Federal Ministry
of Education
and Research

Education and Research in Figures 2016

Selected Information from the BMBF's Data Portal
www.datenportal.bmbf.de

Contents

Foreword

Education, research and innovation represent key areas of action for Germany's future. They are the foundation for both an individual's societal participation and economic success. This is why the Federal Government is focusing on sustainable action: During the current legislative period, it is making an additional nine billion euros available for priority measures in education and research. Over the last ten years, the Federal Government has increased its expenditure on research and development by 75% to 15.8 billion euros. Expenditure on education more than doubled during the same period. These investments are paying off: Germany has a just and efficient education system, an attractive scientific landscape and is one of Europe's innovation leaders.

We want to continue on this successful course and are therefore constantly accepting new challenges. The topic of digitalization is at the top of our agenda. Education, research and science are undergoing fundamental changes under the current process of digital transformation. At the same time, they are the key drivers of further digital developments. The current refugee crisis also calls for new and intensified commitment. The Federal Ministry of Education and Research is assisting the integration of refugees through large packages of measures – ranging from the provision of German-language courses to vocational training and higher education opportunities.

Information and data are being constantly collated and analysed in order to consistently pursue ambitious aims in education and research; namely to ensure greater equity in education, achieve scientific excellence and safeguard growth, prosperity and employment. This brochure presents a summary of the essential basic data. Apart from providing diverse information on different fields of education and research, it also contains details of Federal and *Länder* expenditure.

These facts and data underscore the major importance of education and research in our society and provide an incentive to continue along these lines in the future.

Prof. Dr. Johanna Wanka
Federal Ministry of Education and Research

0 General overviews and structural data

To allow a better understanding of the detailed tables and graphs included in the chapters "Research and Innovation" and "Education", three general tables are provided at the beginning of the brochure. This structural data includes general information on population development for all of Germany and for each of the 16 *Länder*. The budget for education, research and science provides a general overview about national expenditure in these areas.

Fig. 1 Structural data of Germany (2010-2014)

		2010	2011	2012	2013	2014
Population[1]	in 1,000	81,752	80,328	80,524	80,767	81,198
	f	*50.9%*	*51.2%*	*51.1%*	*51.0%*	*50.9%*
Employed persons[2]	in 1,000	38,938	38,916	39,206	39,618	39,942
	f	*45.9%*	*46.3%*	*46.3%*	*46.5%*	*46.6%*
Unemployed persons	in 1,000	3,239	2,976	2,897	2,950	2,898
	r	*7.7%*	*7.1%*	*6.8%*	*6.9%*	*6.7%*
of which						
without completed vocational training	in 1,000	1,340	1,282	1,215	1,284	1,303
	r[1,4]	*20.7%*	*19.8%*	*19.7%*	*20.0%*	*19.9%*
with in-company/ school training[3]	in 1,000	1,575	1,389	1,307	1,359	1,327
	r[1,4]	*5.8%*	*5.1%*	*5.0%*	*5.1%*	*4.9%*
with university of applied sciences degree	in 1,000	74	68	66	72	75
	r[1,4]	*2.7%*	*2.6%*	*2.6%*	*2.6%*	*2.7%*
with university degree	in 1,000	104	101	104	119	127
	r[1,4]	*2.3%*	*2.3%*	*2.5%*	*2.4%*	*2.5%*
Pupils[5]	in 1,000	11,485	11,291	11,114	10,951	10,873
	f	*48.2%*	*48.1%*	*48.0%*	*48.0%*	*47.9%*
Apprentices	in 1,000	1,508	1,461	1,430	1,392	1,359
	f	*39.8%*	*39.3%*	*39.0%*	*38.6%*	*38.3%*
Students at higher education	in 1,000	2,218	2,381	2,499	2,617	2,699
	f	*47.8%*	*47.3%*	*47.4%*	*47.6%*	*47.8%*
Gross domestic product (in billions of euros)		2,576	2,699	2,750	2,809	2,904

Explanation of abbreviations/symbols: in 1,000 = in thousands; f = share of females; r = unemployment rate.
1) As from 2011, findings are based on 2011 Census.
2) As from 2011, calculated with data of the population census (*Bevölkerungsfortschreibung*) that is based on 2011 Census, comparability with the previous years is limited.
3) In-company training and training at full-time vocational schools (*Berufsfachschulen*) plus continuing education at trade, technical and master schools (*Fach-, Techniker- und Meisterschulen*).
4) According to calculations of the Institute for Employment Research. The figures differ from the unemployment statistics of the Federal Employment Agency because different basic values have been used.
5) Pupils at general and vocational schools.
Source: Federal Statistical Office (Fachserie 1 Reihe 4.1.1; Fachserie 11 Reihen 1, 2, 3, 4.1; GENESIS-Online Datenbank, Fortschreibung des Bevölkerungsstandes); Federal Statistical Office and the statistical offices of the Länder (Regional Accounts provided at www.vgrdl.de), Federal Employment Agency (special evaluation and calculations of the Institute for Employment Research)

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-1
Additional data: www.datenportal.bmbf.de/en/0.1

Fig. 2 Structural data of the *Länder* (2014) – [1/2]

		BW	BY	BE	BB	HB	HH	HE	MV
Population	in 1,000	10,717	12,692	3,470	2,458	662	1,763	6,094	1,599
	f	*50.7%*	*50.8%*	*51.1%*	*50.8%*	*51.0%*	*51.4%*	*50.9%*	*50.7%*
Employed persons	in 1,000	5,577	6,677	1,644	1,196	307	907	2,990	738
	f	*46.4%*	*46.4%*	*48.2%*	*47.7%*	*47.6%*	*47.7%*	*46.4%*	*47.8%*
Unemployed persons	in 1,000	230	265	203	125	37	74	184	93
	r	*4.0%*	*3.8%*	*11.1%*	*9.4%*	*10.9%*	*7.6%*	*5.7%*	*11.2%*
of which									
without completed vocational training	in 1,000	108	109	100	33	22	38	97	23
	f	*49.4%*	*47.9%*	*43.7%*	*44.3%*	*45.9%*	*44.5%*	*48.7%*	*42.7%*
with in-company/ school training[1]	in 1,000	98	128	73	81	11	25	69	63
	f	*45.9%*	*45.1%*	*41.8%*	*44.9%*	*43.2%*	*44.0%*	*44.2%*	*44.1%*
with university of applied sciences degree	in 1,000	7	8	8	4	1	3	5	2
	f	*41.8%*	*42.2%*	*47.4%*	*47.2%*	*44.9%*	*48.6%*	*40.1%*	*46.4%*
with university degree	in 1,000	12	15	18	3	2	6	9	2
	f	*49.8%*	*51.1%*	*52.3%*	*49.1%*	*49.5%*	*53.1%*	*48.3%*	*49.5%*
Pupils[2]	in 1,000	1,547	1,657	421	271	91	241	816	173
	f	*47.7%*	*47.6%*	*49.1%*	*48.5%*	*47.7%*	*48.3%*	*47.7%*	*48.8%*
Apprentices	in 1,000	192	242	40	26	15	32	98	19
	f	*38.9%*	*39.1%*	*44.4%*	*34.7%*	*42.8%*	*42.9%*	*38.3%*	*37.4%*
Students at higher education	in 1,000	357	368	171	50	36	96	238	39
	f	*46.7%*	*48.5%*	*49.5%*	*51.5%*	*47.2%*	*48.8%*	*47.1%*	*48.9%*
Gross domestic product (in billions of euros)		438	522	117	62	30	103	250	38

Explanation of abbreviations/symbols: in 1,000 = in thousands; f = share of females; r = unemployment rate; for abbreviations of the *Länder* see glossary.
1) In-company training and training at full-time vocational schools (*Berufsfachschulen*) plus continuing education at trade, technical and master schools (*Fach-, Techniker- und Meisterschulen*).
2) Pupils at general and vocational schools.
Source: Federal Statistical Office (Fachserie 1 Reihe 4.1.1; Fachserie 11 Reihen 1, 2, 3, 4.1; GENESIS-Online Datenbank, Fortschreibung des Bevölkerungsstandes); Federal Statistical Office and the statistical offices of the Länder (Regional Accounts provided at www.vgrdl.de); Federal Employment Agency (special evaluation)

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-2
Additional data: www.datenportal.bmbf.de/en/0.2

Fig. 2 Structural data of the *Länder* (2014) – [2/2]

		NI	NW	RP	SL	SN	ST	SH	TH
Population	in 1,000	7,827	17,638	4,012	989	4,055	2,236	2,831	2,157
	f	*50.9%*	*51.2%*	*50.9%*	*51.2%*	*51.0%*	*51.0%*	*51.2%*	*50.7%*
Employed persons	in 1,000	3,794	8,285	1,986	457	1,931	1,042	1,355	1,056
	f	*46.3%*	*46.1%*	*46.2%*	*45.7%*	*47.0%*	*47.1%*	*47.0%*	*47.0%*
Unemployed persons	in 1,000	268	763	116	37	187	126	101	90
	r	*6.5%*	*8.2%*	*5.4%*	*7.2%*	*8.8%*	*10.7%*	*6.8%*	*7.8%*
of which									
without completed vocational training	in 1,000	130	426	57	20	43	33	47	19
	f	*47.4%*	*47.4%*	*48.5%*	*48.1%*	*42.6%*	*44.2%*	*45.1%*	*44.4%*
with in-company/ school training[1]	in 1,000	115	278	50	15	127	83	46	64
	f	*45.4%*	*43.7%*	*44.0%*	*43.8%*	*46.4%*	*46.8%*	*44.9%*	*46.9%*
with university of applied sciences degree	in 1,000	6	14	2	1	6	3	2	3
	f	*42.7%*	*42.8%*	*40.9%*	*37.6%*	*48.1%*	*49.4%*	*41.1%*	*46.1%*
with university degree	in 1,000	10	25	4	1	8	3	3	3
	f	*50.8%*	*48.5%*	*51.0%*	*48.9%*	*49.6%*	*48.3%*	*50.7%*	*49.9%*
Pupils[2]	in 1,000	1,129	2,548	542	125	446	233	397	236
	f	*47.9%*	*47.8%*	*47.7%*	*47.4%*	*49.1%*	*48.5%*	*47.9%*	*48.8%*
Apprentices	in 1,000	146	310	69	18	47	28	49	26
	f	*37.7%*	*37.9%*	*36.9%*	*37.2%*	*36.0%*	*34.8%*	*39.1%*	*34.3%*
Students at higher education	in 1,000	191	726	123	30	113	55	56	51
	f	*47.9%*	*47.2%*	*50.5%*	*48.9%*	*45.0%*	*49.2%*	*48.0%*	*48.6%*
Gross domestic product (in billions of euros)		254	625	128	34	109	56	84	54

Explanation of abbreviations/symbols: in 1,000 = in thousands; f = share of females; r = unemployment rate; for abbreviations of the *Länder* see glossary.
1) In-company training and training at full-time vocational schools (*Berufsfachschulen*) plus continuing education at trade, technical and master schools (*Fach-, Techniker- und Meisterschulen*).
2) Pupils at general and vocational schools.
Source: Federal Statistical Office (Fachserie 1 Reihe 4.1.1; Fachserie 11 Reihen 1, 2, 3, 4.1; GENESIS-Online Datenbank, Fortschreibung des Bevölkerungsstandes); Federal Statistical Office and the statistical offices of the Länder (Regional Accounts provided at www.vgrdl.de); Federal Employment Agency (special evaluation)

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-2
Additional data: www.datenportal.bmbf.de/en/0.2

Fig. 3 Budget for education, research and science[1], by expenditure areas, in billions of euros and by share of GDP (2005-2014)

Expenditure area			2005	2010	2012	2013	2014
A+B	Education[2]	billions of euros	143.3	175.6	181.4	186.5	190.7
		share of GDP	*6.2%*	*6.8%*	*6.6%*	*6.6%*	*6.5%*
C	Research and development[3]	billions of euros	55.9	70.0	79.1	79.7	83.6
		share of GDP	*2.4%*	*2.7%*	*2.9%*	*2.8%*	*2.9%*
D	Other education and science infrastructure	billions of euros	4.1	5.0	5.4	5.5	5.5
		share of GDP	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*
A+B+C+D	**Total expenditure on education, research and science[4]**	**billions of euros**	**193.9**	**237.8**	**251.9**	**257.4**	**265.5**
		share of GDP	***8.4%***	***9.2%***	***9.1%***	***9.1%***	***9.1%***

Explanation of abbreviations/symbols: GDP = gross domestic product; OECD = Organisation for Economic Co-operation and Development.
1) Expenditure pursuant to the performance concept. Demarcation pursuant to concept 2012. 2014 figures are preliminary.
2) For a more detailed overview of the education area see figure 19.
3) Calculated using research and development (R&D) statistical methods (Frascati Manual / OECD report).
4) The budget for education, research and science has been consolidated by the higher education expenditure on research and development, because this position is included in both, A and C.
Source: Federal Statistical Office (Bildungsfinanzbericht 2015, table 2.2-1 and 2.3-1; Budget für Bildung, Forschung und Wissenschaft 2013/2014)

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-3
Additional data: www.datenportal.bmbf.de/en/1.9.1

1 Research and innovation

Research, development and innovation form the basis for Germany's prosperity and competitiveness. Viable solutions for environmentally friendly energy, efficient health care, sustainable mobility, secure communication and secure production in Germany cannot be developed without progress in science and technology. The challenges Germany is facing up to also concern other countries in Europe and across the world.

Germany has been investing more funds in research and development (R&D) in recent years than ever before. The Federal Government's expenditure on R&D rose by 9.0 billion euros between 2005 and 2016 to 15.8 billion euros (target) in 2016. This represents an increase of over 75%. According to provisional calculations, the state and industry spent almost 84 billion euros on R&D in 2014. This represents approximately 2.9% of Germany's Gross Domestic Product (GDP). This means that Germany has almost achieved the target of the Europe 2020 Strategy of spending an annual 3% of GDP on R&D.

Germany accounts for 30% of all R&D expenditure in the European Union; five of Europe's ten most innovative companies come from Germany. Germany is also among the innovation leaders worldwide. This is shown, for example, by its record new ranking in the field of scientific publications: One in six German scientific publications is listed among the studies most quoted internationally. Germany has also been able to increase its exports of research-intensive goods and now once again takes second place behind China and ahead of the Unites States of America.

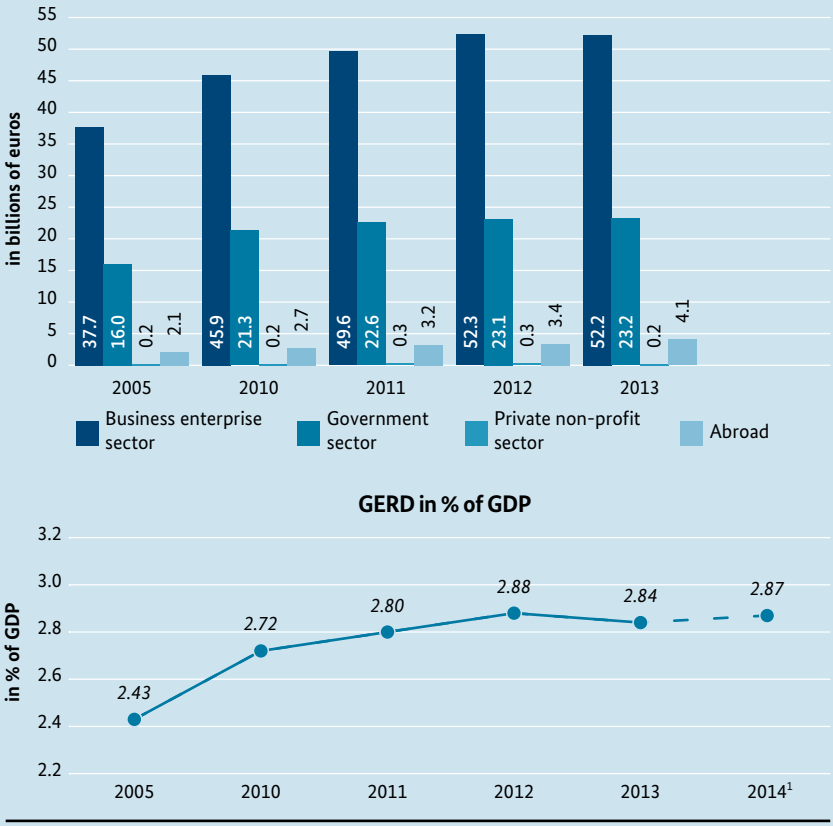
It is essential to consider future trends and challenges in order to maintain Germany's strong international position in the long term. Digitalization is a decisive factor here as it offers new opportunities for fields of application such as artificial intelligence and human-technology interaction. Boosting the flagging innovative strength of small and medium-sized enterprises (SMEs) is another important aspect. Here the Federal Ministry of Education and Research is introducing structural measures such as the new "10 Point Programme - Priority for SMEs".

Further information
Internet portal:
- High-Tech Strategy (www.hightech-strategie.de)

Publication:
- 2016 Federal Report on Research and Innovation (www.bmbf.de/de/bundesbericht-forschung-und-innovation-735.html)

Continuing to expand research and innovation is vital for Germany's future economic prosperity. The Federal Government has consistently prioritized research and development. Between 2005 and 2016 spendings on this area increased from 9.0 billion to 15.8 billion euros (2016 target). This represents an increase of over 75%.

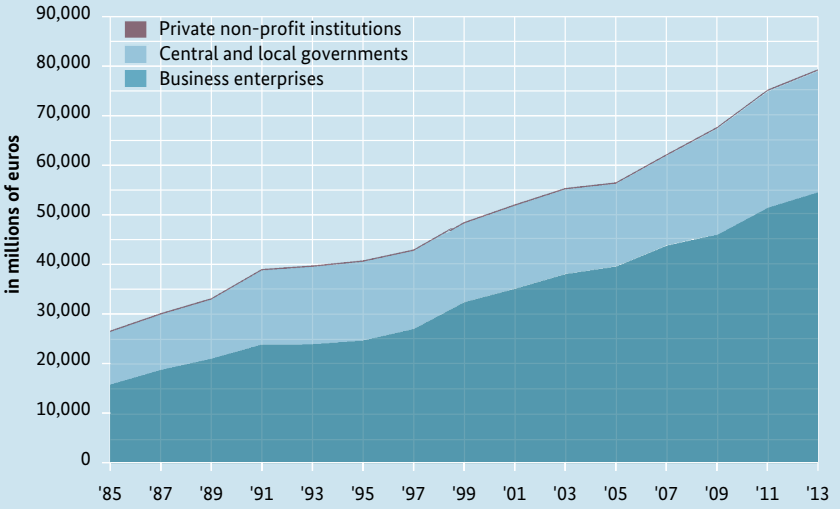
Fig. 4 Gross domestic expenditure on research and development (GERD), by funding sectors (implementation view) and GERD in % of the gross domestic product (2005-2014)



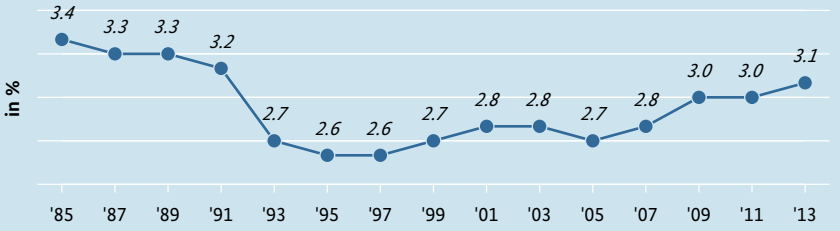
Explanation of abbreviations/symbols: GDP = gross domestic product.
Note: Figures for even years are estimates.
1) Provisional figures.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 1
Data: Stifterverband Wissenschaftsstatistik; Federal Statistical Office; Federal Ministry of Education and Research

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-4
Additional data: www.datenportal.bmbf.de/en/1.1.1

Fig. 5 R&D expenditure of the Federal Republic of Germany and funding thereof (1985-2013)



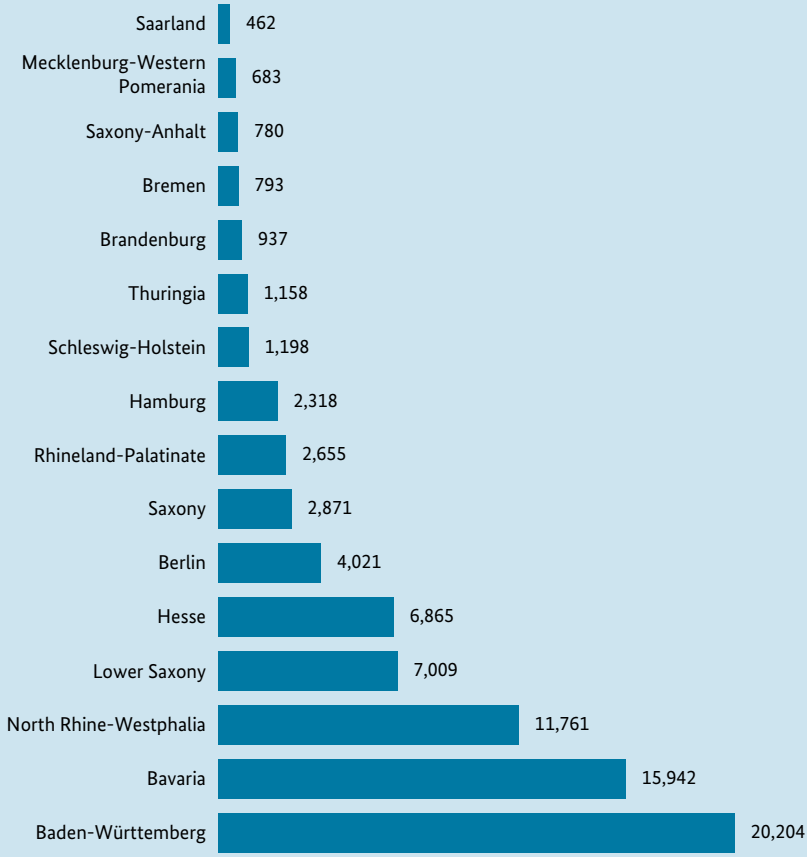
Share of the funding by central and local governments, in % of the overall government budget



Explanation of abbreviations/symbols: R&D = research and development.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 2; **Data:** Federal Statistical Office; Stifterverband Wissenschaftsstatistik; Federal Ministry of Education and Research

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-5
Additional data: www.datenportal.bmbf.de/en/1.1.2

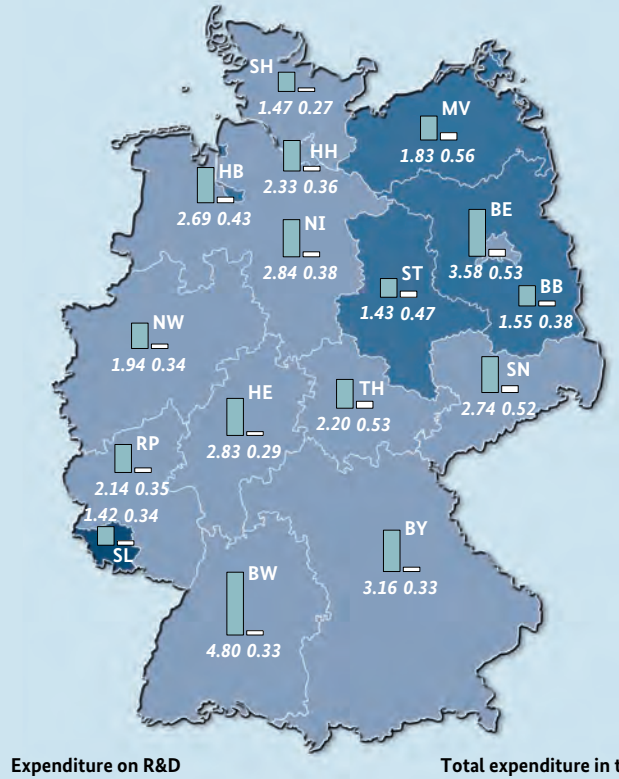
Fig. 6 Regional distribution of the R&D expenditure of the Federal Republic of Germany as a whole (implementation of R&D), in millions of euros (2013)



Explanation of abbreviations/symbols: R&D = research and development.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 3
Data: Federal Statistical Office; Stifterverband Wissenschaftsstatistik; Federal Ministry of Education and Research

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-6
Additional data: www.datenportal.bmbf.de/en/1.1.3

Fig. 7 Regional expenditure on research and development (2013)

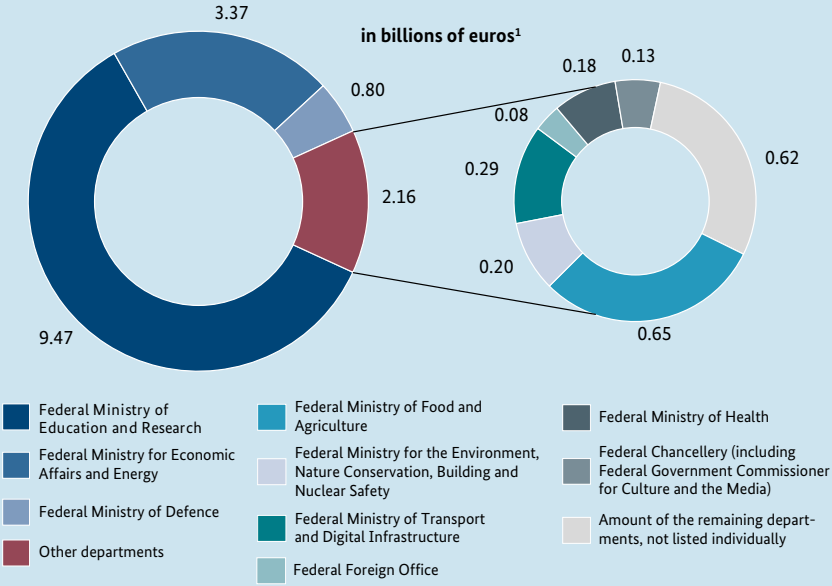


Explanation of abbreviations/symbols: R&D = research and development; GDP = gross domestic product; for abbreviations of the *Länder* see glossary.
Source: Stifterverband Wissenschaftsstatistik; Working group "Regional Accounts"; Federal Statistical Office; calculations of the BMBF

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-7
Additional data: www.datenportal.bmbf.de/en/1.1.11

In addition to the activities carried out by the Federal Government, the *Länder* also run a large number of specific funding measures in the areas of research policy, technology policy and innovation policy. They build on the specific strengths of the individual regions in technology, business and innovation as well as on existing geographical structures and characteristics. Such regional differences make a significant contribution to strengthen the German research and innovation system as a whole.

