

Teacher Shortage in Germany

How Germany's States are affected by and coping with Teacher Shortage

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Educational Research

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Teacher shortage in Germany

Summary

This article deals with the current and expected shortage of teachers in Germany. The school and education system in Germany is a matter for the federal states. The article takes this into account by providing a complete list of the 16 federal states and explaining to what extent the individual states are affected by the shortage of teachers and how they deal with it.

In addition, an attempt is made to highlight similarities and special situations. The article is a stocktaking within an international research project on the shortage of teachers in Europe.

Opening

This article is written in connection with the international research project WATS' up (**W**hat **a**bout **t**eacher **s**hortage?). WATS' up deals with the question of teacher shortage in European countries, especially in Sweden, Denmark and Germany. The starting point of the project is a research initiative of the partner universities Mittuniversitet (Sundsvall, Sweden), Aarhus Universitet (Denmark) and Bergische Universität Wuppertal (Germany), whose declared aim is to work out the similarities and special features of the cooperating countries in connection with the shortage of teachers and to gain deeper insights into each countries' shortage of teachers through a mutual understanding.

Prof. Dr. Maria Anna Kreienbaum, member of the initiating research group, gives a brief introduction to the historical development of and historical reasons for teacher shortage in Germany. Her comments are more concerned with the strategic considerations and justifications of policy-makers and education ministers. The text presented here gives, as far as possible, an overview of the measures of the individual federal states and presents them first. In the further course, obvious differences and similarities are highlighted and an attempt is made to point out structural features that enable a typification of the states with regard to their shortage of teachers.

Teacher shortage is a widespread phenomenon in Germany. Despite this has to be approached in a differentiated way. The shortage of teachers does not equally affect all subjects, all school types or all regions. Searching for the term 'teacher shortage in Germany' (In German: Lehrermangel in Deutschland) on Google and you will get more than 209,000 hits in no time. Teacher associations, parents, media and politicians repeatedly point to the lack of teachers.

Since 1979, the Ständige Konferenz der Kultusminister der Länder in der Bundesrepublik Deutschland¹ (KMK – Kultusministerkonferenz) has regularly reported on the recruitment of teachers. On the basis of current data, the development of new and graduated teacher students, admissions to the preparatory service and the recruitment of teachers to the public school system are documented (KMK - Kultusministerkonferenz 2019).

¹ Standing Conference of the Ministers of Education and Cultural Affairs of the states in the Federal Republic of Germany

Currently, the existing and expected shortage of teaching staff at primary schools is a cause for concern throughout Germany. A shortfall of at least 26 300 teachers in primary schools (!) across Germany by the year 2025 is expected (Klemm und Zorn 2019). Klemm and Zorn found out that 11 000 new teachers would have to be employed by 2025. Taking in employees who are set to retire, this would lead to 26 300 vacant primary school teaching positions. In 2019/2020 there were 204 837 primary school teachers in Germany employed. If one compares the expected shortage with the current number of employees, this shortage would amount to 12.8%. As things stand today, one in eight primary school teachers would be missing.

It is not apparent how high the proportion of teachers will be, who studied an overlapping teaching profession, and then will be deployed in lower secondary schools. Therefore, it can only be stated that the shortage of teachers in the primary sector in 2025/2026 will be in the range of 15 310 to 21 420 according to KMK estimates.

This overall picture changes significantly, however, if the demand caused by the higher number of schoolchildren in the primary sector is added. In this case, in 2025/2026 the shortage of at least 15 310 increases by another 10 994 - i.e. to at least 26 304 graduates. (Klemm and Zorn 2019)

Somehow the German school system seems to be confronted with teacher shortage all of a sudden. Demographic development, decreasing numbers of pupils in classes, the popularity of the teacher profession and a comfortable number of experienced teachers teaching as civil servants did not cause any concerns. In fact, government and politics expected a return: The number of pupils would decrease, therefore less room and less teachers would be needed and this return could be invested in the development of all day schooling. (Klemm und Zorn 2017)

Klemm and Zorn's findings are 'a wake-up call'. In fact, the topic permeates public media on a regular basis. Parents, teachers and politics are aware of the 'Herculean task' as Jörg Dräger, chairman of the Bertelsmann foundation, said, dealing with the shortage will be.

As the following text will show, **the lack** of teachers is connected to teacher status as well as teacher training and teaching conditions. **The lack** of teachers in primary schools can partially be explained by the less attractive payment, whilst the teacher training itself is demanding and university places are missing. **The lack** of teachers in secondary schools varies by subject, school type and region.

Aim and Research Question

The aim of this article is to give an overview of the the very inconsistent teacher shortage situation in Germany and to collect and introduce all kinds of measures (i.e. salary raise, media campaigns, increasing the number of study places) taken in mind to deal with teacher shortage by politics and ministries.

