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Developing a Residential Construction Course: Aligning Curriculum with Industry Needs Through Job Posting Analysis

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Developing a new course that aligns with current and future industry demands is a common challenge for construction management programs. A systematic approach to this process is through a needs assessment, which helps evaluate and determine the most appropriate course content. While consulting faculty and administration is important, their insights can sometimes be outdated, particularly when based on individual experiences in the residential sector. One of the effective ways to ensure the course meets industry needs is through an analysis of job postings. This approach provides direct insights into the skills, qualifications, and experience employers seek, offering a comprehensive and up-to-date view of workforce requirements that internal perspectives alone may not capture. This paper presents the development of a residential construction course at the McWhorter School of building Science, Auburn University. The methodology involved a comprehensive review of 70 job postings in the residential sector, analyzing job roles, required experience, qualifications, and responsibilities. The analysis focused on job roles and identifying key competencies sought by employers. The findings identified critical skills such as a deep understanding of residential construction means and methods, onsite construction management, effective use of technology, and preconstruction management. Additionally, the analysis highlighted the need for soft skills like communication and leadership, in interactions with clients, design teams, or the construction teams. This paper presents the details of the job posting analysis and the course development.

Key Words: Course Development, Residential Construction, Job Post Analysis

Introduction

Designing construction courses around industry needs is crucial to ensure students have the skills and knowledge to succeed in the field. By aligning education with industry practices, courses help bridge the skill gap, making graduates more employable. This partnership also advances collaboration between academia and industry, providing opportunities for practical experience through internships, co-op programs, and project-based learning. Additionally, it keeps the curriculum current with the latest advancements in technology, regulations, and construction practices. One of the methods of developing a course according to industry demands is an in-depth analysis of job postings. Analyzing

job postings can present the most in-demand skills, certifications, and qualifications employers require. This paper presents a comprehensive review of 70 job postings to develop a course on residential construction at the McWhorter School of building Science, Auburn University. All the job postings were related to residential construction.

Literature Review

This literature examines various methodologies and approaches for developing construction management curricula or a single course. Below the literature review is divided into the methodologies used for needs assessment.

Survey-Based Approaches to Identifying Essential Skills

To align construction management programs with industry needs, several studies have utilized structured surveys to identify the most important skills expected from graduates. Wang et al., (2025) conducted a study demonstrating the critical role of interdisciplinary learning in architecture, engineering, and construction (AEC) education. Through surveys sent to alumni and industry professionals, the study found that both technical expertise and interdisciplinary skills significantly contribute to career success by fostering teamwork, effective problem-solving, and positive industry contributions. (Wang et al., 2025). Another study by Ahmed, Yaris, Farooqui, and Saqib (2014) used a survey to evaluate 93 skills across seven areas. These findings emphasize that a comprehensive understanding of construction processes, project management, and technical expertise is crucial for graduates. Other studies have focused on specialized areas within construction management. For instance, Tatum and Conradi (2019) conducted a survey with contractors in the U.S. to identify the desired skills for students specializing in electrical systems, while Burgett, Perrenoud, and Smith (2018) developed a curriculum guide for Heating, Ventilating, and Air Conditioning (HVAC) topics (Burgett et al., 2018; Tatum & Conradi, 2019). These focused studies highlight the importance of aligning curricula with specific areas of construction.

Industry Panel and Consensus Building

Stakeholder consultation is another widely used method in curriculum development. A paper presented the curriculum review process initiated to align undergraduate competencies with industry needs and accreditation standards. Using the nominal group technique, the faculty engaged industry representatives to identify key educational priorities, resulting in curriculum restructuring guided by industry insights and American Council for Construction Education standards (Benhart & Shaurette, 2014). Similarly, Tatum (2013) interviewed contractors to develop a curriculum focused on electrical systems, while Lucas (2014) used industry input to design a Building Information Modeling (BIM) curriculum (Tatum & Nelson, 2013; Lucas, 2014). Leathem and Burt (2024) conducted a study on needs assessment to determine the essential activities required of new graduates in the construction management industry within their first three years. Two focus groups were conducted at two different locations, involving a total of 29 participants (Leathem & Burt, 2024). A limitation of this study was the relatively small sample size, which may affect the generalizability of the findings. Additionally, the inclusion of only alumni participants further limits the broader applicability of the results.

