

# INSUFFICIENT CONDITIONS FOR DISTANCE LEARNING IN GERMANY EXACERBATE EDUCATIONAL INEQUITY

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DOI: 10.24989/ocg.v341.15

## **Abstract**

*Every three years, the OECD conducts the so-called PISA studies (Programme for International Student Assessment), the largest international studies of school performance. These studies test whether participating pupils can apply their acquired knowledge and link information in a meaningful way - key competencies for being successful in the information society of the 21st century. Some 600,000 pupils from 79 countries and regions participated in the latest 2018 PISA test. In the first test, conducted in 2000, Germany's pupils performed poorly, but now they achieve above-average results. But of concern to German education policymakers is the substantial achievement gap between pupils from favorable socioeconomic backgrounds and those from unfavorable social backgrounds in Germany. Although there has been progress since the first study in 2000, there have been setbacks in recent years. Further setbacks could follow. Due to the Corona crisis, schools had to be closed for several weeks. At short notice and without preparation distance learning was prescribed. However, Germany is not sufficiently prepared for this. In an international comparison, the technical equipment in schools, a prerequisite for sustainable "digital" learning success for pupils, is not particularly good. Pupils' conditions at home, especially among disadvantaged pupils, are also often not conducive to successful distance learning. They are less well equipped with PCs and laptops, have less access to the Internet, receive significantly less support from their parents, and their housing conditions are much more cramped. This raises fears that social selectivity could increase.*

## **1. Pisa studies**

Since 2000, the Organisation for Economic Cooperation and Development (OECD) has commissioned the so-called PISA studies (Programme for International Student Assessment) every three years. The aim is to record basic competencies on reading, mathematics and science of fifteen-year-olds towards the end of compulsory schooling in order to make statements about how well prepared young people are for successful participation in modern society. One of the three fields alternately form the focus. In addition, questionnaires will provide information about the characteristics of the respective school, the attitudes and activities of the young people and the situation at home. Difficulty and competence score scales are subsequently scaled so that the competence scores have a mean of approximately 500 and a standard deviation of 100 in the OECD countries. 37 OECD countries and 42 so-called OECD partner countries took part in the 2018 PISA study. Around 600,000 students took part worldwide. In Germany, 5,500 students at around 220 German schools of all types were tested. Teachers and parents<sup>1</sup> were also surveyed. [9]

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## 2. Pisa shock 2000

In the first PISA test in 2000, in which 32 nations took part, Germany ranked only 21st. The German pupils performed worse than the OECD average in all competence areas. Of particular concern to many education policymakers, however, was the close correlation between social background and academic success in Germany. In no other industrialized nation do children and young people with an immigrant background or from working-class families have such a low chance of getting a good school degree. The shock was profound. Germany's education politicians began to investigate the causes, numerous proposals were discussed and some reform measures were taken. In many places, reformers focused on the expansion of all-day schools, early language support and, finally, the (partial) abolition of the tripartite school system. In the following years, improvements in performance were evident. German pupils achieved results above the OECD average, including the Pisa study in 2018.

## 3. PISA-Study 2018

### 3.1. Reading

The 2018 Pisa study focused on the competence area of reading. At 498 points, the mean value of reading skills in Germany was significantly above the OECD mean of 487. In 2000, however, the mean score of young people in Germany was still significantly below the mean value of the OECD countries. In all countries that participated in the 2018 PISA study, girls achieved significantly higher mean scores in reading literacy than boys; in Germany, boys scored 486 points and girls 512 points. In addition to looking at the mean values, the disparity of reading skills is of particular importance for educational policy. This is measured in form of standard deviation and provides information about how large the differences in competency of the pupils are within the individual countries. The standard deviation of reading literacy in Germany is 106 points, which is significantly larger than the spread across all OECD countries (99 points). This means that there are considerable differences between pupils with very good reading abilities and pupils with poor abilities within Germany. At 20.7%, Germany has a very high proportion of pupils with very poor literacy skills. Compared to the last PISA study in 2015, the proportion has even increased, especially in non-grammar school types. In further in-depth analyses, the differences between school types were examined. A distinction is made between grammar schools (Gymnasien) and non-grammar school types (secondary school, school with several courses of study, integrated comprehensive school and secondary school: in German: Hauptschule, Schule mit mehreren Bildungsgängen, Integrierte Gesamtschule and Realschule).<sup>2</sup> It is not surprising that within the non-grammar school types, there is a wider spread of reading competence (93) than within grammar

