hochschulforum
digitalisierung

# Reinventing Education in the Digital Era

## 4-Day Foresight Challenge

Berlin, June 27-30, 2017
Summary Report

# Will digitisation create equal opportunities for all through education?

These questions and many more were the basis of the 4-Day Foresight Challenge that took place from 27 June to 30 June in Berlin, Germany.

The Foresight Challenge brought together a small group of selected students from several countries from all over Europe, as well as from India, Egypt, Nigeria and the United States to envision what the future of education could look like in an era of fast digitisation.

## What role will education play in the future?

## How do you imagine the future of digital and nondigital learning?

## Can digitisation of education create equal opportunities for all?

## What is your vision for an update of the education system?

While the first day was a get-together and all about exchanging ideas, thoughts and personal backgrounds, the second day was the main workshop day. The students worked on future scenarios on what education could look like in 20 years. On the third and fourth day of the Foresight Challenge, students attended the Global Learning Council Summit, not only to listen to and hear from international experts about the impact of digitisation on education, but they, also, had the chance to talk to many of them to conduct interviews and gain further insights into the topics.

A few days after the challenge, three students even had the opportunity to participate on stage at a conference on education in the digital era hosted by the German Federal Ministry of Education and Research (BMBF) and to present their results and opinions during a panel discussion.

This report aims to share insights into the 4-Day journey and to share the results from the main workshop with the developed future scenarios. Moreover, the report includes contributions from the participating students, who conducted interviews with experts and wrote statements and reflections.

The report aims to be a stimulus for further reflection on the future of education.

We hope you enjoy reading it!

# Reflections

We asked the participating students to reflect on the impulses, ideas and thoughts that they grappled with during the Foresight Challenge and the Global Learning Council Summit.

> "We need to check what competences people need to have
> for their future life."

by Joshua Land

All stakeholders in the sector of education have recognised how important it is to change our education system in times of digitisation. Big companies have significant power with their access to masses of data. Soon they could also begin launching virtual universities and schools due to their financial and technological abilities.

We will hopefully be taking part in shaping education in a positive and personal way. We need to overcome fear of failure and we need to be open to change and experiments. We need to check what competences people need to have for their future life. Is there a more circular living so that competences change every now and then? Are there core competences that machines cannot overtake?

Learning how to build knowledge for critical thinking, decision-making and solving problems could be among them. There needs to be a connection and interactivity between the knowledge we have and the knowledge which is available on the internet. We need to organise the available knowledge in a meaningful way given the digital resources.

In the end, education is there to create independent people. People who take responsibility in leading us all towards a good future. Do whatever you like and love what you do! Education is love.

To all students. Let us be part of implementing digitisation in our universities. I think there will be more opportunities to do something. Education is the base of all change that can be made within our world. With digitisation, all people can have access to a good education.

Our generation needs to lead our world into a good future. Bad policymakers will fail – money and greed will fail - love and peace will win over all.
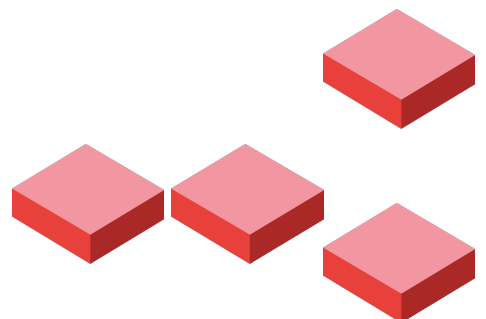
About the author:
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*Why do we stick with old paradigms, such as curricula and the standardisation of learning processes? Will technologies such as augmentation ever be able to replace real environment learning?*

by Isabel Dahlhausen

Our technologies are already able to create extraordinary things, like autonomous driving, virtual and augmented reality, the internet of things and so on. On the other hand, we still love to learn in face-to-face learning environments and to verify our knowledge with paper & pencil tests.

If we really want to create something better than currently exists, we need a systematic change — not just in our mindsets, but also in our society on a global scale. Everything gets increasingly decentralised and therefore communication becomes more important.

Think about a future scenario where it could be possible that we only learn in a virtual environment with many students from all over the world:

*What language are we going to speak?*
*What cultural habits are we going to use?*
*Could we overcome language problems with the help of our mobile devices and other tools?*

Think about a second future scenario, about a shift from curricula to skills: With our prescribed curriculum, we know what we get. We know what it means to be an engineer or a teacher.