Job Post Analysis and Competency Identification

Job post analysis can be considered an effective tool to identify the competencies valued by employers. A study utilized job descriptions to identify the competencies expected from construction graduates (Attallah et.al, 2019). Another study analyzed seven years of job posting data and conducted interviews with engineering employers to clarify how "leadership" is defined for entry-level engineering roles. Results revealed key leadership competencies valued by companies, including initiative, communication, interpersonal skills, teamwork, and engagement, providing insights to help engineering programs align curricula with industry expectations (Hartmann & Jahren, 2015).

Development of Residential Construction Course

The literature review presents various approaches. The authors have selected job post analysis to identify specific skills, competencies, and expertise that employers actively seek in new hires. It also allows educators to identify the technical skills, industry demands, project management expertise, and soft skills most valued by employers in the field.

Methodology

Seventy job postings were extracted from companies that were members of the National Association of Home Builders (NAHB). A database was prepared to include various information from each job post. The information included was the job title, required experience, required education, salary, job description, and job responsibilities. Thematic analysis was conducted on job descriptions and job responsibilities, which is a method of analyzing themes and patterns in the data sets (Tracy, 2019). For detailed data analysis, an iterative approach was used. Tracy (2019), defines the iterative approach as, “a reflexive process in which the researcher visits and revisits the data, connects empirical materials to emerging insights, and progressively refines his/her focus and understandings.” Several codes were generated through this method.

Table 1. Information extracted from each job post

Job Type	Required Experience	Salary
Designers	Fresh / Some experience	NA
Superintendent	1-5 Years	41-60k
Estimating	6-10 Years	61k-80k
Scheduling	11-15 Years	81k - 100k
Field Engineer	16-20 Years	101k-120k
Project Management	21+ Years	121k+
Leadership		
Required Qualifications	**Employment Type**	**Job Description/Job Responsibilities,**
High School Diploma	Full Time	This was very descriptive.
2-Year College Degree	Part Time / Internship	Discussed in detail below.
4-Year College Degree	NA	
NA		

Six different data points were extracted from each of the 70 job posts including job type, required experience, salary, required qualification, employment type, and job description/job responsibilities (Table 1). All information was compiled in one Excel file for further analysis. The job titles were coded into seven different types;(1) Designers, (2) Superintendent, (3) Estimating, (4) Scheduling, (5) Field Engineer, (6) Project Management, and (7) Leadership. The job titles were coded to maintain consistency. For instance, all architects, designers, and draft manager roles were categorized under

"Designers." Similarly, Assistant Superintendent, Senior Superintendent, and Superintendent positions were grouped under the code "Superintendent." Leadership positions, including Division Manager, Director of Sales, Assistant Vice President, Director of Land Development, etc., were classified under "Leadership". Positions titled “Project Engineer, Field Engineer, and Assistant Field Engineer were grouped into “Field Engineer”. This method was consistently applied across all job types for coding. Table 1 specifies the information extracted from each job post and codes used for further analysis.

The coding process began by examining and segmenting text from the job descriptions that highlighted specific job responsibilities. Each text segment was assigned a relevant code that summarized its meaning or significance. This coding phase was crucial as it laid the groundwork for organizing data into coherent patterns. These codes were subsequently refined and grouped, leading to the formation of 11 major themes. The themes encapsulating the primary responsibilities and skills sought in job candidates will be explored and discussed in detail in the following section.

Results

Out of 70 job postings, 3 were for designers, 20 for superintendents, 5 for estimators, one for scheduling, 7 for field engineers, 28 for project managers, and 6 for leadership roles. This distribution highlights a strong demand for project management and superintendent positions, indicating current industry needs.