For this research data is collected by open accessible articles on the internet, like local press, homepages of the states and statistic offices. A main resource of this paper is a statistical publication of the KMK, which delivers data of 'expected teachers to be employed' in Germany from 2018 to 2030. The calculation is based on demographic figures and trends.

Facing these numbers, the ministries of the states have and had to apply or develop strategies to deal with teacher shortage or misleading initiatives which resulted in an oversupply of teachers for

privileged school types and shortages in subjects which are known to be more difficult or more profitable outside school and the teaching profession like mathematics, IT and natural science.

The article starts with a brief overview of the shortage of teachers in Germany and tries to explain why there are so great differences. As there are 16 federal states in Germany and each is responsible for its own education and schools, the article will provide a closer view to each of the states and point out what is special about them in the further process.

The main findings and desiderata of further research will be discussed and presented in the conclusion of the article.

Regional Differences

In the school year 2019/2020, there were 32 332 schools for general education in Germany, with a total of 782 613 teachers and 8 326 884 pupils (Statistisches Bundesamt 2020a, 2020b, 2020c). These numbers are quite impressive but do not explain or describe the teaching situation. Not all German states are equally affected by teacher shortage. ~~There are differences between east and west, between states with more rural areas (Flächenstaaten) and densely populated states with industrial and commercial centers. Therefore, in Germany it is common to look separately to the Western² part of Germany, to the Eastern part of Germany and to its capital city Berlin, which is the most important state in the former German Democratic Republic. Berlin has its own dynamic; it is situated in the more rural Eastern part of Germany and there the metropole is an economic and political center.~~

In Berlin mostly teachers in primary schools are needed. In Bayern, Baden Württemberg, Niedersachsen and Nordrhein Westfalen (they all are states of former West-Germany) mostly affected schools are schools for students with special needs, primary schools, and any secondary schools apart from the *Gymnasium* (grammar school), *Gesamtschule* (comprehensive school) or *Realschule* (middle school). The former *Hauptschule* (main school) is mostly disappearing from the German school system. It is replaced by the so called *Sekundarschulen* (Secondary Schools) or *Regelschulen* (Regular Schools), but those schools are not very popular among teachers. They have to teach those students who did not receive the marks to join the more demanding *Gymnasium*, the well-developed comprehensive schools or some traditional and established *Realschule*. (Millmann 2018).

Schools in rural regions may have problems to fill their teacher positions as well as schools in large cities in their social hotspots. Priboschek (2018) has summarised the complains of several headmasters and teachers at primary schools with the question “who even wants to teach in a social hotspot?” Even if teachers get a pay raise or a reduction in teaching hours, it is more than teaching what is needed in social hotspots: In social hotspots teaching is caring. Caring for the students so they can be taught and are willing to learn and educating the student’s parents to enable them to lead their children successfully through the German school system. (cp Priboschek 2018)

² The classification into East and West is historically justified. In the formerly divided post-war Germany, different school systems were established, some of which have remained until today.



Figure 1 The 16 States of Germany³

There are sixteen states in the Federal Republic of Germany. Each federal state has its own federal government and its own school law. The individual states are historically responsible for Education and Schooling, but of course all states are bounded to the constitutional law. In order to have some sort of consistency and more transparency the Standing Conference of Ministers of Education and Cultural Affairs (KMK) was founded in 1948 (Sekretariat der Ständigen Konferenz der Kultusminister der Länder in der Bundesrepublik Deutschland). The KMK 'plays a significant role as an instrument for the coordination and development of education in the country. It is a consortium of ministers responsible for education and schooling, institutes of higher education and research and cultural affairs, and in this capacity formulates the joint interests and objectives of all 16 federal states.' (ibid.).

So, the ministers of the federal states early realized the need of cooperation and political exchange facing educational challenges as well as the advantages of being able to design an individual educational system that takes the political and local characteristics in mind. One of its important tasks is to calculate the need of teachers and teacher student places in order to enable the states and communities to fulfil their schooling tasks.

In October 2018 the KMK calculated a shortage of 15 300 primary schools teachers in 2025 (cp. KMK - Kultusministerkonferenz 2018), this was a dramatic finding, which was confirmed and seen even more dramatic by recent researches of the Bertelsmann Foundation. Their study refers to the Federal Statistical Office's population forecast from June 2019. For the year 2025, it predicts that there will

³ (<http://www.bpb.de/nachschlagen/lexika/lexikon-in-einfacher-sprache/249821/bund>)

be 3.254 million to 3.323 million children between the ages of 6 and 10 in Germany which leads to an estimated lack of 26 304 primary school teachers (Klemm und Zorn 2019).

