MILLA*

A NEW CULTURE IN SKILL DEVELOPMENT

Task Force Future of Work in the CDU/CSU parliamentary group

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Berlin, February 2019
Collection of materials

*Modular Interactive Lifelong Learning for All
The **horror stories** about overall job loss are **not very likely**, but …

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**Digitization leads to job loss**

According to an estimate from the **Center for European Economic Research (ZEW)**, the digital transformation could lead to the **loss of 42% of jobs** by 2033 in Germany.

**Digitization creates more jobs**

The widely known study entitled "The Skilling Challenge" reaches the conclusion that automation **creates more jobs** than it eliminates – thus, **155 million new jobs** will be created up to 2030.

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**SOURCE:** Application of the Frey/Osborne Study (2013) to Germany, ZEW (2015); The Skilling Challenge, Ashoka and McKinsey (2018)
... what is certain: in the future, **jobs will fundamentally change**

<table>
<thead>
<tr>
<th>Total working time by activity type in Germany, 2016 to 2030</th>
<th>Fewer hours</th>
<th>More hours</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application of expertise</td>
<td>569</td>
<td>2,293</td>
<td>+1,724</td>
</tr>
<tr>
<td>Interaction with stakeholders</td>
<td>756</td>
<td>1,658</td>
<td>+902</td>
</tr>
<tr>
<td>People development and leadership</td>
<td>152</td>
<td>977</td>
<td>+825</td>
</tr>
<tr>
<td>Unforeseeable physical activities</td>
<td>1,054</td>
<td>1,198</td>
<td>+144</td>
</tr>
<tr>
<td>Data processing</td>
<td>2,678</td>
<td>1,411</td>
<td>-1,267</td>
</tr>
<tr>
<td>Data compilation</td>
<td>3,413</td>
<td>1,906</td>
<td>-1,507</td>
</tr>
<tr>
<td>Foreseeable physical activities</td>
<td>3,097</td>
<td>1,521</td>
<td>-1,576</td>
</tr>
</tbody>
</table>

-755 (around -1%)\(^1\)

**Two-thirds of employees** must **align** their competencies on an **ongoing basis** to remain viable in the future labor market.

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1 Assumption: 37 million people working an average of 35 hours per week for 52 weeks per year

Technological advances have always led to **shifts on the labor market**

**Share of overall employment by sector in the US**
Percent, 1850 to 2015


**Traditional sectors** such as agriculture continue to **shrink**, while **knowledge and service sectors show strong growth**
During industrialization, wages developed positively only after maximum radical reforms.

Actual wages in Europe and Asia develop depending on reform scope.

But in the 19th century, people had **more time** than they do today

<table>
<thead>
<tr>
<th>Technology</th>
<th>Time to 25% of US population use</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>46 years</td>
<td></td>
</tr>
<tr>
<td>Telephone</td>
<td>35 years</td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td>7 years</td>
<td></td>
</tr>
<tr>
<td>Smartphones</td>
<td>5 years</td>
<td></td>
</tr>
</tbody>
</table>

- **Technology cycles** are getting **increasingly shorter**
- **We do not even know** many of the **technologies** that will emerge in the coming years

This greater speed increasingly forces a change in activities

19th and 20th century

Traditional education and professional pathway

Schooling  Vocational training  Profession

21st century

Future education and professional pathway (lifelong learning)

Schooling  Vocational training  Changing profession  skill development

Already today, only half of those between 18 and 24 years of age work in the profession they learned\(^1\)

Source: Future of Work team, ver.di Position Paper on skill development (09 Aug 2018); Schmiederer, BIBB/BAuA Youth Employment Survey 2011/2012 (2014), 1: Based on dual training graduates
**Danger of mismatch** – simultaneous unemployment and shortage of skilled employees!

