Table 2.

Stage 5 Data Analysis and Results. From the eight articles located, the instances of service, teaching, and research/scholarship were identified. Each of the articles was reviewed for the type of research requirements for tenure. For an article mentioning any specific type of research activity a count of (1) was provided. If a non-specific response could be applied to more than one type of activity, the count was applied to all the activities. The rate was determined by the count divided by the total number of papers (8).

Results

The results from previously published articles were tabulated to identify trends based on typical faculty workload, research, teaching, and service. As is noted above, construction management faculty have seen their departments transition by moving into an engineering group or changing Carnegie Classifications. These faculty members may need understanding by the administration or may themselves need to understand how these transitions will affect their EPT processes.

Table 2. Articles Meeting Criteria

Publication	Author	Title	Service	Teaching	Research/ Scholar
IJCER	Burgett, J.M., Smith, J.P., & Lavang, Y.	A Comparison Between Industry's and Academia's Perceptions of a Career in Construction Education	X	X	
IJCER	Badger, W.W. & Smith, J.C.	Ranking Construction Programs: The Academic Debate Begins	X	X	X
ASC Conf.	Sewalk, S. Taylor, J.M., Puddicombe, M., & Chinowsky, P.	A Survey of Construction Management Programs: Publications, Expectations and Compensation			X
ASEE	Tymvios, N., & Hildreth, J.	Perceptions of Requirements for and Impediments to Tenure for Construction Faculty		X	X
ASEE	Tymvios, N., Miskioglu, E., Christou, E., & Wheatley, B. B.	Pre- and Post-Tenure: Perceptions of Requirements and Impediments for Faculty in Civil Engineering, Architectural Engineering, and Construction Disciplines		X	X
ASEE	Estes, A., Nuttall, B., & McDaniel, C.	Researchers And Practitioners: A Dual Track Path To Tenure That Works		X	X
ASEE	Schrader, C. B., Chyung, S. Y., Hughes, W. L., Sasaki, K., Cole, T., & Chiasson, J. N.	How can we Help Faculty Balance Between Teaching and Scholarly Activities?		X	X
ASEE	Rose, A.	Making Service Count: Advice For New Engineering Educators	X		
		Subtotals	3	6	6

In the area of research, existing literature suggests that construction faculty producing a minimum of one to two publications annually (including proceedings), with up to 9 journal articles before tenure (Sewalk et al. 2015), are at an acceptable range of research/scholarly productivity. Other research

shows research requirements including fifteen (15) to twenty (20) research proposals submitted before tenure (Tymvios and Hildreth 2015). As seen in Table 3, the literature review also found these key terms as the most prevailing in existing literature, though with not much emphasis on non-competitive research proposals/grants and conference presentations.

Table 3. Research/Scholarship Activities Identified in Articles

Research Activities	**n**	**n/N (%)**
Peer-Reviewed Journal Full Paper	3	37.5%
Competitive Federal Research Proposals/Grants (Dollars)	3	37.5%
Peer-Reviewed Proceedings Full Paper	3	37.5%
Competitive Non-Federal Research Proposals/Grants (Dollars)	3	37.5%
Non-Competitive Research Proposals/Grants (Dollars)	1	12.5%
Conference Presentations	1	12.5%

In the area of teaching, existing research shows that construction faculty teach an average of 10 student credit hours annually without any correlation to research requirements (Mosier et al. 2023). There have been previous efforts to document the amount of time construction faculty spend teaching, with up to 18 student credit hours annually, and its effect on the tenure process (Tymvios and Hildreth 2015). While a high teaching load is identified as an impediment to effectiveness and tenure, there is no evidence of teaching load as a metric for evaluation (Tymvios and Hildreth 2015). The systematic review identified that teaching EPT considers student feedback the most important factor over the recognition of teaching activities and curriculum/course development.

Table 4. Teaching Activities Identified in Articles

Teaching Activities	**n**	**n/N (%)**
Curriculum and Course Development	1	12.5%
Recognition of Teaching Activities	2	25.0%
Student Feedback	3	37.5%
Other	2	25.0%

Though not always specified as a workload requirement, consideration must also be given to service requirements. Service may be included as a percentage of the workload, with an average expected to be about 20% (Laughton et al. 2021). The following service activities which count towards EPT, include university service, industry or professional service, local or regional community service, department/school/college service, and other accreditation (ABET or ACCE) activities

Table 5. Service Activities Identified in Articles

Service Activities	n	n/N (%)
Department/School/College Service	1	12.5%
University Service	2	25.0%
Industry or Professional Service	2	25.0%
Local or Regional Community Service	2	25.0%
Other (ABET)	2	25.0%

Discussion

The analysis of existing literature regarding construction science and management faculty workload for EPT reveals a clear and significant trend in research, teaching, and service expectations. A trend with major implications in the light of departmental transitions and institutional reclassification.