Fig. 8 Federal Government expenditure on R&D, by departments (2016 TARGET)



Explanation of abbreviations/symbols: R&D = research and development.
1) Differences in the calculation may arise due to sums in billions being rounded up or down.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 4
Data: Federal Ministry of Education and Research

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-8
Additional data: www.datenportal.bmbf.de/en/1.1.4

Fig. 9 Federal Government expenditure on science, research and development, by funding areas, in millions of euros (2015/2016)

Funding area[1]	2015 (TARGET)[2,3]		2016 (TARGET)[2]	
	Total	R&D	Total	R&D
A Health research and health industry	2,331.3	2,071.7	2,478.7	2,228.9
B Bioeconomy	290.1	290.0	281.9	281.8
C Civil security research	108.4	102.8	109.7	104.1
D Nutrition, agriculture and consumer protection	841.4	719.2	916.0	789.9
E Energy research and energy technologies	1,670.0	1,246.8	1,736.4	1,310.0
F Climate, environment, sustainability	1,464.1	1,254.1	1,527.7	1,319.8
G Information and communication technologies	809.4	779.1	944.3	906.2
H Vehicle and traffic technologies including maritime technologies	435.7	336.2	492.2	391.2
I Aerospace	1,480.1	1,477.7	1,656.9	1,654.5
J Research and development to improve working conditions and in the service sector	150.5	93.5	154.1	95.7
K Nanotechnologies and materials technologies	560.4	531.1	580.2	551.1
L Optical technologies	187.5	183.2	192.9	188.6
M Production technologies	220.9	218.8	232.2	230.0
N Regional planning and urban development; construction research	103.7	100.4	144.8	111.6
O Innovations in education	910.7	601.8	955.0	468.2
P Humanities; economics and social sciences	1,281.5	1,001.4	1,404.7	1,097.9
Q Innovation funding for SMEs	1,124.8	1,114.7	1,140.9	1,130.8
R Innovation-relevant underlying conditions and other cross-cutting activities	553.5	457.9	535.0	427.0
T Funding organisations, restructuring of the research field in acceding areas; construction of universities and primarily university-specific special programmes	3,532.7	694.2	3,845.6	723.6
U Large-scale equipment for basic research	1,200.5	1,200.3	1,275.6	1,275.3
Z Global reduced expenditure; budget reserve	-404.2	-404.2	-260.2	-260.2
Total of civil funding areas	**18,853.1**	**14,070.6**	**20,344.5**	**15,026.1**
S Military scientific research	892.6	829.9	840.2	775.8
Total expenditure	**19,745.7**	**14,900.5**	**21,184.7**	**15,801.9**

Explanation of abbreviations/symbols: R&D = (of which) research and development; SMEs = Small and medium-sized enterprises.

1) According to the Federal Government's planning system 2009. Expenditure was implemented in accordance with the Federal Government's planning system 2009. Expenditure of non-university research organisations are distributed among funding areas and funding priorities.

2) Distribution among funding areas partly estimated or extrapolated. Including "Energy and climate fund" (*Energie- und Klimafonds*). Research promotion for electromobility is financed by the "Energy and climate fund". As of 2016, including future investments.

3) Differences from previously published documents due to subsequent changes in the allocation to R&D.

Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 5

Data: Federal Ministry of Education and Research

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-9
Additional data: www.datenportal.bmbf.de/en/1.1.5

The Federal Government's activities make up the lion's share of government funding for research, development and innovation. The focus is the High-Tech Strategy, which was launched in 2006, and its updated version (the new High-Tech Strategy – Innovations for Germany) which prioritises future challenges: the digital economy and society, the sustainable economy and energy, the innovative workplace, healthy living, intelligent mobility and civil security. Activities that are important to society – such as educational research and research in the humanities – are also supported. The method applied here shows the R&D expenditure of the Federal Government as a whole, regardless of the Ministry which provided the funding, classified according to research subject.

Fig. 10 BMBF expenditure on science, research and development, by funding areas, in millions of euros (2015/2016)

Funding area[1]		2015 (TARGET)[2]		2016 (TARGET)[2]	
		Total	R&D	Total	R&D
A	Health research and health industry	1,874.5	1,874.5	2,018.7	2,018.7
B	Bioeconomy	289.9	289.9	281.6	281.6
C	Civil security research	69.8	69.8	67.3	67.3
D	Nutrition, agriculture and consumer protection	52.4	52.4	56.0	56.0
E	Energy research and energy technologies	934.2	616.9	956.5	639.7
F	Climate, environment, sustainability	1,051.2	1,051.2	1,110.6	1,110.6
G	Information and communication technologies	668.3	656.4	771.1	758.9
H	Vehicle and traffic technologies including maritime technologies	23.8	23.8	24.9	24.9
I	Aerospace	96.5	96.5	102.2	102.2
J	Research and development to improve working conditions and in the service sector	53.3	53.3	53.9	53.9
K	Nanotechnologies and materials technologies	465.1	465.1	485.1	485.1
L	Optical technologies	177.0	177.0	182.4	182.4
M	Production technologies	207.6	207.6	219.9	219.9
N	Spatial planning and urban development; construction research	17.3	17.3	18.8	18.8
O	Innovations in education	681.9	443.6	729.1	413.9
P	Humanities; economics and social sciences	753.3	753.3	822.1	822.1
Q	Innovation funding for SMEs	183.6	183.6	187.3	187.3
R	Innovation-relevant underlying conditions and other cross-cutting activities	422.7	367.1	384.3	314.6
T	Funding organisations, restructuring of the research field in acceding areas; construction of universities and primarily university-specific special programmes	3,370.8	666.1	3,680.7	695.0
U	Large-scale equipment for basic research	1,199.8	1,199.8	1,274.9	1,274.9
Z	Global reduced expenditure; budget reserve	-404.2	-404.2	-260.2	-260.2
Total expenditure		**12,188.8**	**8,861.1**	**13,167.4**	**9,467.8**

Explanation of abbreviations/symbols: BMBF = Federal Ministry of Education and Research; R&D = (of which) research and development; SMEs = Small and mediumsized enterprises.
1) According to the Federal Government's planning system 2009. Expenditure was implemented in accordance with the Federal Government's planning system 2009. Expenditure of non-university research organisations are distributed among funding areas and funding priorities.
2) Distribution among funding areas partly estimated or extrapolated.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 6
Data: Federal Ministry of Education and Research

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-10
Additional data: www.datenportal.bmbf.de/en/1.1.6

Fig. 11 Federal Government expenditure on science, research and development, by recipient groups, in millions of euros (2013/2014)

Recipient group		2013 (ACTUAL)[1]		2014 (ACTUAL)[1]	
		Total	R&D	Total	R&D
1.	**Territorial authorities**	**6,876.3**	**2,921.5**	**6,852.1**	**2,885.4**
1.1	Federal Government	2,243.4	1,108.7	2,307.0	1,146.5
1.1.1	Federal Government-owned research institutions[2]	1,891.9	960.2	1,961.9	1,003.0
1.1.2	Other institutions of Federal administration	351.5	148.5	345.1	143.5
1.2	*Länder* and communities	4,632.9	1,812.8	4,545.1	1,738.9
1.2.1	Research institutions of the *Länder*	145.0	138.6	141.2	134.5
1.2.2	Universities and university hospitals	3,706.2	1,602.0	3,631.6	1,536.7
1.2.3	Other institutions of the *Länder*	735.6	36.7	732.3	32.8
1.2.4	Communities, local authority and special-purpose associations	46.1	35.5	40.1	35.0
2.	**Private non-profit organisations**	**8,031.5**	**7,567.7**	**8,332.3**	**7,860.0**
2.1	Research funding organisations (e.g. MPG, FhG, DFG)	3,923.3	3,726.1	4,071.1	3,877.0
2.2	Helmholtz Association of German Research Centres (HGF)	2,863.3	2,791.7	2,990.0	2,905.3
2.3	Other non-profit science organisations	1,101.9	947.4	1,131.5	978.6
2.4	Other non-profit organisations	143.0	102.5	139.7	99.1
3.	**Business enterprise sector**	**2,629.0**	**2,450.3**	**2,407.3**	**2,217.4**
3.1	Business enterprises	1,854.9	1,712.9	1,681.5	1,522.7
3.2	Services if rendered by companies and the professions	774.0	737.4	725.9	694.8
4.	**Abroad**	**1,397.3**	**1,332.7**	**1,286.7**	**1,226.1**
4.1	Payments to business enterprises abroad	107.9	98.3	82.1	71.4
4.2	Contributions to international organisations and other payments to recipients abroad	1,289.4	1,234.5	1,204.5	1,154.6
5.	**Cross-group positions**	**5.4**	**2.7**	**0.7**	**-0.2**
Total expenditure[3]		**18,939.4**	**14,275.0**	**18,879.1**	**14,188.7**

Explanation of abbreviations/symbols: R&D = (of which) research and development; MPG = Max Planck Society; FhG = Fraunhofer Society; DFG = German Research Foundation.
1) Including "Energy and climate fund" (*Energie- und Klimafonds*). As from 2012, research funding in the area of electro mobility is financed by the "Energy and climate fund".
2) Differences from previously published documents due to subsequent changes in the allocation to R&D.
3) Minor discrepancies with regard to earlier publications are due to subsequent data collection or retroactive revision of the allocation to recipient groups.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 9
Data: Federal Ministry of Education and Research

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-11
Additional data: www.datenportal.bmbf.de/en/1.1.8

Fig. 12 R&D expenditure of the Federal Government and the *Länder*, by research objectives, budget appropriations in millions of euros (2011-2015)

Research objective[1]		2011	2012	2013	2014	2015[2]
1.	Exploration and exploitation of the earth	418,4	380.3	426.5	442.9	454.6
2.	Environment	642.1	687.5	705.6	779.2	806.4
3.	Exploration and exploitation of space	1,096.7	1,132.3	1,173.3	1,189.8	1,224.2
4.	Transport, telecommunication and other infrastructures	338.2	358.1	374.4	375.5	375.0
5.	Energy	906.4	1,062.8	1,313.3	1,324.5	1,259.1
6.	Industrial production and technology	3,626.0	3,046.1	3,190.5	3,064.2	3,151.1
7.	Health	1,093.3	1,266.1	1,272.4	1,342.1	1,335.9
8.	Agriculture	743.4	691.2	719.1	729.2	800.4
9.	Education	186.7	230.5	266.9	308.2	394.5
10.	Culture, recreation, religion and mass media	300.7	301.2	299.9	287.9	287.3
11.	Political and social systems, structures and processes	381.0	396.9	454.7	484.4	505.4
9.-11.	**Total of education, culture, recreation, religion, mass media, political and social systems, structures and processes**	**868.4**	**928.7**	**1,021.6**	**1,080.5**	**1,187.2**
12.	General advancement of knowledge: R&D financed from General University Funds (GUF)	9,384.5	9,609.1	10,137.5	10,034.3	10,265.3
13.	General advancement of knowledge: R&D financed from other sources than GUF	3,844.5	4,150.4	4,331.2	4,370.2	4,627.2
Non-apportionable funds[3]		-155.9	-169.1	-239.2	-346.3	-404.2
Total civil R&D expenditure		**22,806.2**	**23,143.4**	**24,426.1**	**24,386.1**	**25,082.3**
14.	Defence	937.3	926.8	944.9	977.4	819.8
Total		**23,743.5**	**24,070.2**	**25,371.0**	**25,363.5**	**25,902.1**

Explanation of abbreviations/symbols: R&D = research and development.
1) In keeping with the nomenclature for the analysis and comparison of scientific programmes and budgets (NABS) – edition 2007. 2010-2011 including "Investment and redemption fund" (*Investitions- und Tilgungsfonds*) (economic stimulus package – *Konjunkturpaket II*). As from 2011, on the part of the Federal Government including "Energy and climate fund" (*Energie- und Klimafonds*).
2) Provisional figures.
3) Global reduction in the expenditure of the Federal Ministry of Education and Research (BMBF) which cannot be assigned to research objectives 1 to 13 until ACTUAL figures are available as well as competition funds for the Leibniz Association (WGL) from the Federal Government and the *Länder*.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 16
Data: Federal Ministry of Education and Research, Federal Statistical Office

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-12
Additional data: www.datenportal.bmbf.de/en/1.2.3

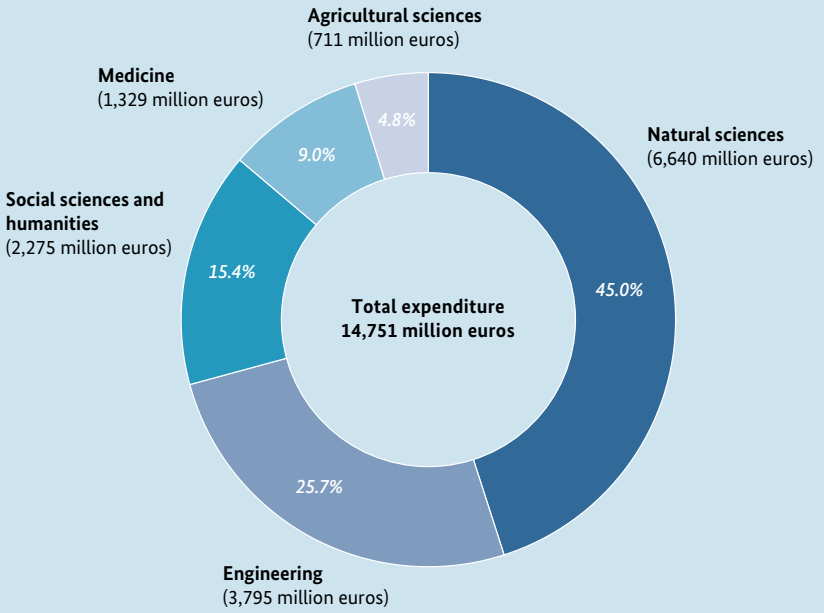
Fig. 13 Employees, turnover and intramural R&D expenditure of enterprises[1], by economic activities (2013)

Economic activity[2]			Em-ploy-ees[3]	Turn-over[3]	Intramural R&D expend.		
					Total	Per em-ployee	Share of turn-over
			1,000	€ m	€ m	€ 1,000	in %
A	**01-03**	**Agriculture, forestry and fishing**	**6**	**1,903**	**144**	**24.0**	***7.6***
B	**05-09**	**Mining and quarrying**	**21**	**4,187**	**15**	**0.7**	***0.4***
C	**10-33**	**Manufacturing**	**3,253**	**1,097,832**	**46,049**	**14.2**	***4.2***
	10-12	Food products, beverages and tobacco products	112	45,153	315	2.8	*0.7*
	13-15	Textiles, apparel, leather	28	6,532	113	4.0	*1.7*
	16-18	Wood products, paper products, printing	53	15,559	227	4.3	*1.5*
	19	Coke and refined petroleum products	7	38,373	94	13.4	*0.2*
	20	Chemicals and chemical products	239	115,466	3,346	14.0	*2.9*
	21	Basic pharmaceutical products and pharmaceutical preparations	117	43,302	4,075	34.8	*9.4*
	22	Rubber and plastic products	146	33,748	970	6.6	*2.9*
	23	Glass, ceramics and non-metallic mineral products	72	15,183	292	4.1	*1.9*
	24	Basic metals	160	75,017	530	3.3	*0.7*
	25	Fabricated metal products	186	37,328	743	4.0	*2.0*
	26	Computer, electronic and optical products	378	86,346	7,342	19.4	*8.5*
	27	Electrical equipment	203	44,370	2,130	10.5	*4.8*
	28	Machinery and equipment	609	147,779	5,388	8.8	*3.6*
	29	Motor vehicles, trailers and semi-trailers	733	335,826	17,187	23.4	*5.1*
	30	Other transport equipment	87	28,005	2,018	23.2	*7.2*
	31-33	Other manufacturing of products	124	29,845	1,279	10.3	*4.3*
D E	**35-39**	**Electricity supply; water supply, waste management**	**151**	**231,366**	**209**	**1.4**	***0.1***
F	**41-43**	**Construction**	**69**	**14,935**	**80**	**1.2**	***0.5***
J	**58-63**	**Information and communication**	**251**	**54,603**	**3,170**	**12.6**	***5.8***
K	**64-66**	**Financial and insurance activities**	**83**	**231,208**	**290**	**3.5**	***0.1***
M	**69-75**	**Professional, scientific and technical activities**	**234**	**64,636**	**2,930**	**12.5**	***4.5***
Remaining categories			**954**	**268,126**	**408**	**0.4**	***0.2***
Total			**5,022**	**1,968,795**	**53,296**	**10.6**	***2.7***

Explanation of abbreviations/symbols: R&D = research and development; 1,000 = in thousands; € m = in millions of euros; € 1,000 = in thousands of euro.
1) Not including institutions for cooperative industrial research and experimental development.
2) Classification of economic activities, 2008 edition.
3) Employees and turnover of enterprises with internal and/or external R&D expenditure.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 24
Data: Stifterverband Wissenschaftsstatistik

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-13
Additional data: www.datenportal.bmbf.de/en/1.5.2

Fig. 14 Expenditure of non-university science institutions, by fields of science (2013)

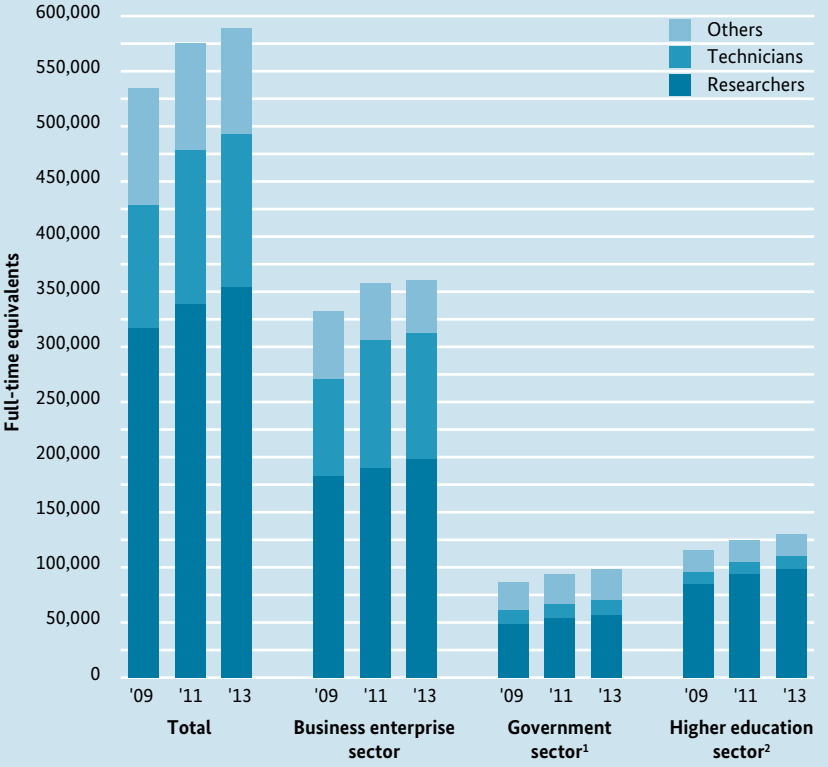


Note: Possible rounding differences.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 29
Data: Federal Statistical Office; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-14
Additional data: www.datenportal.bmbf.de/en/1.6.5

Alongside R&D expenditure, the number of people working in R&D is the most important indicator of R&D resources. About 600,000 people work in this area in Germany – in business, in research institutions and at universities. The significant increase in R&D personnel since 2007 makes it clear that R&D has risen considerably in importance. In total, there were approximately 80,000 more full-time R&D positions in 2013 than in 2007. The present figures include people who conduct actual research work, but also groups of people who carry out technical or other supporting activities.

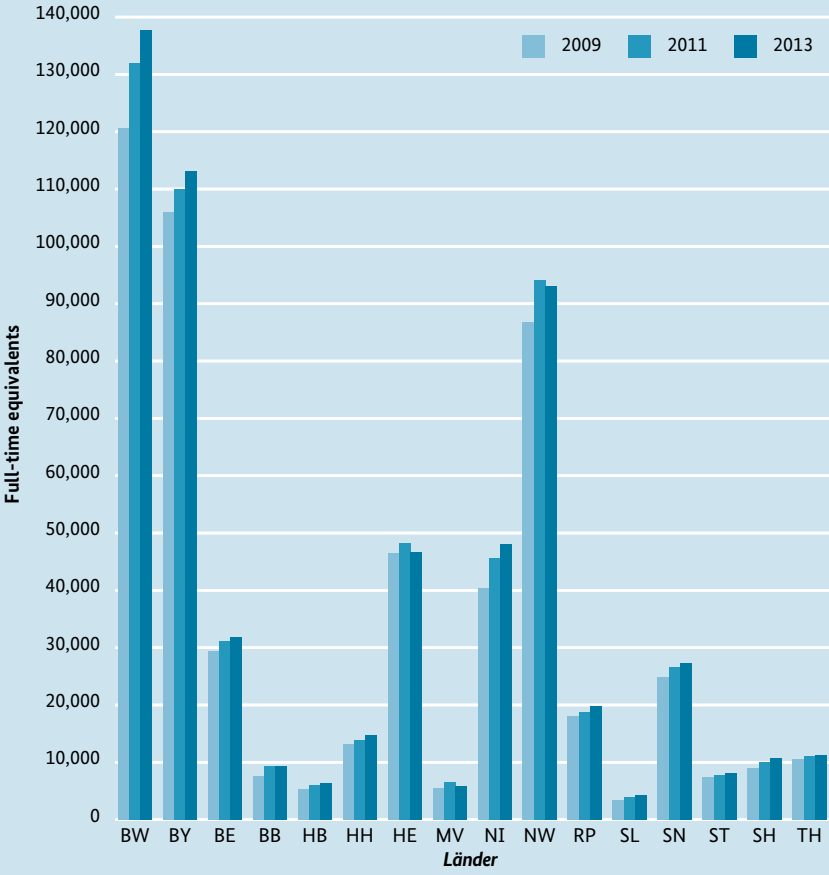
Fig. 15 R&D personnel, by personnel groups and sectors of employment, based on full-time equivalents (2009/2011/2013)



Explanation of abbreviations/symbols: R&D = research and development.
1) Government institutions and private non-profit organisations financed primarily by the government.
2) Figures for the higher education sector refer to full-time staff of private and state universities (ACTUAL), calculated in accordance with the procedure agreed on by the Standing Conference of Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany (KMK), the German Council of Science and Humanities, the Federal Ministry of Education and Research (BMBF) and the Federal Statistical Office.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 31
Data: Stifterverband Wissenschaftsstatistik; Federal Statistical Office

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-15
Additional data: www.datenportal.bmbf.de/en/1.7.1

Fig. 16 Regional breakdown of R&D personnel, based on full-time equivalents (2009/2011/2013)



Explanation of abbreviations/symbols: R&D = research and development; for abbreviations of the *Länder* see glossary.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 33
Data: Federal Statistical Office; Stifterverband Wissenschaftsstatistik

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-16
Additional data: www.datenportal.bmbf.de/en/1.7.3

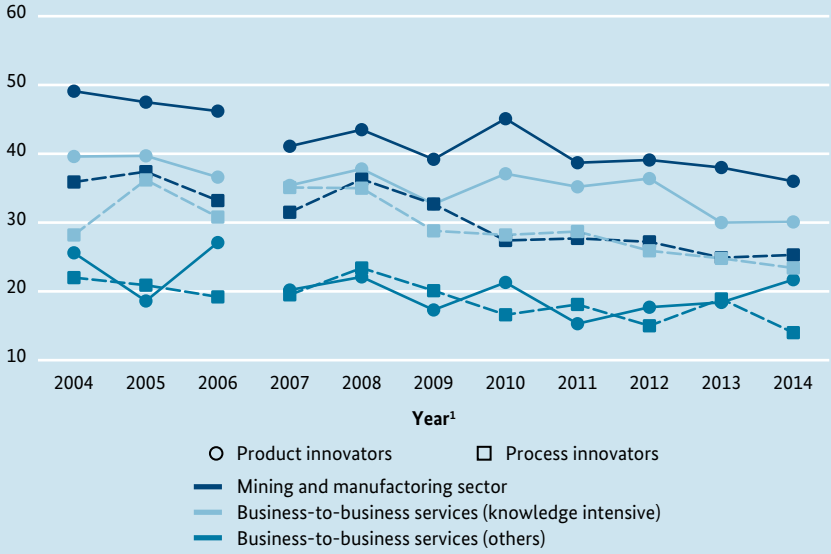
Fig. 17 Higher education expenditure on teaching and research, by types of higher education institution, in millions of euros (2011-2013 ACTUAL)

Expenditure[1] on	Year	Total higher education expenditure[2]	Universities[3], colleges of education, theology and art	Medical facilities[4,5]	Universities of applied sciences and colleges of public administration
Central institutions	2011	**9,021.6**	7,079.4	-	1,942.2
	2012	**9,270.9**	7,234.7	-	2,036.2
	2013	**9,616.3**	7,417.4	-	2,199.0
Natural sciences	2011	**5,073.5**	4,720.7	-	352.9
	2012	**5,208.5**	4,824.2	-	384.3
	2013	**5,361.0**	4,946.0	-	415.0
Engineering	2011	**4,095.7**	2,753.7	-	1,342.0
	2012	**4,234.8**	2,814.1	-	1,420.7
	2013	**4,419.4**	2,885.2	-	1,534.2
Medicine[6]	2011	**5,289.8**	1.6	5,242.2	46.0
	2012	**5,262.1**	1.6	5,206.2	54.3
	2013	**5,043.4**	1.7	4,983.1	58.6
Agricultural sciences	2011	**519.0**	393.4	-	125.6
	2012	**527.9**	402.0	-	125.9
	2013	**548.1**	412.2	-	136.0
Social sciences and humanities	2011	**6,226.5**	4,720.7	-	1,505.8
	2012	**6,434.7**	4,824.2	-	1,610.5
	2013	**6,685.2**	4,946.0	-	1,739.1
Total	**2011**	**30,226.1**	**19,669.5**	**5,242.2**	**5,314.5**
	2012	**30,938.8**	**20,100.8**	**5,206.2**	**5,631.8**
	2013	**31,673.4**	**20,608.5**	**4,983.1**	**6,081.8**

Explanation of abbreviations/symbols: - = no figures or magnitude zero.
1) University expenditures, minus income for activities other than teaching and research (such as for treatment of patients in university clinics), and calculated on basis of university financial statistics (*Hochschulfinanzstatistik*).
2) Not including additional amounts for payments to civil servants, grant funding for support of (post-) graduates and other funds of the German Research Foundation (DFG).
3) Excluding medical facilities.
4) University clinics including the "human medicine" subject group at universities.
5) Breaks in time series are due to restructuring and to a shift from cameralistic accounting to standard commercial accounting procedures.
6) Including central institutions of university clinics.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 26; **Data:** Federal Statistical Office

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-17
Additional data: www.datenportal.bmbf.de/en/1.6.1

Fig. 18 Product and process innovators (2004-2014)



1) Break in time series between 2006 and 2007 due to changes in the survey method, respectively the definition of the population. 2014 figures are provisional.
Source: Centre for European Economic Research (indicator report relative to German innovation survey)

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-18
Additional data: www.datenportal.bmbf.de/en/1.8.1
www.datenportal.bmbf.de/en/1.8.2

Important types of innovations include product and process innovations. The figure shows that the highest product and process innovation rates are found in the manufacturing sector. The innovation rates of the knowledge intensive services are on a similar level while those of the other services are considerably lower.