In 12 years, the required capabilities on the labor market will have already **changed fundamentally**

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>2016 working hours</th>
<th>Forecast change in working hours up to 2030</th>
<th>2030 working hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Billions</td>
<td>Percent</td>
<td>Billions</td>
</tr>
<tr>
<td>Physical and manual</td>
<td>113</td>
<td>-16</td>
<td>95</td>
</tr>
<tr>
<td>capabilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic cognitive</td>
<td>62</td>
<td>-17</td>
<td>51</td>
</tr>
<tr>
<td>capabilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher cognitive</td>
<td>78</td>
<td>7</td>
<td>83</td>
</tr>
<tr>
<td>capabilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social and emotional</td>
<td>67</td>
<td>22</td>
<td>82</td>
</tr>
<tr>
<td>capabilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technological capabilities</td>
<td>42</td>
<td>52</td>
<td>84</td>
</tr>
<tr>
<td>Total</td>
<td>632</td>
<td></td>
<td>375</td>
</tr>
</tbody>
</table>

The mismatch has already begun
Vacant specialized IT and management positions reported in Germany

Remarks

• Since 2009, the number of vacant IT positions in Germany has increased by around 175%

• This trend illustrates the need to train specialized IT employees

• 75% of software developer positions are in non-software companies

• Internationally, a large share of IT developers – 48% in 2015 – had no formal IT qualification; they gained their IT skills online based on learning by doing

Source: The labor market for specialized IT employees, Bitkom (2017); Stack Overflow Developer Survey (2015)
Mismatch – 100,000 people affected cost the government EUR 6 billion

Estimates of unemployment and shortage of skilled employees with associated annual costs

<table>
<thead>
<tr>
<th>Shortage of skilled employees</th>
<th>Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each 100,000 skilled employees missing translates into lower government revenues</td>
<td>Government costs per 100,000 unemployed</td>
</tr>
<tr>
<td>Economic loss (including lost revenues)</td>
<td>EUR 2.9 billion per year</td>
</tr>
<tr>
<td>EUR 3.1 billion per year</td>
<td>EUR 6.8 billion per year</td>
</tr>
</tbody>
</table>

Additional unemployment of 10% (realistic scenario) would cost the government EUR 265.5 billion per year.

The negative economic impact would be even higher at EUR 431.1 billion per year.

1 Tertiary impact (such as health costs) not considered
2 In some historical shifts, often even higher

Source: Future of Work team, calculated based on IW (2018) and IAB (2017)
The **quantitative skill gap** – a large share of the population does not develop themselves further or does too little

Survey of 46,362 people between the ages of 30 and 60 on skill development over the past year

**Source:** skill development participation in Germany, IAB (2017)
The qualitative skill gap – employees do not learn the appropriate competencies

Current skill development focus

<table>
<thead>
<tr>
<th>Focus actually required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Digital competencies</td>
</tr>
<tr>
<td>2  Social competencies</td>
</tr>
<tr>
<td>3  Self-/health management</td>
</tr>
</tbody>
</table>

Source: Future of Work team
Additionally – digital competencies (e.g., programming) can currently be learned **online with 90 percent only in English**

*Leading providers of online courses* such as Coursera, EdX, and Udacity **only offer these in English**

The **organizational skill gap** – the status quo overburdens individuals

Deficits of the German further education system

<table>
<thead>
<tr>
<th>Current situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unclear, confusing</td>
</tr>
<tr>
<td>Not central</td>
</tr>
<tr>
<td>Not tailored</td>
</tr>
<tr>
<td>Lack of impact measurement</td>
</tr>
<tr>
<td>Analog</td>
</tr>
<tr>
<td>Regionally weakly networked</td>
</tr>
<tr>
<td>Legal hurdles</td>
</tr>
</tbody>
</table>

Source: Future of Work team
Skilling can become the most important location factor for Germany

Most important location criterion
Sufficiently qualified employees

2
Materials and resource costs

3
Labor costs

4
Financial system and economic situation

5
Qualification and availability of scientists

Source: Deloitte – Global Manufacturing Competitiveness Index (2010)
Germany needs a *shift in skill development*

Source: Future of Work team
Interim insights – Germany must become active to close the skill gaps and prevent costs in the billions

1. It is likely that digitization will **eliminate no/only a limited number of jobs overall**

2. However: Activities and, with this, **required capabilities will change radically**

3. **Mismatch danger**: simultaneous unemployment and shortage of skilled employees!