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<sup>2</sup> In Germany, education is a matter of the federal states. Each federal state has its own school types and names. First of all, the pupils go to elementary school (Grundschule), which lasts four years in most federal states. This is traditionally followed by the three-tier school system in: Hauptschule, Realschule and Gymnasium. A Hauptschule ("general school") is a secondary school in Germany, which offers Lower Secondary Education (Level 2) according to the International Standard Classification of Education. A Gymnasium is a type of school with a strong emphasis on academic learning, and providing advanced secondary education, comparable to British grammar schools. The third type in the German secondary school system, the Realschule, is ranked between Hauptschule (lowest) and Gymnasium (highest). In recent years there have been numerous reform efforts (partly due to the PISA shock). There are more and more community schools (Gemeinschaftsschulen, Gesamtschule). Community school stands for different forms of longer learning "together". The basic principle is the flexible cooperation of different types of schools up to the complete consolidation into one type of school with the aim of a longer common school time. The aim is to achieve better permeability in the education system and more effective integration of migrant children.

schools (76). It is worrying that 29% of young people at non-grammar schools are on the lowest proficiency levels (I and II). They only have very limited reading skills. [11]

Ranking position	Country	Mean (points)	Standard deviation (points)
1.	Estonia	523	93
2.	Canada	520	100
3.	Finland	520	100
15.	Germany	498	106
16.	Slovenia	495	94
20.	Czech Republic	490	97
	OECD-Mean	487	99
22.	Austria	484	99
26.	Hungary	476	98
32.	Slovakia	458	100

**Table 1: Mean values, standard deviations: Reading literacy of selected OECD countries**  
Indicated are the top three countries and the countries from which the most conferees come from.  
Source: [2] p. 59.

An interesting finding with regard to digitalisation can be seen in a direct comparison of the understanding of texts when they are presented to readers either in printed form or in digital form on a screen. Delgado, Vargas, Ackerman and Salmerón (2018) prove a superiority in reading comprehension for the printed medium, especially for factual texts. One reason for this discrepancy could be that reading on the screen suggests a rather superficial processing mode, the information presented is processed less deeply. [4]

### 3.2. Mathematics

In mathematics, German pupils achieve an average score of 500 points. This means that German pupils are also significantly above the OECD average of 489 points in this field of competence. As in previous studies, there are significant gender differences in the mathematical competencies. In mathematics, in contrast to reading, male pupils achieve better results than female pupils. With a standard deviation of 95 points, Germany also has a significantly higher dispersion in this area of competence than the OECD average (91). The high dispersion reveals big differences in the mathematical competence of low-performing and high-performing pupils. [11]

Ranking position	Country	Mean (points)	Standard deviation (points)
1.	Japan	527	86
2.	South Korea	526	100
3.	Estonia	523	82
9.	Slovenia	509	89
15.	Germany	500	95
17.	Czech Republic	499	93
18.	Austria	499	93
	OECD-Mean	489	91
26.	Slovakia	486	100
30.	Hungary	481	91

**Table 2: Mean values, standard deviations: Mathematic literacy of selected OECD countries**  
Indicated are the top three countries and the countries from which the most conferees come from.  
Source: [4] p. 196.

### 3.3. Natural Science

The pupils in Germany scored 503 points in natural science. In this field of competence, too, they are above the OECD average of 489 points. However, here too - as in the other two competency fields - a wide disparity can be observed. A fifth of the young people do not reach competence level II. In the non-grammar school types, scientific literacy has even decreased significantly compared to the previous PISA study in 2015. The performance of girls and boys hardly differs. Here too, the standard deviation provides information on the heterogeneity of the distribution of competencies in a country. The widest differences within the OECD countries are in Israel (111), followed by the Netherlands (104), Germany (103), New Zealand (102) and Australia (101). In all these countries, the dispersion is significantly above the OECD mean (94). The promotion of young people with weak competencies in Germany remains a challenge. Obviously, the German education system does not succeed in providing equal support for low- and high-achieving young people. A relatively large proportion of young people achieve only inadequate results. These young people are not sufficiently educated for their future path, especially in the workplace and in society in general. Education systems such as Estonia or Japan show that successful broad-based funding in the sense of natural sciences can be more successful for everyone that does not neglect even highly competent young people. [11]

