Engineering Studies Don’t Deliver Enough of the Right Skills?

The Importance of Skills and Competencies in Working Life and Their Development Through Studies Across Different Fields from Perspective of Recent Finnish Graduates

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Background

Engineering work requires both disciplinary and transversal competencies. Previous research indicates persistent gaps, especially in transversal skills.

This study examines the gap between how important skills are perceived to be for working life and how well they are developed during studies from the perspective of recent graduates, with a focus on field-specific patterns.

Research questions

1. How does the perceived importance of skills and competencies in working life vary across fields of study?

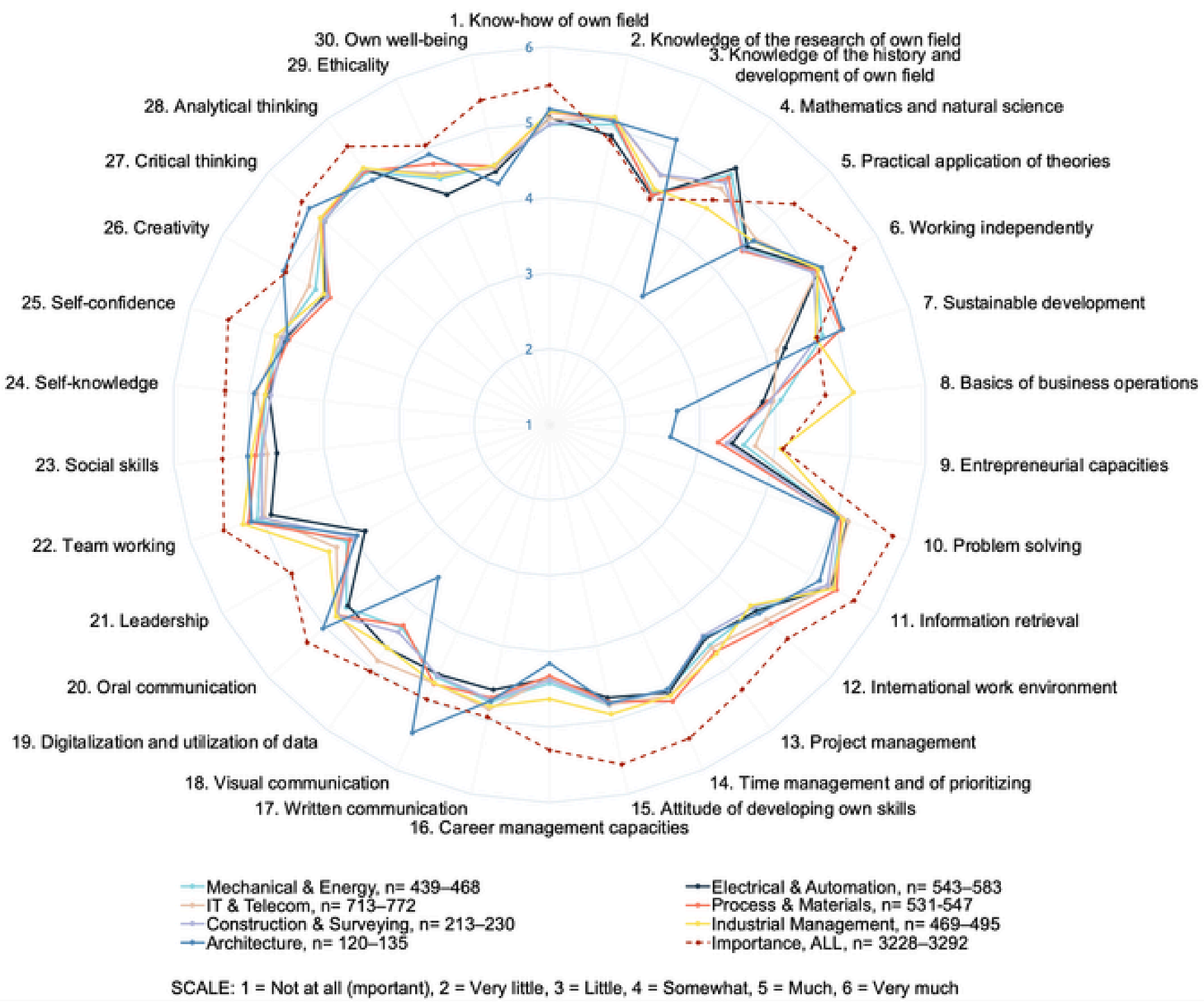
2. What kinds of field-specific patterns can be identified in the alignment or mismatch between the importance of skills and their development during studies?

Data & methods

- **3 342** recent graduates from **8** Finnish universities (response rate 69%). Survey conducted Dec 2024–Jan 2026
- 30 skills and competence areas rated on a 1–7 Likert scale (1 = Not at all, 6 = Very much, 7 = Cannot say)
- Skills gap = Importance - Development (–5 to 5). Negative = skills gap & Positive = skills surplus
- Analysis: descriptive statistics and non-parametric tests, 95% significance level

About the study
Cross-sectional survey (TEK Graduate Survey 2025) of recent master’s graduates in engineering and architecture in Finland, conducted in collaboration between TEK and eight Finnish universities awarding master’s degrees in engineering and architecture.

Perceived development of skills during studies across fields of study



Key findings

1 Universally valued skills across all fields

Problem solving (highest overall), information retrieval, working independently, attitude to develop skills, self-confidence and analytical thinking are among the most important skills across fields.

2 A broad skills gap exists across all fields

Generic / transversal skills show the largest gaps, particularly in career management and leadership.

Field-specific knowledge and mathematics and natural science skills develop better relative to importance.

3 Well-being: a major cross-field gap

Taking care of one’s own wellbeing shows a negative gap across all fields and is consistently among the largest gaps.

4 Field-specific patterns in importance and development

Although generic gaps appear across all fields, skill development follows the pedagogical and professional emphases of each field.

Industrial Management: the highest development in business competencies and entrepreneurial capacities.

Architecture: the most distinctive overall competence profile compared with the other fields.

Implications for engineering education

→ Embed transversal skills systematically across curricula, not only as add-ons.

→ Strengthen the link between theory and practical application in all fields.

→ Prioritize wellbeing and support students’ transition to working life.

→ Develop career management and teamwork more systematically.

Conclusion

Graduates consider a wide range of skills important for their careers, yet the development of these skills during studies is consistently lower than their perceived importance.

Generic work-life competences show systematic skills gaps across fields, while discipline-specific profiles shape how skills develop.

Both findings point to a need for stronger and more systematic development of skills in higher engineering education.

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