2 Education

Education provides prospects for personal careers of each and every individual as well as for the future and prosperity of our society. The challenges of demographic change and of a looming skills shortage can only be addressed if everyone in Germany is given an opportunity for sound education and the best possible support in developing his or her talent – irrespective of background and material resources. This requires the cooperation of all decision-makers. Since 2008, the Federal Government and the *Länder* have been committed to greater equity in education, better performance and improved transfer opportunities in the education system as part of the Qualification Initiative for Germany.

The joint efforts are paying off, as is shown in the following examples: The provision of care for children under the age of three has improved considerably. Since 2008, the number of school-leavers with general higher education entrance qualifications has been growing and is now well over 50%, while the number of those without a secondary general school-leaving certificate is steadily falling. More than one in two young people in an age bracket takes up higher education studies. Participation in continuing education and training reached a record level of 51% in 2014. Education expenditure rose from approximately 176 billion euros in 2010 to approximately 191 billion euros in 2014.

The current refugee crisis is confronting the education system with new challenges. Integration through education must become a priority in the years to come because integration cannot function without education. The Federal Education Ministry is supporting the integration of refugees under two major packets of measures - ranging from learning German to taking up training or higher education.

Further information

Internet portal:

- German Education Server – the central directory for educational information on the Internet (www.bildungsserver.de)

Publications:

- Education in Germany 2016 – an indicator-based report including an analysis of education and migration (www.bildungsbericht.de)
- 2016 Report on Vocational Education and Training (www.bmbf.de/de/berufsbildungsbericht-2740.html)
- Data report of the Federal Institute for Vocational Education and Training on the 2016 Report on Vocational Education and Training (http://datenreport.bibb.de)
- 2015 Report on Education Financing (www.destatis.de/DE/Publikationen/Thematisch/BildungForschungKultur/BildungKulturFinanzen/Bildungsfinanzbericht.html)

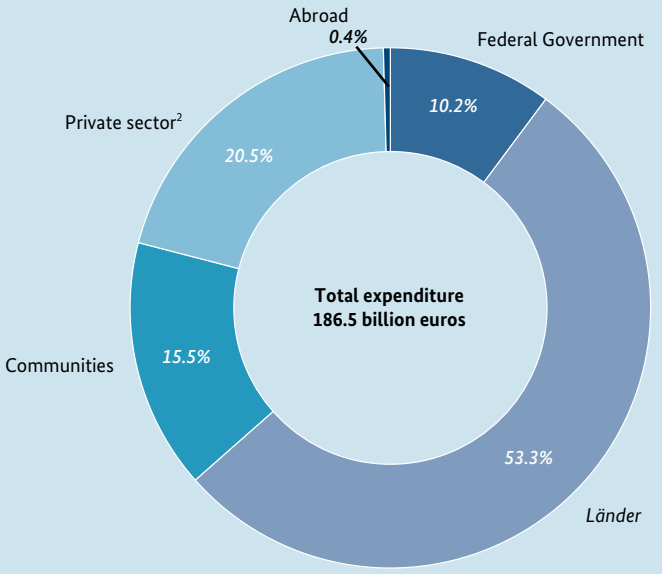
Fig. 19 Budget for education[1], by expenditure areas, in billions of euros (2005-2014)

Expenditure area		2005	2010	2012	2013	2014
A	**Education budget in international demarcation (ISCED 2011)**	**129.3**	**157.9**	**164.0**	**168.2**	**171.8**
	- Share of GDP	***5.6%***	***6.1%***	***6.0%***	***6.0%***	***5.9%***
A30	**Expenditure on educational institutions (state and private funded)**	**114.7**	**138.0**	**143.9**	**148.1**	**151.7**
	- Share of GDP	***5.0%***	***5.4%***	***5.2%***	***5.3%***	***5.2%***
A31	ISCED 0: Pre-primary level	13.2	19.3	21.8	23.9	25.1
	of which: Children aged younger than 3 years	2.4	5.8	7.0	8.1	b
	Children aged 3 to school entrance	10.8	13.4	14.8	15.8	b
A32	ISCED 1-4: School and close to school levels	75.4	85.6	86.4	87.6	89.6
	of which: General programmes	53.4	61.9	62.5	63.9	b
	Vocational programmes	9.8	10.8	10.7	10.7	b
	In-company training under the dual system	10.5	10.6	10.8	10.7	b
A33	ISCED 5-8: Tertiary level	23.6	30.9	33.6	34.4	34.9
	of which: Vocational programmes	0.6	0.8	0.9	1.0	b
	Academic programmes	21.7	28.6	31.1	31.8	b
	of which: R&D at higher education institutions	9.4	12.7	14.0	14.3	14.3
A34	Others (without ISCED classification)	2.5	2.3	2.1	2.2	2.2
A40/ A50	**Remaining expenditure in international demarcation**	**14.6**	**19.8**	**20.0**	**20.1**	**20.1**
	- Share of GDP	***0.6%***	***0.8%***	***0.7%***	***0.7%***	***0.7%***
B	**Additional education-relevant expenditure in national demarcation**	**14.0**	**17.7**	**17.4**	**18.3**	**18.9**
	- Share of GDP	***0.6%***	***0.7%***	***0.6%***	***0.6%***	***0.6%***
B10	Continuing vocational education	7.9	10.0	10.6	10.9	11.2
B20	Expenditure on other educational opportunities	4.7	6.6	6.0	6.4	6.7
B30	Assistance to participants in continuing education	1.3	1.1	0.7	0.9	1.0
A+B	**Total education budget**	**143.3**	**175.6**	**181.4**	**186.5**	**190.7**
	- Share of GDP	***6.2%***	***6.8%***	***6.6%***	***6.6%***	***6.5%***

Note: Possible rounding differences.
Explanation of abbreviations/symbols: GDP = gross domestic product; ISCED = International Standard Classification of Education; R&D = research and development; b = no data because the numerical value is not sufficiently reliable.
1) Expenditure pursuant to the performance concept. Demarcation pursuant to concept 2012. 2014 figures are preliminary.
Source: Federal Statistical Office (Bildungsfinanzbericht 2015, table 2.2-1 and 2.3-1; Budget für Bildung, Forschung und Wissenschaft 2013/2014)

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-19
Additional data: www.datenportal.bmbf.de/en/1.9.1

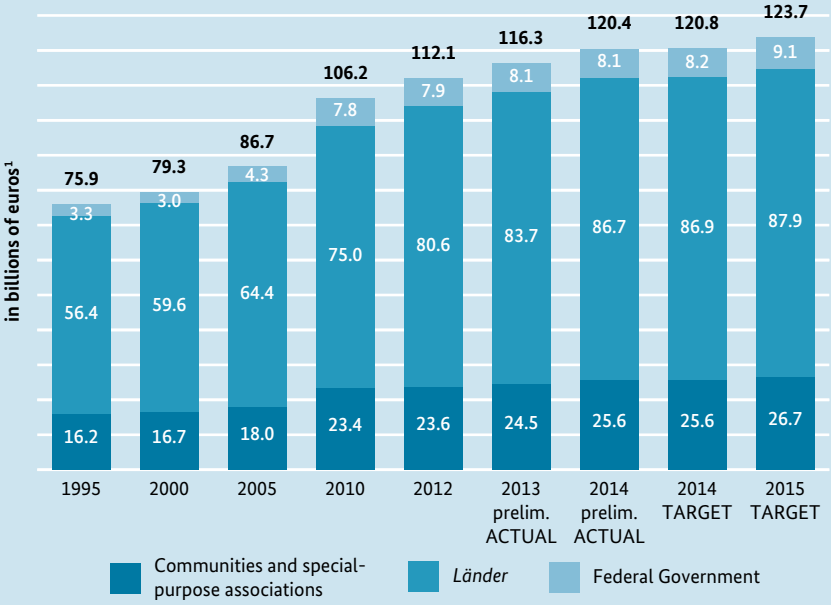
Fig. 20 Budget for education for all education areas, by funding sectors, in share of total expenditure[1] (2013)



Note: Possible rounding differences.
1) Financial statement (funder), in consideration of payment transactions between federal, *Länder* and local governments (initial funds), defined due to concept 2012. The concept of initial funds follows up the direct spendings on education of the federal, *Länder* and local governments, including transfers to other public budgets. The federal funding contribution (initial fund) thus comprises direct federal expenditure plus net transfers to the *Länder* and local government level.
2) Private households, businesses, private non-profit institutions.
Source: Federal Statistical Office, Budget für Bildung, Forschung und Wissenschaft 2013/14

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-20
Additional data: www.datenportal.bmbf.de/en/1.9.2

Fig. 21 Development of public spending on education (1995-2015)

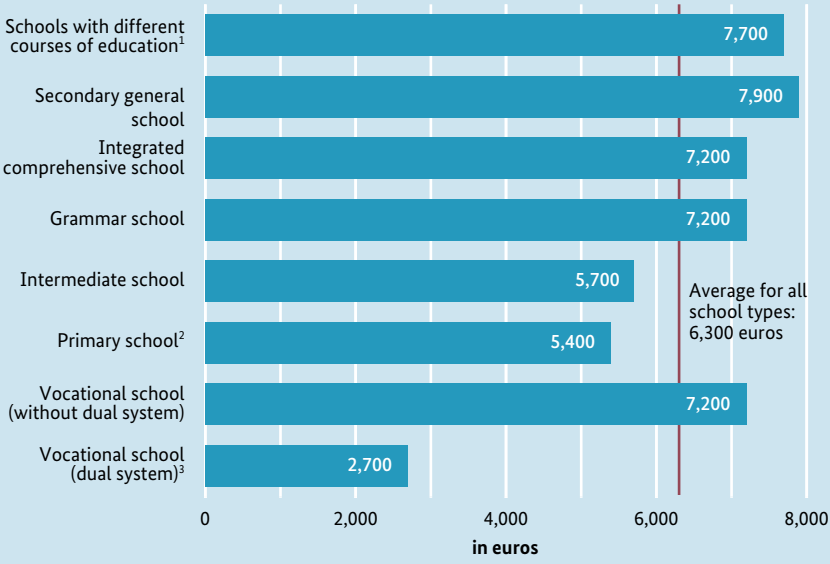


1) Possible rounding differences.
Source: Federal Statistical Office, Bildungsfinanzbericht 2015, table/figure 3.0-1

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-21
Additional data: www.datenportal.bmbf.de/en/2.1.13

Public spending on education has risen steadily since 1995 from 75.9 billion euros to 123.7 billion euros in 2015. Since 2005, the overall increase was 37.0 billion euros. In this period, federal expenditure on education more than doubled to an amount of 9.1 billion euros in 2015.

Fig. 22 Expenditure on public schools per pupil, by school types (2012)

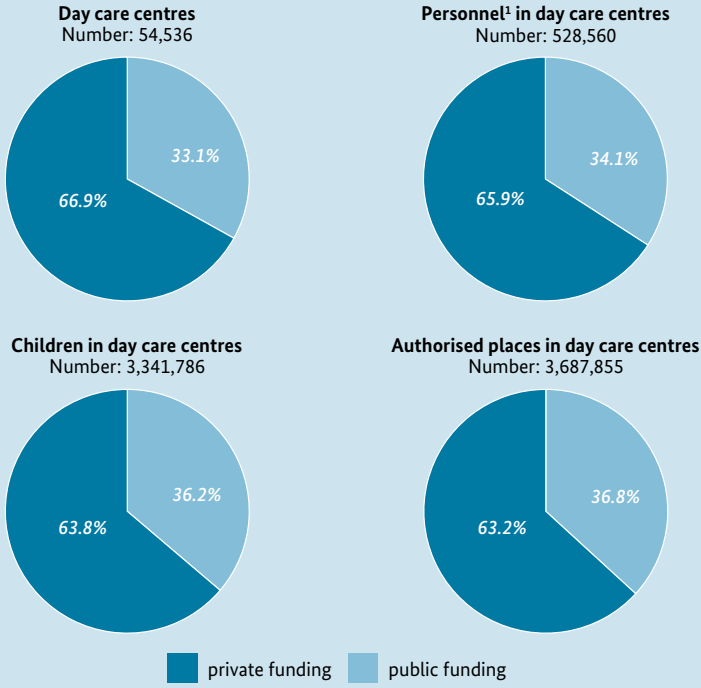


1) Integrated classes for pupils at secondary general and intermediate schools.
2) Berlin and Brandenburg without 5th and 6th grade.
3) Part-time lessons.
Source: Federal Statistical Office, Bildungsfinanzbericht 2015, tables 4.2.4-1, 4.2.4-2 / figure 4.2.4-1

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-22
Additional data: www.datenportal.bmbf.de/en/2.1.14

This graph shows the average annual expenditure per pupil. There are great differences between the different school types. The low expenditure on vocational schools under the dual system is mainly due to the part-time nature of teaching at vocational schools. Company spending on training under the dual system is not included here.

Fig. 23 Day care centres, personnel, number of children and number of authorised places (at 01 March 2015)



1) Educational staff (excluding exempted centre management, administration, housekeeping and building services).
Source: Federal Statistical Office, Statistics on child and youth welfare; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-23
Additional data: www.datenportal.bmbf.de/en/2.2.1

Unlike general schools and higher education institutions, a majority of childcare facilities are run by independent, non-state organisations (such as churches, charities, and parent associations).

Fig. 24 School enrolments, pupils and graduates/school-leavers at general schools (2010-2014)

At general schools		2010	2011	2012	2013	2014
School enrolments	**t**	**707,458**	**711,040**	**687,795**	**689,736**	**710,834**
	f	***48.5%***	***48.5%***	***48.6%***	***48.5%***	***48.6%***
Pupils	**t**	**8,796,894**	**8,678,196**	**8,556,879**	**8,420,111**	**8,366,666**
	f	***49.1%***	***49.0%***	***49.0%***	***48.9%***	***48.9%***
at primary schools including orientation stage	t	2,948,936	2,891,273	2,843,715	2,806,056	2,808,033
	f	*49.0%*	*49.1%*	*49.1%*	*49.1%*	*49.1%*
at secondary general schools	t	703,525	656,754	607,878	553,653	507,502
	f	*43.9%*	*43.8%*	*43.6%*	*43.5%*	*43.5%*
at schools with different courses of education[1]	t	370,852	399,899	433,637	453,930	477,102
	f	*46.8%*	*46.6%*	*46.5%*	*46.3%*	*46.2%*
at intermediate schools	t	1,166,509	1,130,004	1,080,598	1,015,160	950,706
	f	*49.3%*	*49.3%*	*49.2%*	*49.2%*	*49.1%*
at integrated comprehensive and Free Waldorf schools	t	665,613	714,250	763,556	835,227	904,136
	f	*49.9%*	*49.7%*	*49.4%*	*49.1%*	*48.9%*
at grammar schools	t	2,475,174	2,433,128	2,387,590	2,329,990	2,304,546
	f	*52.7%*	*52.6%*	*52.5%*	*52.5%*	*52.6%*
Graduates/school-leavers	**t**	**865,316**	**882,913**	**868,790**	**895,334**	**850,721**
	f	***49.4%***	***49.6%***	***49.4%***	***49.5%***	***49.1%***
without secondary general school certificate	t	53,058	49,560	47,648	46,295	46,950
	f	*39.0%*	*39.7%*	*39.7%*	*39.9%*	*39.6%*
with secondary general school certificate	t	179,753	168,660	157,498	151,314	146,649
	f	*42.2%*	*42.1%*	*41.8%*	*41.7%*	*41.3%*
with intermediate school certificate[2]	t	350,856	339,758	344,527	377,364	375,791
	f	*49.7%*	*49.4%*	*49.5%*	*49.4%*	*49.1%*
with entrance qualification for universities of applied sciences[2]	t	13,455	13,769	13,945	1,068	841
	f	*52.4%*	*52.6%*	*52.3%*	*47.6%*	*47.4%*
with university entrance qualification	t	268,194	311,166	305,172	319,293	280,490
	f	*55.6%*	*55.3%*	*54.7%*	*54.6%*	*54.7%*

Explanation of abbreviations/symbols: t = total; f = share of females.
1) Integrated classes for pupils at secondary general and intermediate schools.
2) Break in time series between 2012 and 2013. As from 2013, the category intermediate school certificate includes the proof of the academic part of the entrance qualification for studies at universities of applied sciences.
Source: Federal Statistical Office, Fachserie 11 Reihe 1; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-24
Additional data: www.datenportal.bmbf.de/en/2.3.30

The number of school students in Germany is decreasing during the period under review due to demographic developments. The steady decrease of school enrolments up to and including 2013 affects, with a delay in time, the amount of students at primary schools (*Grundschulen*) and secondary schools (*weiterführende Schulen*) (figure 24). The student-teacher ratio (figure 25) has improved across all school types with few exceptions such as schools with different courses of education (*Schularten mit mehreren Bildungsgängen*).

Fig. 25 Student-teacher ratio[1] at general schools (2010-2014)

School type	2010	2011	2012	2013	2014
Primary school	17.4	17.0	16.6	16.4	16.3
Orientation stage independent of school type[2]	13.9	13.2	13.2	13.2	12.7
Secondary general school	12.1	11.8	11.6	11.4	11.4
Schools with different courses of education[3]	11.8	12.2	12.3	12.3	12.1
Intermediate school	17.6	17.3	16.8	16.5	16.3
Grammar school					
Secondary level I	16.2	15.7	15.3	15.0	15.0
Secondary level II	13.2	12.9	12.6	12.3	12.3
Integrated comprehensive school					
Primary level	15.2	16.2	15.8	16.2	16.4
Secondary level I	13.9	13.6	13.3	13.1	12.8
Secondary level II	12.8	12.9	12.7	12.5	12.3
Free Waldorf School					
Primary level	18.2	18.2	17.6	17.3	17.5
Secondary level I	13.3	12.9	12.7	12.4	12.3
Secondary level II	13.1	12.7	12.7	13.2	13.0
Special needs school	5.7	5.6	5.5	5.4	5.3
Evening secondary general school	16.9	14.5	19.3	20.1	19.5
Evening intermediate school	22.0	21.0	20.2	19.9	20.1
Evening grammar school	16.3	16.1	15.3	14.9	14.3
Adult education college	12.2	12.1	11.4	11.7	11.4
Total	**14.3**	**14.1**	**13.8**	**13.6**	**13.5**

Explanation of abbreviations/symbols: KMK = Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany.
1) The student-teacher ratio is related to the total number of pupils and the total number of teachers. This ratio cannot be equated with the respective average class size, because several teachers frequently supervise a class.
2) Orientation stages independent of school type are comprehensive institutions of grades 5 and 6. If the orientation stages are integrated in particular school types for organisational reasons, they are disclosed with them and cannot be separated.
3) Integrated classes for pupils at secondary general and intermediate schools.
Source: KMK, Dokumentation Nr. 209, Zusammenfassende Übersichten 6.1

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-25
Additional data: www.datenportal.bmbf.de/en/2.3.25

Fig. 26 General schools, by school types (2010-2014)

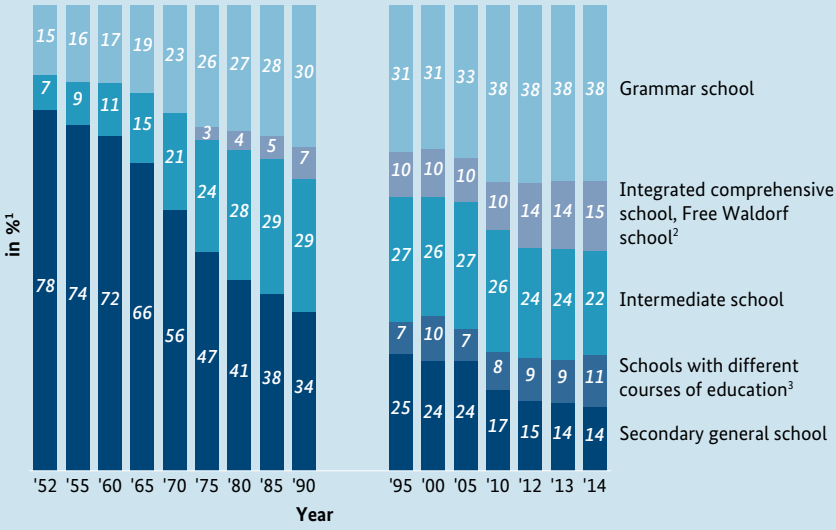
School type	2010	2011	2012	2013	2014
Pre-school class	280	277	282	283	285
School kindergarten	1,247	1,123	1,081	1,046	999
Primary school	16,290	16,103	15,971	15,749	15,578
Orientation stage independent of school type[1]	1,083	1,073	1,046	1,055	1,059
Secondary general school	3,883	3,606	3,416	3,193	3,039
Schools with different courses of education[2]	1,489	1,648	1,828	1,782	1,802
Intermediate school	2,593	2,530	2,525	2,399	2,313
Grammar school	3,101	3,124	3,122	3,124	3,125
Integrated comprehensive school	1,019	1,118	1,175	1,452	1,778
Free Waldorf School	207	211	215	214	215
Special needs school	3,320	3,282	3,258	3,191	3,117
Evening school and adult education college	325	325	320	322	325
Total	**34,837**	**34,420**	**34,239**	**33,810**	**33,635**

1) Orientation stages independent of school type are comprehensive institutions of grades 5 and 6. If the orientation stages are integrated in particular school types for organisational reasons, they are disclosed with them and cannot be separated.
2) Integrated classes for pupils at secondary general and intermediate schools.
Source: Federal Statistical Office, Fachserie 11 Reihe 1

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-26
Additional data: www.datenportal.bmbf.de/en/2.3.1

Because of the decline in student numbers resulting from demographic developments, the number of general schools went down by about 1,202 between 2010 and 2014. The number of schools is falling particulary sharply at the school types primary school (*Grundschule*) and secondary general school (*Hauptschule*). In contrast, the number of integrated comprehensive schools (*Integrierte Gesamtschule*) has increased significantly.