Ranking position	Country	Mean (points)	Standard deviation (points)
1.	Estonia	530	88
2.	Japan	529	92
3.	Finland	522	96
8.	Slovenia	507	88
11.	Germany	503	103
16.	Czech Republic	497	94
23.	Austria	490	96
	OECD-Mean	489	94
27.	Hungary	481	94
32.	Slovakia	464	96

**Table 3: Mean values, standard deviations: science literacy of selected OECD countries**  
**Indicated are the top three countries and the countries from which the most conferees come from.**  
 Source: [5] p. 224.

### 3.4. Still high correlation between educational success and social background

The results of the 2018 PISA study once again show that the correlation between social origin and education is particularly strong in Germany, compared with other OECD countries, although the gap is no longer quite as large as it was in 2000. Even if the gap decreased, compared to the year 2000, it has actually increased somewhat again compared with the test of 2015. Compared with other European countries, the performance differences between young people without an immigrant background and young people with an immigrant background in particular is relatively big.

The study also examined what proportions of fifteen-year-olds with and without an immigrant background attend a Gymnasium or a non-grammar school. The proportion of fifteen-year-olds without an immigrant background who attend a Gymnasium is 13 percentage points higher than the proportion of their peers with an immigrant background. At non-gymnasium schools, the share of fifteen-year-olds with an immigrant background is 14 percentage points higher than the share of fifteen-year-olds without an immigrant background. [11]

	Grammar school	Non-grammar school types
Without immigration background	43.0 %	52.8 %
With immigration background	29.8 %	66.4 %

**Table 4: Percentage of fifteen-year-old pupils with an immigrant background in grammar schools and non-grammar school types. (Total does not equal 100 per cent as some students could not be "assigned")**

Not only the school system, but also the German higher education system is characterized by strong social selectivity. This is also shown by the results of the so called "Bildungstrichter". Out of 100 children from non-academic families, only 27 begin studying. If the parents have a university degree, on the other hand, it is 79 out of 100 - so the chance for academic children is around three times higher. These data show a very strong correlation between educational success and social background. For pupils with a migration background, social origin plays an important role. [5]

Overall, children from socially weaker and less educated families in Germany have significantly worse chances of success at school and universities than children with highly educated parents. This is also confirmed by the figures of the Federal Statistical Office and raises the issue of educational justice in Germany. 61% of children under 15 years whose parents themselves have a high level of education attended a Gymnasium in 2015. Only 18% of the children of highly educated families went to a Realschule or Gemeinschaftsschule. Only a very small proportion of 3% attended the Hauptschule. Parents with an intermediate level of education most often send their children to the Realschule (35%), only 30% attend the Gymnasium. Almost as many children (28%) attend a Gemeinschaftsschule. The Hauptschule is rarely chosen (7%). About every fifth child of parents with Hauptschul-degree also attended a Hauptschule in 2015. At the same time, the number of Gesamtschüler in these families increased. Almost every third child (31%) attended a Gesamtschule. Only every seventh child from a family with low education attended a Gymnasium (14%). [15]

	High Education	Middle Education	Low Education
Gymnasium	61	30	14
Realschule	18	35	33
Hauptschule	3	7	22
School with several courses	18	28	33

**Table 5: School attendance by educational attainment of parents (2015 in %)**

The level of education also correlates very strong with poverty. At 35.9%, the poverty rate of pupils of the Hauptschule in 2012 was more than twice as high as that of all pupils (17.6%). The poverty rate of pupils of the Realschule (17.2%) hardly differed from the overall average, while only 8.6% of pupils attending a Gymnasium were at risk of poverty. The significantly higher poverty rates of pupils with a migrant background compared to those without a migrant background in all types of schools were particularly striking. Across all types of school, children with a migration background (29.4%) were almost three times as likely to be at risk of poverty as those without a migration background (10.7%). [8]

#### 4. Corona und shutdown

In spring 2020, the Corona virus spread rapidly in Europe and also in Germany. To contain the Corona virus, schools were closed for several weeks in all federal states - in spring 2020 (also in winter 2020/2021 and spring 2021). "Overnight", schools were faced with the task of establishing digital forms of teaching. Many schools, also teachers and pupils, were unprepared. The pupils had to learn predominantly at home - in what form exactly, is handled very differently from school to

school. However, these school closures and distance learning could lead to an increase in social selectivity.

