



“Neither the devil’s work nor a promise of salvation”

Experience with digital learning in distance teaching will change school education

By Katja Irle

The pandemic is showing learners and teachers alike the limitations of digital teaching and the importance of social relationships. However, the crisis is also revealing the advantages of distance learning. If used cleverly, digital delivery can be a driver of innovation in schools.

A future scenario: Mila (15) can sleep longer today. The teenager no longer has to struggle out of bed at 6:30 every morning in order to arrive punctually at school. She did some work in advance yesterday and uploaded the solutions to her maths tasks onto the school's portal late in the evening. The feedback appointment with the teacher is not scheduled until 11:00 in the virtual timetable. Until then, Mila can take it easy.

What is still considered a pleasant side effect of coronavirus-induced distance learning could soon be part of a new learning culture. "I'd like to continue learning as it suits me after the pandemic too and not be so dependent on the fixed timetable at school," says 17-year-old Tom. That could mean: With the help of online learning systems, he could make faster progress in his favourite subjects. In subjects where he still has some gaps, he would be given additional tasks to meet his individual needs. The new flexibility through online learning would not only accommodate his personal biorhythm. Even if a teacher falls ill, the lesson would not have to be cancelled entirely, as is often the case when there is a shortage of teachers.

Communicating complex material better

"Lots of new possibilities are opening up at the moment that are changing learning," says Kai Maaz, education researcher and executive director of the DIPF Leibniz Institute for Research and Information in Education. For him, digitalisation in schools is "neither the devil's work nor a promise of salvation." However, especially with regard to computer simulations of complex material, for example in the natural sciences, he sees great opportunities through new technologies. Another field he mentions is adaptive digital learning, where intelligent learning systems

adapt learning content to individual students' personal needs. This could assist teachers in their own diagnosis of children's strengths and weaknesses and help them to provide individual learning support, he says.

How is the individual school student progressing? Do they repeat the same mistakes? What is the learner particularly good at? What additional material is needed? These are important questions along the path to personalised learning. In education, this is, in fact, old hat – of course teachers know that each child should be seen with his or her individual strengths and weaknesses. However, due to time constraints in everyday teaching this is rarely feasible. Whether teachers' diagnostic expertise is fundamentally superior to the algorithms of learning programmes should also be questioned – or whether good interaction between humans and machines might not result in a better learning plan.

Tools such as the Bettermarks online learning system, which a large number of schools are using for maths teaching especially during the pandemic, deliver feedback on performance levels to both the students and the teachers. The digital maths teacher recognises mistakes and gives the children guidance. If an answer is incorrect, the system presents solutions and helps the children to look things up. Teachers, in turn, can adapt the range of tasks for their classes, ideally even for each individual student. Even if, as experts say, such digital systems are not yet sufficiently capable of communicating new knowledge well, they could at least expand on what has already been learned and in so doing relieve the respective teacher's workload. They could even help to compensate for deficits, foster strengths and thus see to more educational equity.

More flexible learning: For adolescents in particular, a pleasant side effect of distance learning was that they could organise their day more freely.

“School without face-to-face classes does not work”

So far the theory. “In practice, unfortunately, we’re still a long way from making optimum use of digital alternatives,” says Kai Maaz. To date, he has experienced teaching during the crisis mainly as the “digitalisation of analogue material.” Above all parents know what he means by this: From incomprehensible work assignments with links that lead to nowhere and poor, homemade learning videos to photographs of textbooks and being told to print out 20 pages of them – all this can be found on schools’ learning platforms.

However, even if teachers are experienced in digital teaching, the pandemic is showing that not all children benefit from it. Initial studies confirm that children who are already disadvantaged are left further behind because they do not have the necessary hardware or support from their families, and they need personal contact to their teacher. Technology cannot replace real contact between teachers and students. Of this Kai Maaz is also convinced: “The crisis is

showing that school without face-to-face classes does not work. That’s why teachers will continue to occupy a key position in future.”

The younger the children, the more this holds true. When Diemut Kucharz, educational scientist and professor of primary school education at Goethe University, looks at distance learning, she sees that the limitations have become obvious: “Children need personal relationships and guidance. In the case of primary school children, you first of all have to awaken their interests.” Sounds logical. After all, textual material cannot help a child who is learning to read and write – nor can explanations via video. Kucharz is convinced that the ability to communicate and learn educational language is also coupled with direct contact to the teacher. “Facial expressions and gestures play a major role in storytelling and reading out loud. They cannot be substituted by computer programmes.” Empirical studies also reveal, she says, that the teacher’s personality and attention are central to learning: “Children want to form a relationship with their teachers – in real life, not via a monitor.”

IN A NUTSHELL

- The school closures during the pandemic drew attention to the possibilities of digital schooling – in future too. Education researcher Kai Maaz sees tremendous opportunities for teaching complex contexts and for individual learning.
- The crucial factor is the interaction of humans and machines: Algorithms could relieve teachers’ workload, but not simply replace them.
- The younger the children, the more important the teacher: Learning in primary school has a lot to do with building relationships, stresses Diemut Kucharz, professor of primary education. Nevertheless, digitalisation presents opportunities here too.
- So far, there has been too little digital training for teachers in Germany, which has proved negative especially in the emergency situation of the pandemic. Professor Holger Horz’s “Digi_Gap” project aims to close such gaps.
- Educational scientist Professor Merle Hummrich warns against underestimating the importance of school as a place for socialisation.
- Distance learning in the pandemic has widened the social gap even further.