Fig. 27 Pupils in class 8, by school types (1952-2014)

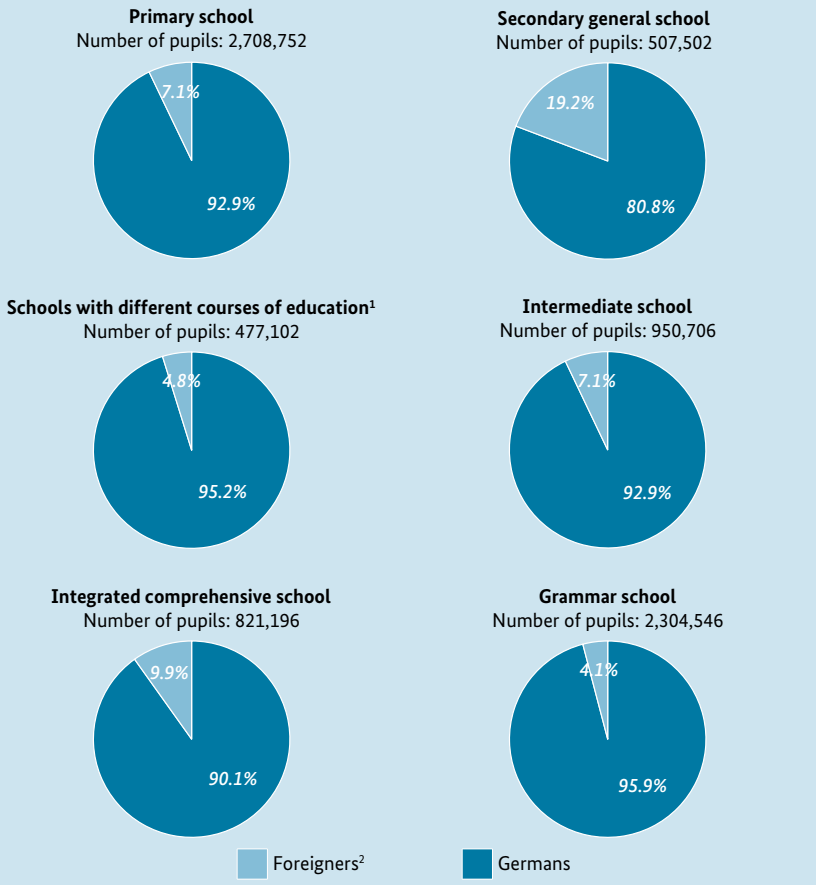


Note: Possible rounding differences.
1) Not including special needs school. Since 1995 including the eastern German *Länder*.
2) Since 1975 included separately in official statistics.
3) Combined classes for pupils in courses at secondary general school and intermediate school that first arose in the eastern German *Länder* after the German reunification.
Source: Federal Statistical Office, Fachserie 11 Reihe 1; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-27
Additional data: www.datenportal.bmbf.de/en/2.3.34

While the number of secondary general school (*Hauptschule*) students has been falling constantly over the last sixty years from 78% to 14% in 2014, the percentage of grammar school (*Gymnasium*) students has increased considerably. More than a third of all students have attended this type of school since the 1990s.

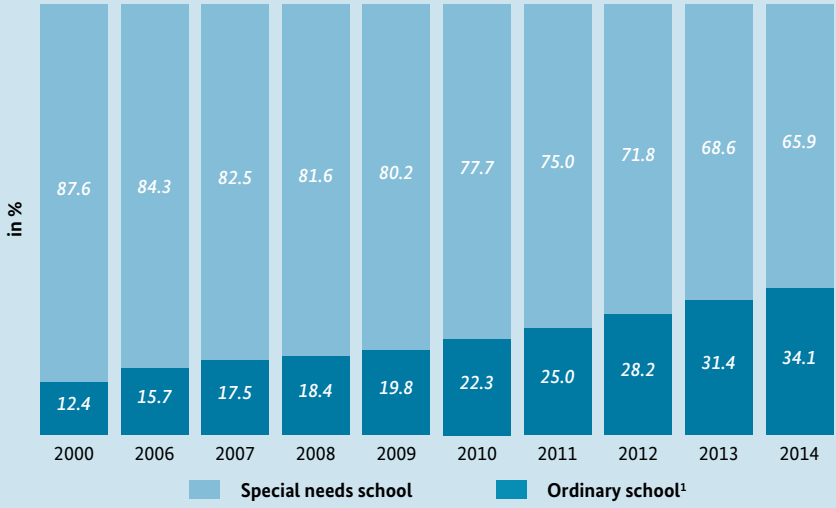
Fig. 28 Share of foreign pupils at general schools, by selected school types (2014)



1) Integrated classes for pupils at secondary general and intermediate schools.
2) Pupils who have a foreign passport or whose nationality is unknown.
Source: Federal Statistical Office, Fachserie 11 Reihe 1; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-28
Additional data: www.datenportal.bmbf.de/en/2.3.32

Fig. 29 Distribution of pupils with special educational needs on special needs schools and ordinary schools (2000/2006-2014)

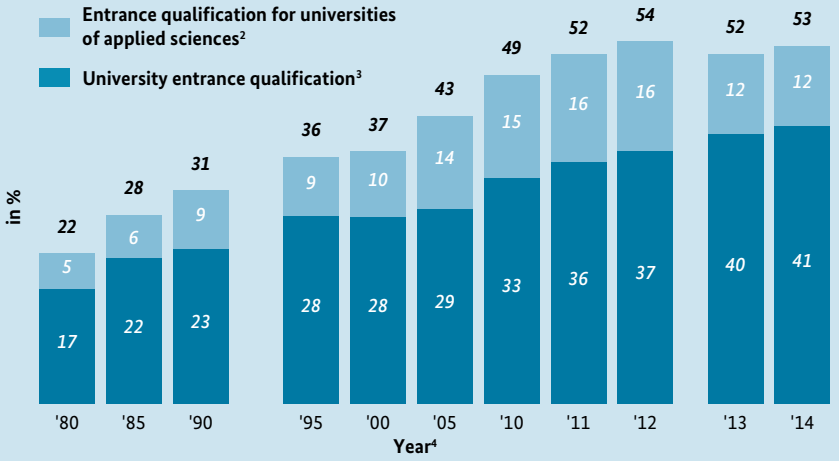


Explanation of abbreviations/symbols: KMK = Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany.
1) Ordinary schools include all general schools without special needs schools.
Source: KMK, Dokumentation Nr. 189, 196, 202 und 210, table A1.1.4.2

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-29
Additional data: www.datenportal.bmbf.de/en/2.3.13

The number of integrational pupils, meaning children and young people with special educational needs, who do not go to special needs schools but to ordinary schools, has risen constantly since 2000. A particularly strong increase has been recorded since the reporting year 2010.

Fig. 30 Percentage[1] of people qualified to enter higher education of the age-specific population, by types of qualification (1980-2014)



1) Until 2005, the percentage of people qualified to enter higher education is related to the average 18 to under 21 age group. As of 2010, the percentage of people qualified to enter higher education is related to the population of the specific years of birth. Quotas are calculated for single age groups, and afterwards they are added up. Until 2013, population data are based on past censuses. As of 2014, population data are based on 2011 Census. From 2010 to 2013, data are adjusted considering the double *Abitur* graduation classes. Rounding differences are possible.
2) As of 2013, excluding academic part of entrance qualification for universities of applied sciences (as of 2012, in Saxony-Anhalt).
3) Including subject-restricted higher education entrance qualification.
4) Since 1995, including eastern German *Länder*.
Source: Federal Statistical Office, Fachserie 11 Reihe 4.3 and 4.3.1

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-30
Additional data: www.datenportal.bmbf.de/en/2.5.85

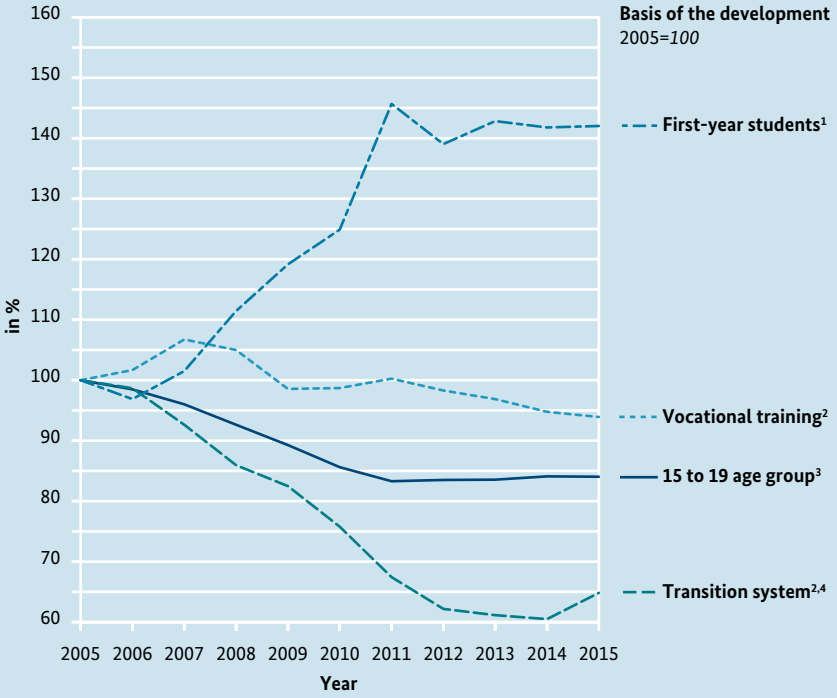
Fig. 31 Pupils at vocational schools, by school types (2010-2014)

School type		2010	2011	2012	2013	2014
Part-time vocational school[1]	t	1,613,579	1,558,964	1,519,244	1,482,022	1,444,086
	f	*39.8%*	*39.4%*	*39.1%*	*38.7%*	*38.4%*
Pre-vocational training year	t	51,811	48,941	48,810	49,230	53,201
	f	*40.0%*	*40.0%*	*39.1%*	*38.9%*	*36.5%*
Basic vocational training year at full-time school	t	32,478	29,622	28,217	28,748	29,963
	f	*37.2%*	*36.1%*	*36.8%*	*37.0%*	*35.5%*
Vocational extension school	t	533	481	427	360	298
	f	*26.8%*	*27.0%*	*26.7%*	*29.4%*	*27.2%*
Full-time vocational school	t	478,426	455,212	436,948	431,200	425,991
	f	*57.6%*	*57.4%*	*57.5%*	*57.5%*	*57.2%*
Two-year full-time vocational school	t	24,666	24,768	23,196	22,033	20,739
	f	*42.0%*	*41.0%*	*40.5%*	*41.7%*	*41.1%*
Specialised grammar school	t	163,294	168,359	172,879	180,712	189,967
	f	*51.2%*	*51.5%*	*51.9%*	*52.3%*	*52.6%*
Specialised upper secondary school	t	139,808	137,447	134,151	136,658	139,630
	f	*52.1%*	*51.9%*	*52.2%*	*52.3%*	*52.4%*
Trade and technical school	t	175,569	180,612	185,202	190,965	193,418
	f	*49.9%*	*50.9%*	*51.1%*	*51.7%*	*51.9%*
Specialised academy	t	7,810	8,077	8,324	8,658	8,746
	f	*83.4%*	*83.9%*	*84.1%*	*83.7%*	*83.8%*
Total	**t**	**2,687,974**	**2,612,483**	**2,557,398**	**2,530,586**	**2,506,039**
	f	***45.1%***	***44.9%***	***44.8%***	***44.8%***	***44.6%***

Explanation of abbreviations/symbols: t = total; f = share of females.
1) Part-time vocational schools are institutions that are part of the compulsory education system for young people who are in vocational training programmes (dual system), have an employment or are unemployed.
Source: Federal Statistical Office, Fachserie 11 Reihe 2

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-31
Additional data: www.datenportal.bmbf.de/en/2.4.4
www.datenportal.bmbf.de/en/2.4.6

Fig. 32 Transition from school to post-school careers – development of new entrants in selected iABE sectors and first-year students (2005-2015)

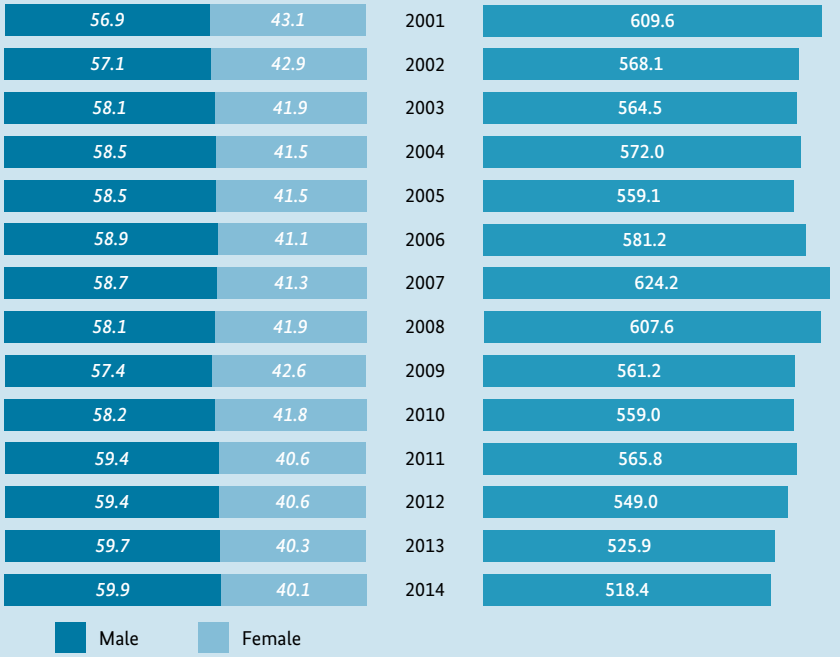


Explanation of abbreviations/symbols: iABE = integrated reporting on vocational training (see glossary).
1) Summer semester and following winter semester (e.g. 2005 = SS 2005 and WS 2005/2006). 2015: preliminary results, source: Fachserie 11 Reihe 4.1 Vorbericht.
2) 2015: preliminary results.
3) As of 2011, data are based on 2011 Census. 2015 data are estimated, source: 13th coordinated population projection by the Federal Statistical Office.
4) Integration into training.
Source: Berufsbildungsbericht 2015, Übersicht 10; Fachserie 11 Reihe 4.1; Schnellmeldung Integrierte Ausbildungsberichterstattung 2015; GENESIS-Online Datenbank, Fortschreibung des Bevölkerungsstandes
Data: Federal Institute for Vocational Education and Training; Federal Statistical Office; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-32
Additional data: www.datenportal.bmbf.de/en/2.3.43

This graph shows how young people's educational careers have changed over time. The number of young people who entered the transition system fell by about 35% between 2005 and 2012, since then the number increased slightly. In the area of vocational training the 2015 number is just marginally below the level of 2005. The number of first-year students in higher education increased constantly until 2011 and now the percentage of first-year students reaches more than 50%. The partially strong increase in the years 2010 and 2011 was due to the introduction of the shortened *Abitur* (from 13 to 12 years) that was implemented by the *Länder* in different years and the official ending of compulsory military service in the year 2011.

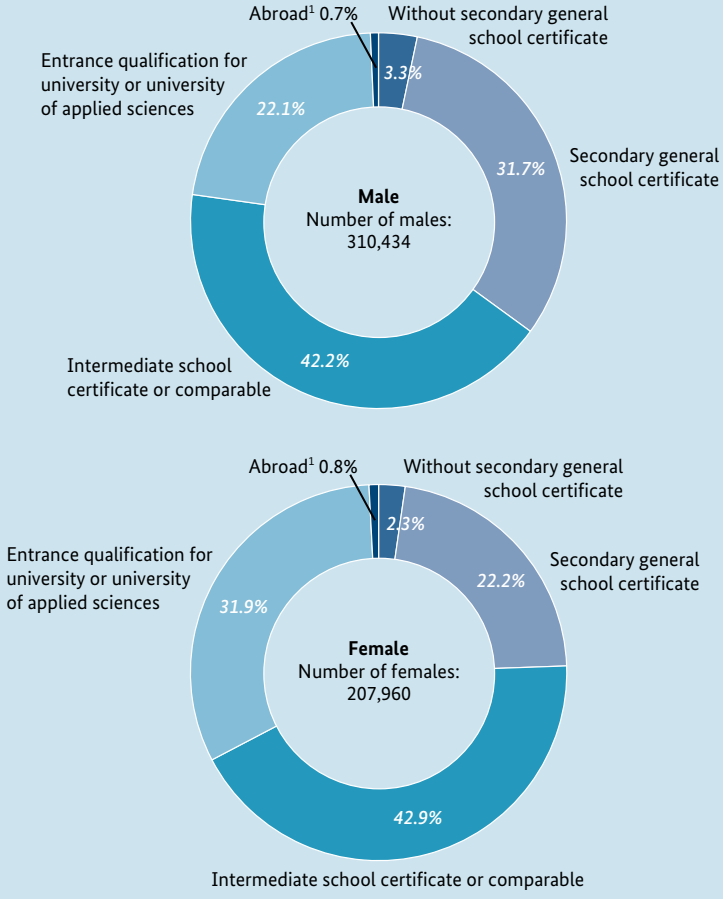
Fig. 33 Newly concluded training contracts (2001-2014)



1) Due to the new statistics concept in 2007, the results before and after the adjustment are comparable to a limited extent only.
Source: Federal Statistical Office, Fachserie 11 Reihe 3; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-33
Additional data: www.datenportal.bmbf.de/en/2.4.34

Fig. 34 Newly concluded training contracts, by educational background (2014)



1) School-leaving certificates acquired abroad that are not assignable.
Source: Federal Statistical Office, Fachserie 11 Reihe 3; calculations of the DZHW

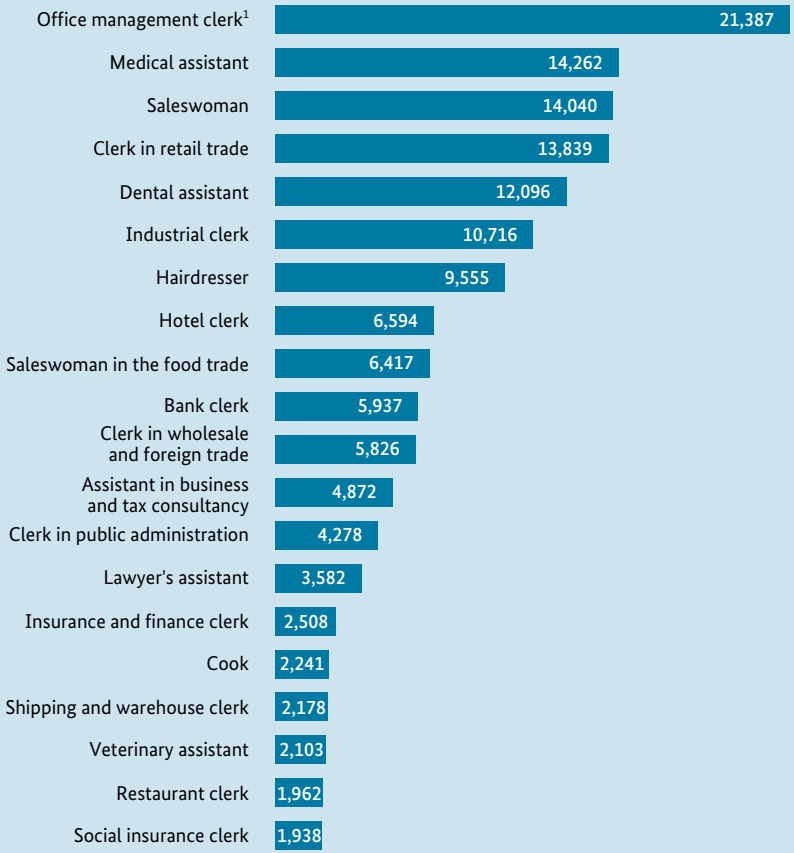
BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-34
Additional data: www.datenportal.bmbf.de/en/2.4.34

Fig. 35 Newly concluded training contracts of males in the 20 most popular training occupations (2015)

Note: 56.0% of the new contracts of males have been concluded in these 20 occupations.
1) Office management clerk including predecessor occupations: office clerk, office communications employee and office communications clerk.
Source: Federal Institute for Vocational Education and Training, survey as of 30 September 2015

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-35
Additional data: www.datenportal.bmbf.de/en/2.4.38

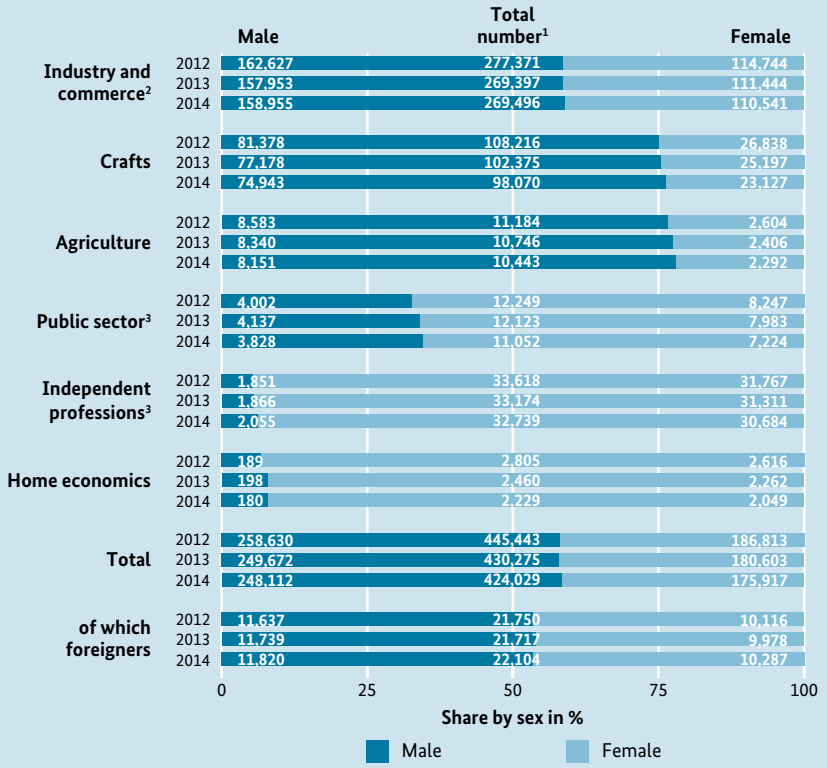
Fig. 36 Newly concluded training contracts of females in the 20 most popular training occupations (2015)



Note: 70.5% of the new contracts of females have been concluded in these 20 occupations.
1) Office management clerk including predecessor occupations: office clerk, office communications employee and office communications clerk.
Source: Federal Institute for Vocational Education and Training, survey as of 30 September 2015

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-36
Additional data: www.datenportal.bmbf.de/en/2.4.39

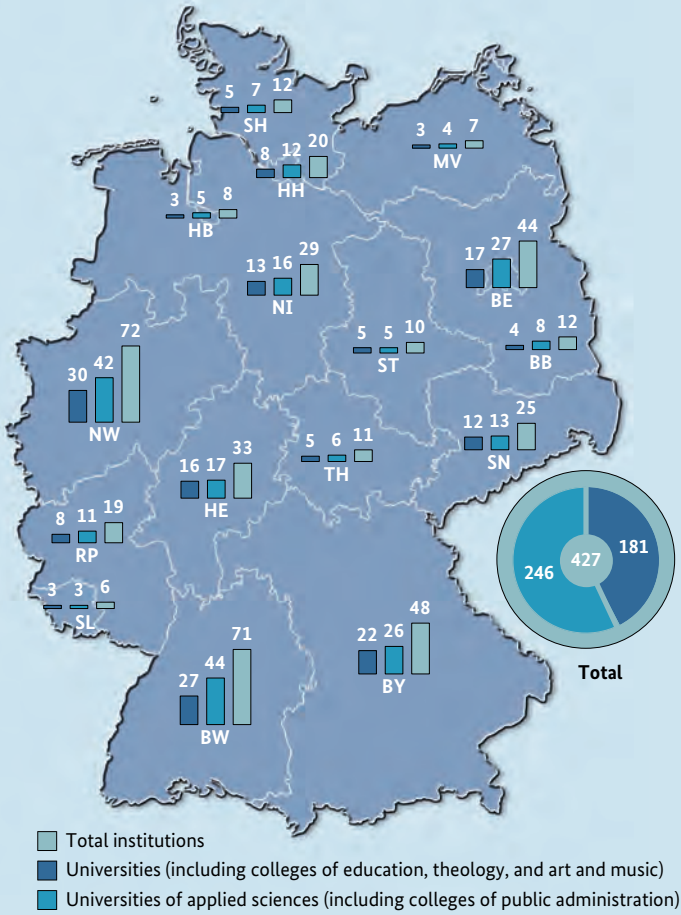
Fig. 37 Successful final examinations, by sex and training sectors (2012-2014)



1) Differences in sums possible due to the rounding procedure to ensure privacy in vocational education statistics. For further information see source.
2) Including banking, insurance, hotels and restaurants, transport.
3) Excluding training contracts registered at other competent authorities (chambers) outside this training sector, according to the vocational training act (*Berufsbildungsgesetz*).
Source: Federal Statistical Office, Fachserie 11 Reihe 3

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-37
Additional data: www.datenportal.bmbf.de/en/2.4.31
www.datenportal.bmbf.de/en/2.4.32
www.datenportal.bmbf.de/en/2.4.37

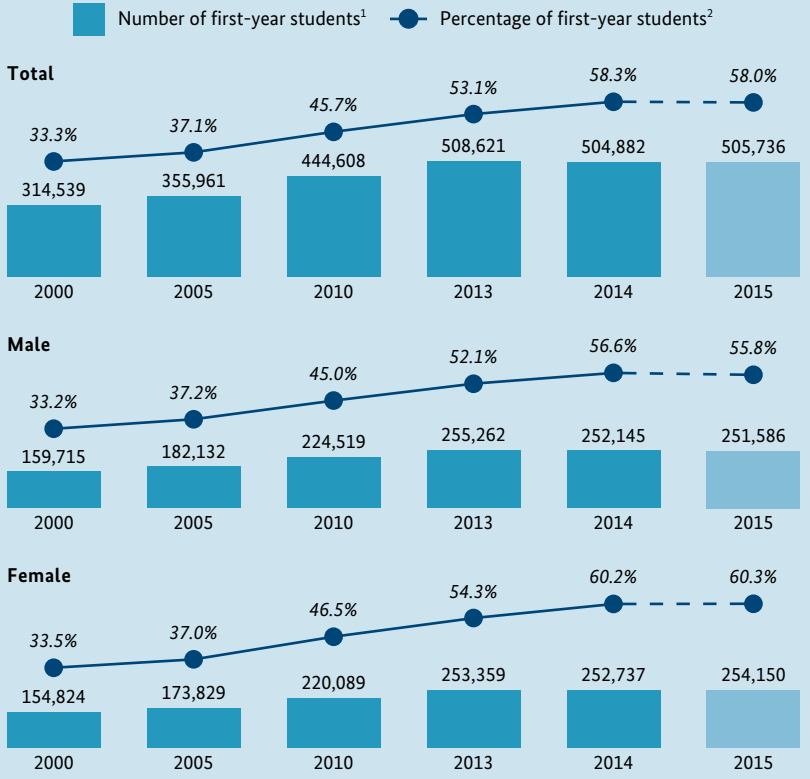
Fig. 38 Higher education institutions[1], by types and *Länder* (WS 2014/2015)