*What will recruiting look like, if fixed job titles no longer exist? How do we do small talk and tell someone about our job - do we just describe it by skills?*
*What skills do we need?*

As stated by the American scientist and politician Rush D. Holt, the main skills that we need will be thinking outside the box, critical thinking, as well as communication skills.
Furthermore, it will be important to stay focused and develop a decisiveness to choose the right set of information at the right time.

Unguided and uninstructed learning may influence peoples' success in focusing on these issues. You need special skills to benefit from an unguided environment. The key to success is self-regulated learning. Although self-regulated learning is not entirely new, many people lack the ability to apply this.

Therefore, we initially need to promote and enhance such key competencies, before we focus on a new digital era.
There is much more behind the scenes that is needed to cope with advancing technologies and a reinvention of education which leads us to raise many more questions:

*Does technology change us or is a changing and more competitive technology an answer to changing demands? Do we want to empower people to withstand the labour market or do we want to empower people just as an end in itself?*

About the author:
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From Blockchain to Artificial Intelligence and Virtual Reality, the speakers at the GLC summit and students were imagining how the learning experience could change in the coming years due to emerging technologies. There are promising ideas, fascinating testimonials. Moreover, the business aspect plays a fundamental role.

## by Estevan Vilar

In most developed countries education is a business that is growing: tuition fees keep rising, MOOC platforms are competing to become the standard, and universities are launching more and more programs to regain attractiveness. However, during the Global Learning Council Summit, it was felt that none of the industry leaders were presenting their vision and strategy to really crack the code for the future of education.

We might understand the possible roles of machines, but we have not further developed the role of the human being. Academics know how hard it is to individualise a method or process because of contexts such as culture, language and brain structures. As the French philosopher Montesquieu said, "Man is a social animal formed to please in society" and I believe only another human can handle the social aspect. It would have been great to see during the summit how teachers would harness technology to educate the citizens of tomorrow; a generation that is born in a context of political and financial turmoil. It is the first tribe of truly digital natives, but also a generation facing a growing income gap and a shrinking middle-class. Therefore, we need to gain a better understanding of how education leaders can give them the tools to solve these problems.

Our current demographic situation can be characterised by developed countries facing an increasingly ageing population and many developed countries that have a significant proportion of their population under the age of 18 years. This leads to a shortage in the workforce. Immigration might become more relevant than ever in many countries. Speakers at the summit developed great insights into the use of technology, but were lacking on how to firstly give access to technology and then to scale accessibility for a population that earns less than $5 a day.

The philosophy behind the harmonisation of higher education standards in Europe through the Bologna process was not really present during the summit. Skills acquired during primary and secondary school are essential and shape the future of a human being. Yet no standards exist at a worldwide level. Recognition of skills globally is a painful barrier to individual mobility. Most of the recognition process goes through standardized tests that are not suitable to everyone, in the same way a unique teaching method does not fit everyone.

Overall, the Global Learning Council Summit was an excellent chance to get an insight into the state of education worldwide. It was also a great opportunity to see what education is still lacking and which areas leaders of tomorrow should focus their energy on.

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# What will education look like in 20 years?

The main workshop on the second day of the Foresight Challenges was built around scenario development techniques, letting students work in a structured way on future scenarios.

The workshop started with impulses on the current state of the world and the technological advancements that are already in place today in fields such as robotics, augmented reality, 3D printing, Artificial Intelligence and many more. Students then developed their personal education timeline, what it would look like if they were born today. With these impulses, students then worked in parallel in four groups on future scenarios based on the guiding question of what education would look like in 20 years' time. Their results were combined in one overall visualization that resembles the four perspectives in one view as shown on the next pages.

The students had the opportunity to present their outcomes at the reception of the Global Learning Council Summit to an international audience of experts in the field of education.

The following pages show the visual results and give detailed explanations of what is happening in these scenarios.

Berlin 2017

# Reinventing Education in the Digital Era

the skill line

traveling

at home

3+5

if(a)

Evolution of Education = Skillacation

The future of education rests on its ability to adapt to future disruptions in the labour market. These disruptions can be driven by technological innovation or other geo-political factors.

- Future education systems should be skill-based and not age-based.
- Teaching in future classrooms would be topic-based and not subject-based.
- The assessment would be done on the level of skills gained by the learner.