Research Activities. Literature analysis reveals an expectation of one to two publications per year. Therefore, construction faculty should consider Peer-Reviewed Journal Full Papers, potentially reaching almost 7 journal articles prior to tenure (Masters-Waage et al. 2024). Also, Competitive Federal Research Proposals/Grants, Peer-Reviewed Proceedings Full Papers, and/or Competitive Non-Federal Research Proposals/Grants are essential towards tenure and promotion requirements. These products all received equally high rankings based on the number of papers that identified them as needed research products. The quantity of production of these scholarly activities varies and should only be considered a guideline. Yet data from the synthesis (Table 3) suggest that non-competitive proposal and conference presentations are notably undervalued, comprising just 12.5% of recorded activities. While 37.5% of studies referenced journal or proceedings publications and competitive grants. The variances in results suggest bias towards competitive, peer-reviewed outputs, potentially disadvantaging construction faculty that are more engaged in community-oriented or regional common interdisciplinary activities.

Teaching Activities. On average, construction faculty teach 10 student credit hours annually, though this can rise to 18 hours per year (Johnson et al. 2024, Mosier et al. 2023, Razalli et al. 2021). Higher teaching workload is recognized as a barrier to research productivity. However, it is not routinely factored into the EPT criteria for construction faculties. For construction faculty, the teaching activity that ranked highest for EPT is student feedback, which is frequently presented in the form of teaching evaluations or student surveys. As seen in Table 4, this priority of students' feedback over curriculum development or recognition of teaching innovations may result in faculty focusing on course delivery without institutional support for pedagogical development. Comparable research in other fields links elevated teaching loads with reduced faculty well-being and diminished research output, reinforcing the need for balanced and transparent workload policies.

Service Activities. There was not a standout activity for service by the construction faculty. As some service items were unique, one of them was professional service through accreditation, specifically ABET. While this breath reflects an engaged faculty role, it also introduces ambiguity. Consequently, construction faculty amid institutional transition may struggle to understand how service aligns with EPT standards.

Study Proposition. The findings of this study proposes that there should be a more established disciplinary benchmarks for research and teaching criteria that account for yearly publication while also recognizing non-competitive outputs. There should be equitable workload polices, i.e.

departments should adopt workloads to clearly define research teaching, and service expectations to help reduce ambiguity and overload. Adopt and use a transparent service credit for evaluation of faculty who assist with program accreditations, by developing a framework to measure time and commitment. Also, an approach to support teaching development for curriculum innovation and instruction while prioritizing mentoring faculty transitioning into research roles.

Conclusion

Construction faculty continue to operate under diverse expectations shaped by discipline homes and institutional context. Very little research has been performed about construction faculty EPT. EPT has been studied in areas outside of construction education, like in arts & sciences, business, education, (Sutherland 2017, Griffith and Altinay 2020, Levander 2022). This research provides a benchmark and a guideline both for construction faculty and the institution as to accepted activities for the EPT process. It is especially important to note that construction faculty may teach up to 18 course credit hours annually (Tymvios and Hildreth 2015). This type of loading is not consistent with a high research requirement. Therefore, some consideration must be given to the balance within the evaluation. A tailored transparent approach to evaluation is essential to support faculty success across the diverse spectrum of construction education.

A content analysis was performed on six journals which focus on Construction and Education. Due to the limited number of publications in this area, no statistical analysis could be performed. While limited, this research is important since construction crosses over many disciplines. Construction education programs can be housed in Architecture, Business, Engineering, and more. The diversity in the discipline is part of the reason that Construction does not have obvious and comparable EPT requirements across institutions.

Limitation And Future Work

Despite offering important insight into faculty evaluation within construction education, this study is subject to several limitations that may influence the findings. References used for the qualitative review were restricted to publications known to publish construction education, such as ASC, ASEE, and ASCE. The limited number of articles in the construction specific domain could call into question the additional value of a literature review. The metrics relied primarily on the frequency of reported activities and were limited in access to actual tenure dossiers or institutional promotion guideline requirements. However, determining there is a lack of research in this area is the value of the research. Future work should include adding new research in the area of construction faculty EPT, especially for transition programs. Also, a mixed method approach combining qualitative reviews with robust institutional data to quantify workload distribution, time allocation, service requirement, and promotion timelines.

These limitations underscore the need for broader, deeper, and more empirically grounded studies into construction faculty evaluation across diverse academic environments. Addressing these EPT gaps will not only enhance fairness and transparency but also support the long-term success and retention of faculty in an increasingly interdisciplinary profession.

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