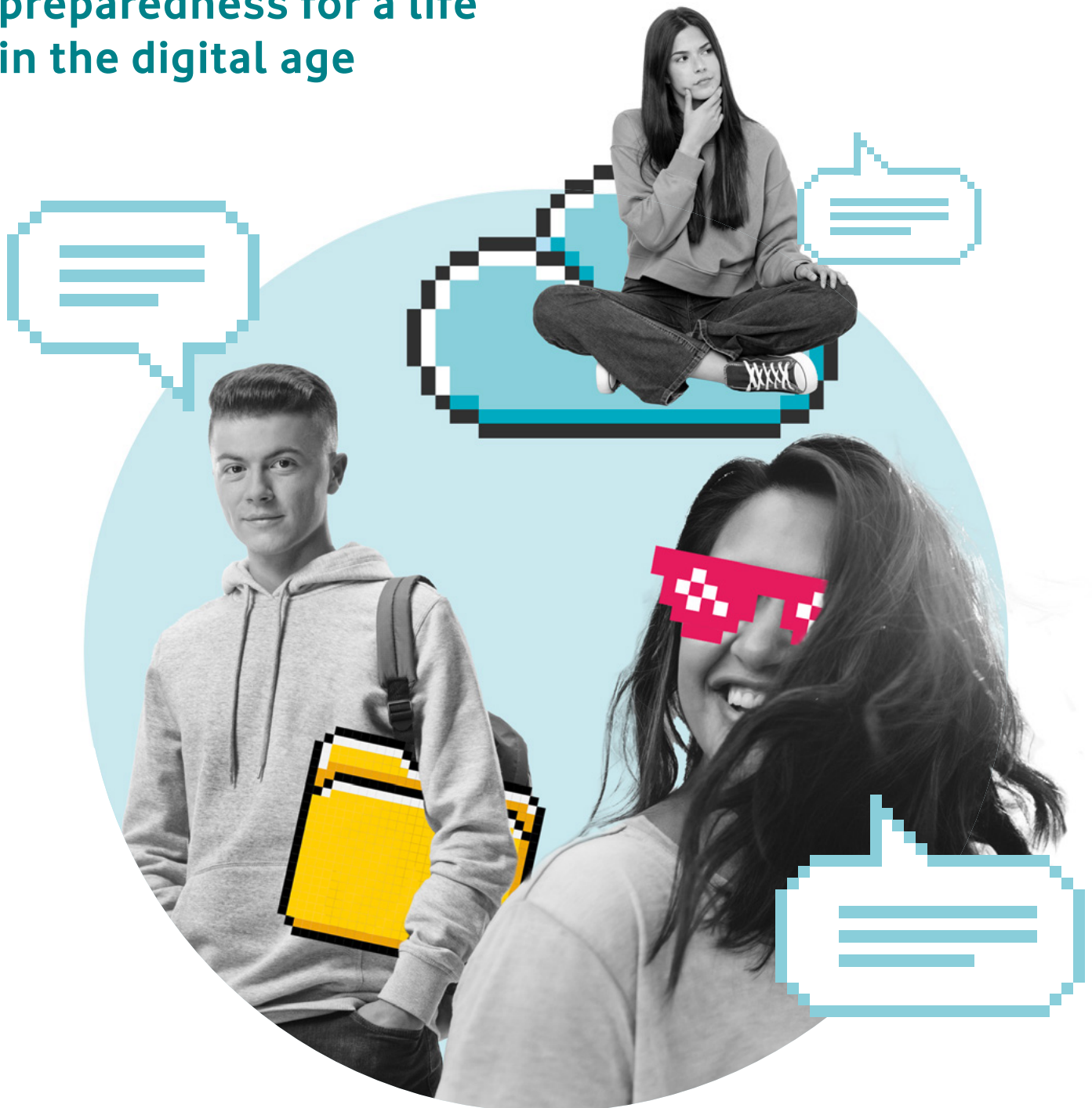


EQUIPPED FOR THE FUTURE?

Young people on their preparedness for a life in the digital age



A survey conducted on behalf of the Vodafone Germany Foundation

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What does the younger generation say? Experience and expectations with a view toward a life in the digital world

Matthias Graf von Kielmansegg

Good education has always aimed at providing young people with the best possible preparation for the challenges of the future. They should be given the tools they need to gradually take control of their own lives. A central goal of education is the self-determined and responsible shaping of one's own future as well as that of society. Educational content, however, is generally rooted in past experiences and seeks to derive universal lessons from that past for the future.

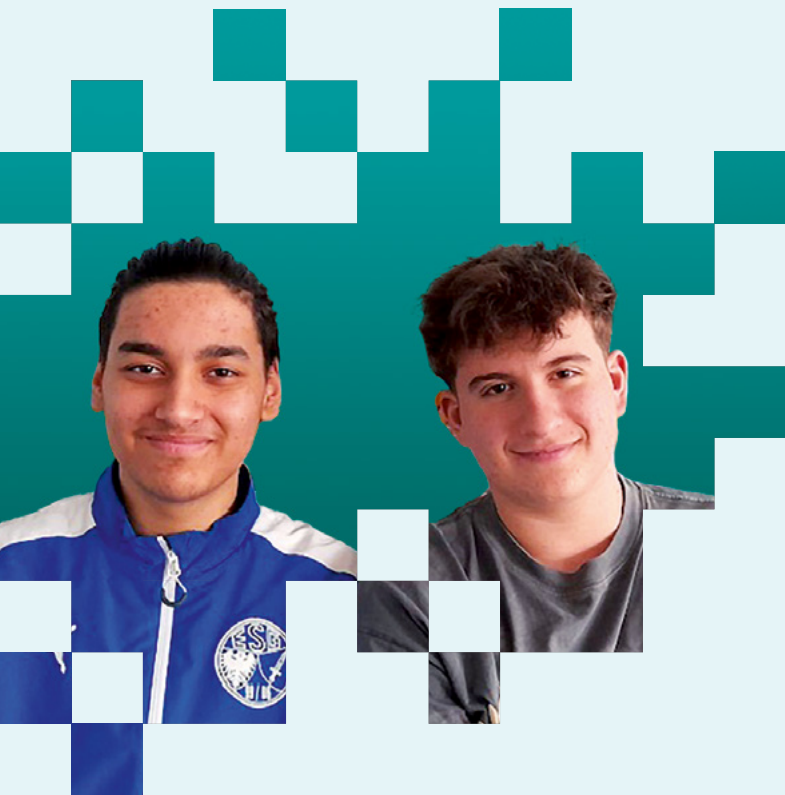
Yet as our society becomes increasingly shaped by digitalisation, futurists and economic experts forecast that children born today will enter adulthood in a world that is decisively different from today's. An honest assessment of whether the coming years will be marked by disruptive transformation to a greater degree than the recent past can only be made in hindsight. But there is no doubt that massive change is coming.

How, then, do we hope to make decisions on the set of skills we should provide our children for their journey into the future? Experts have been engaged in a lively debate on the issue for years. Children, youth and young adults, though, are seldom participants in that debate – despite the fact that they are the focus of that discussion and are expected to meet certain requirements while in school. They are also hoping to continue their education in a vocational training programme or at university to be as best prepared as possible for their personal and professional paths.

How do young people view the education they have thus far received and how do they view their futures? What skills do they think are important and what are their views of “21st Century Skills”? Do they feel well prepared for the future?

With this survey, the Vodafone Germany Foundation wants to give young people a voice. Their answers should assist those involved in the debate – from the fields of education, politics, science, business and society – to better understand how those aged 14 to 24 view their own futures. The survey aims to provide insight into whether young people view digitalisation more as an advantage or disadvantage to society in general and to their own lives in particular. And it should make clear which skills respondents believe are essential for successfully shaping their own lives.

“Our school tries its best”



Two pupils speak with the Vodafone Germany Foundation about well-organised backpacks, free Monday mornings and why pen and paper are anything but obsolete.

The two pupils are 16 years old and attend 10th grade at a vocational-prep high school in the German state of North Rhine-Westphalia. They expect to graduate this year. They are both student liaisons, helping fellow pupils when they have conflicts with other pupils or with teachers, or in cases of cyberbullying. One is also the head student representative.

“Our school is trying its best, but as young people these days, we spend a lot of time in the digital world in our free time, and it’s a big contrast to our daily lives at school,” the two say when describing their school’s digitalisation efforts in an interview with the Vodafone Germany Foundation. The pupils say that some progress has been made, though challenges still remain, and they provide insights into how well prepared they feel for a digital future. They also discuss their desires and hopes for the development of schools and the possibilities open to young people to participate in that development.

VODAFONE GERMANY FOUNDATION (VGF) Since the coronavirus pandemic, a lot has changed at some schools. Digitalisation, which was turned to as an emergency measure during the pandemic so that instruction could take place at all, has become fully integrated into the school day in many places. What's the situation at your school?