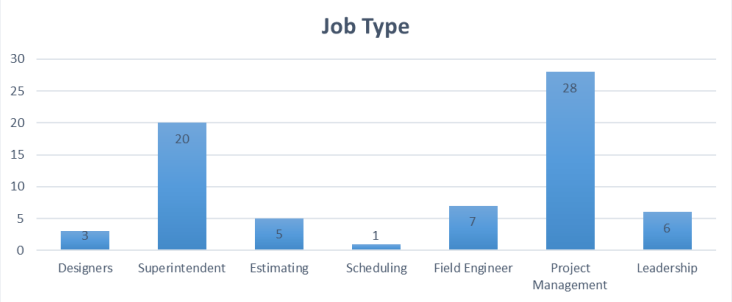

Figure 1. Job Type

Job Type Vs. Required Education

There were three options for the required education: a High School Diploma, a two-year college degree, and a four-year college degree. Out of 70 job postings, 6 required a High School Diploma, 17 required a two-year college degree, and 47 required a four-year college degree (Figure 2).

Job Type vs. Required Experience

Among the 70 job postings, 13 specified no experience requirement, 32 required 1-5 years of experience, 17 required 6-10 years, 5 required 11-15 years, and 3 required 16-20 years. Figure 3 illustrates the distribution of required experience across job types. Most job types required 1-5 years of experience, especially in project management and superintendent roles, with few entry-level or highly experienced positions. All leadership roles demand experience of 6-10 years.

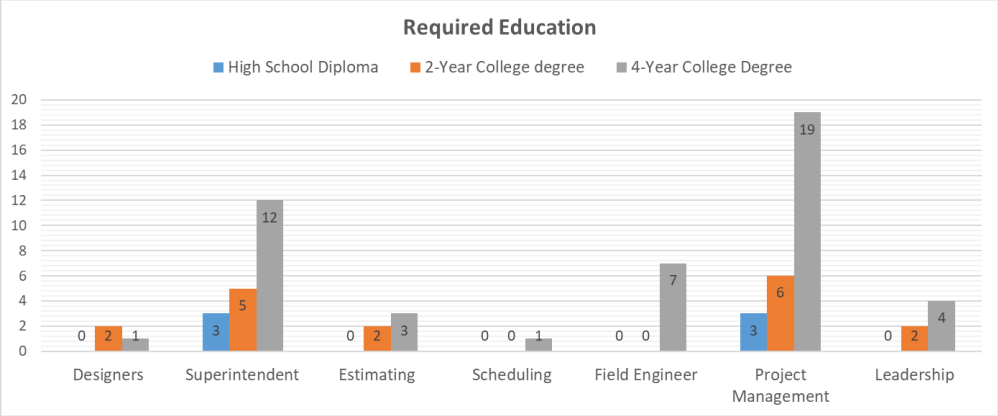

Figure 2. Job Type vs. Required Education

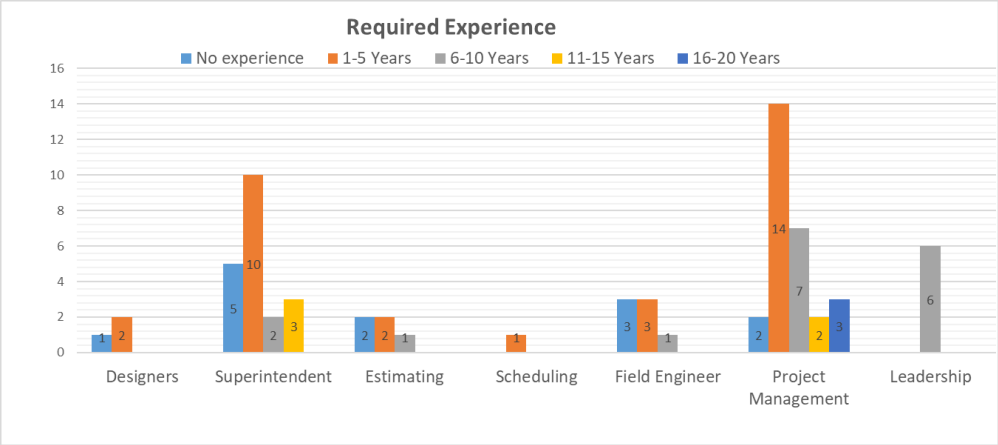

Figure 3. Job Type vs. Required Experience

Job Type vs. Salary

Only nine job postings included salary information. Among these, two designer positions offered a salary range of $41,000–$60,000; one superintendent position offered $81,000–$100,000; one field manager position offered $41,000–$60,000; four project manager positions offered $61,000–$80,000; and one leadership role offered a salary of $121,000 or more. Salary data suggests that compensation varies significantly by job role and responsibility level. Entry-level roles, such as designers and field managers, offer lower salaries, while leadership roles command higher salaries.