The German States and how they are affected by and deal with teacher shortage
The states appear in geographical order from north to south and from west to east. The states are introduced in their German spelling and further mentioned by the official short form of their name. As every single state is introduced, with its expected shortage for 2020 and a its way to face the shortage if necessary.

Schleswig Holstein (SH)

In 2018 SH complains a lack of approximately 310 teachers, although there are more teachers expected in the next couple of years, SH might not be able to get enough teachers at schools for pupils with special needs and at primary schools (KMK - Kultusministerkonferenz 2018). Even if the data in SH is not severe, SH is actually struggling to recruit teachers for some regions. So, SH launched a model project to make those schools more attractive for teachers. 'We create targeted incentives in certain regions. In this way, we can succeed in recruiting teachers for schools in regions that have a particularly high demand but have not been in sufficient demand by applicants so far', Education Minister Karin Prien was cited by the ministry's homepage. Former teacher students who enter the second phase of teacher training can earn an additional salary of 250 € per month for choosing a primary school or a Förderzentrum⁴ with an extraordinary need of teachers as their teacher training school (Landesportal Schleswig Holstein 2020).

Niedersachsen (NI)

In 2020 NI is expecting a lack of approximately 780 teachers. Mostly needed are teachers who are qualified for both, primary schools and secondary schools (440) (KMK - Kultusministerkonferenz 2018). The figures do not precisely show where exactly the teachers are needed, taking the data of SH and the other states in mind, it is reasonable to guess that most of these teachers are wanted for primary schools. Some schools in NS, especially grammar schools, have too many staff, while others have dramatically too few. Therefore, the school ministry and the schools with spare teaching hours can decide to delegate teachers from their home school with spare capacities to those with a lack of teachers. These secondments are usually temporary and last one or two semesters. It does not take into account, that teachers are experienced in their local school, that they work in a team of colleagues, that they have to adjust to the school and that they have to build up a relationship to their students. So this is probably the most unpopular solution among headmasters, teachers and parents (Grüling 2019; Bildungsportal Niedersachsen 2020).

Bremen (HB)

In 2020 Bremen needs 150 teachers more than there are expected for secondary schools, and at least twenty teachers for primary schools (cp. KMK - Kultusministerkonferenz 2018). The daily press of Bremen (Scharfenberg 2019) counts 18 vacant teacher positions at primary schools, but many positions are filled by teacher students, who are not fully qualified. This is a problem for the teacher students as well as for the pupils. Bremen tries to face teacher shortage by extending the so called "Quereinsteige" (side entrances). Academics who have studied at least two subjects to Master-level can apply for the regular teacher training program. Academics with a longer working experience after leaving the university can start teaching right away but must join an additional teacher training program (Freie Hansestadt Bremen).

⁴ A Förderzentrum is a support center = center for the support of children with special needs and their parents

Hamburg (HH)

In 2020 Hamburg needs approximately 50 teachers more than there are expected for all school types. On the one hand 90 teachers will be needed who are qualified for 'primary schools and some secondary schools', on the other hand 40 teachers more than needed will be qualified for teaching students with special needs. For the vocational schools a plus of 10 teachers is expected (cp. KMK - Kultusministerkonferenz 2018). Since Hamburg is, as well as Bremen, a state of its own, the numbers are smaller than in other states, but nevertheless alarming. Hamburg will have to divide the teachers among its schools or recruit them from its neighbor states. As Hamburg was able to reduce the number of students in classes and extend teaching hours recently, there are more options to face an increasing number of students. Media and politics are not highly alarmed yet. (Hamburger Morgenpost 2019; Freie und Hansestadt Hamburg 2021) ⁵

NI, HB and HH are locally linked together, therefore they will have to face teacher shortage together to find satisfying and practical solutions.

Mecklenburg-Vorpommern (MV)

In 2020 MV expects a shortage of 210 teachers, 2021 even 360. The mostly affected schools are primary schools (2020 only 20 teachers will be missing but in 2021 it will be 100) and secondary schools (2020 210, 2021:240) (KMK - Kultusministerkonferenz 2018). Compared to the other states the lack of teachers for lower secondary schools is remarkable. In 2019 there were too many teachers for grammar schools leaving the teacher training programs. To keep them in the state of MV they were employed as civil servants at secondary schools and some of them got the same conditions as teachers on upper secondary schools/grammar schools. They were employed as 'Studienrat'. This somehow reasonable solution was not legal, but reveals an important question concerning the teacher status: Is it the academic knowledge or the pedagogical task which is more demanding? Germany believed in homogenic learning groups at every school, now an inclusive education is demanded. This would mean, that multi-professional teams at any school would be needed and the salary system would have to be adjusted. The traditional hierarchic way does not seem to be adequate.