ABDUL To be honest, there are pretty much no digital tools at our school. We have a set of iPads that we regularly use. Beyond that, we have a digital projector. But we still also work with an overhead projector. It's still around.

OLIWIER In general, we tend to use the iPads in non-core subjects like biology, geography or religion, although sometimes also in mathematics. But generally, in the core subjects, we use the projector and pen and paper.

VGF What is your view of the use of iPads in class?

OLIWIER I think they make some things quite a bit easier. In religion, for example, all the work we do is digital. Our teacher, for example, sends us our work directly to our iPads – it's a lot faster than handing out worksheets. It makes things much more comfortable.

ABDUL When we use the iPad in maths class, a lot of things just become easier. For instance, you can enter parabolas or other formulas into an app, which then helps you out. Another example is research: We have access to Wi-Fi at school and can quickly collect information.

OLIWIER And doing presentations! You can prepare presentations at home and bring them to school on a USB stick. You can then continue working on them at school. But not on the iPad, which is totally annoying, because we don't have the necessary apps on the iPads to do presentations. For that, I have to work on a computer.

Still, you no longer have to print things out to then glue them onto a poster or something like that, rather you can share your presentation with the class using the projector. Then, you can share the file with everybody, and you don't have to print out handouts anymore. That makes things easier.

VGF Do you like learning that way at school?

OLIWIER Personally, I still prefer learning with pen and paper. Because the pen we use to write on the iPad isn't an Apple pen, so there's an annoying delay when you write. I write fast, and it's no fun when there's a delay. You always have to go back to check if everything was recognised correctly. So I prefer writing with pen and paper. But I do think it's great that we no longer have all the different worksheets, thus eliminating the chaos in my backpack. You always have everything with you. Still, there is a limit when it comes to the storage capacity of the iPads. They only have 64 gigabytes, and that's not a lot.

ABDUL I'm a bit different on that score. I prefer writing on the iPad. My writing looks cleaner on the iPad and my entries are easier to read. If you make a writing mistake, it is corrected automatically. If you write quickly with a pen, your "m" can sometimes look like an "n", and you get a misspelling. But the iPad avoids that problem.

VGF Is it easy to switch between digital and analogue?

OLIWIER That is one of the biggest problems. This switching between the digital and the non-digital is really hard to manage. For example, when some things have to be transferred from paper to the iPad, or vice versa. It's a lot of work. On top of that, the subject matter in some subjects is saved digitally, while in other subjects it's filed away in folders. You always have to remember.



“

That is one of the biggest problems. This switching between the digital and the non-digital is really hard to manage.”

ABDUL My strategy for merging is that I always take a photo of my worksheets and then load them onto the iPad. That makes things a bit easier, but it's still complicated.

VGF **Is the manner of teaching and learning the same whether you are using your iPads or your folders? Or have things changed in the way the lessons are presented?**

OLIWIER We don't do any group work, because our class is considered to be loud and difficult (grins).

ABDUL Those are just rumours, of course (laughs).

OLIWIER But teaching hasn't really changed much, though that also has to do with our internet connection at school. We have Wi-Fi, but it hardly ever works. Particularly in situations when several classes are using it at the same time, the connection will break off or loading times are so long that it's impossible to work quickly. The school tried to solve the problem by getting a Wi-Fi router for our classroom, but it still doesn't work. When the entire class is working digitally, it quickly gets overloaded.

VGF **In such a situation, is it even possible to acquire digital skills at school?**

OLIWIER I guess I'd say that we really acquire those during our free time. The apps that we use in school tend to be "apps for children". A three-year-old could figure out how to use them. In maths, for example, we use exactly the same app for studying as they do in the fifth form. Sorry, but that's ridiculous.

VGF **Do you have the feeling that your school is keeping pace with the "normalcy" of your digital day-to-day lives? Is your school keeping up with your private lives?**

ABDUL I'd say that the school has unfortunately fallen far behind. Our school is trying its best, but as young people these days, we spend a lot of time in the digital world in our free time, and it's a big contrast to our daily lives at school. But I would say that the school is doing all it can and that we should support it.

OLIWIER Yes, definitely. I mean, right now we are sitting here in the computer room and – well – the computers aren't exactly the best. They're 200-euro PCs; you can't do all that much with them. Not long ago in technology class, we were working on 3D printing, and I could hardly do anything on the PC because it was constantly lagging. So I would certainly say that school is falling behind. It's just a fact.

VGF **If you could completely redesign your school – if you could say what should be taught and what shouldn't be taught, how long it should go for, what the classrooms should look like, and so on – what changes would you make? What would be your priorities?**

ABDUL I think individualised schedules would be cool. So you wouldn't have to show up to school at 8 a.m. if you're not a morning person, but then stayed in school until 4 p.m. You could schedule your day on your own. Teachers would offer their subjects at different times during the day, and you would attend one of them. You could have two classes one day, and then six or seven the next. You could maybe take Monday morning off, but then stay longer on Fridays. You'd essentially design your own schedule and be in charge of your own organisation. You'd have deadlines for what had to be done by when, but it would be up to you how to get there. Some young people learn better in the morning and others prefer the afternoons.

Plus, I feel like the maths we are learning don't have all that much to do with our private lives. I would eliminate some stuff. I already know that I don't want to become a mathematician or an engineer, so I'd rather use that time for other subjects that I need for my future. That doesn't mean that I don't want any maths instruction at all, the basics are important. But for me, I don't need quite as much. Those who see themselves in this professional field can decide to take more intense maths classes.

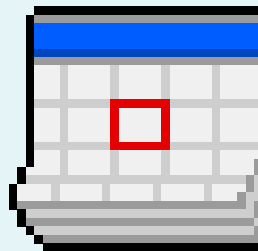
Beyond that, I would offer more foreign languages, so that students who have language ability and are interested in languages can learn a second foreign language, like in university prep high schools. I think that should be offered in vocational high schools as well. Otherwise, though, I'd leave everything as it is. What about you Oliwier?

OLIWIER I would leave a lot the way it is. Just a bit less talking. After half an hour, it should be time to start working, and not only after 50 minutes of talking when you then only have 10 minutes to work and the rest is homework. That's what happens a lot. When some pupils in class have questions, they are answered at length. But when others don't have any questions and want to get to work, they have to wait. That leads to disruptions in class because you get bored. It would also mean that you'd end up with less homework.

I would also change the design of the classroom. They are all a bit dreary, with no colour. It's not the kind of atmosphere you like to spend time in. You wouldn't decorate your room at home like that.

“

I think customised schedules would be cool ... You'd have deadlines for what had to be done by when, but it would be up to you how to get there.”



ABDUL Yeah, I agree. Every classroom looks the same.

OLIWIER I would definitely build a library as well. There are a lot of people who aren't really able to study at home after school. If there was a library, they could study there instead of on the floor at home or outside. I don't really think a chill out room is necessary, since the school has a courtyard, and you can sit on a bench to chill out. But maybe a room for cold days. Right now, we always have to be outside, even when it's cold, and you can quickly catch a cold.

ABDUL Oh yeah! And a cafeteria! Because we don't have one. It is often the case that we have a hard time concentrating in the afternoon. To be honest, it doesn't really matter if you're working with an iPad or with pen and paper if you're hungry. It would be great if we could buy something to eat at school at a decent price.

And I would offer a subject where things from everyday life are explained, like how to do your taxes, for example, or how to avoid being conned, or how to find an apartment or what you need to pay attention to when you live by yourself. I would also, of course, offer philosophy or anti-depression courses, where teachers would tell you what to do if you were feeling down or being bullied.

OLIWIER Yeah, my school would also do something about bullying, especially cyberbullying. If schools focus more on digital, then there will be more cyberbullying – and we really need to be talking more about it and learning more about how to address it.

VGF That all sounds quite interesting! A lot of suggestions that would be really important to implement! Would you like to be given more opportunities to shape education in Germany?

ABDUL It would be great if youth were asked more frequently. After all, we're the ones who are supposed to be educated. But the decisions are always only made by older people who have forgotten what school is like at our age. They've forgotten how we learn and what we learn. I think that teachers are the experts and know best what tasks are good for us and when. But I really think it would be great if we had the opportunity to suggest subjects about which we want to know more.

OLIWIER Yeah, I agree.

This interview has been edited for length.

“

I would definitely build a library as well. There are a lot of people who aren't really able to study at home after school.”



Executive summary

Digitalisation and societal change

Digitalisation is profoundly changing many areas of society and is thus having an impact on each and every one of us. The results of the youth survey show that 14- to 24-year-olds attach great importance to this process. Young people are optimistic: **More than two-thirds (69 percent) primarily see the advantages that digitalisation can have for society. 79 percent likewise expect to be able to benefit from this shift in their own personal development.**

#21st Century Skills – living and working in the digital age

In the context of unpredictable societal change, it is especially important to understand what skills are (and will remain) relevant in the 21st century. **With that in mind, youth and young adults view digital skills as essential for their futures (79 percent believe they are very or extremely important).** At the same time, social and emotional skills are seen as essential: 77 percent of respondents believe it is very or extremely important to be able to deal with stress and pressure, and 73 percent emphasise the importance of being able to relax every now and then. The ability to communicate (71 percent), creativity (70 percent) and critical thinking skills (70 percent) are also valued.