Figure 4. Themes Generated Through Job Descriptions

Job Descriptions/ Responsibilities

Based on an analysis of 70 job postings, the job descriptions/ responsibilities were categorized into the following themes shown in Figure 4 and Table 2.

1. Field Operations: Field operations represent the core activities needed to manage and oversee on-site construction tasks, which require an in-depth knowledge of residential construction means and methods. This theme emerged from job descriptions involving various aspects of managing and ensuring smooth site operations. They covered scheduling, safety measures, inspections, site utilization, directing activities, addressing issues, maintaining uniformity in methods, and overseeing staff to complete construction processes efficiently. Regular site walks to monitor progress and maintain construction standards were also frequently mentioned.

2. Project Management and Vendor Coordination: The analysis revealed that project management and coordination skills were highly valued. Tasks included assisting in the review and tracking of Request for Information (RFIs), shop drawings, and submittals, preparing construction schedules, and collaborating with the broader project team and stakeholders to maintain progress and alignment with project plans. It included the ability to effectively coordinate with subcontractors and vendors, managing the selection, supervision, and performance of subcontractors and vendors. It also included coordinating services, negotiating terms, providing assistance, and developing strong partnerships to support efficient construction processes.

3. Information Technology (IT): The use of IT in construction was emphasized in job postings that required proficiency in software tools for project estimation and documentation. Common tasks included utilizing systems like Smart-Bid to prepare subcontractor bid lists, maintaining estimating

databases, and tracking RFIs, submittals, and consultant reviews. Use of Excel was required in almost all job roles.

4. Change and Risk Management: Job postings frequently emphasized the need for professionals skilled in change management and risk control. This theme involved managing and documenting change orders, ensuring they are properly scheduled, recommended, and approved to align with project modifications. They also include handling unfunded change orders, overseeing project plan amendments, and soliciting necessary approvals to maintain project continuity and mitigate risks.

5. Building Codes, Zoning Codes and Inspections: A significant portion of job postings highlighted the importance of ensuring compliance with building regulations. Knowledge of the Uniform Building Code (UBC) and local codes was a common requirement. Knowledge of zoning codes also emerged as a theme to ensure compliance and avoid legal issues or project delays. Other responsibilities included working closely with local building officials to schedule and conduct inspections.

6. Client and Stakeholder Engagement: Building and maintaining strong relationships with clients and stakeholders was a key theme in many job postings. Leadership and project management roles specifically included duties like fostering industry relationships with brokers, developers, and partners to expand sourcing networks. This engagement ensured alignment between project goals and stakeholder expectations.

7. Documentation and Reporting: Accurate documentation and reporting were critical skills reflected in the job analysis. Common responsibilities included managing and reviewing shop drawings to ensure alignment with project specifications and scope. It also included handling related submittals, understanding product details, maintaining accurate documentation, and overseeing RFIs to facilitate clear communication and project compliance. Project engineers were noted for coordinating with government officials to secure approvals and managing essential project documents such as RFIs and inspection records.

8. Leadership and Team Dynamics: Leadership skills were frequently highlighted, particularly for roles like project managers. Job postings described responsibilities such as effectively assigning, supervising, and managing team members to foster productivity and collaboration. It also involved training and engaging team members and supporting them in specialized roles to contribute to the overall success of the construction project.

9. Site and Safety Management: Ensuring site safety was a prevalent theme, with many postings referencing OSHA 30-Hour certifications and first aid/CPR certifications as preferred qualifications. Job descriptions called for professionals capable of implementing and upholding site safety programs, conducting regular inspections, and maintaining compliance with safety standards and regulations.

