TEK Graduate Survey 2016

• Academic Engineers and Architects in Finland TEK and Finnish universities of technology together conduct a yearly feedback survey for graduated academic engineers and architects.

• The feedback and results are utilized in developing university education and influencing the educational policy making.

• TEK is responsible for accomplishing the survey and the universities are responsible of reaching their new graduates.

• The survey is directed by a Directory Board having a representative from every participating university.

• More information, results and resources: www.tek.fi/vastavalmistuneet

• Contact:
  • Arttu Piri, Analyst, TEK: arttu.piri@tek.fi

SURVEY THEMES
1. Basics
2. Studies
3. Skills and expertise: Importance and development
4. Support and guidance
5. Master’s Thesis
6. Working along the studies
7. Employment
8. Satisfaction with the studies
TEK Graduate Survey 2016

Participating universities and schools

<table>
<thead>
<tr>
<th>UNIVERSITIES AND SCHOOLS</th>
<th>IN RESULTS AND GRAPHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Aalto University</td>
<td>Aalto ALL</td>
</tr>
<tr>
<td>School of Chemical Engineering</td>
<td>Aalto CHEM</td>
</tr>
<tr>
<td>School of Electrical Engineering</td>
<td>Aalto ELEC</td>
</tr>
<tr>
<td>School of Engineering</td>
<td>Aalto ENG</td>
</tr>
<tr>
<td>School of Science</td>
<td>Aalto SCI</td>
</tr>
<tr>
<td>School of Arts, Design and Architecture</td>
<td></td>
</tr>
<tr>
<td>2. Tampere University of Technology</td>
<td>TUT</td>
</tr>
<tr>
<td>3. Lappeenranta University of Technology</td>
<td>LUT</td>
</tr>
<tr>
<td>4. Oulu University</td>
<td>OU</td>
</tr>
<tr>
<td>5. Turku University</td>
<td>TU</td>
</tr>
<tr>
<td>6. Vaasa University</td>
<td>VU</td>
</tr>
<tr>
<td>7. Åbo Akademi University</td>
<td>ÅAU</td>
</tr>
</tbody>
</table>
# Responses and graduates in 2016

<table>
<thead>
<tr>
<th></th>
<th>ALL</th>
<th>Aalto CHEM</th>
<th>Aalto ELEC</th>
<th>Aalto ENG</th>
<th>Aalto SCI</th>
<th>Aalto ALL</th>
<th>TUT</th>
<th>LUT</th>
<th>UO</th>
<th>UT</th>
<th>UV</th>
<th>ÅAU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Responses 2016</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2120</td>
<td>112</td>
<td>294</td>
<td>342</td>
<td>257</td>
<td>1007</td>
<td>638</td>
<td>233</td>
<td>161</td>
<td>24</td>
<td>26</td>
<td>33</td>
</tr>
<tr>
<td><strong>Graduates 2016</strong></td>
<td>3115</td>
<td>179</td>
<td>384</td>
<td>420</td>
<td>323</td>
<td>1364</td>
<td>835</td>
<td>410</td>
<td>360</td>
<td>72</td>
<td>52</td>
<td>48</td>
</tr>
<tr>
<td><strong>Response rate 2016</strong></td>
<td>68 %</td>
<td>63 %</td>
<td>77 %</td>
<td>81 %</td>
<td>80 %</td>
<td>74 %</td>
<td>76 %</td>
<td>57 %</td>
<td>45 %</td>
<td>33 %</td>
<td>50 %</td>
<td>69 %</td>
</tr>
</tbody>
</table>
M.Sc. (Tech) education in Finland 2016