Self-assessment: Digital skills among youth and young adults

Young people – the so-called digital natives – appear to be quite thoughtful when it comes to assessing their own digital skills. Not all of them are convinced they are as skilled as they need to be. Just under a third (30 percent) of respondents have doubts about their capacity to identify fake news. **Many also question their ability to protect their own data on the internet: 52 percent feel certain or extremely certain about their abilities in this regard, but 48 percent are rather uncertain when it comes to data protection.**

Digital infrastructure at educational institutions

Two-thirds of youth and young adults believe their educational institutions – whether it be school, university or a vocational training programme – are well or extremely well outfitted with digital technologies. There is, however, a gap between schools on the one hand, and universities and vocational training programmes on the other. And when it comes to specifics, the rather optimistic image grows muddled. **44 percent of pupils find fault with the digital infrastructure at their school, and 48 percent say that their school does not possess a reliable and fast internet connection. In addition, only 54 percent of respondents say that computer science is a regular subject at their school, and only 44 percent say there are enough freely available tablets or computers for all students.**

The digital skills of teachers from the perspective of the younger generation

To prepare youth and young adults for a digital future, teachers must also be able to competently navigate this environment. But on that issue, the situation is rather mixed in schools. **9 percent of pupils say their teachers' digital skills are poor, while an additional 35 percent report they are less than optimal. 56 percent, meanwhile, say their teachers have good (43 percent) or very good (13 percent) digital skills.** University students and participants in vocational training programmes are far more convinced of their instructors' digital skills, with 73 percent of vocational training participants and 76 percent of university students saying they are at least good.

Room for improvement in preparing for a life and work in the digital age

69 percent of young people who have begun working or who have completed a diploma or university degree say the preparation they received for an environment suffused with digital technologies was inadequate. Respondents who are still receiving instruction (pupils, vocational trainees and university students) are less critical of the preparation they are receiving and tend to rate it as good or very good (68 percent).

69 percent of young people who have begun working or who have completed a diploma or university degree say the preparation they received for an environment suffused with digital technologies

Evaluation of the study results

Young people are optimistic and see the advantages of digitalisation

The vast majority of 14- to 24-year-olds believe that digitalisation will produce significant economic and societal changes (→ **Graphic 1**). Especially in the business world and their future professional life, 94 percent anticipate very strong (48 percent) or strong (46 percent) changes. A similar share (91 percent) believes that our society and our social interactions will change very strongly (43 percent) or strongly (48 percent).

In general, youth and young adults are quite positive when thinking about their futures and the changes that digitalisation will bring. Regardless of socioeconomic differences, optimism outweighs pessimism (→ **Graphic 2**). More than two-thirds (69 percent) see advantages for societal development and 79 percent expect that digitalisation will benefit their own personal developments. Youth and young adults who have achieved a higher level of education or who see themselves as belonging to a more advantaged socioeconomic class are even more optimistic in this regard.

The question as to whether digitalisation will have a positive or negative effect on respondents' own personal development also revealed slight differences based on educational level and socioeconomic background: Young people with more advanced degrees tend to have a more positive view of the future (83 percent). That is also true of young people who view themselves as being better off financially (86 percent) (→ **Graphic 2**).

Just under half of respondents (48 percent) believe that digitalisation will be advantageous for their own professional development (→ **Graphic 3**). Only every tenth respondent (10 percent) is concerned about a negative effect on their career prospects and just under a third (30 percent) believe that digitalisation won't likely have an effect on their own professional development.

91%

expect digitalisation to produce changes to society and social interaction.

Graphic 1: Changes through digitalisation

How strongly will **the economy and professional life** change through the use of digital technologies in the coming years?



How strongly will **society and social interaction** be changed through the use of digital technologies in the coming years?

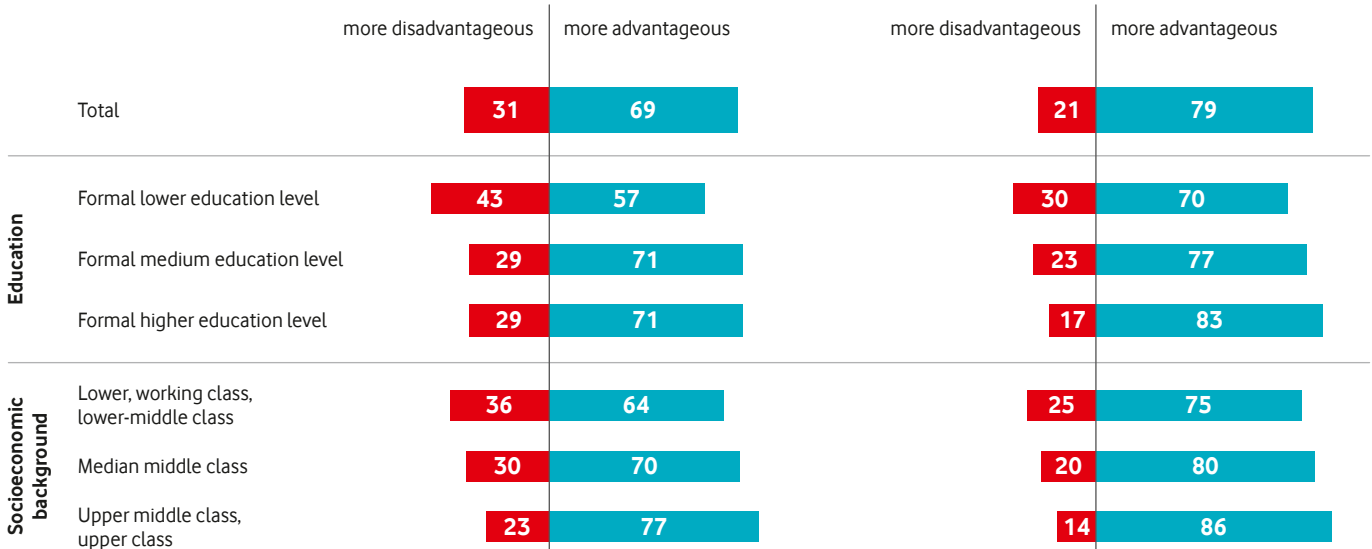


■ not at all ■ a little ■ strongly ■ very strongly

Graphic 2: Advantages and disadvantages of digitalisation

Do you believe the increased use of digital technologies is more advantageous or more disadvantageous for **the development of our society**?

Do you believe the increased use of digital technologies is more advantageous or more disadvantageous for **you personally and your own future**?



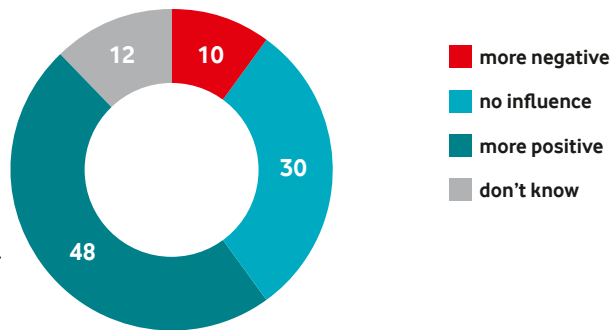
Results presented as a percentage
 Respondents: 2,069 people questioned between the ages of 14 and 24

Graphic 3: Digitalisation and professional prospects

What influence do you expect digitalisation to have on your future career in terms of **professional opportunities and possibilities**?

48%

hope digitalisation will bring professional advantages.



Results presented as a percentage
 Respondents: 2,069 people questioned between the ages of 14 and 24

Why do you think that the increased use of digital technologies is more likely to be disadvantageous to you personally?

“At school, it produces a completely new and different kind of stress that I hadn’t experienced before. Assignments can even be uploaded in the evenings, and it never ends. You never have the feeling of finally being finished with something.”

“Because my family doesn’t have the financial means to provide me with the equipment I would need, and there seems to be too little support on that issue.”

“There will be fewer and fewer jobs available and more and more careers for which you need a university degree.”



“I am creative and enjoy doing handicrafts and working with my hands. If everything becomes more digital, there will also be a reduced need for people like me.”

Why do you think that the increased use of digital technologies is more likely to be advantageous to you personally?

“I have access to an almost infinite supply of knowledge. There is a significant shortage of computer scientists, which translates into pretty good job security for computer scientists, which is what I want to become.”

“Keeping in touch with friends, especially friends who live a long way away. Taking care of bureaucratic things from home. Working from home.”



“I learn faster, and I learn more with the help of digital tools.”

“It makes me more flexible. I can do my work from home or abroad. Plus, communication with each other is far easier. Problems can be recognised and solved more quickly.”