4. The **gaps in skill development will cost Germany billions**

Source: Future of Work team
MILLA forms a new foundation for **future skills** and for **capturing competencies**

1. New **online offering**
2. Coordination and recommendation of **offline offerings**
3. Documentation of **competencies**
4. New **professional network** for **everyone**

**MILLA**
*Modular Interactive Lifelong Learning for All*

Source: Future of Work team
MILLA offers tailored online courses, personal recommendations, and much more

**Everything at a glance**: online and nearby courses, news on potential employers, and an overview of learning progress

**Support** is provided via 4 channels
1. FAQs (catalog)
2. Chatbots
3. Phone
4. Advising offerings

Under "News" find out, for example,
- What capabilities are needed on the market
- How to improve your chances of being hired

Source: Future of Work team
Competence points for completed courses are rewarded with premiums and certificates for the labor market.

Participants can receive premiums for their skill development activities up to an annual limit.

A certificate can be downloaded and submitted to a potential/current employer.

Completed courses can be revisited.

Source: Future of Work team, Shutterstock.com, Alexey Boldin/Shutterstock.com
Competence points are the currency of skill development - They can be used on the professional development and professions markets

**Classic providers**
Award points for **offline** skill development (e.g., acquiring social competencies)

**Online providers**
Award points for **digital** formats, e.g., learning (programming) languages

**Companies**
Award points for **internal** skill development

**Individuals**
Can also take tests for competencies **beyond the professional realm** to earn points (e.g., sports clubs)

**Competency points** are earned offline or online and serves participants as **digital currency** on the **skill development market** (e.g., for premiums and certificates). Existing providers can also award points for former offerings. The players on the professional development and professions markets are free to also recognize the points

Source: Future of Work team
Online offerings look like this today

Source: Netflix (2018), Shutterstock.com
Individual settings right after loading the page the second time – skilltainment instead of "continuing organized learning after completing initial training".

1 Definition of skill development according to Federation/Federal State Commission, Booklet 83 (2000)
Source: Netflix (2018), Future of Work team
Offering **quality** is subject to **ongoing government review**

**Traditional skill development offerings**
Classic providers for general and profession-related formats along with those from schools and universities

**Digital offerings (skilltainment)**
Innovative online content from learning institutions, individuals (YouTube example), or game producers

**Company offerings**
Requirements-based content, particularly from companies affected by the shortage of skilled employees

**Offerings from nonprofit institutions**
Content that can be learned in, e.g., associations, chambers, unions, or foundations

**Fundamental quality control**
- Curatorship of certified providers reviews (online and offline) course offerings
- Curatorship + AI assesses provider suggestion for scope of competence points and relevance

**Real-time quality monitoring:**
Number of competence points achieved, ongoing relevance factor updating, customer reviews

Source: Future of Work team
Content is imparted using a microlearning approach and continuously improved using a "closed loop"

Continuous review of learning impact

Individualized

MILLA

Assessable

Enhanced fit precision for optimized course content

Modular

Optimization of the appropriate 3-minute modules

Source: Future of Work team
Providers are compensated in line with actual **use, relevance, and assessment**

Relevant capabilities are continuously measured based on employer demand

Providers can view the relevant capabilities listed and produce courses

Government curatorship reviews and certifies courses

Course is approved and listed in the platform

Course is completed and competence points awarded

Provider receives payment in line with use, relevance, and assessment

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**Example I: Introduction to Python (programming language)**

- Competence points earned: 10
- (basic compensation: e.g., EUR 0.20/point)
- Relevance factor 0.9
- 4 stars
- EUR 7.20