Aalto ALL, 44%
TUT, 27%
LUT, 13%
UO, 12%
UV, 2%
ÅAU, 2%
# OVERVIEW OF GRADUATES 2016

## By field of education

<table>
<thead>
<tr>
<th>ABBR.</th>
<th>MECH</th>
<th>ELECT</th>
<th>ICT</th>
<th>PRCS</th>
<th>CONST</th>
<th>IND. MAN</th>
<th>ARCH</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responses:</td>
<td>248</td>
<td>418</td>
<td>264</td>
<td>321</td>
<td>133</td>
<td>218</td>
<td>26</td>
<td>1628</td>
</tr>
<tr>
<td>- Share of total:</td>
<td>15%</td>
<td>26%</td>
<td>16%</td>
<td>20%</td>
<td>8%</td>
<td>13%</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Internationals:</td>
<td>8%</td>
<td>13%</td>
<td>28%</td>
<td>14%</td>
<td>2%</td>
<td>11%</td>
<td>8%</td>
<td>14%</td>
</tr>
<tr>
<td>Females:</td>
<td>9%</td>
<td>16%</td>
<td>15%</td>
<td>46%</td>
<td>18%</td>
<td>34%</td>
<td>54%</td>
<td>24%</td>
</tr>
<tr>
<td>Age, mean:</td>
<td>27.0</td>
<td>26.9</td>
<td>27.2</td>
<td>26.7</td>
<td>27.3</td>
<td>26.5</td>
<td>27.4</td>
<td>26.9</td>
</tr>
<tr>
<td>Duration of studies, mean:</td>
<td>7.0</td>
<td>7.2</td>
<td>7.7</td>
<td>6.7</td>
<td>7.0</td>
<td>6.6</td>
<td>7.3</td>
<td>7.0</td>
</tr>
<tr>
<td>No absent semesters:</td>
<td>72%</td>
<td>73%</td>
<td>70%</td>
<td>80%</td>
<td>68%</td>
<td>73%</td>
<td>80%</td>
<td>73%</td>
</tr>
<tr>
<td>No delays in studies:</td>
<td>29%</td>
<td>33%</td>
<td>27%</td>
<td>34%</td>
<td>24%</td>
<td>32%</td>
<td>23%</td>
<td>31%</td>
</tr>
<tr>
<td>No exchange studies:</td>
<td>89%</td>
<td>91%</td>
<td>90%</td>
<td>93%</td>
<td>87%</td>
<td>81%</td>
<td>73%</td>
<td>89%</td>
</tr>
<tr>
<td>Employed at the time of graduation:</td>
<td>67%</td>
<td>69%</td>
<td>75%</td>
<td>56%</td>
<td>88%</td>
<td>74%</td>
<td>79%</td>
<td>70%</td>
</tr>
<tr>
<td>- Work corresponding well with the level of education</td>
<td>75%</td>
<td>82%</td>
<td>80%</td>
<td>79%</td>
<td>77%</td>
<td>79%</td>
<td>71%</td>
<td>79%</td>
</tr>
<tr>
<td>Would reselect their current line of studies:</td>
<td>68%</td>
<td>68%</td>
<td>77%</td>
<td>62%</td>
<td>66%</td>
<td>78%</td>
<td>71%</td>
<td>69%</td>
</tr>
</tbody>
</table>
OUTLINE OF THE PRESENTATION

RESULTS 2016
• 1. EXPERTISE & SKILLS
  – What are the expertise & skill profiles of new graduates?
• 2. EMPLOYABILITY
  – Who are those whose career gets kick-started after graduation (or earlier)?
• 3. GENERAL SATISFACTION
  – Who are the most satisfied with their fresh M.Sc (Tech) education in Finland?
  – Would they do it again?

REFLECTION
• 1. EXPERTISE & SKILLS
  – Is this what we are aiming to?
  – Is this what is needed by society?
• 2. EMPLOYABILITY
  – What can we do to foster employability of our new graduates?
• 3. GENERAL SATISFACTION
  – Is this the best we can do?
• CONCLUSIONS
  – Are we doing the right thing with M.Sc. (Tech) education in Finland?
1. EXPERTICE AND SKILLS

SURVEY OUTPUT

• 26 areas of skills and expertise measured from 3 viewpoints:
  – Perception of IMPORTANCE in forthcoming working life
  – Perception of the amount of DEVELOPMENT IN STUDIES
  – Perception of the amount of DEVELOPMENT IN WORK done along the studies

• Scale for IMPORTANCE & DEVELOPMENT
  – 1 = not at all -> 6 = very much, (7=cannot answer)

ANALYSIS

- Group means for each area of skill / expertise
  - By university / school
  - By field of education
- Dimension reduction by factor analysis
  - 6 FACTORS of expertise
  - Factor PROFILES
1. EXPERTICE AND SKILLS

1. Know-how of own field
2. Knowledge of the research of own field
3. Mathematical and natural science
4. Practical application of theories
5. Sustainable development
6. Basics of business operations
7. Entrepreneurial capacities
8. Problem solving
9. Information retrieval
10. Foreign languages
11. Skills related to international work environment
12. Management skills
13. Time management and prioritizing
14. Attitude towards developing own skills
15. Career management capacities
16. Written communication
17. Oral communication
18. Leadership
19. Team working
20. Social skills
21. Self-knowledge
22. Self-confidence
23. Critical thinking
24. Analytical thinking
25. Ethicality

ALL, n = 1884

1 = Not at all (important)
2 = Very little
3 = Little
4 = Somewhat
5 = Much
6 = Very much
7 = Cannot answer