21st Century Skills: Digital know-how is indispensable

Young people want exposure to a broad range of skills

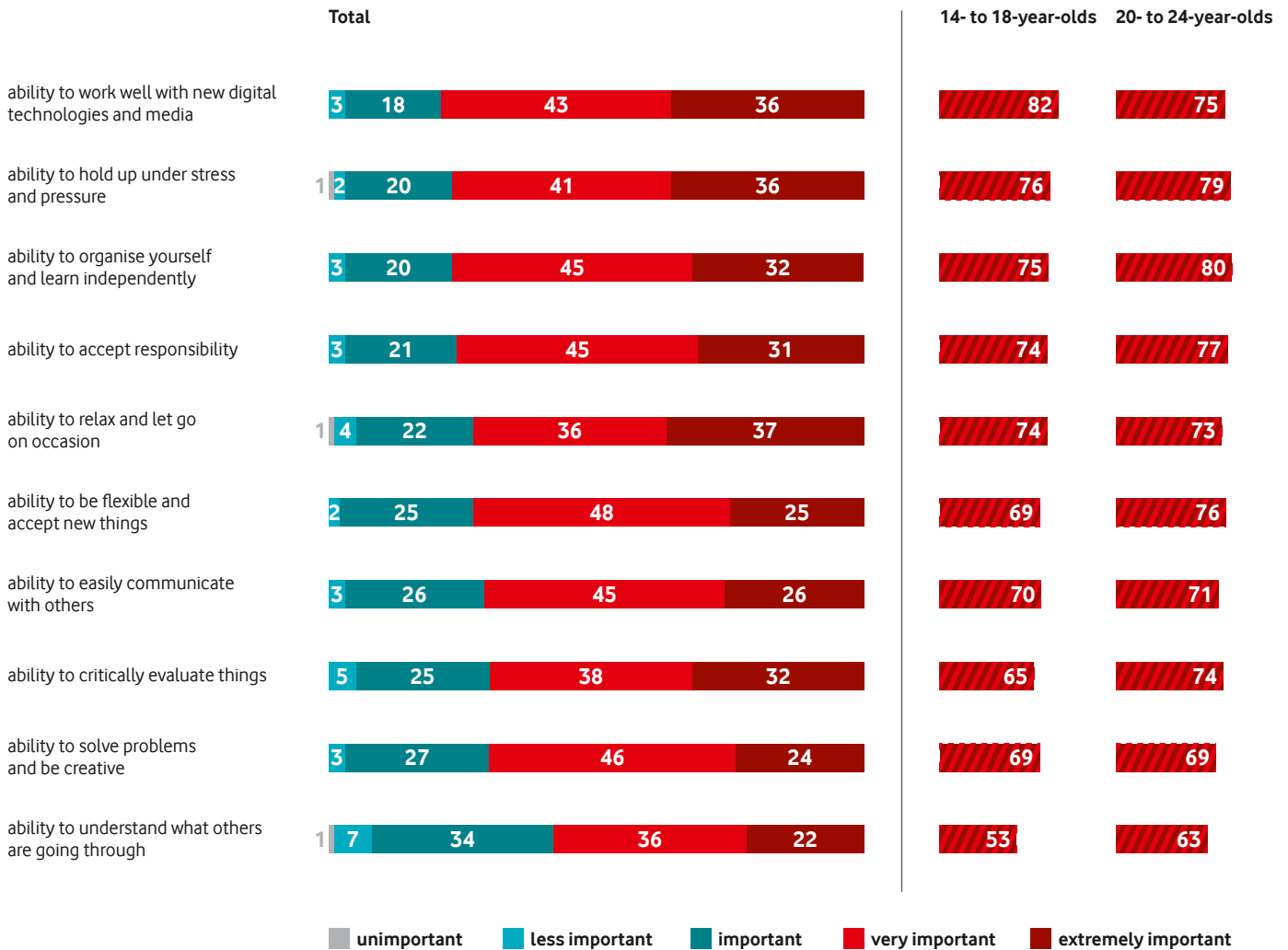
From the viewpoint of 14-to-24-year-olds, success in a society where digital technologies and the internet have a significant effect on cooperation requires a significant array of skills (→ **Graphic 4**). 79 percent of respondents agree that good digital skills are extremely or very important. In addition to actually working with digital technologies and media, a significant level of resilience is seen as decisive: Around three-quarters (77 percent) of youth and young adults believe that it is extremely or very important to be able to deal with stress and pressure – or to be able to relax on occasion (73 percent). But there is a whole list of other skills – like independence, flexibility, the ability to communicate and think critically, and creativity – that are considered by young people to be important for succeeding in a digital society.

Empathy, the ability to understand what others are going through, is viewed as less valuable, but still seen as very important or important by a majority (58 percent), though young adults aged 20 to 24 attach greater importance to this capacity than adolescents aged 14 to 19 (63 to 53 percent) (→ **Graphic 4**). Flexibility (76 to 69 percent) and the ability to think critically (74 to 65 percent) are seen by 20- to 24-year-olds as more important than by those aged 14 to 19.



Graphic 4:
21st Century Skills: The relevance of future know-how

How important do you think the following **skills and personal attributes** are to be successful in a society where the internet and other digital technologies play a significant role?



Results presented as a percentage
Respondents: 2,069 people questioned between the ages of 14 and 24

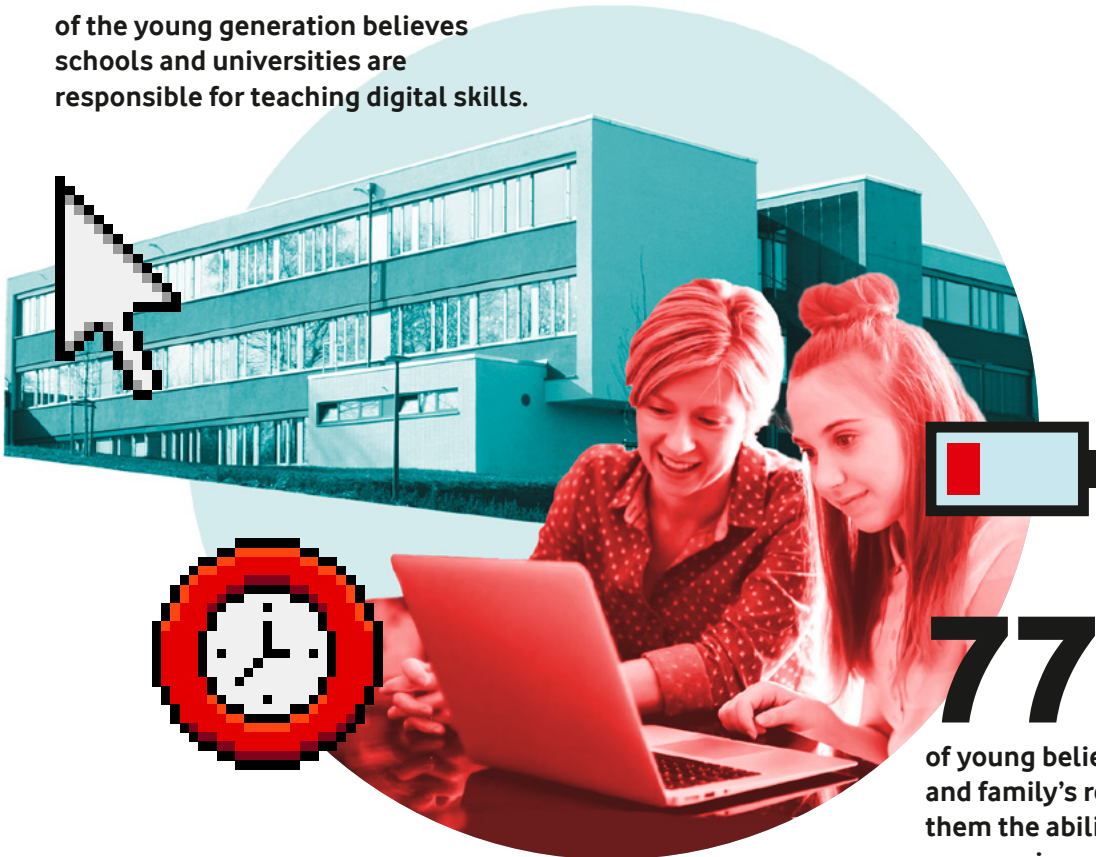
Teaching digital skills is a clear task of schools

When it comes to teaching the social and emotional skills necessary for their futures, young people tend to believe their parents should take the lead: From their perspective, the family is primarily responsible for teaching attributes like resilience (47 percent), sense of responsibility (63 percent), the ability to relax (77 percent) and empathy (79 percent) (→ **Graphic 5**).

When it comes to the use of digital technologies (76 percent) and independent organisation (60 percent) – two skills broadly seen as extremely important – respondents are more likely to see those skills as being the responsibility of educational facilities, meaning schools or universities. When it comes to communication, critical thinking and creativity, young people believe that both their parents and their educational facilities bear responsibility. Young people are far less likely to see companies and employers as bearing the primary responsibility for teaching these skills; only a fifth of all respondents believe companies or employers are responsible for teaching a sense of responsibility, resilience and flexibility (→ **Graphic 5**).