**Example II: Stay fit with Thermomix**

- Competence points earned: 7
- (basic compensation: e.g., EUR 0.20/point)
- Relevance factor 0.3
- 5 stars
- EUR 2.10
MILLA creates a skill development culture
The platform adds value for every resident, employer, and provider

**Government**
Provides the platform and advises populace

**Course providers**
Offer courses and compete with other providers

**Individuals**
Use the platform for free, interests-led skill development offerings, receive the associated certificates and premiums

**Employers**
Can more easily identify qualified employees based on competence points (also based on courses in scarce qualifications)

Source: Future of Work team
The skill development platform is a platform for the middle and not for remedial support ("WeGebAU"\textsuperscript{1})

\begin{itemize}
  \item Around 69 million individuals are no longer in initial education, yet learning new capabilities is becoming increasingly important in professional life.
  \item The skill development platform offers all these people the opportunity to gain easy access to skill development free of charge.
\end{itemize}

**Explanation**

| Individuals | 82.7 million |
| Initial education | 14.1 million |
| Employable population and retirees | 68.6 million |
| Employable | 45.9 million |

**Age (years)**

- 0
- 25
- 45
- 65
- 100

The platform targets all individuals – particularly those after initial education.

MILLA targets the center of society and dismantles inequalities to enable participation and equal opportunity independent of an individual’s situation.

\textsuperscript{1} "Program for further developing employees with low qualifications and older employees in the organization" of the Federal Ministry of Labor and Social Affairs

Source: Destatis – Statistical Yearbook (2017)
Target group: Smith and Miller examples

Ms. Smith
43 years old, employed as an administrator in a bank. Her job is strongly affected by digitization.

She is aware that she will be regularly confronted with new work approaches and digital tools (e.g., electronic files and online applications).

Ms. Smith has many new colleagues, who frequently talk about digital topics and also approach work differently than she does. Her department head has also suggested that she look into skill development in "agile working methods".

Beyond this, Ms. Smith is a member of the Chinese exchange association. She has not yet ventured into learning the language, but has heard frequently that the language would likely also help her professionally.

Mr. Miller
51 years old, employed as a furniture carpenter at a local production facility. At his workplace, digital forms of working are increasingly supplementing the methods and techniques he learned earlier.

Plans are delivered exclusively in digital form and parts are machined to the millimeter. A few weeks ago, the managing director announced the purchase of a 3-D printer to be able to produce small parts with more precision and in consistent quality.

Mr. Miller now plans skill development in computer-aided design. He finds the new tools very helpful, but also sees the danger that he could lose his job if he cannot keep up with the new requirements profile.

Source: Future of Work team
A technical base enables many individual networks – open or as closed intranet solutions

Each subplatform builds on a central technical base; content and networking within the platforms are, however, different by interest area and community; they can also be set up as closed intranet solutions (e.g., within companies)

Source: Future of Work team
## Further MILLA functions

### Schools
- Can check for **gaps in their curricula and close them on an ongoing basis**
- Can promote pupils in **relevant capabilities in line with their affinities** early on
- Can additionally provide pupils with the opportunity for **focused preparation** for later studies

### Higher education
- Can provide students with short-term, verifiable, and economical **access to government-evaluated learning modules**
- Can thus **free up additional capacity** for own **research**
- Can enable **digital access to content in different subjects**

### Immigration authorities
- Can **already help potential immigrants in understanding, verifying, and developing suitable specialized knowledge in their home countries**
- Can provide on-site support in **learning the language**
- Can place and verify **further capabilities in line with requirements on site**

### Companies
- Can place employees via MILLA "**job rotations**"
  - When shifting tasks or functions
  - In own or another company
- Can establish **new cooperation efforts** between individual companies or entire sectors

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Source: Future of Work team
For the first time, **MILLA enables** the coordinated **compilation** of beyond-the-job competencies.