Nordrhein-Westfalen (NW)

In 2018 NW had to face a shortage of 7 640 teachers, in 2020 the calculated shortage was 370. Compared to 2018 it feels like a huge improvement. But it has to be pointed out that the shortage of 2018 is not covered yet (KMK - Kultusministerkonferenz 2018). In a factsheet the ministry of school and education summarises that the situation at primary schools, schools for students with special needs, and lower secondary schools as well as at schools for vocational education is tense. In sum 15 000 teachers will be missing in the next ten years at those schools but all in all a surplus of 16 000 teachers for grammar schools and comprehensive schools is expected (Ministerium für Schule und Bildung des Landes Nordrhein-Westfalen 2019). Thus, many school leavers want to become a teacher, but they reach for the best-paid teaching positions NW's school system is offering. The ministry of school and education suggests a package of different measures to motivate teachers to apply for teaching positions at schools which are struggling to fill their vacancies. Firstly, there is an additional charge up to 350 € possible. Secondly, side entrances are made more attractive: becoming a teacher based on a regular university education should be made more attractive by taking vocational experiences into account to quantify the salary. Thirdly, already retired teachers are asked to improve their annuity by teaching lessons at school again. (Ministerium für Schule und Bildung des Landes Nordrhein-Westfalen 2019)

⁵ <https://bildungsserver.hamburg.de/lehrausbildung/>

Another measure focusses on the teacher training: The government is forcing an expansion of study capacities for primary school teachers and teachers for students with special needs. Recently 700 additional students can subscribe for a Bachelor of Education for primary schools and 750 additional students can apply for a Bachelor of Education in special needs. (Ministerium für Schule und Bildung des Landes Nordrhein-Westfalen 2019)

As inclusive education is expanding in Germany, more schools need specialized teachers than before. Filling these vacancies, regular teachers can apply for these jobs and qualify “on the job”, former more restrictive rules were loosened up. (Ministerium für Schule und Bildung des Landes Nordrhein-Westfalen 2019)

Further measures aim to an efficient use of resources: re-employing retired teachers, motivating teachers in parental leave to resume teaching as soon as possible by offering a teaching position at a school close to their home when they only stay home for 8 instead of 12 months (Ministerium für Schule und Bildung des Landes Nordrhein-Westfalen 2019)

Last but not least the government is trying to improve the image of the teaching profession by media campaigns. In 2019 and 2020 one million euros each were planned to be spent for campaigns to get more teachers (Ministerium für Schule und Bildung des Landes Nordrhein-Westfalen 2019).

The variety of measures shows how desperate politics are to find a solution. Teachers' associations criticize several of the initiatives especially the salary is a sensitive topic: For established teachers at schools with vacancies teaching is demanding and they are doing their job, getting paid like any teacher at any other school of that kind. Offering new teachers an additional salary for teaching at ‘their’ school could disturb ‘school-peace’ (Paschert 2019).

Sachsen Anhalt (ST)

In ST teacher shortage is spread all over the schools. Teacher shortage is faced by enlarging the study capacities at the universities, which were almost doubled from 2016 to 2019 (550 to 1000), teachers can get paid for additional teaching hours, young teachers in their teacher training teach more lessons on their own, and, if necessary, classes are merged together (Das Bildungsmagazin - news4teachers 2019). The measures mentioned burden the established teachers, who must work more or have to teach more students at a time. These measures include the risk of overtaxing teachers and making them sick. In the long (or even short) run this solution is a destructive one.

Brandenburg (BB)

In BB the teacher shortage affects mostly primary schools (KMK - Kultusministerkonferenz 2018). As the universities offer a double qualification for primary and some secondary schools the surplus of those graduated students may reduce the shortage. This, however, requires attractive payment and working conditions. BB offers an equal payment for primary school teachers and secondary school teachers or teachers for students with special needs. Working full hours means in BB to teach 27 hours at a primary school or 25 hours at any secondary school, which is less than in most other states. At least when they are starting at school, all teachers are paid equally (Ministerium für Bildung, Jugend und Sport des Landes Brandenburg (MBS) 2020). So, BB and its responsible ministers feel well-prepared for teacher shortage.

Nonetheless this optimistic view is not shared by the teachers’ association of BB (Gellner 2019). They point out that there is only one university in BB offering teacher training and that teacher shortage in other states of Germany may affect the schools in BB as well.

Berlin (BE)

Berlin is a popular and growing city. This is, why many teachers are needed. In the past Berlin decided to be more flexible as an employer for teachers and stopped offering teaching positions as civil servants in 2004. Therefore schools could pay more flexible or dismiss unprofessional teachers but mostly it was a strategy to save money. As becoming a civil servant is attractive for many teacher students, graduated teachers prefer to apply for a position at a school in a state which offers this. So instead of improving the teaching quality at Berlin's schools, this policy leads to a lack of applicants and therefore to less quality in schools. Dealing with a severe shortage Berlin hires academics who have studied a subject which is related to school subjects and qualifies them while they are already teaching. Recently there are districts in Berlin where 60 to 70 percent of new teachers hired are so called 'Quereinsteiger' (side entrants) (Berliner Senatsverwaltung für Bildung, Jugend und Familie 2021)

Berlin's politicians are forcing efforts to reestablish teachers' status as civil servants now (Laak 2019). But it is also discussed whether it is the teachers' status or the demanding work in Berlin's hot spots that repels junior teachers from Berlin's schools.