76%

of the young generation believes schools and universities are responsible for teaching digital skills.

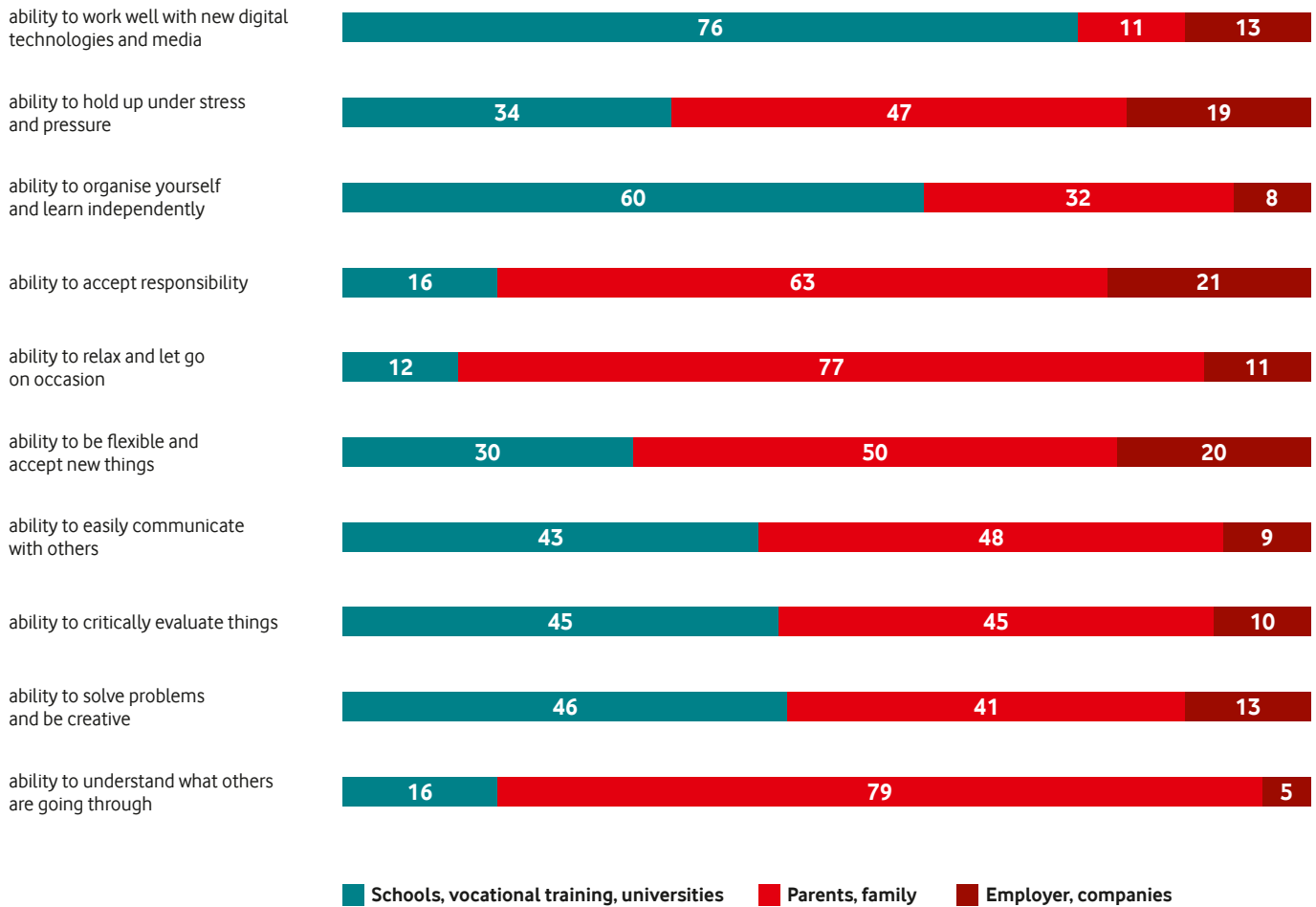


77%

of young believe it is their parents' and family's responsibility to teach them the ability to relax and let go on occasion.

Graphic 5: 21st Century Skills: The teaching of skills necessary for the future

In your opinion, who bears the most responsibility for teaching the following skills and attributes?



Results presented as a percentage

Respondents: 2,069 people questioned between the ages of 14 and 24

Self-Assessment: The digital skills of 14- to 24-year-olds

Confidence in working with digital technologies and uncertainty when it comes to data protection

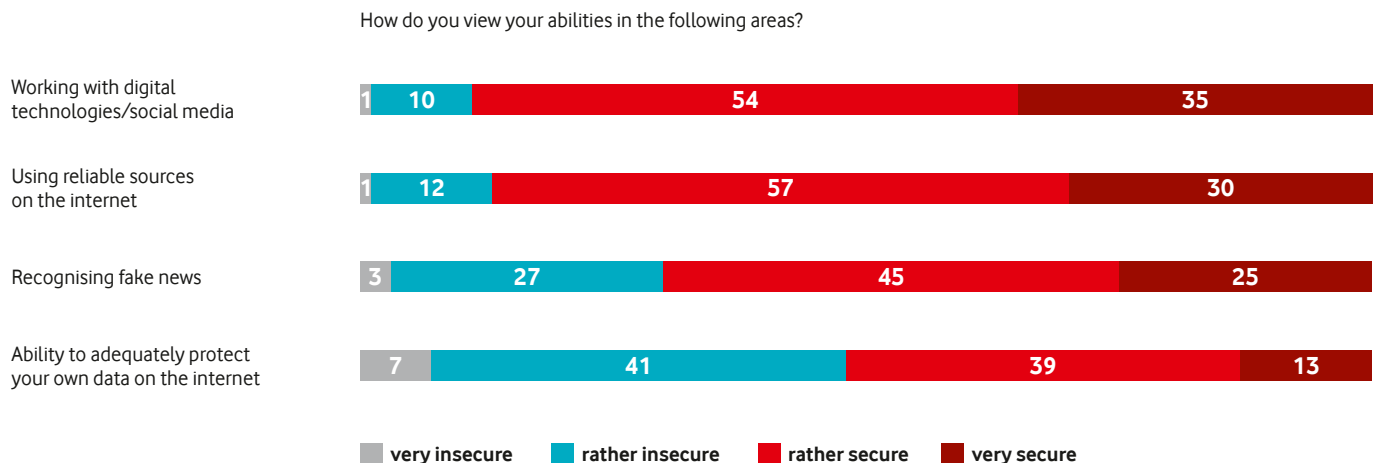
Digital self-confidence among the younger generation in Germany is high. When it comes to working with digital technologies and social media or to consulting reliable sources on the internet, around a third of young people feel very secure, and more than half feel secure (→ **Graphic 6**). Still, just over one-in-ten say they are insecure or very insecure when working with digital technologies (11 percent) or in consulting reliable sources on the internet (13 percent).

More than two-thirds (70 percent) are certain or very certain that they can identify fake news, whereas just under one-third (30 percent) doubt their ability to do so. When it comes to evaluating their own skills, however, the greatest uncertainty has to do with the ability to adequately protect one's own data on the internet. One-half of the 14- to 24-year-olds surveyed (52 percent) feel secure or very secure in doing so, but the other half (48 percent) tend to be insecure with the issue of data protection on the internet (→ **Graphic 6**).

70%

of respondents are sure or very sure of their ability to detect fake news.

Graphic 6:
Evaluation of one's own digital skills



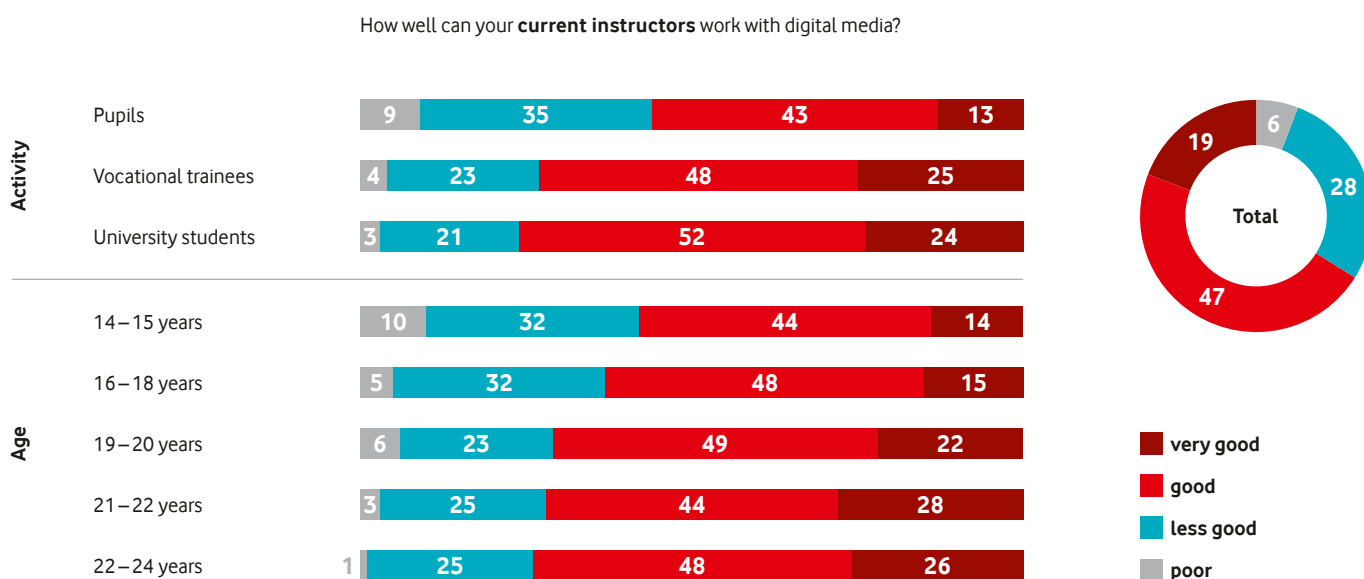
Digital equipment in schools and digital skills of teachers from the perspective of young people