©TEK Graduate Survey 2016
# 1. EXPERTICE AND SKILLS: FACTORS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills related to international work environment</td>
<td>Skills related to international work environment</td>
<td>Social skills</td>
<td>Basics of business operations</td>
<td>Know-how of own field</td>
<td>Problem solving</td>
<td>Critical thinking</td>
</tr>
<tr>
<td>Foreign languages</td>
<td>Foreign languages</td>
<td>Team working</td>
<td>Entrepreneurial capacities</td>
<td>Mathematical and natural science</td>
<td>Time management and prioritizing</td>
<td>Analytical thinking</td>
</tr>
<tr>
<td>Oral communication</td>
<td>Oral communication</td>
<td>Sustainable development</td>
<td>Knowledge of the research of own field</td>
<td>Attitude towards developing own skills</td>
<td>Creativity</td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td>Leadership</td>
<td></td>
<td></td>
<td>Information retrieval</td>
<td>Self-confidence</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Project management</td>
<td>Self-knowledge</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Practical application of theories</td>
<td>Ethicality</td>
<td></td>
</tr>
</tbody>
</table>

**Not included in the factors:**

- Written communication
- Career management capacities
1. EXPERTICE AND SKILLS: FACTORS

Factors of expertise (mean), ALL

<table>
<thead>
<tr>
<th>Factors of Expertise</th>
<th>Importance</th>
<th>Development in Studies</th>
<th>Development in Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business &amp; Management</td>
<td>4,58</td>
<td>3,79</td>
<td>3,76</td>
</tr>
<tr>
<td>Expertise &amp; Substance</td>
<td>4,85</td>
<td>4,98</td>
<td>4,16</td>
</tr>
<tr>
<td>Internationality</td>
<td>5,15</td>
<td>4,38</td>
<td>4,11</td>
</tr>
<tr>
<td>Social Skills</td>
<td>5,34</td>
<td>4,39</td>
<td>4,49</td>
</tr>
<tr>
<td>Working Life Skills</td>
<td>5,53</td>
<td>4,71</td>
<td>4,86</td>
</tr>
<tr>
<td>Analytical Skills</td>
<td>5,18</td>
<td>4,53</td>
<td>4,51</td>
</tr>
</tbody>
</table>
1. EXPERTICE AND SKILLS: IMPORTANCE

IMPORTANCE: MEANS

- Business & Management
- Expertise & Substance
- Internationality
- Human Interaction
- Analyticality

IMPORTANCE: PROFILES

- Mechanical & Energy Engineering
- Electrical & Automation Engineering
- Information & Telecommunications Technology
- Process & Materials Engineering
- Building Construction & Surveying Technology
- Industrial Management
- Architecture
- Total

PROFILES:
Mean(FACTOR)/Sum of means(FACTORS)
2. EXPERTICE AND SKILLS FROM STUDIES

DEVELOPMENT IN STUDIES

Business & Management

Expertise & Substance

Internationality

Human Interaction

Analyticality

DEVELOPMENT IN STUDIES

PROFILES:
Mean(FACTOR)/Sum of means(FACTORS)
1. EXPERTICE AND SKILLS FROM WORK

DEVELOPMENT IN WORK

- Business & Management 1
- Expertise & Substance
- Internationality
- Human Interaction

PROFILES:
Mean(FACTOR)/Sum of means(FACTORS)

DEVELOPMENT IN WORK

- Mechanical & Energy Engineering
- Electrical & Automation Engineering
- Information & Telecommunications Technology
- Process & Materials Engineering
- Building Construction & Surveying Technology
- Industrial Management
- Architecture
- Total
2. EMPLOYMENT

69% of respondents had a work contract or knew where they would work after graduation.
2. EMPLOYMENT

Do you have a previous relation with your employer?

<table>
<thead>
<tr>
<th>1. MECH</th>
<th>2. ELECT</th>
<th>3. ICT</th>
<th>4. PRCS</th>
<th>5. CONS T</th>
<th>6.ID. MAN</th>
<th>7. ARCH</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, based on work experience (excl. Master's thesis)</td>
<td>21%</td>
<td>19%</td>
<td>32%</td>
<td>15%</td>
<td>29%</td>
<td>32%</td>
<td>77%</td>
</tr>
<tr>
<td>Yes, based on Master's thesis</td>
<td>56%</td>
<td>59%</td>
<td>38%</td>
<td>65%</td>
<td>50%</td>
<td>39%</td>
<td>18%</td>
</tr>
</tbody>
</table>

How did you get your current job?