#### 4.1. Requirements / equipment

The learning success of school children in distance learning differs depending on the equipment of the schools, the achievement level of the pupils, school motivation, the home equipment, the housing conditions and in the support possibilities by the parents.

##### 4.1.1. Equipment of schools

If distance learning is prescribed, you need a good digital infrastructure. The Corona-related school closures have exposed the weaknesses of the digitalisation of the education system in Germany. In many cases, the basic foundations of digital education, especially modern equipment in schools, were already lacking before the outbreak of the corona pandemic.

International comparisons show that German schools are not well equipped with digital devices. Quantitative indicators such as the number of computers per pupil in schools show that Germany (0.61), is below the OECD average (0.9). This also applies to the number of computers with internet access, the number of interactive whiteboards and the number of computers with internet access for teachers. [11]

Equipment per pupil in grade 9	Germany	OECD-Mean
Number of computers	0.61	0.90
Number of computers with internet connection	0.57	0.88
Number of portable computers	0.17	0.42
Number of interactive whiteboards	0.10	0.14
Number of computers with internet connection for teachers	0.49	0.57

**Table 6: Equipment per pupil in grade 9**

The digital learning platform “Preply” has published a study in which the current preconditions for successful eLearning and digital education in 30 OECD countries were examined. The study compared the conditions for digital education in Germany with other countries worldwide. For this purpose, data on the status of the digital infrastructure, the digital educational offer and the eLearning market were analysed. In the resulting ranking of the countries, Germany only ranks 13th. Germany's position in the midfield confirms that digitalisation lags behind towards many other countries, especially with regard to broadband speed. Norway offers the best conditions worldwide for successful eLearning, among other things with broadband internet at a speed of 127.2 Mbit/s - almost one and a half times faster than in Germany. [10]

In international comparison, Germany is very far behind in terms of fibre-optic connections. However, fibre optic cable offers an enormous advantage that very high transmission rates and thus very fast internet connections are possible. A fibre-optic connection delivers 10 to 20 times the speed of a copper cable. While Lithuania and Sweden have a very high share of fibre-optic connections in all stationary broadband connections, well over 70%, the OECD average is 28%, Germany only achieves a share of 4%. [12]

Table 7 shows the result of a survey carried out among school principals in 2019 on the availability of high-speed Internet and WiFi in classrooms and subject rooms. Only 36% of all surveyed school principals stated that both - classrooms and specialist rooms - in their school had access to high-

speed internet and WiFi. According to the survey, this form of digital equipment was available in 34% of primary schools and 45% in Gymnasien. [12]

	Yes	No
Overall	36 %	63%
Grundschule	34 %	66%
Haupt-, Real-, Gesamtschule	40%	60%
Gymnasium	45 %	55%

**Table 7: Is high-speed internet and Wi-Fi access available in all classrooms and subject rooms at your school?**

In a survey conducted by “Westdeutscher Rundfunk” in 2019, school principals as well as pupils aged 14 to 20 in Germany were asked to rate the digital equipment in their schools using school grades. In this evaluation, the worst score for both headmaster and 14 to 20 year-olds was for tablet equipment: on average, pupils gave a 4.6 and headmaster a 4.5. Computer equipment received the best average score from both sides and is rated “satisfactory” with a score of 3 (rounded) in each case. [13]

	Grading by pupils	Grading by head teacher
Tablets	4,5	4,6
WLAN	3,6	4,1
Smartboard, interactive boards	4,0	3,5
Computer	2,9	3,2

**Table 8: What grade would you give your school when it comes to equipment with tablets, WLAN, smartboards or computers?**

Overall, Germany is clearly lagging behind the international leaders, which is also perceived by the school headmasters and teachers. Thus, from the perspective of the school headmasters, a clear, but not positive picture emerges. School leaders in Germany perceive the quality of the internet connection and the computing power of the digital devices as well as the availability of suitable software and an effective online learning platform as significantly worse than school leaders in the OECD average. In terms of the quality of internet connectivity, Germany has almost the lowest scores of all OECD countries.