Digital skills of teachers

The majority of respondents have a positive view of the skills of teachers and university instructors in using digital technologies in class (→ **Graphic 7**). Two-thirds of the pupils, vocational trainees and university students surveyed assess the ability of their instructors at school, at university and in vocational training programmes to use digital technologies as very good (19 percent) or good (47 percent). One-third assess their instructors' ability to use digital technologies as less good (28 percent) or poor (6 percent).

The assessment of university students and those in vocational training programmes regarding their instructors is more positive than that given by adolescents still in school to their teachers. Nine percent of pupils view the digital skills of their teachers as poor and 35 percent as less good, while 43 percent view them as good and 13 percent as very good (→ **Graphic 7**).

Graphic 7:
Evaluation of digital skills of instructors in schools, universities and vocational training programmes





* The survey took place from May 4 to June 16, 2022. There were 3,082 respondents from elementary schools and from lower and higher secondary school levels (Sekundarstufe I und II). In Germany, 317 teachers took part in the survey. It can be read online at: www.vodafone-stiftung.de/wp-content/uploads/2022/11/Digitale-Bildung-zwischen-Vision-und-Realitaet_IPSOS-Studie_2022_der-Vodafone-Stiftung-Deutschland.pdf

By comparison, teachers produced the following self-evaluation as part of the IPSOS survey carried out in 2022 on behalf of the Vodafone Germany Foundation*:

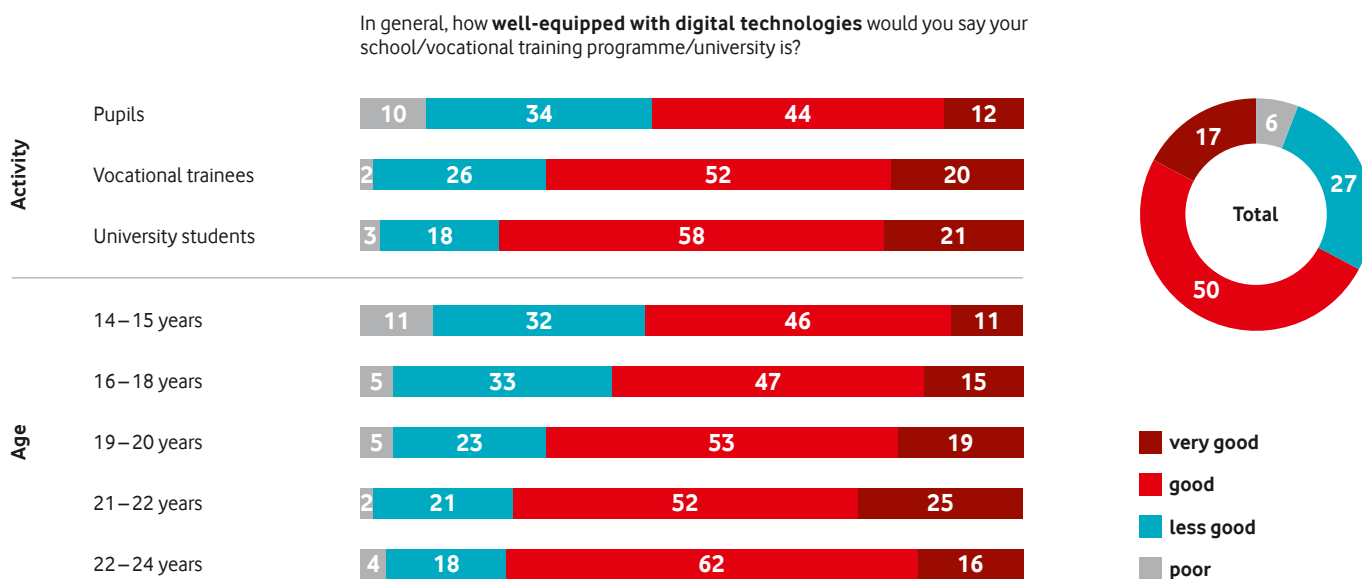
5 percent classified themselves as “leaders” and expressed confidence that they possess a broad and proficient repertoire of strategies for deploying digital technologies in the classroom and providing inspiration to their colleagues. 33 percent of the teachers who participated see themselves as “experts” and believe they are able to use various digital technologies in the classroom in a competent, creative and critical manner. This group of teachers regularly expands their repertoire of strategies for using digital technologies in the classroom. 38 percent of respondents reported that they had begun using digital tools in class and see themselves as “explorers.” Quite a bit behind them are the 20 percent of teachers surveyed in Germany who admit to having very little experience with using digital technologies in the classroom and thus require assistance in doing so (“beginners”). Only 4 percent of those surveyed (“traditionalists”) say they have no experience with using digital technologies in the classroom nor do they plan on integrating such tools in the future.

Digital equipment in educational institutions

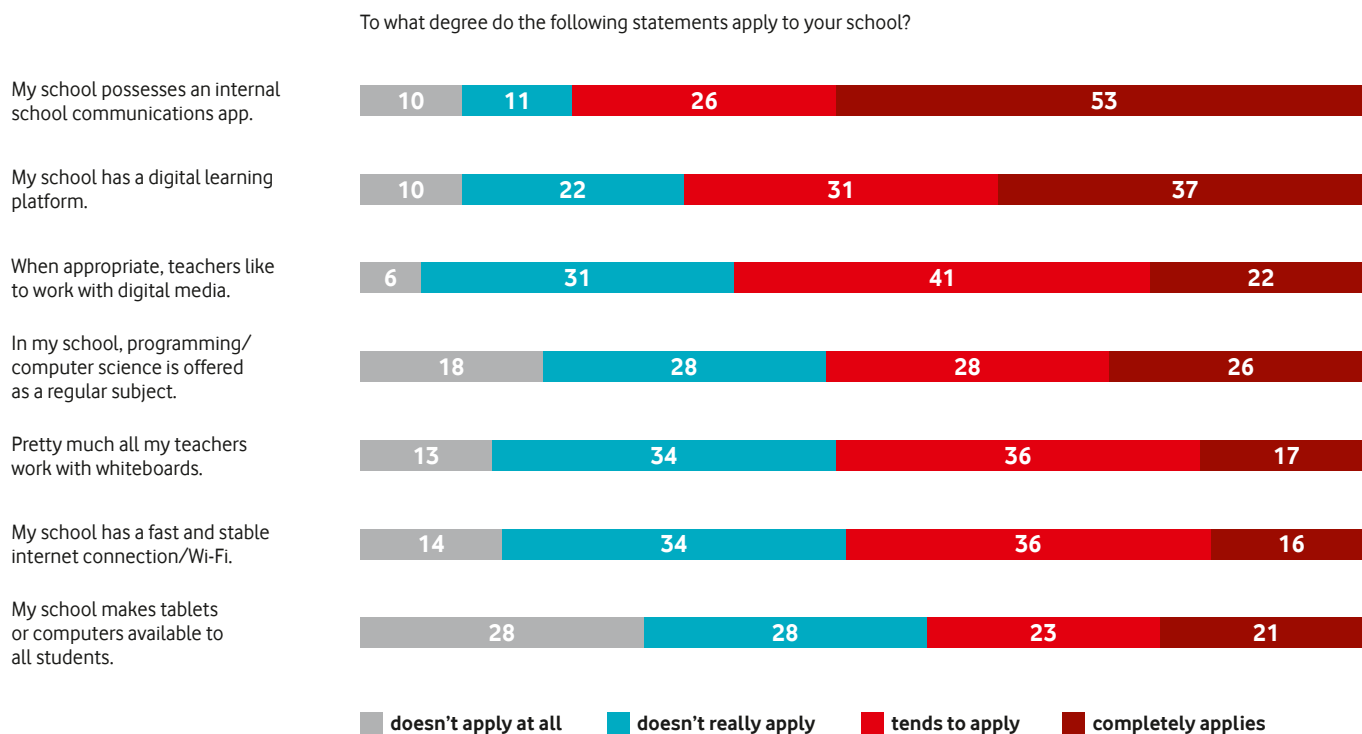
The digital equipment and infrastructure of their educational facilities likewise receives a largely positive evaluation from 14-to-24-year-olds: Two-thirds of respondents believe the availability of digital technologies at their school, their vocational training programme or their university to be very good (17 percent) or good (50 percent), though here too, there is a difference between schools on the one hand, and vocational training programmes and universities on the other (→ **Graphic 8**). 10 percent of pupils rank the availability of digital equipment at their school to be poor, 34 percent less good, 44 percent good and 12 percent very good.