Rheinland-Pfalz (RP)

RP has a slight teacher shortage that spreads all over the school types except Gymnasien. To deal with the shortage the ministry of education enables side entrants. It has to be pointed out, that side entrants are not allowed at Primary Schools. They are searched for Realschule plus and Förderschulen. The applicants for Förderschulen need to have graduated in pedagogics, the applicants for Realschule plus need to be graduated in a specifically announced subject. To guarantee the quality of teaching, teacher training lasts 24 months. There is an additional type of side entrants: they are graduated and have working experience in their subject. They participate in teacher training programs 25 % and teach 75 % of their working hours. Both types can lead to the status civil servant. The ministry is advertising to get more teachers. (Ministerium für Bildung Rheinland Pfalz 2020; Gillmann 2020)

Hessen (HE)

In 2020 HE expected a teacher shortage but seems to have managed to cover the shortage. The ministry of Education in HE does not collect or publish data about classes students missed due to teacher shortage, illness etc., what is criticized by teacher association GEW and parents (HLZ 2020).

The ministry refuses to announce a teacher shortage in general. There are regional differences and differences with regard to the subjects (Hessische Lehrkräfteakademie 2020; HLZ 2020). HE does not allow side entrants on a regular basis. Just for some subjects in vocational schools side entrants are offered to graduated technicians with working experience. HE managed to prepare for the recent need for teachers by establishing more study places at the universities and asking teachers who are about to retire to do so later or even to come back to school or part-time teachers to give more lessons.

Even if there is no urgent teacher shortage recently, HE qualified secondary school teachers to teach as primary school teachers. (Mitteldeutscher Rundfunk MDR 2019)

Thüringen (TH)

In general, there is an expected teacher shortage of 340 in 2020. This does not sound severe, but in 2020 Thüringen has to fill more than 1000 vacant teaching positions. Mostly affected are primary schools and schools for vocational education (each expects a lack of 120 teachers). To reduce teacher shortage TH enables side entrants with additional seminars to qualify them properly. TH tries to encourage young academics to apply for teaching as a profession by starting a campaign on TV and

social media. TH also improved its online application standards to make it easier getting a teaching position. (Das Bildungsmagazin - news4teachers 2020; Mitteldeutscher Rundfunk MDR 2019)

Sachsen (SN)

In 2019 SN was able to fill all vacant teaching positions. There are no figures about teachers required in future or data about expected teacher shortage. However, SN estimates that round about 1000 teachers will retire on a regular basis every year coming and expects more students so even more teachers will be needed. SN enables side entrants and tries to address interested academics by media campaigns, they offer pay raise for special tasks and strongly affected regions, also there is equal payment for primary school teachers and secondary school teachers (if they are fully qualified). Recently SN has offered their teachers positions as civil servants. Last but not least SN prepared itself for the expected teacher shortage by implementing more study places at the universities (Piwarz; Kultusministerium Sachsen 2019)

Saarland (SL)

SL is not affected by teacher shortage. Side entrants to teaching positions are only enabled at schools for vocational education (Ministerium für Bildung und Kultur Saarland 2019; KMK - Kultusministerkonferenz 2018).

Even though Saarland's teachers' association complains about more work for the teachers due to the corona virus in 2020 and emphasizes that approximately 20 % of the teachers belong to the group of particularly vulnerable persons (Berdin und Wagner 2020).

Baden-Württemberg (BW)

In 2020 there is a surplus of 950 teachers for grammar schools expected, but is facing a teacher shortage for almost all the other school types (KMK - Kultusministerkonferenz 2018). Therefore, BW tries to offer fully trained grammar schoolteachers a position at a different school type. If they accept, they will receive an additional qualification for the chosen school type.

For some subjects like music teacher training is available for non-academic professionals. They have to join training courses for 'specialist teachers of music and technical subjects at schools for general education' (Ministerium für Kultus Jugend und Sport Baden Württemberg).