Deficits are evident not only in technical equipment, but also in pedagogical competence of teachers for the use of digital devices and availability of qualified staff for technical support. For the latter, Germany is - in the perception of school administrators - in the lower third of the OECD countries. This shows a fairly consistent picture: From the point of view of school administrators, schools in Germany have considerable deficits in terms of the number of digital resources, their quality, the ICT (Information and Communication Technology) competence of the pedagogicals and the availability of technical staff compared to other countries.

Even though many of the analyses are (merely) assessments by school administrators or pupils and not an actual stocktaking, the perception of those directly affected is an important indicator of the state of digitalisation in the education sector, which places Germany in the bottom third in international comparisons. This result is in line with the findings of other studies. According to the Bertelsmann Stiftung's Digital Education Monitor study, only 16% of teachers rate the technical equipment for digital learning at their schools as very good, 38% as good. Even fewer teachers are completely satisfied with the support available (only 12%), the WLAN (8%) or further training (5%). In this study, teachers are most critical of the school WLAN. One in five said that there was no WLAN at all at their school. Where there is WLAN, more than half of the teachers rate its

quality rather negative. In total, almost two-thirds of teachers in Germany report that there is no or inadequate Wi-Fi. Teachers also complain about the lack of IT support (58%) and the lack of further training (65%). There is also a need for action in other areas. About half of the experts surveyed complain about the insufficient teacher training on the topic of "digitalisation". There is a lack of comprehensive educational concepts that explicitly include the digital possibilities of learning. The inclusion of digital possibilities in teaching would also change the didactics for teaching. This has not yet received any attention in teacher training, nor how disadvantaged pupils can be adequately helped "digitally". [3]

#### 4.1.2. Equipment at home

Not only the equipment of the schools, but also the environment at home often shows considerable deficits with regard to distance learning. The learning success of individual schoolchildren differs depending on their performance level, motivation, technical equipment and the support they receive from their parents. The quantity, but especially the quality of these factors often is poor for the already disadvantaged pupils.

##### 4.1.2.1 Technical Equipment

Internet access is still far from standard among poorer people. Table 9 shows the proportion of the population in Germany with internet access based on net household income per month in January 2020. 90% of people in households with a household net income of 2,000 euros to 2,999 euros had internet access at the time of the survey. But only 66% of people in households with a net household income of up to 1,999 euros had internet access. The poorer households are thus significantly worse equipped with internet access. This means that especially the poorer ones do not even have the basic requirement for distance learning. [14]

Household income	Internet access in %
Up to 1,999 euros	66 %
2,000 – 2,999 euros	90 %
3,000 euros and more	98 %

**Table 9: Share of the population in Germany with internet access by household net income per month (January 2020)**

The study of DIW also shows that pupils from poor backgrounds are significantly worse equipped for distance learning than pupils from affluent backgrounds. "While less than 2% of high-performing pupils do not have internet access at home, this is true for 6% of lower-performing pupils. Likewise, 13% of the underperforming students do not have a PC or laptop in their household, while the proportion of the higher performing pupils is 11%." [6] However, it is also important that every pupil owns a laptop or a personal computer. One laptop in a household is not sufficient to participate suitable in distance learning if there live several children in the household. In 2017/18, only 28% of 12-year-olds in Germany had their own PC or laptop, compared to 41% of 14-year-olds. Children who grow up in unfavourable domestic living conditions often have to cope with even worse learning equipment. For example, only 15% of 12-year-olds in households receiving social welfare have their own computer, in families with three or more children only one in four 14-year-olds has their own PC - in single-parent households, however, one in two does. [7]



#### 4.1.2.2. Motivation

With regard to motivation at school, there are significant differences between higher- and lower-performing pupils, which could probably also be related to the success of distance learning. The better performing pupils are mostly more motivated to catch up the learning contents. While only 4% of the better-performing pupils do not like going to school, the proportion among the poorer-performing pupils is almost 14%. [6] Distance learning in particular requires a certain amount of self-motivation. It is to be feared that in case of distance learning, the underperforming pupils show rather lower willingness to be motivated to pursue the school material. In school lessons, the teacher can act as a corrective - at distance learning, this is probably more difficult. A lack of technical equipment is likely to reinforce the lower motivation of poorly performing pupils.