Explanation of abbreviations/symbols: WS = winter semester; for abbreviations of the *Länder* see glossary.
1) Including private institutions. Institutions with multiple locations are counted only once.
Source: Federal Statistical Office, Fachserie 11 Reihe 4.1; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-38
Additional data: www.datenportal.bmbf.de/en/2.5.1

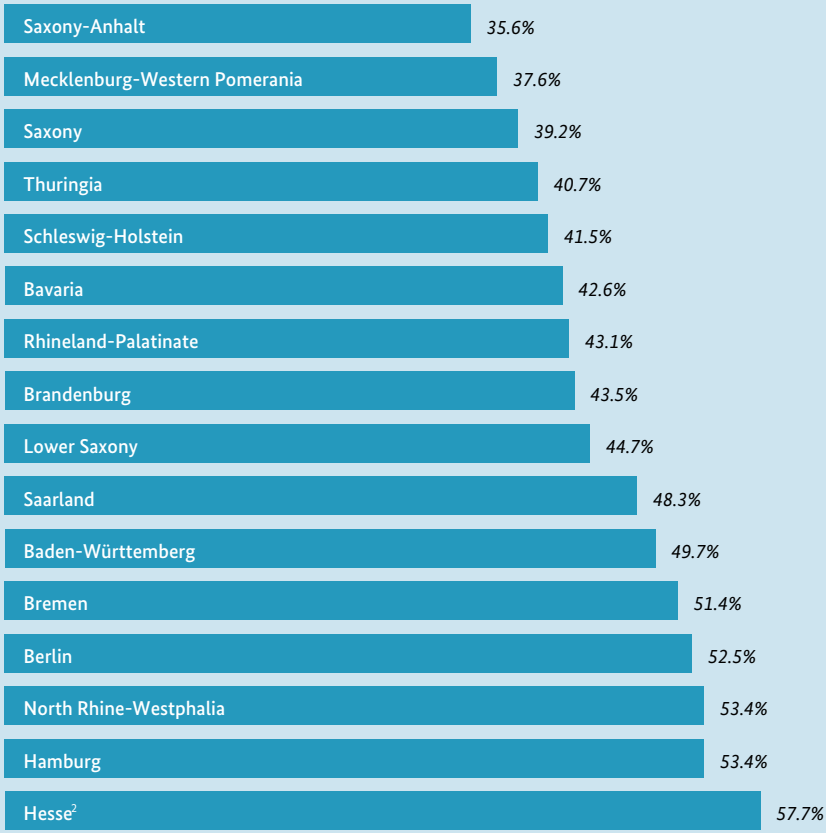
Fig. 39 First-year students and percentage of first-year students, by sex (2000-2015)



1) Summer semester and following winter semester (e.g. 2010 = SS 2010 and WS 2010/2011). 2015: data are preliminary, source: Fachserie 11 Reihe 4.1 Vorbericht.
2) Share of students in their first semester (first enrolment) in the age-specific population (related to the year of birth). As of 2014, population data are based on 2011 Census. From 2010 to 2013, data are adjusted considering the double *Abitur* graduation classes. 2015: data are preliminary, source: Schnellmeldungsergebnisse der Hochschulstatistik.
Source: Federal Statistical Office, Fachserie 11 Reihe 4.3.1

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-39
Additional data: www.datenportal.bmbf.de/en/2.5.73

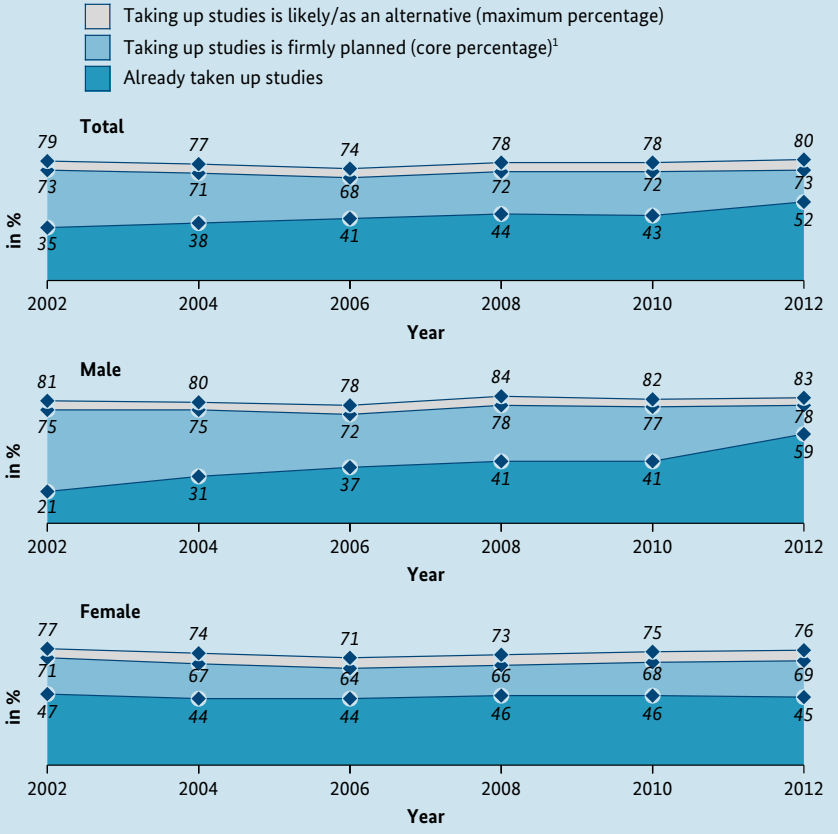
Fig. 40 Percentage of first-year students[1], by *Land* in which the higher education entrance qualification has been acquired (2014)



1) Share of students in their first semester (first enrolment) in the age-specific population (related to the year of birth).
2) In Hesse double *Abitur* graduation classes by a factor of 1.3.
Source: Federal Statistical Office, Fachserie 11 Reihe 4.3.1

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-40
Additional data: www.datenportal.bmbf.de/en/2.5.73

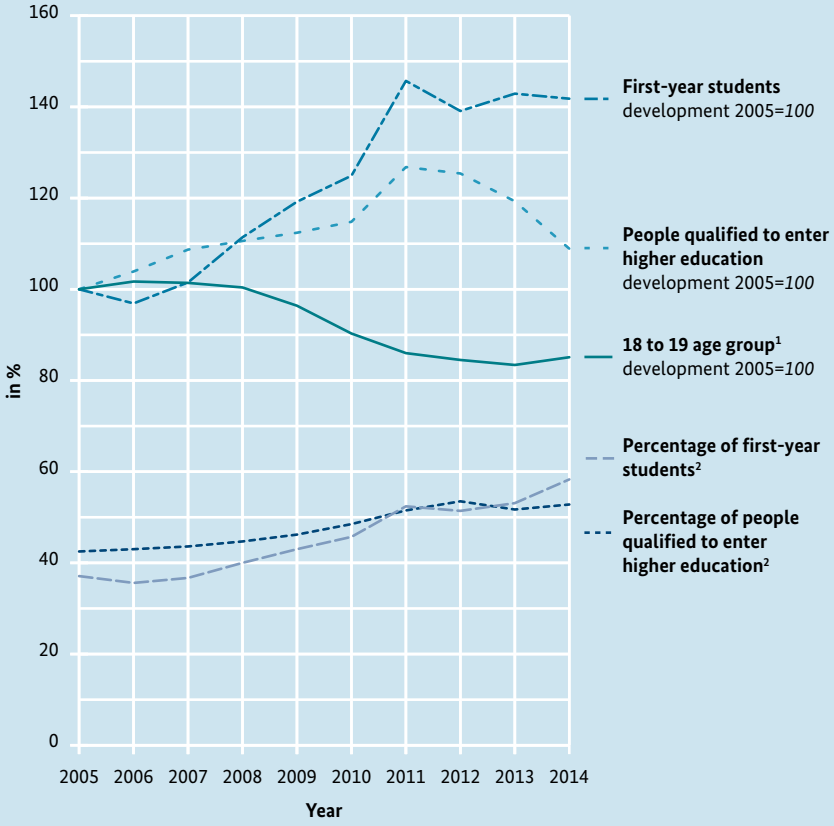
Fig. 41 Percentage range of people who pursue higher education, by sex (2002-2012)



Note: For explanations of the percentage range of people who pursue higher education see glossary.
1) Excluding colleges of public administration and colleges of the armed forces. Since 2008, including vocational academies (*Berufsakademien*) and Baden-Württemberg Cooperative State University.
Source: Deutsches Zentrum für Hochschul- und Wissenschaftsforschung, Forum Hochschule 6/2014, Studienberechtigte 2012 ein halbes Jahr vor und ein halbes Jahr nach Schulabgang, table A5.8

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-41
Additional data: www.datenportal.bmbf.de/en/2.5.74

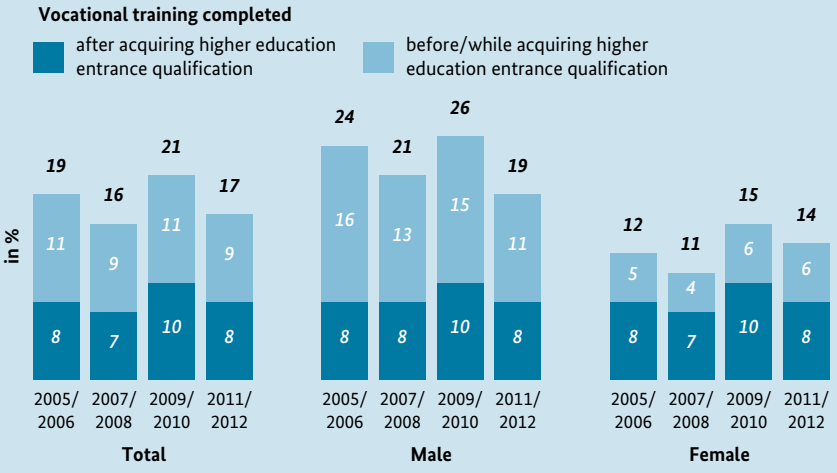
Fig. 42 Transition to higher education – development of basic figures (2005-2014)



1) As from 2011, findings are based on 2011 Census.
2) From 2007 to 2013, the figures are adjusted considering the double *Abitur* graduation classes. As of 2014, population data are based on 2011 Census.
Source: Federal Statistical Office (Fachserie 11 Reihe 4.3.1; GENESIS-Online Datenbank, Fortschreibung des Bevölkerungsstandes); calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-42
Additional data: www.datenportal.bmbf.de/en/2.5.75

Fig. 43 German first-year students at higher education institutions who have completed vocational training, by sex (winter semester 2005/2006-2011/2012)

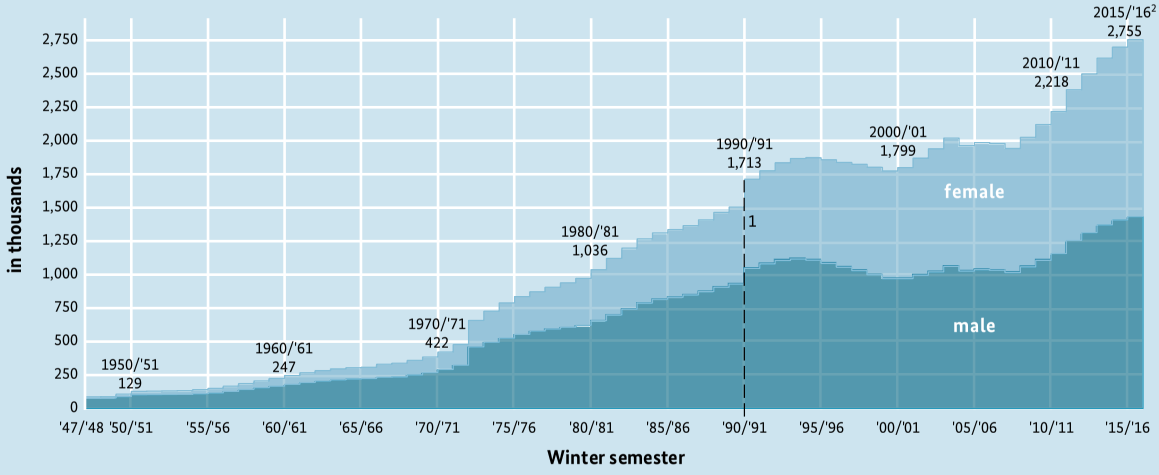


Note: Possible rounding differences.
Source: Datenreport zum Berufsbildungsbericht 2009, Übersicht A5.4.2-3; Datenreport zum Berufsbildungsbericht 2011 and 2013, table A4.6.3-4; **Data:** Deutsches Zentrum für Hochschul- und Wissenschaftsforschung, Studienberechtigtenbefragungen; calculations of the Federal Institute for Vocational Education and Training

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-43
Additional data: www.datenportal.bmbf.de/en/2.5.76

The rate of first-year students at higher education institutions who completed company-based training before entering higher education increased slightly among both men and women in 2009/2010. In 2011/2012 the rate again decreased.

Fig. 44 Number of students, by sex (winter semester 1947/1948-2015/2016)

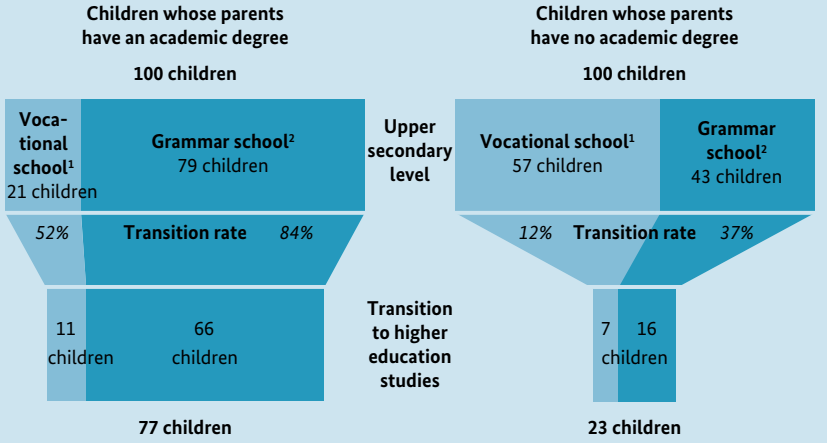


1) Since 1990, including eastern German *Länder* and Berlin-East. **2)** Preliminary results, source: Schnellmeldungsergebnisse der Hochschulstatistik.
Source: Federal Statistical Office, Fachserie 11 Reihe 4.1 and special evaluation

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-44
Additional data: www.datenportal.bmbf.de/en/2.5.23 www.datenportal.bmbf.de/en/2.5.24

Demographic developments and the expansion of education in the 1960s led to a strong increase in the number of university students. Women in particular benefited from this development. While only 19.7% of all students in the 1950/1951 winter semester were women, this figure has risen continuously, reaching 48.0% in the 2015/2016 winter semester (preliminary result).

Fig. 45 Educational filter: Social selection and educational paths, by the parent's educational status (2009)



1) Specialised upper secondary school, two-year full-time vocational school, part-time vocational school, full-time vocational school, specialised academy (Bavaria), school for nurses, midwives etc., pre-vocational training year, basic vocational training year.
2) Upper secondary level at general grammer school, integrated comprehensive school, specialised grammar school.
Source: 20th Social Survey of the Deutsches Studentenwerk, fig. 3.27
Data: Federal Statistical Office, special evaluation from the 1999 and 2009 Microcensus; Deutsches Zentrum für Hochschul- und Wissenschaftsforschung, Studienanfängerbefragung 2009

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-45
Additional data: www.datenportal.bmbf.de/en/2.3.31

Figure 45 compares children's participation opportunities in education. A distinction is made according to the education status of the parents. Unlike in previous presentations of the educational filter, the educational background of a child is determined by the education status of both parents and no longer of the father alone. Furthermore, participation in education at secondary level II now distinguishes between upper classes of a grammar school (*Gymnasium*) and vocational schools (*berufliche Schulen*). Children whose parents have an academic background have both greater opportunities to reach the upper secondary grades in grammar schools and to take up university studies. In 2009, 77% of children in this group took up studies. This is more than three times the number of children from non-academics which was at 23%.

Fig. 46 Students, by types of higher education institution, subject groups and sex, share of foreign students (winter semester 2015/2016)[1]

Subject group		Type of higher education institution		
		Total[2]	Uni-versity[3]	University of applied sciences[4]
Humanities	t	**348,069**	337,119	10,950
	f	***67.5%***	*67.4%*	*71.0%*
	a	***12.2%***	*12.3%*	*10.7%*
Sports	t	**27,563**	27,093	470
	f	***38.0%***	*38.1%*	*30.6%*
	a	***4.5%***	*4.6%*	*3.0%*
Law, economics, social sciences	t	**997,580**	563,186	398,152
	f	***56.2%***	*56.4%*	*56.4%*
	a	***9.7%***	*10.5%*	*9.4%*
Mathematics, natural sciences	t	**314,922**	292,284	22,610
	f	***46.5%***	*46.7%*	*44.6%*
	a	***10.9%***	*10.7%*	*13.5%*
Human medicine, health sciences	t	**164,971**	118,642	46,329
	f	***65.2%***	*62.2%*	*72.8%*
	a	***10.1%***	*12.3%*	*4.7%*
Agricultural, forestry and nutritional sciences, veterinary medicine	t	**62,188**	38,845	23,343
	f	***58.1%***	*63.0%*	*49.9%*
	a	***10.3%***	*12.6%*	*6.5%*
Engineering	t	**739,507**	343,044	396,309
	f	***22.1%***	*23.1%*	*21.3%*
	a	***16.3%***	*20.4%*	*12.9%*
Art, art theory	t	**94,019**	64,948	29,071
	f	***62.6%***	*63.3%*	*61.1%*
	a	***18.6%***	*22.0%*	*11.0%*
Total[5]	**t**	**2,755,408**	**1,789,955**	**929,029**
	f	***48.0%***	***51.0%***	***42.1%***
	a	***12.3%***	***13.3%***	***10.8%***

Explanation of abbreviations/symbols: t = total; f = share of females; a = share of foreign students.
1) Preliminary results, source: Fachserie 11 Reihe 4.1 Vorbericht. As from 2015/2016, there has been a change in the subject classification so parts of the data are of limited comparability with the previous years. For more information see source.
2) All higher education institutions including colleges of public administration.
3) Including colleges of education, colleges of theology, colleges of art and music.
4) Excluding colleges of public administration.
5) Including other studies and unclear.
Source: Federal Statistical Office, Fachserie 11 Reihe 4.1; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-46
Additional data: www.datenportal.bmbf.de/en/2.5.77

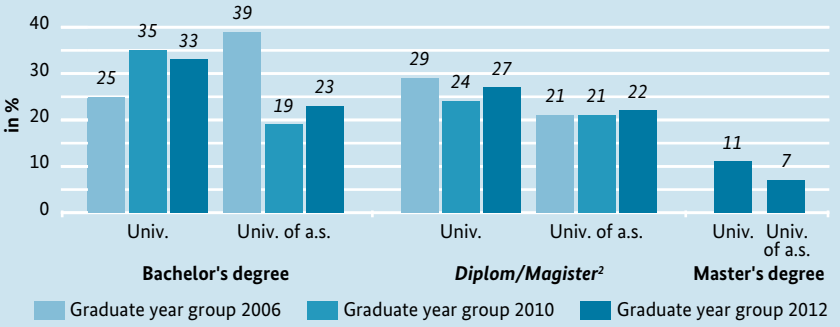
Fig. 47 Higher education graduates, by examination types and sex, share of foreign graduates (2010-2014)

Examination type		2010	2011	2012	2013	2014
Bachelor's degree[1]	t	112,108	152,484	183,169	207,401	229,282
	f	*51.1%*	*50.0%*	*49.3%*	*49.5%*	*48.6%*
	a	*6.9%*	*6.9%*	*6.6%*	*6.6%*	*6.6%*
Master's degree[1]	t	26,722	41,292	58,560	78,358	97,034
	f	*45.7%*	*44.2%*	*45.7%*	*46.2%*	*46.2%*
	a	*28.3%*	*23.2%*	*20.1%*	*18.5%*	*17.7%*
University degree[1,2,3]	t	103,413	94,018	80,290	64,054	50,675
	f	*52.3%*	*51.5%*	*51.9%*	*52.1%*	*53.7%*
	a	*11.0%*	*10.8%*	*10.7%*	*10.2%*	*10.2%*
Degree from university of applied sciences[2]	t	56,248	38,638	25,804	17,381	12,074
	f	*41.1%*	*39.9%*	*39.6%*	*39.5%*	*37.9%*
	a	*7.6%*	*8.4%*	*8.6%*	*8.2%*	*6.3%*
Teacher's degree[4]	t	37,577	38,758	38,708	41,519	43,291
	f	*73.7%*	*73.1%*	*73.5%*	*73.1%*	*73.3%*
	a	*1.8%*	*1.9%*	*1.9%*	*2.1%*	*2.1%*
Doctorate	t	25,629	26,981	26,807	27,707	28,147
	f	*44.1%*	*44.9%*	*45.4%*	*44.2%*	*45.5%*
	a	*14.9%*	*15.1%*	*15.4%*	*15.7%*	*16.4%*
Total degrees	**t**	**361,697**	**392,171**	**413,338**	**436,420**	**460,503**
	f	***51.4%***	***50.7%***	***50.7%***	***50.8%***	***50.5%***
	a	***9.8%***	***9.8%***	***9.6%***	***9.5%***	***9.5%***
Habilitation	t	1,755	1,563	1,646	1,567	1,627
	f	*24.9%*	*25.5%*	*27.0%*	*27.4%*	*27.8%*
	a	*7.0%*	*8.1%*	*8.9%*	*8.3%*	*9.1%*

Explanation of abbreviations/symbols: t = total; f = share of females; a = share of foreign students.
1) Excluding teacher's degree.
2) Excluding bachelor's degree and master's degree.
3) Including the examination groups "artistic degree" and "other degree".
4) Including teacher's bachelor degree and teacher's master degree.
Source: Federal Statistical Office, Fachserie 11 Reihen 4.2, 4.4; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-47
Additional data: www.datenportal.bmbf.de/en/2.5.45
www.datenportal.bmbf.de/en/2.5.102

Fig. 48 Drop-out rates of German students, by degree types and types of higher education institution (graduate year groups 2006/2010/2012)[1]



Explanation of abbreviations: Univ. = university; Univ. of a.s. = university of applied sciences (*Fachhochschule*).
1) The drop-outs of the different degree programmes relate to different years of first-year students.
2) Due to the changes in the higher education structures, the *Diplom/Magister* drop-out rates of the separate graduate year groups are comparable only to a very limited extend among each other as well as with the drop-out rates of the other degree programmes. For further information see source.
Source: Deutsches Zentrum für Hochschul- und Wissenschaftsforschung (Forum Hochschule 3/2012, fig. 3; Forum Hochschule 4/2014, fig. 2, 5, 6, 8 and 9)

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-48
Additional data: www.datenportal.bmbf.de/en/2.5.90

Fig. 49 Development of drop-out rates of German students in state examination degree programmes (graduate year groups 2006-2012)

Source: Deutsches Zentrum für Hochschul- und Wissenschaftsforschung, Forum Hochschule 4/2014, fig. 2

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-49
Additional data: www.datenportal.bmbf.de/en/2.5.90

Fig. 50 Duration of studies with successful final examination, by examination types and sex (2010-2014)

Examination type		2010		2011		2012		2013		2014	
		SH	SS	SH	SS	SH	SS	SH	SS	SH	SS
Bachelor's degree[1]	Male	8.0	7.1	8.1	7.3	8.4	7.5	8.6	7.6	8.6	7.7
	Female	7.5	6.8	7.6	6.9	7.8	7.1	8.0	7.2	8.1	7.3
	Total	7.7	6.9	7.9	7.1	8.1	7.3	8.3	7.4	8.3	7.5
Master's degree[1]	Male	11.2	4.8	11.1	4.7	11.5	4.8	11.6	4.9	11.9	5.0
	Female	10.8	4.7	11.0	4.7	11.1	4.8	11.4	4.9	11.5	5.0
	Total	11.0	4.8	11.1	4.7	11.3	4.8	11.5	4.9	11.7	5.0
University degree[1,2]	Male	13.6	12.3	14.0	12.7	14.4	13.2	15.1	13.8	15.8	14.5
	Female	13.4	12.0	13.6	12.3	14.0	12.6	14.4	13.0	14.8	13.4
	Total	13.5	12.2	13.8	12.5	14.2	12.9	14.7	13.4	15.3	13.9
Degree at university of applied sciences[2]	Male	10.7	9.8	11.1	10.1	11.4	10.3	10.7	9.8	10.1	9.4
	Female	10.0	9.2	10.3	9.4	10.5	9.5	9.7	8.9	9.1	8.3
	Total	10.4	9.6	10.8	9.8	11.0	10.0	10.3	9.4	9.7	8.9
Teacher's degree[3]	Male	13.0	9.9	13.0	9.7	13.0	9.3	13.0	9.0	12.8	8.7
	Female	11.3	8.6	11.3	8.5	11.3	8.1	11.3	7.9	11.2	7.8
	Total	11.7	8.9	11.8	8.8	11.7	8.4	11.7	8.2	11.6	8.0
Total	**Male**	**10.9**	**9.0**	**10.8**	**8.7**	**10.7**	**8.4**	**10.7**	**8.0**	**10.6**	**7.8**
	Female	**10.5**	**8.7**	**10.4**	**8.4**	**10.3**	**8.1**	**10.2**	**7.8**	**10.2**	**7.6**
	Total	**10.7**	**8.8**	**10.6**	**8.5**	**10.5**	**8.2**	**10.5**	**7.9**	**10.4**	**7.7**