<table>
<thead>
<tr>
<th>People build competencies in many areas</th>
<th>Registration of competencies, status quo</th>
<th>Competency registration on MILLA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profession</td>
<td>Only sometimes verifiable</td>
<td>Competencies can be captured and certified much more easily using <strong>microlearning approaches</strong> and <strong>individual tests</strong></td>
</tr>
<tr>
<td>Volunteer work</td>
<td>Difficult</td>
<td></td>
</tr>
<tr>
<td>Family and household</td>
<td>Difficult</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Difficult</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>People build competencies in many areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profession: E.g., based on new responsibilities at job</td>
</tr>
<tr>
<td>Volunteer work: E.g., soccer trainer, choir director, etc.</td>
</tr>
<tr>
<td>Family and household: E.g., raising children, providing nursing care, etc.</td>
</tr>
<tr>
<td>Other: E.g., stays abroad, hobbies, etc.</td>
</tr>
</tbody>
</table>
The urgently required skill development transformation can only be realized digitally.

<table>
<thead>
<tr>
<th>Tailored</th>
<th>Flexible</th>
<th>Modular</th>
<th>Assessable</th>
<th>Economical</th>
<th>Tamper-proof</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Offering aligned to <strong>personal interests based on artificial intelligence</strong></td>
<td>• Courses can be taken <strong>any time and anywhere</strong></td>
<td>• Courses can be offered in <strong>granular modules</strong> (microlearning)</td>
<td>• Users can recognize good courses based on an <strong>assessment system</strong></td>
<td>• <strong>Network effects</strong> lead to low costs, even if an increasing number of individuals participate</td>
<td>• Highest data security and tamper-proof: decentralized organization of <strong>competence points</strong> based on blockchain technology</td>
</tr>
<tr>
<td>• Recognition of <strong>individual strengths and weaknesses</strong> along with the appropriate support</td>
<td>• Skilltainment and <strong>mobile optimization</strong> ensure learning is fun; individuals can briefly develop themselves on the way to work</td>
<td>• Small certifications can be <strong>combined into larger ones</strong> (similar to ECTS at universities)</td>
<td>• Provider compensation is dependent on user reviews and actual learning impact</td>
<td>• Providers save on acquisition; companies save on recruiting costs</td>
<td></td>
</tr>
</tbody>
</table>
Digital activities require digital solutions built on a digital institution

Showcase example: Obama's White House Tech startup – US Digital Service

Given platform success, current **existing skill development obligations** can be **expanded** to further groups

<table>
<thead>
<tr>
<th>Specialist lawyers</th>
<th>Physicians and psychotherapists</th>
<th>Real estate brokers and residential real estate managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>must either publish in scientific journals every year or participate in specialized skill development in a scope of at least 15 hours</td>
<td>must – regardless of whether they have a private practice or are employed – earn at least 250 &quot;skill development points&quot;</td>
<td>have been obligated since 2018 to further develop themselves by taking 20 hours over the period of 3 years</td>
</tr>
<tr>
<td>If they do not fulfill this obligation, they risk <strong>losing their license to practice law</strong></td>
<td>If they cannot prove they have earned these points, they risk <strong>losing their medical license</strong></td>
<td>If they cannot prove they have earned these points, they risk <strong>losing their medical license</strong></td>
</tr>
</tbody>
</table>

If successful: expanding existing skill development obligations **possible**

<table>
<thead>
<tr>
<th>Commerce</th>
<th>Healthcare</th>
<th>Public sector</th>
<th>Teachers</th>
<th>Operators</th>
<th>Unemployed</th>
</tr>
</thead>
</table>

Source: Future of Work team
Depending on its success – MILLA costs from EUR 1 to 3 billion p.a.