#### 4.1.2.3. Different support from parents

Parental support plays an important role in children's learning success, especially in times of school closures. Lower-performing pupils are much more likely to need support with homework. Parents with different educational resources support their children to varying degrees of time and quality. This "educational gap" has tended to increase in recent years and is a central cause of the low educational mobility observed in Germany. Parents with an academic background support their children more often with their schoolwork. [1]

#### 4.1.2.4. Place of learning - cramped living conditions

In the situation with school closures and distance learning, a suitable place of learning at home comes to the fore. Children in poor households are also disadvantaged than children in secure income situations with regard to such a place of learning at home.

On average, in couple families in Baden-Wuerttemberg, each family member has around 30 square meters (sqm) of living space available. Couple families with one or two children have 34 sqm and 30 sqm, respectively, and families with three or more children have 24 sqm. Families with many children thus live in more cramped living conditions. Families with a migration background also live in smaller flats. On average, they have 23 sqm of living space per capita. Family households at risk of poverty have an average living space of 26 sqm per capita. This means that large families, families with a migration background and families at risk of poverty have significantly less space in their homes than the average of all families. (Similar orders of magnitude can be seen in other federal states.)

Life forms	Living space per capita	In cramped living conditions
Couples without children	51,8 sqm	5,9 %
Couples with children	30,1 sqm	45,5 %
With 1 child	33,5 sqm	35,9 %
With 2 children	29,6 sqm	48,2 %
With 3 children	23,9 sqm	70,1 %
Single parents	35,0 sqm	32,6 %
With 1 child	39,4 sqm	23,1 %
With 2 children	31,0 sqm	47,4 %
With 3 children	23,0 sqm	74,7 %
Families with migration background	22,5 sqm	63,8 %
Family households at risk of poverty	25,7 sqm	68,0 %

Table 10: "Confined living conditions"

These basic statements are also confirmed if the proportion of families is considered who live in cramped living conditions compared to the housing situation of all forms of life in Baden-Wuerttemberg. This includes families "who have less than 60% of the median living space" of all living arrangements per capita in the state at their disposal. In particular, couples and single parents with 3 or more children (70% and 75% respectively), families at risk of poverty (68%) and families with a migration background (64%) live - according to this definition - in comparatively cramped conditions.

In addition to living space in square metres, the number of rooms available is another indicator of housing supply. Households are considered "overcrowded" if they do not have the following minimum number of rooms: one room for the household; one room for each couple in the household; one room for each individual aged 18 and over; one room for each two children of the same sex aged 12-17; one room for each child aged 12-17 if the children are of different sexes; one room for each two children under 12. In Germany, the proportion of overcrowded households was 7%. Looking at the overcrowding rate by household type, there are clear differences. In Germany, the overcrowding rate for households with children is 9%, for households without children it is 5%. Households of single parents (23%), households of couples with 3 or more children (13 %) and households at risk of poverty (20%) are particularly frequently affected. These are not good conditions for suitable distance learning. [16]

## 5. Federal Digital Pact

To promote the equipment of schools for better distance learning, the Federal Government and the federal states have already reacted already before the pandemic outburst. With the "DigitalPakt Schule" (Digital Pact for Schools) in summer 2019, the Federal Government is supporting the federal states and municipalities in investing in digital education infrastructure. The aim of the Digital Pact is the nationwide development of a modern digital education infrastructure in schools. By 2025, all schools are to be equipped with a suitable digital educational infrastructure. The federal government will provide 5 billion euros. However, till June 30, 2020, only 15.7 million of the funds had been called. Germany is lagging behind furthermore and is struggling to advance digitalisation.

The Corona crisis revealed that there was a lot of catching up to do nationwide in terms of digital learning. The Corona crisis now provides a boost in terms of digitalisation efforts. Germany is now trying to make up for the failures of the past years in a very short time. As a result of the school closures caused by the pandemic, in summer/autumn of 2020 it was decided to supplement the DigitalPakt with additional 1.5 billion for IT administration, tools for the creation of digital content and loanable school mobile devices for pupils as well as for teachers.

- 500 million euros for an immediate equipment program so that schools can lend laptops to those pupils who do not have their own devices at home
- 500 million euros to support administrators who are supposed to take care of digital technology
- 500 million euros to equip teachers with laptops

For example, every pupil in the state of Bremen (first in Germany) who urgently needs a laptop or tablet for lessons at home are now provided with devices on loan. It is to be welcomed that funds are being made available for such devices. This can already help a lot, but it does not solve all problems. Germany cannot make up - in a very short time - everything what it has missed in the

past years. Didactic instruction must run parallel to the distribution of the terminal devices, because just because the children have tablets or laptops at their disposal does not mean that they are able to use them adequately for distance learning. In addition to better equipment, additional specialists, guidance, adapted curricula - and time is needed. The Corona crisis has shown that more efforts for more equal opportunities is needed, especially in distance learning - otherwise many pupils are left behind.