Explanation of abbreviations/symbols: SH = duration of studies by semesters in higher education; SS = duration of studies by subject-related semesters.
1) Excluding teacher's degree.
2) Excluding bachelor's degree and master's degree.
3) Including teacher's bachelor degree and teacher's master degree.
Source: Federal Statistical Office, special evaluation

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-50
Additional data: www.datenportal.bmbf.de/en/2.5.80

Fig. 51 Doctorates and habilitations, by subject groups and sex (2014)

Subject group	Doctorates		Habilitations	
	Total number	Share of females	Total number	Share of females
Languages, cultural studies	3,015	*57.1%* 	261	*42.9%* 
Sports	157	*38.2%* 	11	*45.5%* 
Law, economics, social sciences	3,646	*38.2%* 	143	*25.2%* 
Mathematics, natural sciences	9,521	*39.8%* 	276	*21.0%* 
Human medicine, health sciences	7,326	*59.8%* 	828	*24.9%* 
Veterinary medicine	437	*83.8%* 	15	*80.0%* 
Agricultural, forestry and nutritional sciences	532	*51.9%* 	20	*40.0%* 
Engineering	3,187	*19.0%* 	53	*15.1%* 
Art, art theory	306	*63.4%* 	20	*40.0%* 
Total[1]	**28,147**	***45.5%*** 	**1,627**	***27.8%*** 

1) Doctorates including subjects outside the fields of study stucture.
Source: Federal Statistical Office, Fachserie 11 Reihen 4.2, 4.4; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-51
Additional data: www.datenportal.bmbf.de/en/2.5.81

Fig. 52 Higher education staff, by subject groups and sex (2014)

Subject group		Total staff	Academic and creative arts staff	Administrative, technical and other staff
Languages, cultural studies	t	**56,226**	50,936	5,290
	f	***57.5%***	*54.6%*	*85.3%*
Sports	t	**3,918**	3,361	557
	f	***42.6%***	*39.8%*	*59.6%*
Law, economics, social sciences	t	**80,126**	72,858	7,268
	f	***39.8%***	*35.8%*	*79.0%*
Mathematics, natural sciences	t	**89,735**	71,126	18,609
	f	***35.0%***	*28.1%*	*61.6%*
Human medicine, health sciences	t	**167,285**	65,272	102,013
	f	***69.9%***	*47.1%*	*84.5%*
Veterinary medicine	t	**2,949**	1,780	1,169
	f	***68.4%***	*64.5%*	*74.3%*
Agricultural, forestry and nutritional sciences	t	**10,106**	6,732	3,374
	f	***50.4%***	*43.2%*	*64.7%*
Engineering	t	**76,999**	61,140	15,859
	f	***23.6%***	*19.3%*	*40.3%*
Art, art theory	t	**20,482**	19,226	1,256
	f	***42.1%***	*41.0%*	*59.3%*
Central facilities[1]	t	**114,130**	27,614	86,516
	f	***58.4%***	*51.9%*	*60.5%*
Central facilities of university clinics[2]	t	**53,190**	1,224	51,966
	f	***68.4%***	*56.2%*	*68.6%*
Total	**t**	**675,146**	**381,269**	**293,877**
	f	***52.0%***	***38.0%***	***70.3%***

Explanation of abbreviations/symbols: t = total; f = share of females.
1) Excluding clinic specific facilities.
2) Only human medicine.
Source: Federal Statistical Office, Fachserie 11 Reihe 4.4; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-52
Additional data: www.datenportal.bmbf.de/en/2.5.82

Fig. 53 Share of males and females in various status and degree groups in the field of higher education (1994/2004/2014)

1) In their first semester (first enrolment).
2) Data of winter semester (e.g. 2014 = WS 2014/2015).
3) Excluding doctorates.
Source: Federal Statistical Office, Fachserie 11 Reihen 4.1, 4.2, 4.4; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-53
Additional data: www.datenportal.bmbf.de/en/2.5.83

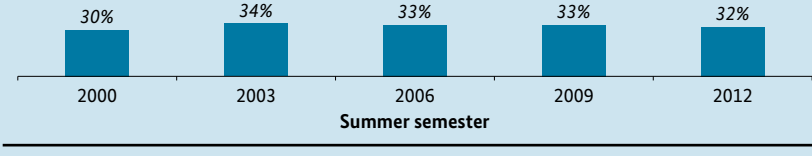
Fig. 54 BAföG – number of recipients; expenditure, by amounts and types of aid (2010-2014)

Recipients/Financial amount	2010	2011	2012	2013	2014
Recipients					
Pupils[1]	323,808	319,206	308,288	292,815	278,194
Students	592,430	643,578	671,059	665,928	646,576
Total	**916,295**	**962,834**	**979,347**	**958,743**	**924,770**
Fully funded	*48.9%*	*47.6%*	*46.7%*	*46.5%*	*46.4%*
Partly funded	*51.1%*	*52.4%*	*53.3%*	*53.5%*	*53.6%*
Average monthly number[2]	**584,850**	**615,368**	**630,164**	**619,620**	**596,380**
Financial amount					
Total (in thousands of euros)	**2,873,065**	**3,180,046**	**3,277,975**	**3,240,623**	**3,142,077**
Grant	*65.9%*	*65.3%*	*64.9%*	*64.8%*	*64.8%*
Interest-free loan	*34.1%*	*34.7%*	*35.1%*	*35.2%*	*35.2%*
Average amount of financial aid per capita[3] (in euros per month)	**409**	**431**	**433**	**436**	**439**

Explanation of abbreviations/symbols: BAföG = Federal Training Assistance Act.
1) Until 2011, the recipients of distant learning institutions are included in total only, since 2012 they are classified as belonging to the group of pupils. **2)** Arithmetic mean of a year's twelve average monthly numbers. **3)** With regard to the average monthly number.
Source: Federal Statistical Office, Fachserie 11 Reihe 7

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-54
Additional data: www.datenportal.bmbf.de/en/2.6.11

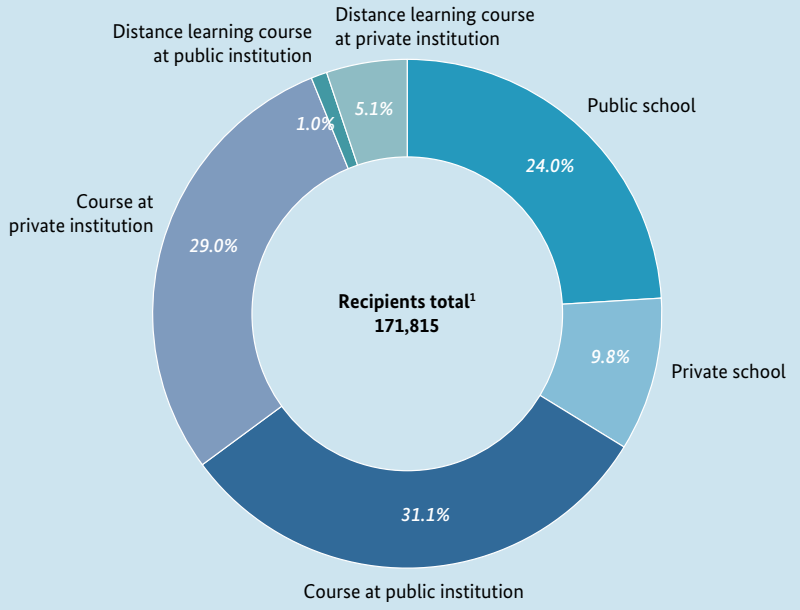
Fig. 55 BAföG – share of recipients of those students in their central higher education semesters (2000-2012)[1]



Explanation of abbreviations/symbols: BAföG = Federal Training Assistance Act.
1) Students in their first six higher education semesters. Since 2009, including master students up to their tenth semester. Since 2012, only students in full-time courses. Until 2003, only German students. Since 2006, including foreigners with a German education. The BAföG quotas of the Social Survey must be regarded as snapshots and therefore there is no comparability with quotas that are based on official BAföG statistics.
Source: 19th and 20th Social Survey of the Deutsches Studentenwerk, fig. 8.1
Data: Deutsches Zentrum für Hochschul- und Wissenschaftsforschung

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-55
Additional data: www.datenportal.bmbf.de/en/2.6.12

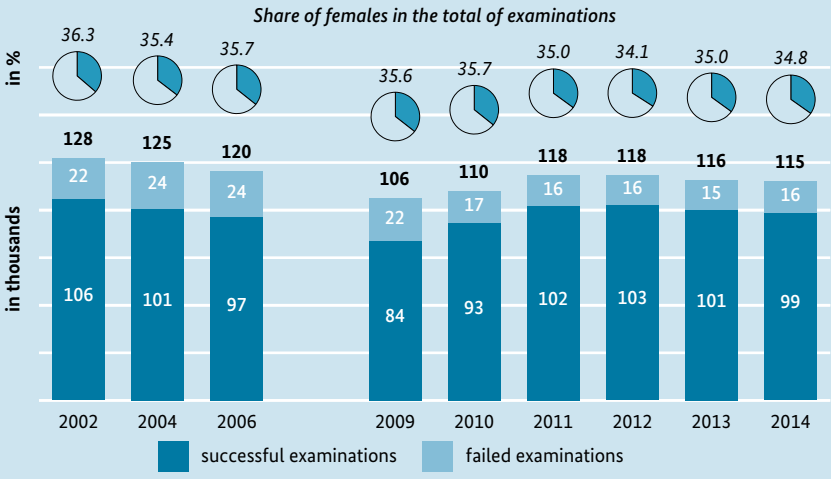
Fig. 56 AFBG ("*Meister*-BAföG") – recipients, by continuing education institutions (2014)



Explanation of abbreviations/symbols: AFBG = Upgrading Training Assistance Act; BAföG = Federal Training Assistance Act.
1) Inclusive foreign case (*Auslandsfall*, AFBG, section 5(2)): 5 recipients.
Source: Federal Statistical Office, Fachserie 11 Reihe 8

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-56
Additional data: www.datenportal.bmbf.de/en/2.6.8
www.datenportal.bmbf.de/en/2.6.9

Fig. 57 Further training examinations / *Meister* examinations, by sex (2002-2014)[1]

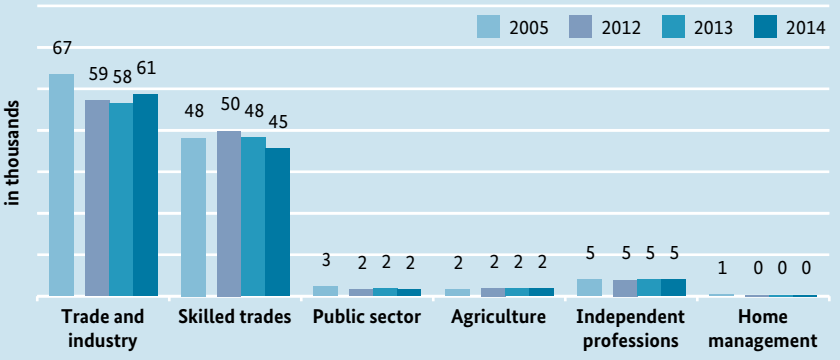


1) Due to the redesign of the statistic in 2007, the comparability of the results before and after this change is limited. For 2007 and 2008 no data has been published of the field further training examination / *Meister* examination. Possible rounding differences.
Source: Federal Statistical Office, Fachserie 11 Reihe 3; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-57
Additional data: www.datenportal.bmbf.de/en/2.7.13

The sharp drop in the number of *Meister* examinations until 2009 can be attributed to two factors: First, the number of new training contracts fell by about 74,000 between 1999 and 2009 (about 62,000 of them in the skilled trades alone). This reduces the number of potential participants in *Meister* courses. Second, as a result of the reform of the Craft Trades Law in early 2004, a *Meister* qualification is no longer necessary to run a business in more than half of all skilled trades. After the low in 2009, an increase was recorded until 2012, in particular in the number of successful examinations, while the numbers for 2013 and 2014 slightly declined.

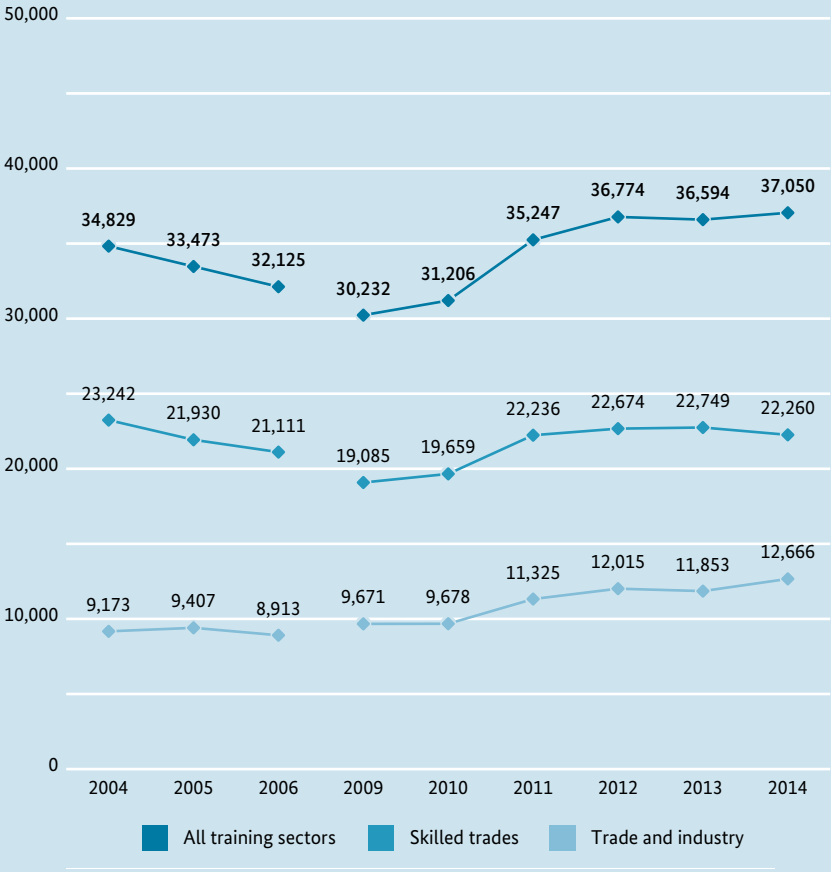
Fig. 58 Further training examinations / *Meister* examinations, by training sectors (2005/2012-2014)[1]



1) Due to the redesign of the statistic in 2007, the comparability of the results before and after this change is limited.
Source: Federal Statistical Office, Fachserie 11 Reihe 3

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-58
Additional data: www.datenportal.bmbf.de/en/2.7.13

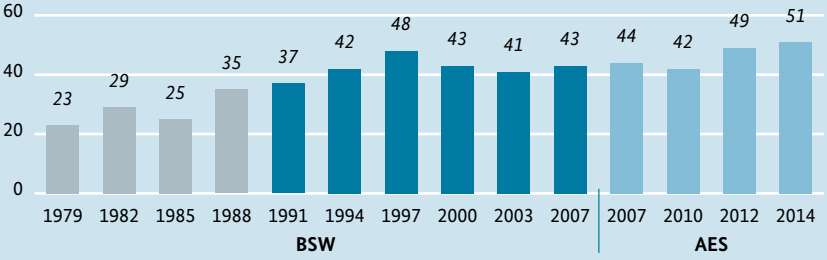
Fig. 59 Successful *Meister* examinations, by training sectors (2004-2014)[1]



1) Due to the redesign of the statistic in 2007, the comparability of the results before and after this change is limited. For 2007 and 2008 no data has been published of the field further training examination / *Meister* examination.
Source: Datenreport zum Berufsbildungsbericht 2009, table B5.2-4 (updated)
Data: Federal Statistical Office, Fachserie 11 Reihe 3; calculations of the Federal Institute for Vocational Education and Training and of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-59
Additional data: www.datenportal.bmbf.de/en/2.7.14

Fig. 60 Participation in continuing education in Germany (1979-2014)

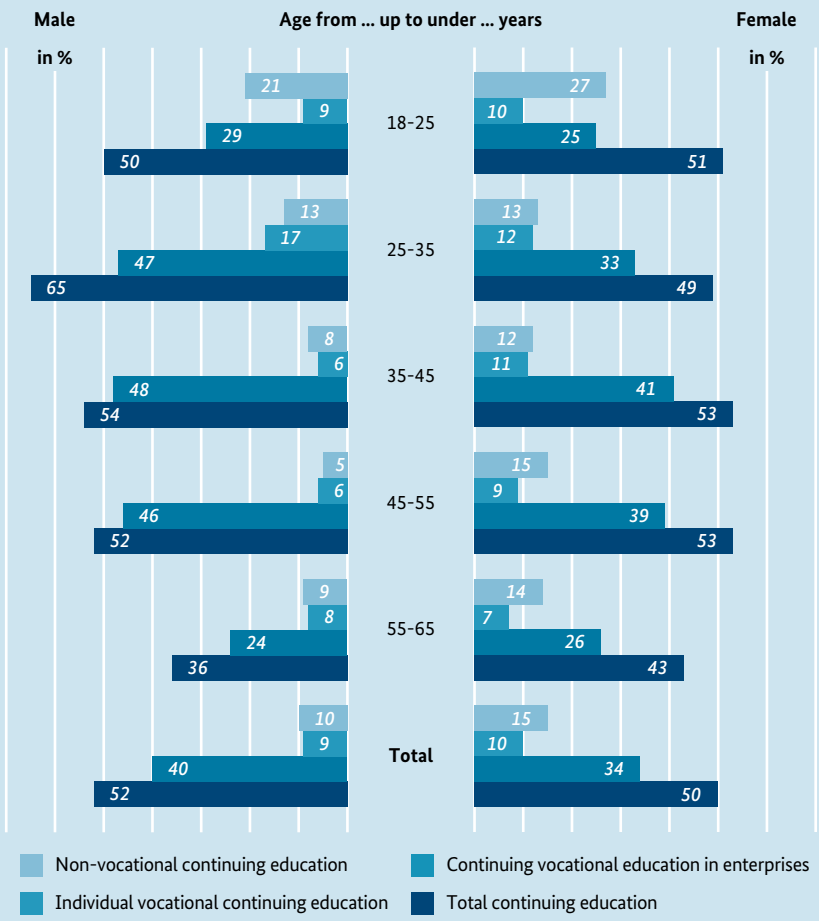


Explanation of abbreviations/symbols: BSW = continuing education reporting system (*Berichtsystem Weiterbildung*); AES = Adult Education Survey.
1) As from 1991, including eastern German *Länder* and Berlin-East. Basis until 2007: persons aged 19 to 64. Basis as of 2010: persons aged 18 to 64.
Source: TNS Infratest Sozialforschung, Adult Education Survey 2014

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-60
Additional data: www.datenportal.bmbf.de/en/2.7.24

In 2014, 51% of the 18 to 64 year olds took part in continuing education. This value confirms the trend of growing participation in continuing education noted since 2012. The participation rate in continuing education varies widely among different groups of persons. Younger people participate more often than older people. The age group of the 25 to 34 year old shows the highest participation rate; and the higher the level of education, the greater the participation in continuing education.

Fig. 61 Participation in continuing education, by age groups and sex (2014)



Source: TNS Infratest Sozialforschung, Adult Education Survey 2014

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-61
Additional data: www.datenportal.bmbf.de/en/2.7.11

Fig. 62 Participation rates in continuing education, by age groups, highest school-leaving qualification and highest vocational qualification (2012/2014)

Resident population aged 18 to 64	Participation rate (in %)							
	Continuing education, total		Vocational continuing education in enterprises		Individual vocational continuing education		Non-vocational continuing education	
	2012	2014	2012	2014	2012	2014	2012	2014
Age group Age from ... up to under ... Years								
18 - 25	***49***	***50***	*23*	*27*	*12*	*9*	*22*	*24*
25 - 35	***51***	***58***	*38*	*40*	*10*	*14*	*12*	*13*
35 - 45	***52***	***53***	*40*	*45*	*9*	*9*	*11*	*10*
45 - 55	***51***	***53***	*40*	*42*	*9*	*7*	*10*	*10*
55 - 65	***38***	***39***	*27*	*25*	*6*	*8*	*12*	*12*
Highest school-leaving qualification[1]								
Secondary general school certificate or below	***32***	***36***	*23*	*27*	*5*	*6*	*8*	*8*
Intermediate school certificate	***51***	***53***	*40*	*41*	*8*	*9*	*11*	*11*
Entrance qualification for universities of applied sciences or higher	***64***	***62***	*44*	*43*	*14*	*13*	*18*	*18*
Highest vocational qualification								
Without any vocational qualification	***37***	***39***	*18*	*22*	*9*	*7*	*15*	*15*
Training / full-time vocational school	***44***	***47***	*33*	*36*	*7*	*8*	*10*	*9*
Meister / trade and technical school	***65***	***66***	*53*	*58*	*9*	*11*	*15*	*11*
Higher education degree	***68***	***67***	*51*	*48*	*15*	*15*	*17*	*18*
Total	***49***	***51***	***35***	***37***	***9***	***9***	***13***	***12***

1) The groups by highest school-leaving qualifications are summed up on the base of the very differentiated AES questionnaire. Due to the weak database, the following groups are not listed: the groups that (a) did not state a school-leaving qualification and (b) did not obtain a school-leaving qualification because they still attend school.
Source: TNS Infratest Sozialforschung, Adult Education Survey 2014

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-62
Additional data: www.datenportal.bmbf.de/en/2.7.15

Fig. 63 Participation, amount of time and costs of continuing vocational education in enterprises[1], by economic sectors (2010)

Economic sector[2]		Participation rate (in %)			Participation		Costs for courses per employee (in euros)
		Total employed	By sex		Per employee (in hours)	Per participant (in hours)	
			Male	Female			
B 5-9	Mining and quarrying	*52.0*	*53.3*	*46.8*	10	20	676
C 10-12	Mfr. of food products, beverages and tobacco	*45.7*	*46.8*	*44.4*	7	16	u
C 13-15	Mfr. of textiles and textile products; Mfr. of leather and leather products	*45.7*	*49.2*	*41.4*	10	21	u
C 17-18	Mfr. of paper and paper products; printing and reproduction	*45.9*	*49.6*	*35.9*	9	20	(454)
C 19-23	Mfr. of coke and refined petroleum products, chemicals, chemical products, basic pharmaceutical products and preparations, rubber and plastic products, and of other non-metallic mineral products	*48.2*	*48.5*	*47.5*	10	21	(718)
C 24-25	Mfr. of basic metals and fabricated metal products	*38.8*	*39.3*	*36.4*	8	22	(542)
C 26-28, 33	Mfr. of computer, electronic and optical products; Mfr. of machinery and equipment n.e.c.; repair and installation of machinery and equipment	*58.6*	*60.1*	*52.7*	14	24	u
C 29-30	Mfr. of transport equipment	*45.2*	*44.9*	*46.8*	11	24	801
C 16, 31-32	Mfr. of wood and wood products; furniture; other manufacturing	*37.4*	*35.8*	*41.2*	6	15	(351)
D + E 35-39	Electricity; water supply, sewerage, waste management and remediation activities	*56.6*	*58.5*	*50.6*	14	25	(1,040)
F 41-43	Construction	*42.7*	*44.2*	*30.3*	7	17	370
G 45	Wholesale and retail trade and repair of motor vehicles and motorcycles	*56.4*	*58.2*	*49.5*	14	26	(847)
G 46	Wholesale trade, except of motor vehicles and motorcycles	*39.9*	*43.7*	*33.8*	6	15	u
G 47	Retail trade, except of motor vehicles and motorcycles	*45.5*	*57.1*	*39.5*	9	21	u
H 49-53	Transportation and storage	*49.3*	*51.8*	*41.3*	10	20	u
I 55-56	Accomodation and food service activities	*42.3*	*43.6*	*41.5*	5	12	(228)
J 58-63	Information and communication	*57.1*	*58.5*	*53.8*	20	36	u
K 64-65	Financial and insurance activities	*55.8*	*55.0*	*56.4*	17	31	(1,426)
K 66	Activities auxiliary to financial services and insurance activities	*26.1*	*22.6*	*29.9*	12	45	u
L+M	Real estate activities; professional, scientific and technical activities	*39.8*	*39.4*	*40.3*	8	19	u
Total		***47.0***	***49.0***	***43.2***	**11**	**23**	**734**

Explanation of abbreviations/symbols: Mfr. = Manufacture; u = no data because the numerical value is not sufficiently reliable; () = limited informational value because numerical value is of limited statistical reliability.
1) In enterprises that provide continuing vocational training.
2) According to the classification of economic activities (NACE Rev. 2).
Source: Federal Statistical Office, Fourth European Continuing Vocational Training Survey 2010 (CVTS4)

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-63
Additional data: www.datenportal.bmbf.de/en/2.7.22

3 International comparison

Globalization has become a fact. The question is no longer whether to act globally but how good we are at it. International comparisons provide a means of orientation. The results show that Germany is in an excellent position!