Bayern (BY)

In 2020 there is a lack of 900 teachers. From 2014 to 2018 there was no teacher shortage in BY. In 2019 340 teachers were missing, in 2020 the shortage increased to 900. Primary schools and lower secondary schools are mostly affected (cp. KMK - Kultusministerkonferenz 2018)

BY is newly confronted with teacher shortage. In former years BY was able to quit side entrants and qualify teachers for an additional school type to fill the vacancies at primary schools or middle schools or teaching positions for children with special needs. The recent teacher shortage strongly affects BY. Parents are used to properly qualified teachers for their children and teachers are not willing to follow the suggestions of the Minister for Education, like working more hours and or letting go the options of a sabbatical year. They point out that working conditions are already hard and over hours, enlarging classes or delaying the age of retirement will not fix the problem (cp. Günther 2020; Czerny 2020)

The suggested measures are restrictive and result in resistance. There is much going on in BY and it must be observed how the politicians and ministries will react.

Analyse

What further information can be extracted from this detailed overview of the federal states?

The states were presented in a geographical order, but a different presentation may enlighten some phenomenon. Are there similarities between the four smallest states or the three so called city states (Stadtstaaten) Berlin, Bremen and Hamburg? Berlin is the largest city state. It covers an area of around 890 square kilometres, has a population of 3 644 826 and it also has the highest population density in Germany with 4 090 inhabitants per square kilometer.

Table 1: The four smallest states of Germany⁶

State	Size in km ²	Inhabitants 31.12.2018	Population density 31.12.2018	Shortage of teachers in 2020
<i>Saarland</i>	<i>2.571,11</i>	<i>990.509</i>	<i>385</i>	<i>90</i>
Berlin	891,12	3.644.826	4.090	880
Hamburg	755,09	1.841.179	2.438	50
Bremen	419,36	682.986	1.629	10

Berlin currently needs 880 teachers and has a much bigger shortage than Hamburg and Bremen, even if the sizes of the states are kept in mind. As already discussed, Berlin's teachers are not civil servants and as this is one of the most important benefits for most teacher students, many fully-trained teachers try to get a position in Brandenburg. Hamburg and Bremen do not have to cope with this problem, nevertheless they must find strategies to fill recent and future vacancies. As small planning units, they can probably better observe and anticipate the current and future situation and develop tailor-made strategies. Saarland probably benefits from being a small planning unit. It is among the four smallest states of Germany, and somehow it is comparable to the city states, it has more inhabitants than Bremen but fewer than Hamburg, it has a low population density. What is even more remarkable: there is no teacher shortage.

Table 2: The four most populous states of Germany⁷

State	Size in km ²	Inhabitants 31.12.2018	Population density 31.12.2018	Shortage of teachers in 2020
Nordrhein-Westfalen	34.112,31	17.932.651	526	370
Bayern	70.541,57	13.076.721	185	900
Baden-Württemberg	35.748,22	11.069.533	310	50
Niedersachsen	47.709,50	7.982.448	167	760

Are there similarities between the most populous states of Germany? Nordrhein-Westfalen has almost 18 million inhabitants and among the most populous states the highest population density. This state has much experience with teacher shortage. A distinction can be made between immediate measures and long-term solutions. The variety of measures is large and seems to be very specific. In contrast to Nordrhein-Westfalen, Bayern has little experience with teacher shortages and seems to have tried and tested few strategies available so far.

⁶ Own presentation based on Statistische Ämter des Bundes und der Länder 2020

⁷ Ibid.

Bayern has a lower population density and larger rural areas; the rules for teacher training are so different from the other states, that it is not so easy for graduated teachers from other states to teach in Bayern or for teachers from Bayern to teach elsewhere.

Baden-Württemberg has managed its number of teachers well, so far. The fitting of trained teachers for vacant positions is sometimes not right, which is dealt with by additional training. So, there only a gentle correction is necessary.

Niedersachsen seems to have enough teachers but is struggling to get unattractive vacancies filled.

There are no obvious similarities among the most populous states of Germany. As already mentioned in the beginning of this text, every state is responsible for its schools and education. This autonomy enables and demands local strategies.

Conclusion

One country, but different situations and different approaches to deal with the problem of teacher shortage. The closer view on the map of Germany, its federal states and their teaching situation at schools reveals on the one hand, that local situations are different, and it is important to have this in mind dealing with a surplus of educated teachers as well as with a shortage of teachers. On the other hand, German states cannot act as if they are isolated from the rest of the country. This can be seen in Berlin and Brandenburg in an impressive way. Berlin educates many teacher students and nevertheless has a great shortage of fully trained teachers which is partially explainable with more attractive teaching positions in Brandenburg (cp. Kreienbaum 2021).

Saarland seems, compared to Berlin and Brandenburg, to be more isolated. It is a small state, framed by the neighbour states France and Luxemburg. So maybe this fact helps Saarland to attract graduated teacher students for its own schools. They probably do not have to fear a high mobility of its graduated teachers. If this is correct, it is easier to calculate how many teacher students are needed at the universities to fill future vacancies.