Primary school: subject didactics in demand

Professor Kucharz is anything but an opponent of digitalisation. She also sees potential for learning at primary school level in future, for example in computer-aided learning progress assessment, as is currently being tested with the “quop” programme, among others at primary schools in Hessen (www.quop.de). At the heart of quop are tests in reading and mathematics, which are based on the educational standards prescribed for each school year. Digitalisation can also help if material that has already been learnt needs to be cemented again and again by practising – for example spelling or arithmetic, says Kucharz. Here, digital programmes could supplement or even supersede the paper workbooks commonly used until now – with the advantage that children would receive immediate feedback and therefore be more motivated, she adds. For university teachers, their experience with digitalisation during the pandemic has by all means had positive effects: “A few years ago, my student teachers still had enormous reservations about digitalisation in primary schools. Now in the pandemic, it’s like a dam is breaking.” Nonetheless, she assumes that digital learning in primary school teaching is still viewed more critically than elsewhere: “It’s not enough to bring the software developers on board, subject didactics specialists are also called for.”

Quality of digital teaching left to chance

The cultural battle of “digital versus analogue”, as has been fought out especially in education

for years, seems to be giving way to the realisation that the future of learning is “digital *and* analogue”. For this to succeed, schools not only need better technical equipment. Training and continuing education for teachers must change as well. Even before the pandemic, studies showed that teachers lack digital skills. For example, a special analysis of the 2018 PISA Study revealed that there are not enough opportunities for continuing education for teachers in Germany. This has a number of implications: According to the analysis, less than 44 per cent of headmasters and headmistresses consider their teachers proficient enough to use new technologies for effective teaching. In the worst-case scenario, this means poor teaching despite good technology.

In distance learning, these shortcomings are now becoming obvious. It is often left to chance whether children are taught reliably and competently or fall behind at home. While one teacher holds video conferences on a regular basis and delivers feedback via the learning portal, the other only uses worksheets in their teaching because he or she lacks the technology or know-how – or both.

With the “Digi_Gap” project in the framework of the “Qualitäts offensive Lehrerbildung (QLB)”, a campaign for quality in teacher education, Goethe University had already set out to close such gaps even before the coronavirus crisis. Work is being done on interdisciplinary training and continuing education formats. On the one hand, student teachers learn how to



Photo: Nina Ludwig



Photo: Stephan Rumpff/Süddeutsche Zeitung

The classrooms remained empty, but online connections overheated. Even younger school students had to get to grips with virtual lessons and the interweaving of the two worlds.



Photo: Nina Ludwig

Under certain circumstances, school could become a social event even in distance learning, like here in the open air in Bockenheim.

handle selected digital technologies in a practice-oriented way. On the other hand, they need to understand when using a whiteboard is an effective teaching method and when it is not.

Individual performance assessment instead of class work?

Particularly during the months of the pandemic, Professor Holger Horz, executive director of the Academy for Education Research and Teacher Education and the project's scientific director, is receiving positive feedback from young teachers who have "practised" with "Digi_Gap" at the university: "They say: This came to our rescue in distance teaching." He is convinced that the trend towards digitalisation will be unstoppable after the coronavirus crisis. He too sees potential, for example in individual support for school students, adaptive learning and learning assessments. Horz, professor for the psychology of learning, even predicts that individual performance assessments will catch on in place of class tests: "Alternative assessment methods are putting the current grading system increasingly into question." In addition, distance learning has drawn our attention once again to the lone wolf existence of many teachers: "We've seen that the closed-door policy is a big disadvantage and understood that we need networking and cooperation instead. That will have an impact."

In educational science, however, not everyone is singing the praises of digitalisation. In the framework of the VERSA project and with the help of case studies, Goethe University professors Barbara Asbrand, Merle Hummrich and

Mirja Silkenbeumer are examining the changes brought about by distance schooling. It is not just a matter of not enough mobile devices, unstable internet and didactic problems. They are investigating how social and student-teacher relationships are changing because at present these are being overlooked. "During the pandemic, the focus is above all on the cognitive and technical level," says Merle Hummrich, "What appears to be particularly important is which tools make for efficient teaching." School, however, is an interactive social affair. In her view, school as a place for socialisation is being questioned right now. The result: "Responsibility is shifted towards the parental home." Especially for older school students, autonomy processes are "frozen", and important exchange in peer groups is interrupted, she says. In the framework of VERSA, Hummrich and her colleagues are looking at the impact: Will social interaction in learning groups be the same after the crisis as it was before? Will rituals that structure the school day stay in place? Do school students change when they are only connected to each other and the teacher via digital formats? If gestures and facial expressions are reduced to a minimum?

When it comes to educational equity, it is already evident that coronavirus-induced distance learning tends to make existing ills even worse. Studies such as the "School Barometer" of the Institute for the Management and Economics of Education (IBB) at the University of Teacher Education Zug in Switzerland show a distinct "scissor effect": Children from privileged families mostly do well, while their disadvantaged peers fall further behind. That is why Merle Hummrich is very sceptical whether digitalisation – for example in the areas of personalised learning and performance feedback – can help to make education "more equitable" in future. This would mean schools stepping back from their responsibility to teach children something, she says: "If individual pupils can't cope then, it's their own fault and not the school's." ●



The author

Katja Irle, born in 1971, is an education and science journalist, author and moderator.

k.irle@schreibenundsprechen.eu