On the European Commission's Innovation Index 2015, Germany ranks fourth in the leading group and with regard to world-market relevant patents per one million inhabitants, Germany is top placed in international comparison. The same applies to the scientific publications per one million inhabitants. In 2014, Germany ranked with 1,318 publications ahead of the USA and about 27% ahead of the EU average.

In the area of education, Germany is also maintaining a good position: The results of PISA 2012 show that Germany is now significantly above the OECD average (mathematics: 494 points, reading: 496 points, science: 501 points) in all three domains (mathematics: 514 points, reading: 508 points, science: 524 points). Germany has constantly improved its results in all the three tested domains in comparison to the first PISA survey in 2000.

Internationalization is one of the Federal Government's priorities in this legislative period. It is pursuing the aim of making even better use of the potential and opportunities of international cooperation. At the same time, Germany will face up to its global responsibility, namely to find pioneering answers to the challenges of globalization and to shape solutions – for example for an even more sustainable economy, the turnaround of the energy system or in the context of skilled staff, migration and professional mobility. Furthermore, international collaborations provide an opportunity to define Germany's role more clearly in the merging economic, science and education areas and to increase efficiently the presence of German science and research abroad. Europe is a mainstay of Germany's international commitment.

Further information

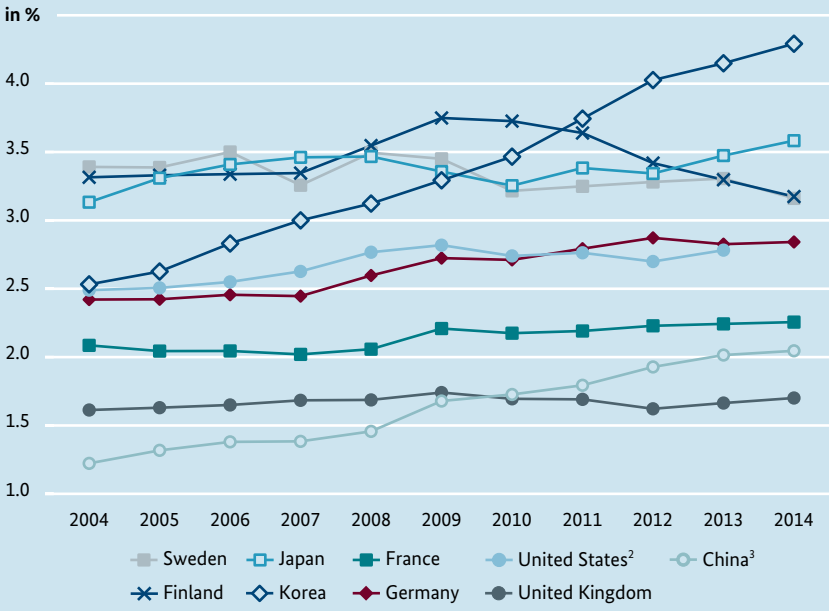
Internet portals:

- OECD database (http://stats.oecd.org/)
- Eurostat database (http://ec.europa.eu/eurostat/data/database/)
- German Education Server (www.bildungsserver.de/innovationsportal/)
- Eurydice – Education Information Network in the European Community (https://webgate.ec.europa.eu/fpfis/mwikis/eurydice/index.php/Main_Page)

Publication:

- Education at a Glance 2015 / OECD indicators (www.oecd.org/edu/eag.htm)

Fig. 64 Gross domestic expenditure on research and development (GERD), share of gross domestic product in selected countries (2004-2014)[1]



1) Some figures are provisional, estimated, or only partly comparable with figures from previous years (see original edition of "Main Science and Technology Indicators").
2) 2014: no data available.
3) Excluding Hong Kong.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 19
Data: OECD ("Main Science and Technology Indicators 2015/2")

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-64
Additional data: www.datenportal.bmbf.de/en/1.3.1

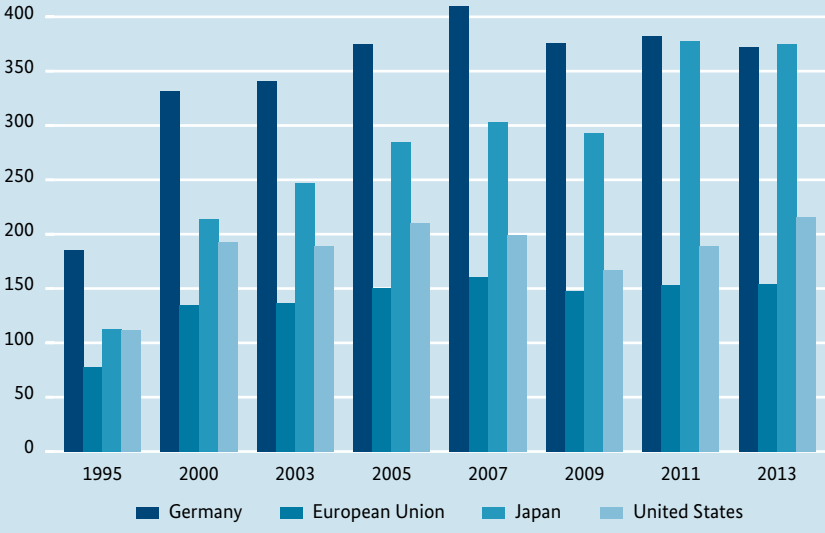
The indicator for selected countries shows different dynamics: Behind Korea, Finland, Sweden and Japan belong to the leading countries. Since 2008, Germany has been on an upward trend (with the exception of a small decline in 2013), and since 2011, Germany has been slightly ahead of the USA.

Fig. 65 R&D personnel in selected OECD countries, based on full-time equivalents (1995/2008-2014)[1]

Explanation of abbreviations/symbols: R&D = research and development; OECD = Organisation for Economic Co-operation and Development.
1) Some figures are provisional, estimated, or only partly comparable with figures from previous years (see original edition of "Main Science and Technology Indicators").
2) 2014: no data available.
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 37
Data: OECD ("Main Science and Technology Indicators 2015/2")

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-65
Additional data: www.datenportal.bmbf.de/en/1.7.11

Fig. 66 World-market relevant patents: Germany, European Union, Japan and United States (1995-2013)

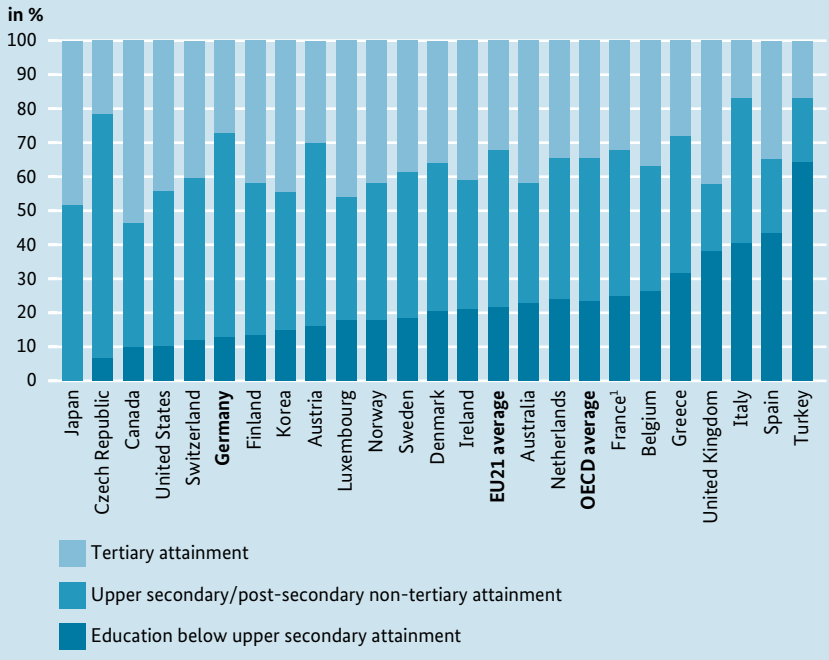


1) Inventions registered in the European Patent Office or at the World Intellectual Property Organization (WIPO).
Source: Bundesbericht Forschung und Innovation 2016, EB I Tab. 41
Data: EPA -PATSTAT, EPAPAT, WOPATENT, OECD, Eurostat, World Bank; calculations of the Fraunhofer Institute for Systems and Innovation Research

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-66
Additional data: www.datenportal.bmbf.de/en/1.8.4

World-market relevant patents are inventions filed in Europe or with the World Intellectual Property Organization. Such patents are particularly important for Germany's export-oriented economy, as they help ensure that the invention is protected even beyond the domestic market. The number of patents per million inhabitants in Germany increased by about 12% between 2000 and 2013. In 2013, Germany listed 372 registrations; that was about 41% above the EU average.

Fig. 67 Educational attainment: Adult population in selected OECD countries (2014)

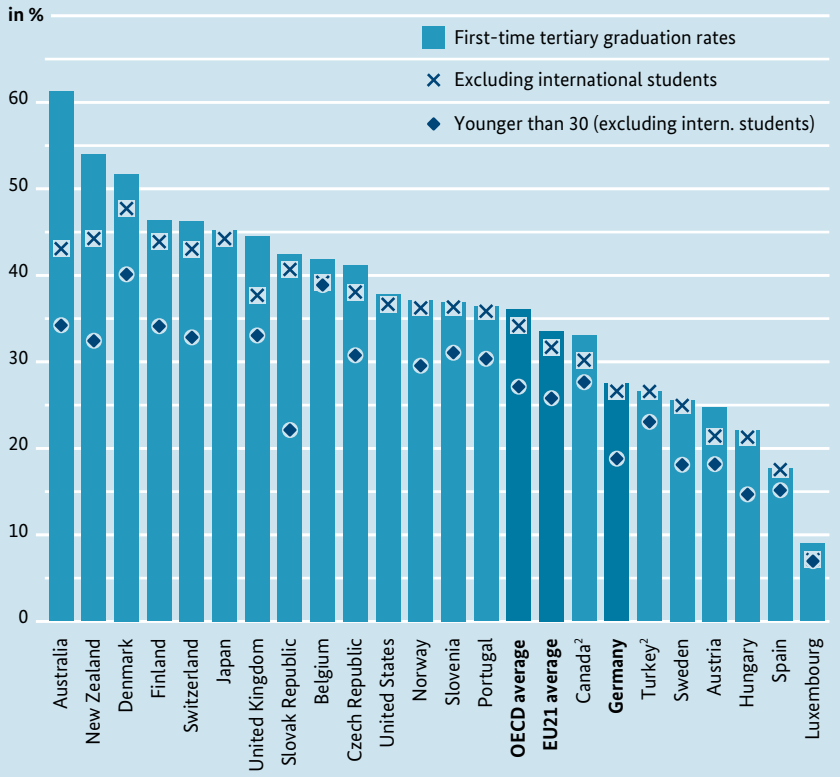


Explanation of abbreviations/symbols: OECD = Organisation for Economic Co-operation and Development.
1) Year of reference 2013 instead of 2014.
Source: OECD, Education at a Glance 2015, table A1.1a; calculations of the DZHW

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-67
Additional data: www.datenportal.bmbf.de/en/0.56

This graph illustrates the internationally well-positioned German educational attainment of the 25 to 64 year olds; about 87% achieved at least an upper secondary degree. That is mainly a result of the well-established vocational training system and the dual training system.

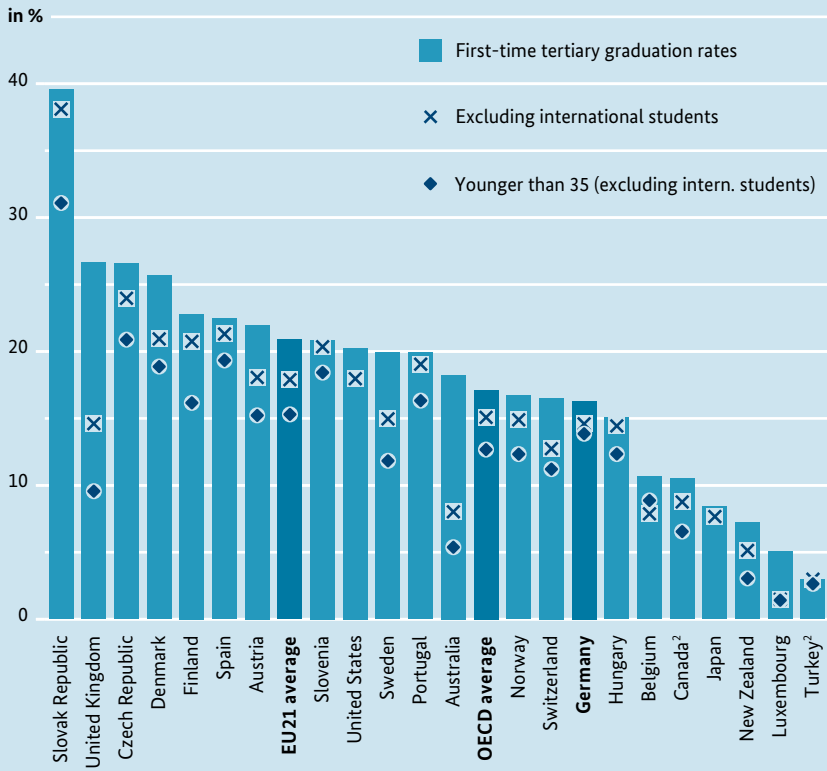
Fig. 68 First-time graduation rates[1] for ISCED level 6 (bachelor's or equivalent) in selected OECD countries (2013)



Explanation of abbreviations/symbols: ISCED = International Standard Classification of Education (see glossary); OECD = Organisation for Economic Co-operation and Development.
1) Net graduation rates measure the share of graduates of a specific age cohort. The rates indicate the extent of the share of young adults who successfully complete academic or professional education programmes at tertiary level. The net graduation rates shown in this figure are calculated as sum of age-specific graduation rates (the number of graduates of individual age cohorts is divided by the corresponding population).
2) Year of reference 2012 instead of 2013.
Source: OECD, Education at a Glance 2015, table A3.1

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-68
Additional data: www.datenportal.bmbf.de/en/2.5.103

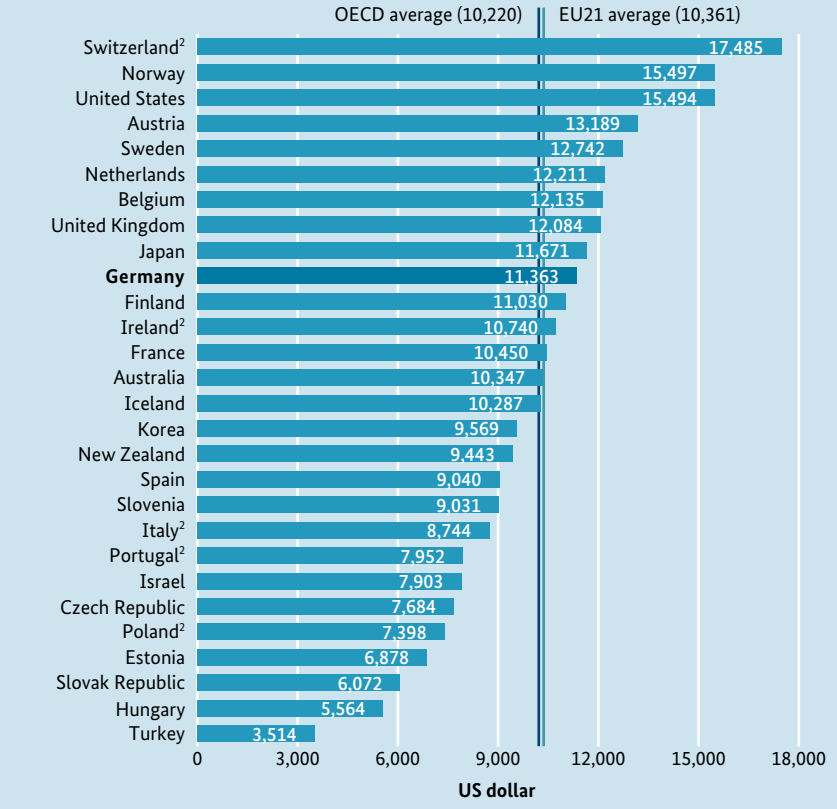
Fig. 69 First-time graduation rates[1] for ISCED level 7 (master's or equivalent) in selected OECD countries (2013)



Explanation of abbreviations/symbols: ISCED = International Standard Classification of Education (see glossary); OECD = Organisation for Economic Co-operation and Development.
1) Net graduation rates measure the share of graduates of a specific age cohort. The rates indicate the extent of the share of young adults who successfully complete academic or professional education programmes at tertiary level. The net graduation rates shown in this figure are calculated as sum of age-specific graduation rates (the number of graduates of individual age cohorts is divided by the corresponding population).
2) Year of reference 2012 instead of 2013.
Source: OECD, Education at a Glance 2015, table A3.1

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-69
Additional data: www.datenportal.bmbf.de/en/2.5.103

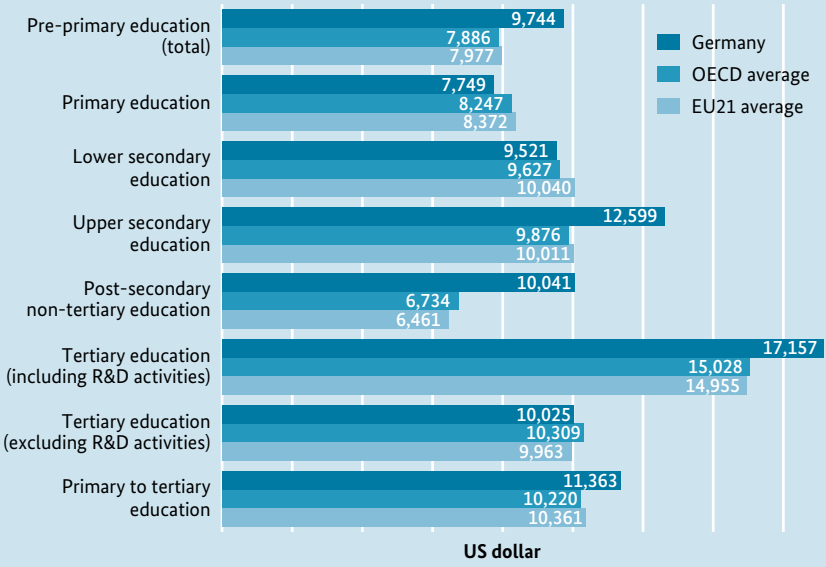
Fig. 70 Annual expenditure on educational institutions per pupil/student from primary to tertiary education (2012)[1]



Explanation of abbreviations/symbols: OECD = Organisation for Economic Co-operation and Development.
1) Expenditure at a particular level of education is calculated by dividing the total expenditure on educational institutions at that level by the corresponding full-time equivalent enrolment. Expenditure is converted into equivalents US dollar by dividing the national currency figure by the purchasing power parity (PPP) index for the gross domestic product (GDP). The 2012 exchange rate for Germany between US dollar (PPP) and euro was 1.273.
2) Public institutions only (for Italy excluding tertiary education).
Source: Bildungsfinanzbericht 2015, table/figure 5.1.1-1; **Data:** OECD

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-70
Additional data: www.datenportal.bmbf.de/en/2.1.17

Fig. 71 Annual expenditure on educational institutions per pupil/student, by levels of education (2012)[1]

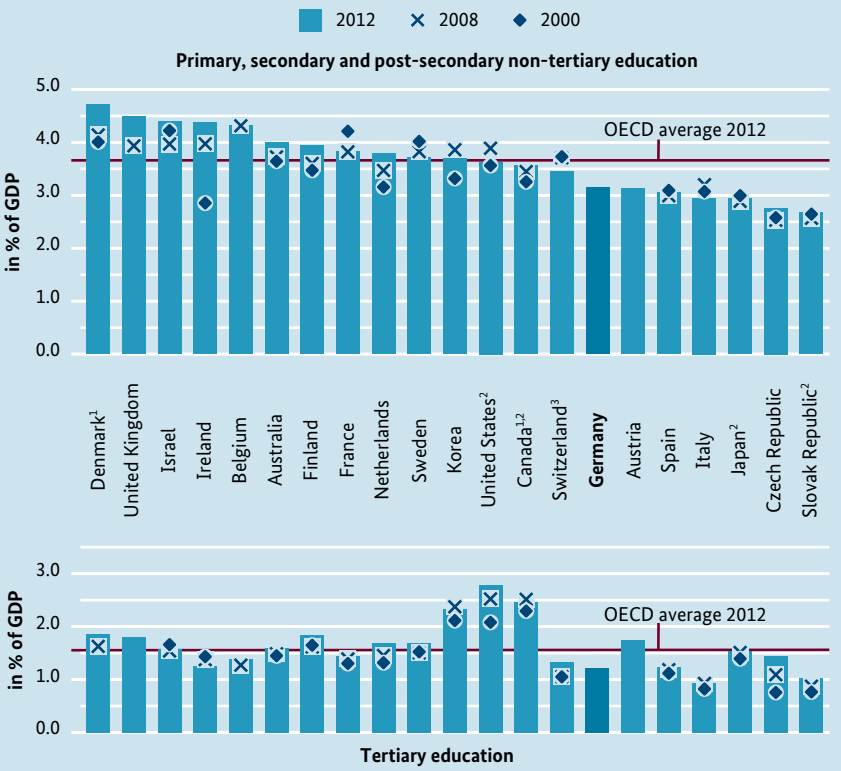


Explanation of abbreviations/symbols: R&D = research and development; OECD = Organisation for Economic Co-operation and Development.
1) Expenditure at a particular level of education is calculated by dividing the total expenditure on educational institutions at that level by the corresponding full-time equivalent enrolment. Expenditure is converted into equivalents US dollar by dividing the national currency figure by the purchasing power parity (PPP) index for the gross domestic product (GDP). The 2012 exchange rate for Germany between US dollar (PPP) and euro was 1.273.
Source: Bildungsfinanzbericht 2015, table 5.1.1-1, figure 5.1.1-2; **Data:** OECD

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-71
Additional data: www.datenportal.bmbf.de/en/2.1.17

The expenditure on educational institutions per student is an indicator of the staff and financial resources available to the institutions in question. A look at the levels of education shows the differences in spending as well as Germany's position compared to the OECD/EU21 average. Germany is well above the average values most notably in post-secondary non-tertiary education and in tertiary education (including R&D activities).

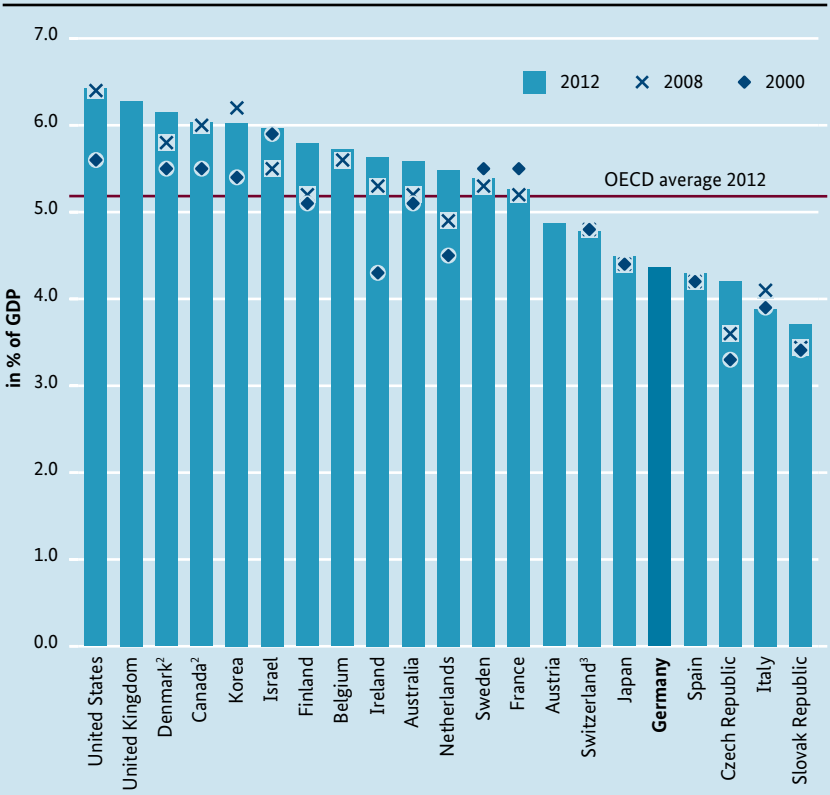
Fig. 72 Expenditure on educational institutions as a percentage of GDP, by levels of education in selected OECD countries, from public and private sources (2000/2008/2012)



Explanation of abbreviations/symbols: GDP = gross domestic product; OECD = Organisation for Economic Co-operation and Development.
Note: For the years 2000 and 2008, there are no data available for some countries.
1) Year of reference 2011 instead of 2012.
2) Some levels of education are included in others.
3) In tertiary education public expenditure only.
Source: OECD, Education at a Glance 2015, table B2.2

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-72
Additional data: www.datenportal.bmbf.de/en/2.1.22

Fig. 73 Expenditure on primary to tertiary education institutions[1] as a percentage of GDP, in selected OECD countries, from public and private sources (2000/2008/2012)



Explanation of abbreviations/symbols: GDP = gross domestic product; OECD = Organisation for Economic Co-operation and Development.
Note: For the years 2000 and 2008, there are no data available for some countries.
1) Excluding undistributed programmes.
2) Year of reference 2011 instead of 2012.
3) In tertiary education public expenditure only.
Source: OECD, Education at a Glance 2015, table B2.2/chart B2.3

BMBF's Data Portal: Figure link: www.datenportal.bmbf.de/fig-73
Additional data: www.datenportal.bmbf.de/en/2.1.22

4 Glossary

Academic and creative arts staff
The group of academic and creative arts staff at institutions of higher education mainly includes members of established academic staff, senior administrators and directors, and employed academic and creative arts staff.