Particularly in the schools, there are deficits in specific categories (→ **Graphic 9**): Only around half of pupils say that computer science is a regular subject in their school (54 percent) and that teachers work with white boards (53 percent). In addition, 48 percent of pupils say their schools do not have a fast and stable internet connection. Only 44 percent say that their school has enough tablets or computers available for all students.

Graphic 8: General evaluation of digital equipment at educational facilities



Graphic 9: Digital equipment of schools



Results presented as a percentage

Respondents: 2,069 people questioned between the ages of 14 and 24

Room for improvement in preparing youth for a life and career in the digital age

Young people in educational facilities tend to believe they are well prepared for a digital future

Two-thirds (68 percent) of school students, vocational trainees and university students – those who are still in a formal learning environment – see themselves as very well or well prepared for a future in which digital technologies play an important role. One-third (32 percent), by contrast, are more critical of the preparation for a digital future they are receiving in educational facilities (→ **Graphic 10**).

Looking back, those just beginning their careers feel they haven't been sufficiently well prepared by schools and universities

In contrast to youth and young adults in schools, vocational training programmes and university, the verdict of young adults who have obtained a degree or diploma or who have already begun their careers isn't as positive. Among this group, just short of one-third (31 percent) have a positive view, while 69 percent say the preparation they received during their schooling was insufficient (→ **Graphic 10**).

Graphic 10: Preparing for a digital future

How well is your school/vocational training programme/university **currently** preparing you for a career in which digital technologies play an important role?



How well did the schooling you received **in the past** prepare you for a work environment in which digital technologies play an important role?

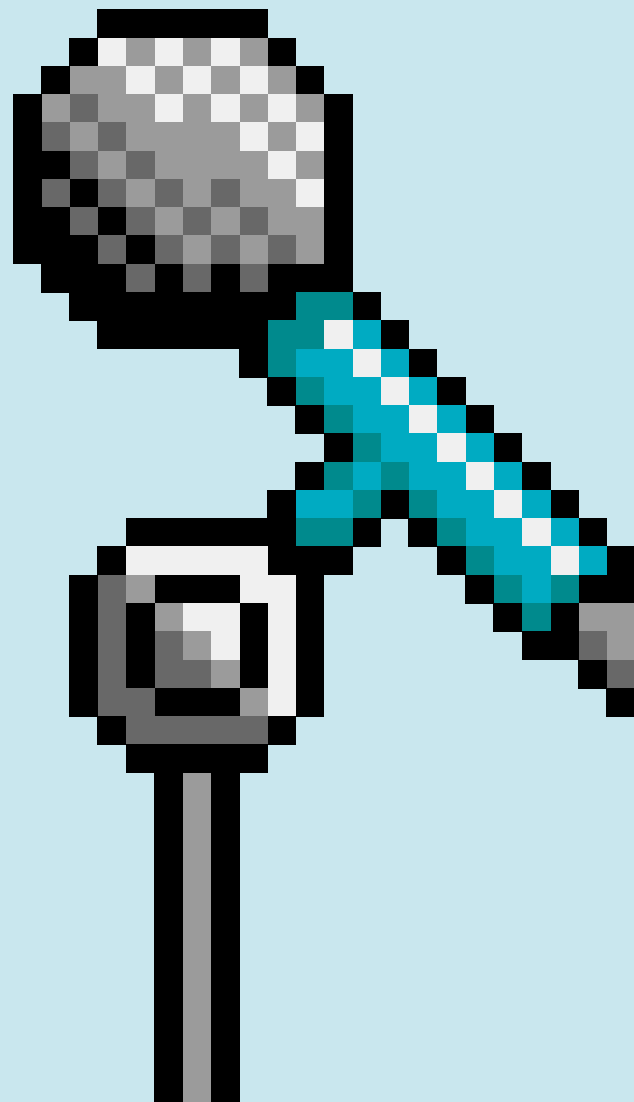


poorly less well well very well

69%

of those just starting their careers feel they haven't been sufficiently prepared for working in the digital age.

**Discussion of the study results
with Verena Pausder and
Prof. Dr. Andreas Schleicher**



“Schools must become more agile and take more risks”



Photographer:
Nils Hasenau

In an interview with the Vodafone Germany Foundation, Verena Pausder speaks about what it means today to educate young people to become responsible citizens.

Verena Pausder is an entrepreneur, founder, author and digital expert – and also a prominent champion of education who invests her passion in diverse efforts to help make young people’s voices heard.

Young people are seldom asked for their views on the education system, even though they are the central focus of all the debates surrounding the issue. Pausder views the results of the study as a clear mandate for stakeholders in the education system. In an interview with the Vodafone Germany Foundation, she offers encouragement to schools and politicians: “What we need is more courage.”

VODAFONE GERMANY FOUNDATION (VGF) Verena Pauser, you are an entrepreneur, founder, author and digital expert – and also a prominent champion of education who invests her passion in diverse efforts to help make young people’s voices heard. This is exactly what we, at the Vodafone Germany Foundation, focus on with in our latest youth study. In your opinion, what should young people know and be able to do today and in the future so that they can find the right path in an increasingly digital world?

VERENA PAUSDER (VP) I can respond with a quote from Alexander von Humboldt, who said that we should educate responsible citizens of the future at school. And part of being a responsible citizen in the 21st century is being able to look behind the scenes of data, to distinguish between fake news and disinformation and real news and to be a creator in this world – i.e., to have experienced something like programming or robotics in the real world and not just heard about it. The ability to easily interact with media, so I can both create a presentation and write an essay digitally. All of this, in my view, should be taught in school and not left to parents at home.

VGF What needs to change in schools or in the education system so that more young people will be able to say: “I feel well prepared for my professional life in the digital age”?

VP There is a very clear mandate that something must change, because we always underestimate the cost of doing nothing! We always think that if we do nothing, then we have done nothing wrong. But the fact that only a third of young people say they feel prepared goes hand in hand with a huge price they pay – namely, that they can only be consumers of the future. That they are not empowered to be able to shape it themselves!

What we need is more courage: We always talk about what could happen if we do this and that, whether data protection is guaranteed ... And we talk far too little about what we’re actually missing out on by not doing it.

An attitude of: “Let’s just try it out: Let’s let the schools off the leash a bit more, let’s trust the school administrators more to look for their own ways to reach the goal” – that actually can only lead in the right direction. After all, we still have a lot of room for improvement if only one-third of students so far feel prepared for their professional lives.

VGF Why do you think schools seem to lack a focus on preparing students for the working world?

VP That’s not just the case with digital education! Also, in terms of entrepreneurial education or financial education, there is always a fear that – if schools include too much “real life” or too much “topicality” – students won’t receive a solid foundation and that these might just be short-lived trends. There is a strong desire for schools and the education they provide to be focused on the long-term. And of course education should be focused on the long-term! But that also means including in the curricula precisely those topics that will play a huge role in the reality of the lives of children and youth, whether we are talking about sustainability or digitality.

For that reason, I believe schools must become more agile. Schools need to have more courage to bring in people from the outside. Schools must dare to allow teaching materials that have not been published by the same textbook publishers for 50 years but may originate from someone new for once.

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VGF You have seen the results of our youth survey. What surprised you most about it? Both positively and negatively? And what recommendations for action would you derive?

VP What surprised me in a totally positive way was that 79 percent of the young people surveyed said: I think technology and media literacy are extremely important. Positively surprised, because we always act as if we are forcing something on schools or children and young people with digitality that we would actually rather keep them away from. It's along the lines of: “Kids and teens are already spending enough time on their devices – please don't add them at school.”

But the fact that one is pure consumption and the other empowerment, maturity, learning – we differentiate too little! Here, young people are now speaking a very clear language. They're saying: “No, this is super important to us! Make sure that this happens in school!”

I was negatively surprised that half of the respondents say they don't feel well prepared in terms of data, data privacy and data literacy. Because every digital application relies on data – it depends on me understanding what I'm giving data away for, what is being done with that data, but also how data can help me and improve my life. If I am left in the dark about these aspects, if I am not trained, then we end up being consumers of non-European platforms and not responsible citizens. That should not be our goal.