Cost calculation, EUR billions\(^1\)

<table>
<thead>
<tr>
<th></th>
<th>Indirect spend</th>
<th>Direct spend</th>
<th>Minimal scenario</th>
<th>Expected scenario</th>
<th>Maximal scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>7.3</td>
<td>8.1</td>
<td>7.7</td>
<td>5.6</td>
<td>15.4</td>
</tr>
<tr>
<td>Public</td>
<td>7.7</td>
<td>8.1</td>
<td>13.3</td>
<td>5.6</td>
<td>15.4</td>
</tr>
</tbody>
</table>

**skill development costs to date**

**Additional costs for MILLA**

**EUR 28.7 billion, 2014**

**EUR 1 to 3 billion\(^1\) additionally per year**

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\(^1\) Calculations include costs of government institutions, platform, premium payments for participants, and compensation for providers

Source: Future of Work team; Education Finance Report (2014)
Others intend to invest more money into the **existing system** – we are creating a **new offering**

**Opportunity account**
- All employees should receive a personal opportunity account with a **starting balance from government** amounting to EUR 5,000
- This is to enable taking **time off** from work for **skill development and qualification**
- Financing a **startup** should also be enabled by this
- Focus: those with limited qualifications

**Education savings**
- Tax benefits for individuals who **save their private money for their (further) development** – similar to the concept of home savings and mortgage
- The program may not exceed the existing scope specified by the BfA, meaning it cannot **generate additional costs**
- Motto: The majority of Germans are **not needy**

**Employment insurance**
- Preventive skill development as **second core action area of job centers and employment agencies**
- Skill development of **master craftsman loans** into a **law for lifelong learning** (in the form of subsidies and loans)
- Support for **starting up a business** with loans of up to EUR 25,000

**No agenda**
- ...
- ...
- ...

Source: ZEIT ONLINE (2017)
The qualification initiative does not go far enough – it is insufficient as a national skill development strategy

Qualification initiative

- **Skill development support for everyone employed** (regardless of qualification and age) with up to **100%** support for costs and work compensation
- **Increased** unemployment benefits after skill development – from one month to at least **three months**
- **No statements** on advising for skill development or training for the unemployed

The paper published by the Federal Ministry of Labor and Social Affairs "Qualification Initiative. Knowledge and Security for the Transformation" – which obviously had access to the coalition agreement – places a strong emphasis on training activities for the unemployed. Here, the suggestions to promote skill development for the unemployed are not bad, but they are insufficient when it comes to a national skill development strategy.

The idea of a free, government-based skill development platform meets predominantly with positive resonance.

How would you assess the introduction of a free, government-based skill development offering with a digital platform?

Percent\textsuperscript{1}

<table>
<thead>
<tr>
<th>Positive</th>
<th>Undecided</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>49.0</td>
<td>34.5</td>
<td>16.5</td>
</tr>
</tbody>
</table>

Other insights

- Supporters of all parties in the German Bundestag approve of such a platform, only AfD supporters remain predominantly undecided.
- In particular, those from 18 to 29 years old assess such a platform positively.
- Those from Eastern Germany are more skeptical of the platform compared with Western Germans.

\textsuperscript{1} Random sample margin of error: 3%

Source: Civey (2018)
Germany needs a **central skill development platform**

1. The **existing skill development system** in Germany **cannot close the skill gaps**

2. MILLA promotes a **skill development culture**

3. A **central digital skill development platform** initiated by the government would create an efficient infrastructure and a **currency for the skill development market** based on competence points

4. Those offering courses are incentivized based on **impact-based compensation**; individuals, by a **premium model** for participation

Source: Future of Work team
List of (image) sources

- Education Finance Report (2014)
- Bitkom, the Labor market for IT specialists (2017)
- Federal Ministry of Labor and Social Affairs (2018)
- Civey (2018)
- Destatis – Statistical Yearbook (2017)
- Iconfinder – www.iconfinder.com
- IAB, skill development Participation in Germany (2017)
- IW (2018)
- Pew Research Center The ever-accelerating rate of technology adoption (2017)
- RC Allen, Wages, Prices, and Living Standards in China, Japan, and Europe 1738-1924 (2005)
- Schmiederer, BIBB/BAuA Youth Employment Survey 2011/2012 (2014)
- Stack Overflow Developer Survey (2015)