Academic degree
In Germany, students can receive the following academic degrees after passing the relevant examinations: Bachelor's degree, state examination, *Diplom* and *Magister* (both of which are being phased out), Master's degree and doctorate.

AFBG – Upgrading Training Assistance Act (*Aufstiegsfortbildungsförderungsgesetz*)
The Upgrading Training Assistance Act (AFBG, also known as the "*Meister-BAföG*") has been in force since 23 April 1996. It provides skilled craftsmen and tradesmen of all ages with financial support to upgrade their training and attain higher qualifications. The aim is to counteract the skills shortage in Germany and enhance Germany's competitiveness. The law is a comprehensive funding instrument for vocational skill development in all occupational areas.

Apprentice
An apprentice is someone who is undergoing training under the dual system in a recognized training occupation based on a training contract in accordance with the Vocational Training Act. Apprentices learn on the job or in company/intercompany training centres and simultaneously attend part-time vocational school (dual system).

Bachelor
A Bachelor's degree is the first qualification offered by institutions of higher education after completion of an undergraduate programme. In Germany, Bachelor's courses were introduced in connection with the Bologna process. The standard period of study of most Bachelor's degree courses is six semesters, but can be up to seven or eight semesters (i.e. three to four years). Students can then proceed to a more advanced Master's degree programme or, in exceptional cases, a doctorate.

BAföG – Federal Training Assistance Act (*Berufsausbildungsförderungsgesetz*)
The Federal Training Assistance Act regulates government support for the education of school students and university students in Germany. The main aims of the BAföG are to improve equal opportunities in the education system and to mobilize academic potential in lower-income population groups.

BAföG rate of students in central higher education semesters
This rate indicates the number of BAföG recipients among those students who are potentially eligible for BAföG. In addition to students in the first six higher education semesters, this also includes master students up to their tenth semester. From reporting year 2012 onwards, only students in full-time courses are considered. The rate was introduced in the 20th Social Survey of the German National Association for Student Affairs (Deutsches Studentenwerk) implemented by Deutsches Zentrum für Hochschul- und Wissenschaftsforschung (formerly HIS-Institut für Hochschulforschung). Further information is available at www.sozialerhebung.de.

Continuing vocational education and training
Continuing vocational education and training has the aim of giving people who have completed their training and are already in the workforce additional qualifications or maintaining/refreshing their existing skills in order to secure their employment prospects and enable them to act independently on the labour market. At the same time, it aims to ensure that there are enough well-qualified workers to cover the needs of companies and the economy as a whole.

Double *Abitur* graduation classes / G8
Since 2007, the *Länder* step-by-step had reduced the number of school years necessary to get the *Abitur* from 13 to 12 (G8), with the exception of Rhineland-Palatinate. Between 2011 and 2013, this affects Lower Saxony, Baden-Württemberg, Bavaria, Hesse and North Rhine-Westphalia. In order to maintain comparability to the previous years, concerned data are adjusted to this (for example at quota calculations).

Education budget
The education budget displays the whole public and private expenditure on education. This includes personnel expenditure, operating expenditure and capital spending for the entire area of education (pre-primary education, out-of-school youth education, schools and institutions of higher education, continuing education). Depreciation, financing costs, hours lost due to continuing education of staff, training allowances and pensions for retired education staff are not included. Public spending under the Federal Training Assistance Act (BAföG), on retraining, transport for students etc. is substantiated within the framework of educational funding. The financial contribution of the central, regional and local authorities (Federal

Government, *Länder* and municipalities) to the education budget can be viewed in two different ways – according to the concept of "initial funds" or the concept of "final funds". In the "initial funds" concept, the financial transactions between the central, regional and local authorities are taken into account. The concept of "final funds" does not take financial transactions between the central, regional and local authorities into consideration. The distinction between "initial funds" and "final funds" does not affect the total volume of public spending for the area of education. Nor do transactions between public budgets affect financial contributions from private sources, from abroad, or the total volume of the education budget.

Educational participation rate
The educational participation rate refers to the percentage of people in any given age group who are pursuing a qualification at a certain level (e.g. university degree or training under the dual system).

EU – European Union
The European Union comprises the following 28 member states: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and United Kingdom.
EU19 refers to the 15 member states of the European Union before the enlargement of 1 May 2004 plus four Eastern European OECD countries (Czech Republic, Hungary, Poland and Slovakia).
EU21 refers to the EU member states that are also members of the OECD. Not included are Bulgaria, Croatia, Cyprus, Latvia, Lithuania, Malta, and Romania.

First-year students / new entrants to higher education
New entrants to higher education are students in their first semester (first enrolment) or in their first semester of a certain course of study.

Full-time equivalent (FTE)
Unit to measure the full-time activity of a person over a certain period. This unit serves to express the working time of a person doing part-time R&D work (including part-time workers) as the working time of a full-time R&D worker (cf. Frascati Manual 2002, sections 331 ff.).

Further training examination / *Meister* examination
Further training and *Meister* examinations demonstrate knowledge and skills acquired through further training measures. They must comply with the special requirements of vocational adult education.

GDP – Gross domestic product
GDP is a measure of a country's economic performance over a certain period of time. It measures the value of domestically produced goods and services (added value), as long as these are not used as a basis for the production of other goods and services. Since the changeover to the European System of Accounts 2010 (ESA 2010) in Semptember 2014, R&D expenditure is counted for the most part as capital formation and therefore is no longer rated as intermediate consumption. This new treatment of R&D expenditure within the National Accounts raised the GDP level by about 3%.

GERD – Gross Domestic Expenditure on Research and Development
Total expenditure on domestically performed R&D, whatever the source; this also includes R&D performed within the country and funded from abroad and by international organisations. However, it does not cover the expenditure on R&D performed abroad by international organisations headquartered in the country or R&D funding paid abroad (cf. Frascati Manual 2002, section 423).

Government expenditure on R&D
All resources allocated to R&D by the Federal Government and the *Länder*, regardless of the sector in which R&D is performed.

Habilitation
A habilitation is a postdoctoral qualification to teach at professorial level. The habilitation procedure is an academic examination procedure that includes a habilitation thesis, a colloquium and a public lecture.

Higher education entrance qualification
Admission to a German institution of higher education requires a higher education entrance qualification. To enrol at a university, students must have a general or subject-restricted higher education entrance qualification or pass an aptitude test or an examination for talented/gifted students. The two latter options, subsumed under "admission without a formal higher education entrance qualification" in

official higher education statistics, are particularly common among students at colleges of fine arts and colleges of music. To enrol at a university of applied sciences, students must have a general higher education entrance qualification or an entrance qualification for universities of applied sciences or pass an aptitude test or an examination for talented/gifted students.

iABE – Integrated reporting on vocational training
Integrated reporting on vocational training brings together various official statistics to give an overview of the paths young people's lives take and of vocational training pursued after leaving general schools. A comprehensive system of (educational) sectors and accounts (qualification pathways) describes the programmes available above lower secondary level. Vocational education and training opportunities are categorized according to four (educational) sectors:
"*Vocational training*" (objective: full vocational qualification): A full vocational qualification is the foundation for entering and remaining in employment and for the ability to shape one's own career.
"*Integration into training (transition system)*" (objective: vocational training): Integration measures serve to prepare young people for – and place them in – vocational training. It includes a wide range of programmes and measures, most of them publicly financed.
"*Higher education entrance qualifications*" (objective: acquiring a higher education entrance qualification): A higher education entrance qualification enables people to pursue higher education or vocational training.
"*Academic degree programmes*" (objective: higher education degree): A higher education degree is the foundation for high-level employment.

Industry expenditure on research and development (R&D)
R&D expenditure by business enterprises and institutions for cooperative industrial research and experimental development (IfG).

Innovations
Innovations are new or significantly improved products or services that have been introduced to the market (product innovations) and new or improved production or delivery methods (process innovations) (cf. Oslo Manual 2005, sections 156 and 163).

Institution of higher education
"Institution of higher education" is the general term used for different academic institutions, including those with a practical and artistic focus, that are engaged in training and the promotion of the sciences and arts through research and teaching. Institutions of higher education include universities, colleges of art and music, colleges of education, colleges of theology, comprehensive universities, universities of applied sciences and colleges of public administration.

ISCED 2011 – International Standard Classification of Education
ISCED was developed by UNESCO in the early 1970s to provide a consistent framework for collecting and presenting educational statistics, thus enabling or facilitating national and international comparisons. The classification was updated in 1997 (ISCED 97) and in 2011 (ISCED 2011) and reflects all organized learning processes (see table at the end of the glossary). Since 2015, the new ISCED 2011 is used in the education reports of interntional organisations (UNESCO, OECD, Eurostat).

Labour force
The labour force comprises all civilians in dependent employment, self-employed people and family workers. This includes employees subject to social insurance contributions, apprentices, people in marginal employment, civil servants (not including soldiers), unemployed people, self-employed people and family workers.

***Länder* codes (German states)**

BW = Baden-Württemberg
BY = Bavaria
BE = Berlin
BB = Brandenburg
HB = Bremen
HH = Hamburg
HE = Hesse
MV = Mecklenburg-Western Pomerania
NI = Lower Saxony
NW = North Rhine-Westphalia
RP = Rhineland-Palatinate
SL = Saarland
SN = Saxony
ST = Saxony-Anhalt
SH = Schleswig-Holstein
TH = Thuringia

Master
A Master's degree is the qualification offered by institutions of higher education after completion of a second-cycle programme. It is conferred after one- or two-year full-time or part-time studies. To be admitted to a Master's degree course, students need

to be in possession of a Bachelor's degree or have completed a traditional course of study (*Magister*, *Diplom*, first state examination in law or teaching, medical degree). A Master's degree can build on previous studies or open up new areas of knowledge.

***Meister* examination**
see "Further training examination / *Meister* examination"

OECD – Organisation for Economic Co-operation and Development
The OECD is a forum in which the governments of 34 countries (most of them industrialized nations) work together to meet the challenges related to globalization in the areas of economy, society, environment and governance and take advantage of the associated opportunities. The OECD's stated goals are to contribute to optimal economic development and a rising standard of living in its member countries, to promote economic growth in its member countries and in developing countries, and to facilitate the expansion of international trade.

Percentage of first-year students
The percentage of first-year students (first enrolment) in any given year group is an important indicator for higher education planning.

Percentage of people qualified to enter higher education
This refers to the share of school-leavers qualified to enter higher education in the age-specific population. School-leavers qualified to enter higher education comprise school-leavers with general higher education entrance qualification (including subject-restricted higher education entrance qualification) from general and vocational schools.

Percentage of people who pursue higher education
This refers to the percentage of school-leavers in any given year group who have already started a degree course or have the firm intention of starting one. It is calculated on the basis of a representative survey by Deutsches Zentrum für Hochschul- und Wissenschaftsforschung. In addition to this group (people with a firm intention of pursuing higher education), people who are not yet sure about going to university or are considering it as an alternative can also be factored in. A maximum percentage is calculated in this way.

R&D
Research and development

R&D expenditure
Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications (cf. Frascati Manual 2002, section 63). Expenditure incurred in the context of this work is expenditure on research and development. A distinction is made between intramural and extramural R&D expenditures.
"*Intramural expenditures*" are all expenditures for R&D performed within a statistical unit or sector of the economy during a specific period, whatever the source of funds (cf. Frascati Manual 2002, sections 358 f.).
"*Extramural expenditures*" are the sums a unit, organisation or sector reports having paid or committed themselves to pay to another unit, organisation or sector for the performance of R&D during a specific period (cf. Frascati Manual 2002, section 408). These are mostly research contracts awarded to other companies, universities or governmental research institutes.

R&D personnel
All those directly employed in the area of R&D, regardless of their position. This includes researchers, technical personnel and other staff (cf. Frascati Manual 2002, sections 294 ff.).

School types in Germany

General schools:
- "Adult education college" (*Kolleg*): Establishment where adults attend full-time classes to obtain the general higher education entrance qualification.
- "Comprehensive school" (*Gesamtschule*): Type of school at lower secondary level offering several courses of education leading to different qualifications. It either takes the form of a cooperative comprehensive school or an integrated comprehensive school. In the cooperative type, pupils are taught in classes grouped according to the different qualifications available, whilst in the integrated type, pupils are placed in courses according to level of proficiency in a number of core subjects, but taught together as a year group in all other subjects.

- "Evening grammar school" (*Abendgymnasium*): Establishment at which adults can attend evening classes to obtain the general higher education entrance qualification.
- "Evening intermediate school" (*Abendrealschule*): Establishment at which adults can attend evening classes to obtain an intermediate school-leaving qualification.
- "Evening secondary general school" (*Abendhauptschule*): Establishment at which adults can attend evening classes to obtain a secondary general school-leaving qualification.
- "Free Waldorf School" (*Freie Waldorfschule*): Privately maintained primary and secondary schools, which base their work on the ideological and educational ideas of Rudolf Steiner.
- "Grammar school" (*Gymnasium*): Type of school covering both lower and upper secondary level (years 5-13 or 5-12) and providing an in-depth general education aimed at the general higher education entrance qualification (*Abitur*).
- "Intermediate school" (*Realschule*): Type of school at lower secondary level, usually comprising years 5-10. Provides pupils with a more extensive general education and the opportunity to go on to courses at upper secondary level that lead to vocational or higher education entrance qualifications.
- "Primary school" (*Grundschule*): Compulsory school for all children from the age of 6. It comprises four years, except in Berlin and Brandenburg, where it covers six years.
- "Schools with different courses of education" (*Schularten mit mehreren Bildungsgängen*): A category used in school statistics which applies to types of school providing the courses of education otherwise offered by secondary general schools and intermediate schools. Outside statistics, schools with different courses of education also include comprehensive schools which additionally offer the grammar school course of education.
- "Secondary general school" (*Hauptschule*): Type of school at lower secondary level providing a basic general education, usually comprising years 5-9. Compulsory school, unless the pupil is attending a different type of secondary school.
- "Special needs school" (*Förderschule*): This type of school provides teaching and care for children who have physical or mental disabilities or are at social risk and cannot be taught successfully enough at mainstream schools. As a rule, special needs schools have the same educational mission as other general schools.

Vocational schools:
- "Full-time vocational school" (*Berufsfachschule*): Vocational school at upper secondary level offering a wide range of courses of varying duration. A full-time

school, it prepares or trains students for a specific occupation at different levels of qualification.
- "Part-time vocational school" (*Berufsschule*): Vocational school at upper secondary level generally providing part-time instruction in general and vocational subjects to trainees receiving vocational education and training within the dual system.
- "Pre-vocational and basic vocational training year" (*Berufsvorbereitungsjahr/ Berufsgrundbildungsjahr*): Pre-vocational and basic vocational training year refer to vocational education mostly in the form of full-time schooling which provides basic general knowledge and basic vocational knowledge relating to a certain occupational field.
- "Specialised grammar school" (*Fachgymnasium*): Type of school at upper secondary level offering a three-year course which includes both the general education subjects taught at upper grammar school level and career-oriented subjects, such as business and technology, but which also leads to the general higher education entrance qualification (*Abitur*).
- "Specialised upper secondary school" (*Fachoberschule*): Vocational school at upper secondary level providing two-year courses in various subject areas leading to the entrance qualification for universities of applied sciences. The first year consists of both practical training in the workplace and lessons, whilst the second year covers general and subject-specific lessons.
- "Specialized/vocational academy" (*Fachakademie/Berufsakademie*): Specialized/ vocational academies offer vocational education usually as preparation for an upper-level career. An intermediate school certificate or a recognized equivalent is required for entry. Full-time attendance is for at least two years.
- "Trade and technical school" (*Fachschule*): Vocational school offering continuing vocational training courses of between one and three years which build on initial vocational training and subsequent employment and lead to a further qualification in a profession.
- "Two-year full-time vocational school" (*Berufsoberschule/Technische Oberschule*): Vocational school at upper secondary level in a few *Länder*. Offers those who have completed vocational training in the dual system the opportunity to obtain a higher education entrance qualification.
- "Vocational extension school" (*Berufsaufbauschule*): Vocational extension schools are attended by young people who are undergoing or have completed vocational training or who are or have been employed. On successful completion, pupils earn a certificate equivalent to the intermediate school certificate which qualifies them for entrance to trade and technical schools.

Science expenditure
Science expenditure covers expenditure on research and development (R&D) as well as expenditure on academic teaching and education and other related scientific and technological activities. The latter include, for example, scientific and technical information services, data collections for general purposes, studies on the feasibility of technical projects (feasibility studies for research projects, however, form part of R&D), and development of a basis for decision-making in politics and industry.

Training contract
A training contract is concluded between the company providing training and the apprentice on the basis of the Vocational Training Act or the Craft Trades Law. The content and duration of training and the examination requirements are set out in the Federal Government's training regulations. The training duration is between two and three years, usually three.

Training occupation
In Germany, training occupations are occupational activities that can be learned under the dual system of vocational education and training. Young people can only be trained in officially recognized training occupations. Official recognition is granted through training regulations under the Vocational Training Act (BBiG) or the Craft Trades Law (HwO). The skills to be learned in vocational training are defined in the Vocational Training Act and the training regulations in question.

Training sector
Official statistics differentiate between the following training sectors in company-based vocational training: trade and industry, skilled trades, agriculture, public sector, home management, independent professions (e.g. lawyers and notaries, patent lawyers, tax accountants, tax agents, auditors, doctors, dentists, veterinarians, pharmacists) and maritime transport.

Unemployed
Unemployed people are jobseekers who are temporarily out of employment or employed for less than 15 hours per week, are looking for employment of at least 15 hours per week that is subject to insurance, and submit to the efforts of the employment office or the local authority to find them work – i.e. are able and willing to work.

Unemployment rate
The number of unemployed people is calculated in relation to the number of civilians in dependent employment or, since January 2009, in relation to the total civilian labour force. The unemployment rate is often referred to as the "national unemployment rate", as opposed to the ILO unemployment rate, which is mainly used for the purpose of international comparison.

University of applied sciences (*Fachhochschule*)
Universities of applied sciences offer courses with a greater practical focus, particularly in engineering and the areas of business, social studies, design and informatics. The courses are shorter than at universities.

Assignment of national education programmes to the ISCED 2011 – [1/4]

ISCED level Category	Sub-category	Education programmes
ISCED 0 Early childhood education		
ISCED 01 Early childhood educational development for children younger than three years	010	- Crèches
ISCED 02 Pre-primary education for children from the age of three years to the start of primary education	020 020 020	- Kindergartens - Pre-school classes - School kindergartens
ISCED 1 Primary education		
ISCED 10 general education	100 100 100 100	- Primary schools - Comprehensive schools (grades 1-4) - Waldorf schools (grades 1-4) - Special needs schools (grades 1-4)
ISCED 2 Lower secondary education		
ISCED 24 general education	241 244 244 244 244 244 244 244 244 244 244 244	- Orientation stages (grades 5/6) - Secondary general schools - Intermediate schools - Special needs schools (grades 5-10) - Schools with different courses of education - Grammar schools (grades 5-9/10)[1] - Comprehensive schools (grades 5-9/10)[1] - Waldorf schools (grades 5-10) - Evening secondary general schools - Evening intermediate schools - Catch up on lower secondary school degrees and fulfilment of compulsory education at vocational schools - Vocational schools that lead to intermediate degrees
ISCED 25 vocational education	254	- Pre-vocational training year (and other vocational preparation programmes, e.g. at part-time or full-time vocational schools)

Assignment of national education programmes to the ISCED 2011 – [2/4]

ISCED level Category	Sub-category	Education programmes
ISCED 3 Upper secondary education		
ISCED 34 general education	344 344 344 344 344 344 344	- Grammar schools (grades 10-12/11-13)[1] - Comprehensive schools (grades 10-12/11-13)[1] - Waldorf Schools (grades 11-13) - Special needs schools (grades 11-13) - Specialised upper secondary schools – two-years (without previous vocational education) - Specialised grammar schools - Full-time vocational schools that lead to higher education entry qualification
ISCED 35 vocational education	351 353 353 354 354	- Basic vocational training year (and other basic vocational programmes that are taken into account to the first year of apprenticeship) - One-year programmes at training institutions/schools for health care and social professions - Civil service trainees in the middle grade of civil service - Part-time vocational schools (dual system) - Full-time vocational schools that lead to a vocational certificate (excluding health care and social professions and educator training)
ISCED 4 Post-secondary non-tertiary education		
ISCED 44 general education	444 444 444	- Evening grammar schools, adult education colleges - Specialised upper secondary schools – one-year (after previous vocational education) - Two-year full-time vocational schools
ISCED 45 vocational education	453 454 454 454 454 454	- Two- and three-year programmes at training institutions/schools for health care and social professions - Part-time vocational schools (dual system) (second education after obtaining a higher education entrance qualification)[2] - Full-time vocational schools that lead to a vocational certificate (second education after obtaining a higher education entrance qualification)[2] - Vocational programmes that lead to a higher education entry qualification as well as to a vocational certificate (simultaneously or successively)[2] - Part-time vocational schools (dual system) (second education, vocational) - Part-time vocational schools (dual system) – retrainees

Assignment of national education programmes to the ISCED 2011 – [3/4]

ISCED level Category	Sub-category	Education programmes
ISCED 5 Short-cycle tertiary education		
ISCED 54 general education	-	-
ISCED 55 vocational education	554	Master craftsman training (very short preparation courses only that last less than 880 hours)[3]
ISCED 6 Bachelor's or equivalent level		
ISCED 64 academic	645	- Bachelor's programme at - Universities (scientific institutions of higher education including colleges of education, colleges of theology, and colleges of art and music) - Universities of applied sciences (including schools of engineering), Baden-Württemberg Cooperative State University - Colleges of public administration - Vocational academies
	645	- *Diplom* degree programme at universities of applied sciences
	645	- *Diplom* degree programme at colleges of public administration
	645	- *Diplom* degree programme at vocational academies
	647	- Second bachelor's programme
	647	- Second *Diplom* degree programme at universities of applied sciences
ISCED 65 professional	655	- Trade and technical schools (excluding health care and social professions and educator training) including master craftsman training (preparation courses lasting 880 hours or more)[3], business economist, business administrator
	655	- Training institutions/schools for educators
	655	- Specialised academies (Bavaria)

Assignment of national education programmes to the ISCED 2011 – [4/4]

ISCED level Category	Sub-category	Education programmes
ISCED 7 Master's or equivalent level		
ISCED 74 academic	746	- *Diplom* degree programme at university (including teacher training, state examination, *Magister* programme, artistic and comparable programmes)
	747	- Master's programme at - Universities (scientific institutions of higher education including colleges of education, colleges of theology, and colleges of art and music) - Universities of applied sciences (including schools of engineering), Baden-Württemberg Cooperative State University - Colleges of public administration - Vocational academies
	748	- Second master's programme
	748	- Second *Diplom* degree programme at university
ISCED 8 Doctoral or equivalent level		
ISCED 8 academic	844	- Doctoral studies
ISCED 9 No other classification		
ISCED 99 No other classification	999	Mainly mentally handicapped pupils at special needs schools that cannot be assigned to an education area

1) At grammar schools and integrated comprehensive schools leading to a school-leaving certificate after grade 12, upper secondary level begins at grade 10 instead of 11.).
2) Fully qualifying vocational programmes after obtaining a higher education entrance qualification or fully qualifying vocational programmes that additionally lead to a higher education entrance qualification get allocated to ISCED 454 pursuant to Eurostat definition. Last adjusted to the school year 2012/2013.
3) The allocation is based on the subject field of the preparation courses.

Notes on sub-categories

241	Insufficient for level completion or partial level completion, without direct access to upper secondary education.
244, 254	Level completion, with direct access to upper secondary education.
351	Insufficient for level completion or partial level completion, without direct access to tertiary education.
353	Level completion, without direct access to first tertiary programmes (but may give direct access to post-secondary non-tertiary education).
344, 354	Level completion, with direct access to first tertiary programmes (may also give direct access to post-secondary non-tertiary education).
453	Level completion, without direct access to first tertiary programmes.
444, 454	Level completion, with direct access to first tertiary programmes.

Source: Federal Statistical Office, Bildungsfinanzbericht 2015, Anhang A3

Published by
Bundesministerium für Bildung und Forschung / Federal Ministry of Education and Research (BMBF)
Division for Statistics and International Comparative Analyses
53170 Bonn / 11055 Berlin

Orders
in writing to
Publikationsversand der Bundesregierung
P.O. Box 48 10 09
18132 Rostock
Germany
E-mail: publikationen@bundesregierung.de
Internet: http://www.bmbf.de
or by
Phone: +49 30 18 272 272 1
Fax: +49 30 18 10 272 272 1

July 2016

Printed by
BMBF

Layout
Deutsches Zentrum für Hochschul- und Wissenschaftsforschung, Hannover (www.dzhw.eu)

Photo credits
Cover photo, pages 4, 10, 23, 29, 36, 45, 77: Thinkstock; page 2: Press and Information Office of the Federal Government of Germany, Steffen Kugler; page 17: Royalty-Free / Corbis; page 59: BananaStock Ltd; page 70: Image Source Pink / Getty Images

Edited by
BMBF

QR code to the data portal
www.datenportal.bmbf.de

www.bmbf.de