This interview has been shortened. The video with the entire interview can be accessed via the QRCode/link: <https://youtu.be/pjZ7N-KzQm0>



“We can do better”

In an interview with Vodafone Germany Foundation, Prof. Dr. Andreas Schleicher speaks about how digital technologies have put us in a situation where we must find new answers to the central questions of education.

Andreas Schleicher is an education expert and researcher. He is head of the education division at the Organisation for Economic Co-operation and Development (OECD) and founder of the Programme for International Student Assessment (PISA). In this interview with the Vodafone Germany Foundation, he speaks about the potential of using digital technologies to once again equip young people in schools with future-oriented skills. Schleicher emphasises that intelligent education shouldn't focus on new technologies per se, but on a radical new approach to teaching and learning.

“To this end, politicians can cultivate an innovation-friendly ecosystem,” says Schleicher. That kind of approach would have a positive influence on the educational landscape, he says, and it is long overdue.



VODAFONE GERMANY FOUNDATION (VGF) What does the experience collected by the OECD suggest about the extent to which 21st Century Skills can be better promoted in classrooms through the use of digital technologies?

PROF. DR. ANDREAS SCHLEICHER (AS) The benefit of digital technologies is not that of preserving existing teaching practices, but in completely transforming them. In the health-care sector, we first check the results – the patient’s blood pressure and temperature, for example – and then the decision is made as to which medicine is most appropriate. In the education sector, we tend to give everyone the same medicine – we teach all children in the same manner. And when we then realise many years later that the results are dissatisfactory, we lay the blame on the patient’s motivation or ability.

We can do things better today. Digital technologies give us the ability to find completely new answers to the questions as to what, how, where and when people learn. Already, intelligent digi-



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tal learning systems are not only able to convey knowledge, they can also concurrently monitor how you learn, which tasks and approaches you find interesting and what assignments you find boring or difficult. These systems then adjust learning to your personal learning style with a far greater degree of particularity and precision than is possible in a traditional classroom. Be-

yond that, virtual laboratories make it possible to design experiments yourself and learn from them, instead of just learning about them.

Technology can help teachers go beyond merely transferring knowledge and become individual coaches and mentors to each individual student. That is how countries like South Korea, China and Singapore, which are far further along in this regard, achieve excellent results even with classes far larger than our own.

Technology can give teachers and students access to specialised learning materials that go far beyond textbooks, are available in different formats and can be accessed from anywhere at any time. Technology can promote new teaching methods that turn students into active participants. There are good examples for how technology can promote experiential learning by supporting project and inquiry-based teaching methods, hands-on activities and collaborative learning – and enable formative evaluation in real time.

Those are precisely the kinds of learning instruments that are required to develop knowledge and skills in the 21st century. And last but not least, teachers today can teach and inspire millions of students and spread their ideas around the world.

VGF The influence of artificial intelligence on our lives is growing and it is also changing both teaching and learning in schools. Do you see that more as an opportunity or as a risk for education in schools?

AS If we only create second-class “robots” – children who can only regurgitate what we have taught them – then we should fear AI. We live in a world in which things that are easy to



The world no longer rewards us only for what we know but for what we are able to do with what we know.”

teach and test can also be easily digitised and automated. The world no longer rewards us only for what we know – Google already knows everything – but for what we are able to do with what we know.

In the future, the focus will be on linking the artificial intelligence of computers with the cognitive, social and emotional abilities and values of people. It is about awakening curiosity and the hunger for knowledge – opening the intellect for new things. It is about compassion – opening hearts. And it is about agency – the ability to mobilise our cognitive, social and emotional resources. If we are able to impart those skills, we will be well prepared for the age of artificial intelligence. They will also be our best weapons against the greatest threats of our times: ignorance – closed minds; hate – closed hearts; and fear – the enemy of action.

VGF Competence in using digital technologies and resilience in the face of stress were identified by the 14- to 24-year-olds who took part in our survey as the most relevant of the skills polled. What is your view of this finding and what does it mean for schools?

AS Those are clearly decisive foundational abilities for the 21st century. When it comes to digital abilities, it is less about the interaction with technology than about the cognitive ability to deal with uncertainty and ambiguity. The algorithms behind social media platforms create virtual bubbles that augment our own views

but cut us off from other perspectives. They homogenise opinion and polarise our democracy. That’s why students must learn to think independently and to approach others with understanding. They must learn to reconcile different interests and perspectives with each other – in their local surroundings, but frequently with global consequences. They must find the right balance between competing demands – between fairness and freedom, between autonomy and community, between innovation and continuity, and between efficiency and the democratic process. At work, at home and in the community, people will need a deep understanding for how others think, whether as scientist or artist, and how others in different cultures and traditions live. Societies that succeed in that will have access to the world’s best talents, and through that, they will be able to promote innovation. The task of education is to develop first-class people, not second-class robots.

VGF 68 percent of those respondents who are still in school assess their preparation for a career in the digital age as good or very good. But 69 percent of the young adults who have already begun working say retrospectively that the preparation they received during their schooling was insufficient. What must change so that schools become more career-oriented in the digital age?

AS I think we have to abandon the idea that schools can prepare us perfectly for the working world. In the past, we learned for work. But considering the rapid changes to the working world, learning itself has become the work. If we can teach young people resilience, motivation, a growth mindset and effective strategies for learning, they will be prepared for jobs that don’t yet exist today, for technologies that haven’t yet been developed, and for social challenges that we can’t yet imagine.

VGF How can progress with the development of 21st Century Skills be measured and evaluated such that schools, teachers and education policy-makers can help design better instruction?

AS I think that one of the biggest mistakes that we have made in education over the past centuries is the sharp divide between learning and evaluating. We expect our children to spend years accumulating material, and then, years later, we ask them to reproduce it in abbreviated form in an artificial test situation. In doing so, we flatten and distort the entire educational process. Digital technologies now give us the opportunity to completely integrate learning and assessment in addition to clearly mapping 21st Century Skills along with social and emotional

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competence. The PISA test is proof of that: It already registers digital skills, creative thinking, team problem solving and global competence.

VGF You also have a global perspective. What approaches to the teaching of 21st Century Skills work particularly well and where? Can Germany learn through comparisons with other countries in Europe and beyond?

AS In Europe, Germany can learn a lot from countries like Estonia or Denmark. Internationally, from countries like China and Singapore, particularly when it comes to the systematic use of digital technologies for learning 21st Century Skills. In Germany, the reality is that we have a

patchwork of different solutions. Even in places where internet and technology are available, the schools are often dependent on proprietary and incompatible partial solutions. And because each school decides differently, they aren't able to use the data so that students can learn better, and teachers can teach better. Furthermore, in this fragmented market, technology companies in Germany need an army of salespeople to bring their products to market, which then produces insurmountable hurdles for innovators and startups.

Countries like Estonia and Singapore have shifted attention from learning technology to learning activities and integrated individual, team and class activities into the digital environment. They have developed the hardware such that the devices play a larger role but are not a distraction. Still, the most important lesson from these countries is that no solution will work if teachers don't play a central role in development. If teachers aren't involved in the research and shaping of the technology, they also won't be of help during the implementation.

We must shift our attention from learning technologies to learning activities and do a better job of integrating individual, team and class activities into the digital environment. The hardware must be further developed such that the devices are more present but are less visible and not a distraction. And we need intelligent systems that work for everyone, systems where educational equity isn't an add-on but a central feature.

It is clear that on-site digital solutions don't emerge overnight. But what policymakers can do now is create a broad strategy. Intelligent education isn't primarily about technology, but about a radical new plan for what teaching and

learning can be when it is supported by technology. To this end, politicians can cultivate an innovation-friendly ecosystem by setting standards and implementing a well-designed regulatory framework, with the focus on transparent, explainable and socially negotiated applications. Just as important is strategic financing and acquisition in addition to capacity investments aimed at helping students and teachers work together in developing intelligent, user-friendly, affordable, open and interoperable EdTech tools.

Study info

Responsibility for methodology and realisation

Infratest dimap Gesellschaft für Trend- und Wahlforschung mbH

Random sampling

A total of 2,069 German-speaking adolescents and young adults between the ages of 14 and 24 (1,037 14- to 19-year-olds and 1,032 20- to 24-year-olds) in private households in Germany were surveyed for this study. The selection of participants was made as a quota sample. The quotas were designed such that the sample corresponds to the primary characteristics of the total population surveyed.

Type of survey

Online survey (CAWI = Computer Assisted Web Interviewing)

Time period

November 26 to December 12, 2022

Imprint

About the Vodafone Germany Foundation

To actively shape the digital world, new skills are necessary. We must understand new technologies, critically examine changes and find creative solutions together for the challenges of the 21st century. That is why the Vodafone Germany Foundation is rethinking education for the digital society. Together with leaders from politics, academia and civil society, we are conducting research, taking part in socio-political debates and developing new educational approaches.

www.vodafone-stiftung.de

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