## 6. Conclusion

The Corona pandemic hits the German education system hard. Schools were closed, face-to-face teaching was no longer possible. Very unprepared, the school system had to switch to distance learning. Many schools were not prepared for this. The Corona pandemic exposed very quickly and ruthlessly the schools' inadequate digital equipment. In international comparison, Germany lags behind many other countries. Deficits are not only evident in the technical equipment, but also in the pedagogical competence of teachers for the use of digital devices as well as in the availability of qualified staff for technical support. Experts also criticise the insufficient teacher training of "digitalisation". There is a lack of comprehensive educational concepts. Even before the pandemic, educational opportunities in Germany were very unequally distributed, as the various Pisa tests prove. With distance learning, however, the differences in performance between high-performing and low-performing pupils threaten to increase further. The Corona crisis exposes the very uneven possibilities of digital learning. Distance learning disadvantage children from poorer social backgrounds. They are less likely to have the necessary technical equipment for distance learning. They often do not have their own (internet-enabled) PC and many do not have a quiet place to study. They live in cramped living conditions, where not enough rooms are available. 24% of children receiving social welfare do not have a PC with internet access in their household, 13% do not have a quiet place to study. Almost half of the children live in a flat where there are not enough rooms available. [2] Sufficient support from parents can often not be guaranteed. There is concerned reason that in the case of prolonged school closures for months, lower-performing pupils will lose out during this time. This is a problem that cannot easily be made up without additional, needs-oriented offers in the period after the school closures. Education researchers and economists have long agreed that in the long run, the "price" of closed schools will be paid by the pupils themselves (especially by the disadvantaged pupils), because they will miss essential education. The effects would not only affect individual pupils, but also the entire economy. Politicians have reacted to the shortcomings with the Federal DigitalPact, but far too late and the outflow of funds is shameful. The money is supposed to be used to improve equipment in particular. Good equipment is an important prerequisite, but money alone is not enough. A comprehensive sustainable concept for digitalisation is still not discernible.

## 7. References

- [1] ANGER, C. and PLÜNNECKE, A., (Institut der deutschen Wirtschaft): Homeschooling und Bildungsgerechtigkeit; <https://www.iwkoeln.de/studien/iw-kurzberichte/beitrag/christina-anger-axel-pluennecke-homeschooling-und-bildungsgerechtigkeit-464716.html>
- [2] BERTELSMANN-STIFTUNG: Kinderarmut: Eine unbearbeitete Großbaustelle (factsheet) 2020; <https://www.bertelsmann-stiftung.de/de/themen/aktuelle-meldungen/2020/juli/kinderarmut-eine-unbearbeitete-grossbaustelle>