The main questions are: How successful are the ministries and politicians as well as the universities in recruiting the right number of students for teacher education? How successful are they in attracting people who are passionate and talented for the job?

The overview presented is unique for the German school sector. It takes a look at each federal state and fills the figures with meaning, describes the current teaching situation from the perception of the public, the schools and the education ministries. The text impressively demonstrates that a mere look at the statistical data of university graduations, teacher inflows and outflows is not very insightful and does not reflect the situation at the local schools. So further research, following this initial overview, will have to deepen the understanding. For example, school principals, local school administrators, and district-level school administrators can be interviewed and asked about their insights and opinions about teacher shortage.

Appendix

Table 3: Teacher shortage: Amount and strategies

State North to South West to East	expected Shortage in 2020 ⁸	Most affected ⁹	Measures (based on online research and online account of the ministries)	Number of Schools (Primary schools) ¹⁰	Number of teachers ¹¹ Number of students ¹²
Schleswig Holstein (SH)	-	Special regions and support centers	additional salary of 250 € per month for those students entering their second phase of teacher training in a school with a lack of teachers	1 239 schools in total 665 primary schools	Full time teachers: 13 485 Part time teachers 10 308 Teaching on a hourly basis: 823 Students/pupils: 290 230 Included foreign students: 24 545
Niedersachsen (NI)	760	mostly needed are teachers who are qualified for both, primary schools and secondary schools	Temporary secondments (one or two semesters). Teachers from schools with too many are sent to those schools with a teacher shortage	3 483 schools in total 1 694 primary schools	Full time teachers: 44 598 Part time teachers: 24 156 Teaching on an hourly basis: 7 723 Students/pupils: 822 058 Included foreign students: 86 370
Bremen (HB)	10	Secondary schools	Filling position with teacher students, who are not fully qualified. Expending options for side entrances to teacher positions	195 schools in total 102 primary schools	Full time teachers: 2 987 Part time teachers: 3 123 Teaching on an hourly basis: 781 Students/pupils: 67 233

⁸ KMK - Kultusministerkonferenz 2018.

⁹ KMK - Kultusministerkonferenz 2018, 2019.,

¹⁰ Statistisches Bundesamt 2020d.

¹¹ Statistisches Bundesamt 2020d.

¹² Statistisches Bundesamt 2020d.

State North to South West to East	expected Shortage in 2020 ⁸	Most affected ⁹	Measures (based on online research and online account of the ministries)	Number of Schools (Primary schools) ¹⁰	Number of teachers ¹¹ Number of students ¹²
					Included foreign students: 12 871
Hamburg (HH)	50	'primary schools and some secondary schools', Surplus of teachers for students with special needs.	None yet. Hamburg will harvest the benefits of earlier teacher surplus.	655 schools in total 225 primary schools	Full time teachers: 8 519 Part time teachers: 8 601 Teaching on an hourly basis: 1 582 Students/pupils: 198 889 Included foreign students: 27 644
Mecklemburg Vorpommern (MV)	210	Primary and secondary schools	Recently graduated grammar schoolteachers get an offer to become civil servants at lower secondary schools. Payment and conditions like teaching at upper secondary schools/grammar schools.	714 schools in total 326 primary schools	Full time teachers: 7 584 Part time teachers: 4 007 Teaching on an hourly basis: 1 245 Students/pupils: 151 543 Included foreign students: 8 607
Nordrhein-Westfalen (NW)	370	primary schools, lower secondary schools, schools for students with special needs and schools for vocational education.	Additional salary, incentives to reduce parental leave, re-hiring retired teachers, loosen up rules for side entrances	5 128 schools in total 2 784 primary schools	Full time teachers: 101 262 Part time teachers: 65 544 Teaching on an hourly basis: 10 572 Students/pupils: 1 916 925 Included foreign students: 237 528
Sachsen Anhalt (ST)	430	General demand of teachers in several schools.	Over-hours, school classes are merged, more teacher students at the universities	879 schools in total 501 primary schools	Full time teachers: 12 363 Part time teachers: 2 931 Teaching on an hourly basis: 1 023 Students/pupils: 197 067

State North to South West to East	expected Shortage in 2020 ⁸	Most affected ⁹	Measures (based on online research and online account of the ministries)	Number of Schools (Primary schools) ¹⁰	Number of teachers ¹¹ Number of students ¹²
					Included foreign students: 12 432
Brandenburg (BB)	430	primary schools Surplus of teachers for secondary schools	Equal payment for teachers at primary and secondary schools.	1 434 schools in total 506 primary schools	Full time teachers: 15 126 Part time teachers: 5 280 Teaching on an hourly basis: 1 295 Students/pupils: 247 842 Included foreign students: 14 721
Berlin (BE)	880	primary schools	BE enables side entrants (60 % of applicants for vacant teaching positions in August 2019).	1 274 schools in total 434 primary schools	Full time teachers: 20 877 Part time teachers: 10 877 Teaching on an hourly basis: 2 609 Students/pupils: 365 942 Included foreign students: 60 556
Rheinland-Pfalz (RP)	560	all school types	There are two different types of side entrants. Both types can lead to the status civil servant. The ministry is advertising to get more teachers. ¹³	1 520 schools in total 962 primary schools	Full time teachers: 20 438 Parttime teachers: 14 544 Teaching on an hourly basis: 5 091 Students/pupils: 407 214 Included foreign students: 40 256
Hessen (HE)	Surplus of 110	primary schools, schools for vocational	No side entrants.	3 240 schools in total 1 188 primary schools	Full time teachers: 31 875 Part time teachers: 21 581

¹³ Mitteldeutscher Rundfunk MDR 2019.

State North to South West to East	expected Shortage in 2020 ⁸	Most affected ⁹	Measures (based on online research and online account of the ministries)	Number of Schools (Primary schools) ¹⁰	Number of teachers ¹¹ Number of students ¹²
	But in 2022 there is a shortage of 940 teachers expected.	surplus of teachers for lower secondary schools and grammar schools	More study places at the universities. Delaying retirement age. Increasing teaching contingents of part time teachers. Qualifying secondary school teachers to become primary school teachers. Asking university leavers to apply for teacher training at a primary school even if they studied for a different school type. ¹⁴		Teaching on an hourly basis: Students/pupils: 635 955 Included foreign students: 86 446
Thüringen (TH)	350	primary schools, schools for vocational education	TH enables side entrants. Advertisement for teaching as a profession. Improving online application standards to make it easier get a teaching position. ¹⁵	883 schools in total 435 primary schools	Full time teachers: 12 389 Part time teachers: 3 608 Teaching on an hourly basis: 1 370 Students/pupils: 195 612 Included foreign students: 12 250
Sachsen (SN)	No data	In 2019 SN was able to fill all vacant teaching positions. There are no figures about teachers required in future	SN enables side entrants, ministry is advertising, pay raise, first time in history of SN as a state of Germany it is	1 541schools in total 836 primary schools	Full time teachers: 18 667 Part time teachers: 12 441 Teaching on an hourly basis: 1 250

¹⁴ Ibid.

¹⁵ Mitteldeutscher Rundfunk MDR 2019.

State North to South West to East	expected Shortage in 2020 ⁸	Most affected ⁹	Measures (based on online research and online account of the ministries)	Number of Schools (Primary schools) ¹⁰	Number of teachers ¹¹ Number of students ¹²
		or expected teacher shortage. ¹⁶	enabling teachers to become civil servants, more study places at the universities. Equal payment for primary school teachers and secondary school teachers (if they are fully qualified). ¹⁷		Students/pupils: 381 059 Included foreign students: 23 167
Saarland (SL)	90	Primary schools and grammar schools	SL is not affected by teacher shortage. Side entrants to teaching positions is only possible at schools for vocational education. (Ministerium für Bildung und Kultur Saarland 2019)	307 schools in total 161 primary schools	Full time teachers: 5 837 Part time teachers: 2 522 Teaching on an hourly basis: 91 036 Included foreign students: 13 412
Baden-Württemberg (BW)	50	All school types except grammar schools	BW tries to offer fully trained grammar school teachers a position at a different school type they will then receive an additional qualification for. ¹⁸	5 193 schools in total 2 205 primary schools	Full time teachers: 48 816 Part time teachers: 42 333 Teaching on an hourly basis: 22 088 Students/pupils: 1 109 593 Included foreign students: 139 856
Bayern (BY)	900	2014-2018 there was no teacher shortage in BY. In 2019 340 teachers were	working more hours per week both, on a voluntary basis and on the basis of an order.	4 647schools in total 2 407 primary schools	Full time teachers: 56 455 Part time teachers: 40 622

¹⁶ Zentrum für Lehrerbildung, Schul- und Berufsbildungsforschung 2019.

¹⁷ Mitteldeutscher Rundfunk MDR 2019.

¹⁸ Mitteldeutscher Rundfunk MDR 2019.

State North to South West to East	expected Shortage in 2020 ⁸	Most affected ⁹	Measures (based on online research and online account of the ministries)	Number of Schools (Primary schools) ¹⁰	Number of teachers ¹¹ Number of students ¹²
		missing, in 2020 900. Primary schools and lower secondary schools are mostly affected.	No more retirements before the age of 66. Part time contracts get an increased number of minimum hours to be legal. Sabbaticals won't be able anymore. ¹⁹		Teaching on an hourly basis: 24 105 Students/pupils: 1 248 686 Included foreign students: 141 936

¹⁹ Günther 2020.

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