<table>
<thead>
<tr>
<th>1. MECH</th>
<th>2. ELECT</th>
<th>3. ICT</th>
<th>4. PRCS</th>
<th>5. CONS T</th>
<th>6.ID. MAN</th>
<th>7. ARCH</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>By personal contacts &amp; networks</td>
<td>38%</td>
<td>37%</td>
<td>23%</td>
<td>39%</td>
<td>35%</td>
<td>38%</td>
<td>12%</td>
</tr>
<tr>
<td>Open application &amp; contacting</td>
<td>19%</td>
<td>16%</td>
<td>16%</td>
<td>17%</td>
<td>28%</td>
<td>15%</td>
<td>59%</td>
</tr>
<tr>
<td>By public work announcement</td>
<td>25%</td>
<td>27%</td>
<td>37%</td>
<td>27%</td>
<td>22%</td>
<td>35%</td>
<td>24%</td>
</tr>
</tbody>
</table>

76% of employed graduates had a previous contact with their employer. Masters thesis leads to employment especially in Process & Materials, Mechanical, and Electrical engineering, but not in Architecture.
2. EMPLOYMENT

How well does the content of your job correspond with your field of studies?

<table>
<thead>
<tr>
<th></th>
<th>1. MECH</th>
<th>2. ELECT</th>
<th>3. ICT</th>
<th>4. PRCS</th>
<th>5. CONST</th>
<th>6. ID. MAN</th>
<th>7. ARCH</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very well</td>
<td>41%</td>
<td>43%</td>
<td>52%</td>
<td>47%</td>
<td>53%</td>
<td>49%</td>
<td>53%</td>
<td>47%</td>
</tr>
<tr>
<td>Well</td>
<td>33%</td>
<td>36%</td>
<td>36%</td>
<td>29%</td>
<td>34%</td>
<td>33%</td>
<td>29%</td>
<td>34%</td>
</tr>
<tr>
<td>Moderately</td>
<td>23%</td>
<td>14%</td>
<td>9%</td>
<td>16%</td>
<td>12%</td>
<td>14%</td>
<td>18%</td>
<td>15%</td>
</tr>
</tbody>
</table>

How well does the level of demand in your job correspond with your educational level?

<table>
<thead>
<tr>
<th></th>
<th>1. MECH</th>
<th>2. ELECT</th>
<th>3. ICT</th>
<th>4. PRCS</th>
<th>5. CONST</th>
<th>6. ID. MAN</th>
<th>7. ARCH</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very well</td>
<td>36%</td>
<td>39%</td>
<td>41%</td>
<td>47%</td>
<td>34%</td>
<td>51%</td>
<td>29%</td>
<td>41%</td>
</tr>
<tr>
<td>Well</td>
<td>39%</td>
<td>43%</td>
<td>39%</td>
<td>32%</td>
<td>43%</td>
<td>29%</td>
<td>41%</td>
<td>38%</td>
</tr>
<tr>
<td>Moderately</td>
<td>19%</td>
<td>13%</td>
<td>16%</td>
<td>15%</td>
<td>18%</td>
<td>15%</td>
<td>18%</td>
<td>15%</td>
</tr>
</tbody>
</table>
3. SATISFACTION

If you could choose again, which basic degree or other education would you choose now?

- **Other education**: 5% MECH, 4% ELECT, 2% ICT, 6% PRCSS, 5% CONST, 2% IND, 8% MAN, 4% ARCH, 4% ALL
- **University education, not Tech**: 4% MECH, 9% ELECT, 6% ICT, 8% PRCSS, 15% CONST, 14% IND, 21% MAN, 9% ARCH, 9% ALL
- **Other degree programme/major in Tech**: 23% MECH, 20% ELECT, 15% ICT, 25% PRCSS, 15% CONST, 6% IND, 0% MAN, 18% ARCH, 18% ALL
- **Current degree programme/major**: 68% MECH, 68% ELECT, 77% ICT, 62% PRCSS, 66% CONST, 78% IND, 71% MAN, 69% ARCH, 69% ALL

31% of all graduates would change their line of studies. Still, 87% would stay at the field of Tech.

Most satisfied: Industrial management


University education other than Technology appeals graduates from Architecture, Construction and Industrial Management.
The skills I acquired in my education met my expectations.

My education met my expectations.

The teaching was to a large extent of good quality.

I am satisfied with the used teaching methods.

Contents of the studies were up-to-date.

Research results from the field were applied to teaching.

I am satisfied with the education that I have received.

91% of the graduates are in general very satisfied with their education.

Most critics are pointed towards teaching methods and contents of the studies.