STEM and their Relevance for VET in Germany

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Key characteristics of the German Dual System of VET

- Work-based learning in companies and learning at vocational school
- Cooperation between government, private sector and social partners
- Institutionalised research and advisory
- Acceptance of national training and quality standards

- Qualified VET staff (technical and pedagogical skills)
Profile of qualifications in STEM occupations

- **Academics**: 16% (1,222,000)
- **Non-academics (master craftsmen, technician etc.)**: 23% (1,705,000)
- **Skilled workers**: 61% (4,564,000)

Source:
Employees in STEM occupations in Germany

- 356,000 Maths and Science
- 690,000 IT and Computer
- 6,445,000 Engineering

Career opportunities

Salary of vocational further training graduates in comparison to bachelor graduates (techn./sci.)
Percentage of companies (in per cent) (only companies with 50 or more employees)

# Image and reality of STEM occupations

<table>
<thead>
<tr>
<th>Students’ perceptions</th>
<th>Apprentices’ experiences</th>
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<tbody>
<tr>
<td>little contact with people</td>
<td>Little contact with people</td>
</tr>
<tr>
<td>61 %</td>
<td>17 %</td>
</tr>
<tr>
<td>dangerous</td>
<td>dangerous</td>
</tr>
<tr>
<td>50 %</td>
<td>21 %</td>
</tr>
<tr>
<td>cold</td>
<td>cold</td>
</tr>
<tr>
<td>32 %</td>
<td>8 %</td>
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Internships: crucial for taking up a STEM career

Gender segregation in VET in Germany

Note: The 238 points mark the position of the different VET occupations. Occupations with the code numbers 100-499 belong to the commercial-technical sector; those with the code numbers 500-999 are service sector occupations.

Female occupations = occupations with 80% or more female trainees; Male occupations = occupations with 20% or less female trainees

Source: German Federal Statistical Office (2013), BIBB calculations
TOP 10 popular training occupations - female

- Office Manager
- Medical assistant
- Sales assistant for retail services
- Management assistant for retail services
- Qualified dental employee
- Industrial clerk
- Hairdresser
- Specialist in the hotel business
- Salesperson specialising in foodstuffs
- Wholesale and foreign trade clerk

TOP 10 popular training occupations - male

Motor vehicle mechatronics technician
Electronics technician
Management assistant for retail services
Industrial mechanic
Plant mechanic for sanitary, heating and...
Information technology specialist
Sales assistant for retail services
Warehouse logistics operator
Wholesale and foreign trade clerk
Office Manager

Skill shortage in STEM occupations?

- **252,000 labour market entrances** (158,000 apprentices and 94,000 graduates)
- **Labour market 7.5 million**
  STEM employees subject to mandatory social insurance contributions
- **92,000 retirements (net)**

Source: Bundesagentur für Arbeit: Der Arbeitsmarkt in Deutschland – MINT-Berufe. Nürnberg 2016, p. 16
Development of qualifications in MINT-professions

Digitization: Hightech in the world of work

- Diagnostic programs in garages / car repairing
- Roof inspection with drones
- Dental laboratory technology with 3D scanning and printing
- Precision farming with telematics and GPS
Many thanks for your attention!

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Get more information: www.bibb.de/en
Further information on VET 4.0: