MEASURING THE EFFECTIVENESS OF COMPETENCY MODELS FOR JOB-SPECIFIC PROFESSIONAL DEVELOPMENT OF ENGINEERS & ENGINEERING TECHNICIANS

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ABSTRACT
Motivation:
As many in the transportation workforce approach retirement and the industry transitions into the 21st century, there are two notable challenges: 1) the incredible wealth of institutional knowledge that will be leaving the workforce, and 2) the continued increase in the application of new technologies, skills, and knowledge of the entering workforce. A resulting impact of these issues is that the gap between old and new employee competencies and skills is widening.

Methods:
All job specifications and postings for all civil engineering levels at New England DOTs were analyzed for competencies based on two accepted competency models in the field. Interviewers were conducted to gain the DOT HR perspective.

Results:
There exist notable gaps in competencies and licensure requirements between DOT civil engineer position levels. This research provides a foundation from which to develop competencies for civil engineering positions that is reflective of a more dynamic and sustainable transportation workforce that will excel throughout the 21st century.

DATA & ANALYSIS
Competency Models Chosen for Analysis

Bureau of Labor Statistics (BLS) Model
• Claims all civil engineers should have core competencies, regardless of level
• Seventeen core competencies

American Association of Engineering Societies (AAES)
• 2016 American Society of Association Executives Power of A Gold Award
• Tier ranking system for competencies depending on level of position

RESULTS
• Job specifications are often include more competencies than postings
• Certain BLS core competencies are more often stated in job postings
• Significant difference in EIT and PE licensure requirements between New England DOTs

Comparison of Job Certification Requirements

CONCLUSIONS
• Competency models provide a structure to measure performance and offer a more efficient hiring process
• Several gaps (intentional or otherwise) in competencies exist, even in the highest level civil engineering position at a single DOT
• Each CE-specific competency models for state DOT CE positions should be formed around each DOT’s strategic goals and objectives
  • Recommended that agencies develop the necessary developmental programs and guidelines to verify that their civil engineering employees are able to acquire the competencies needed for the next job level before obtaining the title
• The interview process revealed many DOTs are struggling with similar issues, such as competing with the private sector
  • A competency model platform would be helpful according to DOT personnel, as they change their old specifications or update their posting process in the future