10. Quality Assurance and Standards: Delivering a high-quality product was emphasized across many job descriptions. This included regularly inspecting sites to confirm adherence to company quality standards and ensuring that all construction was completed according to approved methods before signoffs. These responsibilities were integral to maintaining a reputation for excellence.

11. Others: Most job postings emphasized the necessity for employees to participate in and lead meetings, assist with assigned duties, and facilitate clear communication of plans and specifications. Soft skills emerged as a prominent theme. By leveraging soft skills like effective listening, adaptability, and ethical behavior, contractors can foster positive relationships with clients and stakeholders, ultimately enhancing customer satisfaction and increasing goodwill for the company

Table 2. Identified Themes and Associated Tasks

Themes	Tasks	Frequency
Field Operations	Involves site supervision, knowledge of residential construction means and methods, and construction process in general.	88
Project Management and Vendor Coordination	Management of the project and coordination with external vendors and subcontractors for project execution.	85
Information Technology	Technology includes Microsoft Word, Excel, and other building construction-related software like Procore, Bluebeam, Microsoft Project, Revit etc.	84
Change and Risk Management	Dealing with project changes, risk handling, and managing modifications effectively.	82
Building Codes and Inspections	Includes building inspection and building codes with city inspectors' inspection.	65
Client and Stakeholder Engagement	Focused on client and stakeholder interactions, including communication, design meetings, and construction-related meetings.	55
Documentation and Reporting	Documentation processes and reporting responsibilities, covering records, drawings, and reporting progress.	45
Leadership and Team Dynamics	Tasks related to leadership such as guiding teams, collaborating with stakeholders, assigning roles, supervising activities, organizing training, etc.	30
Site and Safety Management	Tasks related to job site safety management and supervision.	27
Quality Assurance and Standards	Tasks related to quality control and quality assurance.	25
Others	Various tasks that require building relationships and soft skills	65

This thematic analysis of job postings provides a comprehensive understanding of skills required in various job roles in the residential sector. The course content should include these major themes identified from a job posting analysis, ensuring it reflects current industry demand, skills, and responsibilities.

Conclusion

In conclusion, the thematic analysis of 70 job postings in construction management highlights the essential roles and responsibilities valued in the industry, particularly the strong demand for project management and superintendent positions. Key themes such as field operations, project management, vendor coordination, and client engagement emerged as critical areas of focus. To effectively prepare students for careers in this field, the course should incorporate content that addresses these essential skills and responsibilities. This includes modules on effective field operations, project management practices, an understanding of building codes and compliance, and an overview of relevant technology in construction processes. Additionally, the course should focus on the development of soft skills, such as communication and teamwork, which are vital for fostering relationships with clients and stakeholders. Based on the data analysis, the course objectives can be summarized into the following objectives:

- Identify key residential construction means and methods, site operations, and safety practices necessary for effective on-site management.
- Evaluate project management tools, including RFIs, submittals, shop drawings, and scheduling, to ensure efficient project execution.
- Examine coordination strategies for managing subcontractors, vendors, and stakeholders to enhance construction efficiency.
- Understand industry-standard software tools, such as Smart-Bid and Excel, for project documentation.
- Understand and manage change orders, assess risks, and ensure project continuity through effective risk management practices.
- Differentiate between building codes, zoning regulations, and compliance requirements to ensure legal and project standards are met.
- Understand leadership and teamwork principles to manage teams and foster effective communication with clients and stakeholders.

By aligning educational content with industry needs, future professionals will be better equipped to navigate the challenges of construction management and contribute positively to their organizations.

Research Limitation

A limitation of this research is that all job postings were sourced from NAHB member companies, including remodelers, custom home builders, mass production home builders, and a small number of multifamily builders. While this provides valuable insights, it may not fully represent the broader residential construction industry or capture emerging trends in other sectors. Additionally, the reliance on job postings may not account for the evolving nature of the industry or the specific needs of a region or non-NAHB affiliated companies.

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