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- [3] BERTELSMANN\_STIFTUNG: Monitor Digitale Bildung; Die Schulen im digitalen Zeitalter (2017); [https://www.bertelsmann-stiftung.de/fileadmin/files/BSt/Publikationen/GrauePublikationen/BSt\\_MDB3\\_Schulen\\_web.pdf](https://www.bertelsmann-stiftung.de/fileadmin/files/BSt/Publikationen/GrauePublikationen/BSt_MDB3_Schulen_web.pdf)
- [4] DELGADO, P., VARGAS, C., ACKERMAN, R. and SALMERON, L., (2018): Don't throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension. *Educational Research Review*, 25, pp. 23–38; <https://doi.org/10.1016/j.edurev.2018.09.003>
- [5] DZHW: Bildungstrichter (2018): Die Aufnahme eines Hochschulstudiums hängt stark von der Bildung der Eltern ab; [https://www.dzhw.eu/services/meldungen/detail?pm\\_id=1523](https://www.dzhw.eu/services/meldungen/detail?pm_id=1523)
- [6] HUEBENER, M. and SCHMITZ, L.: Corona-Schulschließungen: Verlieren leistungsschwächere SchülerInnen den Anschluss? DIW Berlin, 2020; [https://www.diw.de/de/diw\\_01.c.758261.de/publikationen/diw\\_aktuell/2020\\_0030/corona-schulschliessungen\\_\\_verlieren\\_leistungsschwaechere\\_schuelerinnen\\_den\\_anschluss.html](https://www.diw.de/de/diw_01.c.758261.de/publikationen/diw_aktuell/2020_0030/corona-schulschliessungen__verlieren_leistungsschwaechere_schuelerinnen_den_anschluss.html)
- [7] INSTITUT DER DEUTSCHEN WIRTSCHAFT (iwd): Homeschooling - Viele Schüler bleiben auf der Strecke (2020); <https://www.iwd.de/artikel/homeschooling-viele-schueler-bleiben-auf-der-strecke-468288/>
- [8] MINISTERIUM FÜR ARBEIT UND SOZIALORDNUNG; FAMILIE; FRAUEN UND SENIOREN BADEN-WÜRTTEMBERG (Editor); Erster Armuts- und Reichtumsbericht (2015); p. 429; [https://sozialministerium.baden-wuerttemberg.de/fileadmin/redaktion/m-sm/intern/downloads/Anhang\\_PM/Armuts\\_und\\_Reichtumsbericht\\_25\\_11\\_2015.pdf](https://sozialministerium.baden-wuerttemberg.de/fileadmin/redaktion/m-sm/intern/downloads/Anhang_PM/Armuts_und_Reichtumsbericht_25_11_2015.pdf)
- [9] OECD: PISA-Studie: Häufig gestellte Fragen <http://www.oecd.org/berlin/themen/pisa-studie/haeufig-gestellte-fragen.htm>
- [10] PREPLY: Um Klassen smarterer Digitale Bildung im internationalen Vergleich; [https://preply.com/de/d/e-learning-index/?\\_ga=2.23997818.1306076604.1607182687-39109195.1607182687](https://preply.com/de/d/e-learning-index/?_ga=2.23997818.1306076604.1607182687-39109195.1607182687)
- [11] REISS, K.; WEIS, M.; KLIEME, E. and KÖLLER, O.; (Editor) (2019): Grundbildung im internationalen Vergleich; [https://www.pisa.tum.de/fileadmin/w00bgi/www/\\_my\\_direct\\_uploads/PISA\\_Bericht\\_2018\\_.pdf](https://www.pisa.tum.de/fileadmin/w00bgi/www/_my_direct_uploads/PISA_Bericht_2018_.pdf)
- [12] STATISTA: Anteil von Glasfaseranschlüssen an allen stationären Breitbandanschlüssen in den Ländern der OECD im Dezember 2019; <https://de.statista.com/statistik/daten/studie/415799/umfrage/anteil-von-glasfaseranschlussen-an-allen-breitbandanschlussen-in-oecd-staaten/>
- [13] STATISTA: Umfrage zur Verfügbarkeit von schnellem Internet und WLAN in Klassenzimmern 2019; <https://de.statista.com/statistik/daten/studie/1004594/umfrage/umfrage-zur-verfuegbarkeit-von-schnellem-internet-und-wlan-inklassenzimmern/#:~:text=36%20Prozent%20aller%20befragten%20SchulleiterInnen,Gymnasien%20waren%20es%2045%20Prozent.>

- 
- [14] STATISTA: Internetzugang nach Haushaltsnettoeinkommen pro Monat in Deutschland 2020; <https://de.statista.com/statistik/daten/studie/525814/umfrage/internetzugang-nach-einkommen-pro-monat-in-deutschland/>
- [15] STATISTISCHES BUNDESAMT (destatis); Pressemitteilung Nr. 312 vom 8. September 2016; Bildung der Eltern beeinflusst die Schulwahl für Kinder; [https://www.destatis.de/DE/Presse/Pressemitteilungen/2016/09/PD16\\_312\\_122.html](https://www.destatis.de/DE/Presse/Pressemitteilungen/2016/09/PD16_312_122.html)
- [16] STUTZER, E. and SALETZ, S., FaFo FamilienForschung Baden-Württemberg; Familie und Wohnen; pp. 7 – 11; [https://www.statistik-bw.de/FaFo/Familien\\_in\\_BW/R20131.pdf](https://www.statistik-bw.de/FaFo/Familien_in_BW/R20131.pdf)