The skills would be divided chronologically into 3 levels, namely:

- 1st level skill set: communication and language. Skill examples: vocabulary, grammar, empathy, group discussion, etc.
- 2nd level skill set: Applied logic and reasoning. Skill examples: maths, physics, biology, arts and music, social sciences, history, etc.
- 3rd level skill set: Collaboration and specialisation. Skill examples: software development, advanced algebra, trigonometry, etc.

The 1st level skill set would include inter-human communication and inter-cultural communication using specialised translation devices. This would allow for an increase in empathy and inter-cultural relations.

The education system is flexible and can be adapted to different scenarios. This is a systematic change in the transition from old to new ways of learning. The classrooms can be supplemented with augmented/virtual reality devices in order to facilitate learning for everyone, everywhere.

The system would undervalue BA and MA, and the future classrooms would be holistic, open and skill-centred.

skills
portfolio

the skill line

The scenario describes four images in the context of education in the year 2037. These four elements compare learning and teaching scenarios in developing and developed countries and aim to identify a connection between them.

Tina lives in Germany and is 7 years old. She attends school. The classroom can be described as an open learning environment, where they have access to the newest digital devices equipped with the latest learning software. There is also a "live room", a virtual environment, where pupils can explore different "worlds" such as the inside of the human body or forest.

In the scenario, Tina solves the question "How does the squirrel survive in winter?" together with some of her colleagues by walking through the virtual forest. To obtain further information, they can ask their mentor. The teacher is a facilitator who creates the setting and the framework for the pupils' learning path.

Gandalf is the father of Tina and is a professor at a university. As in all universities, lectures are digitalised. He creates his lectures by using a smartboard. The screen and his voice are recorded. There are no books in his office, since all the information is available online. At the moment, he is teaching a biology course to his students from all over the world.

Gavon is one of Gandalf's special students. But who is Gavon? Gavon is a 25-year-old committed and motivated teacher in a remote village in Nigeria. He can attend Gandalf's biology courses because of access to the internet, digital devices and, most importantly, because of instant language translation. Because of these courses, the educational gap is shrinking. And there are other people, who are benefitting from the course.

Amir is a pupil in Gavon's class where basic digital devices connected to the internet are available. With these devices, the pupils experience new ways of learning and teaching, like watching learning videos and using educational software. With the support of Amir, they can gain more insights into specific learning areas.

With this connection, we promote life-long learning and create equal opportunities for mankind.

In the future, the university serves as a backbone for different student target groups. This could be imagined in the scope of following two learning processes:
- Learning by physically travelling and visiting different places in the world while simultaneously being provided with methodological and theoretical knowledge through an online university.
- Learning locally by attending classes online and offline. Through virtual/mixed/augmented reality, the student can apply theoretic knowledge and connect to professionals.

Jasmine, the 'Traveller': Jasmine physically travels to different places to gain relevant experiences and knowledge in projects for her prospective career by getting in touch with professionals and different environments. By then, digital devices such as the 3-D printer have become a basic tool for students. In Jasmine's case, it helps her to construct the items she needs on her travels to rural areas or natural environments.

On the other hand, she stays connected with peers, family and mentors from the university via a multifunctional device for communication with mentors and for knowledge sourcing. This device is also used to capture the knowledge and techniques learned on her journey and to share it on a virtual/digital platform for peers, and to save it for her future career. Apart from this, the university can refer to the digital results of her projects for the recognition of her academic achievements.

Paul, the 'Homie': His learning experience is inverted as compared to the 'Traveller'. He acquires knowledge by attending seminars in the spaces provided by the university, such as learning hubs or maker spaces. The university provides Paul with essential digital devices, such as virtual lenses, 3D printers, tools for mixed and augmented reality to work on specific projects, application projects and holographic tools. Mentors supervise Paul and teach him methodological skills for acquiring knowledge in an efficient way.

Since Paul is interested in medical techniques, he conducts trials with newly developed tools. Therefore, he uses the virtual conference room to exchange experiences and for feedback. Thus, Paul does not use his physical body to travel in space but is travelling rather cognitively. Furthermore, his virtually gained knowledge is going to be recognised by the university for his aspired career.

The university serves as an institution that guides students in their learning journeys with the goal to acquire key competences. It provides them with resources, such as technical devices and mentoring programs, learning hubs and networks. Giving students more freedom to create their own curricula creates self-reliant, creative individuals who encounter problems with the help of critical thinking. Problem-solving skills or problem-based learning is seen as a key competence. This aspect marks the difference to what normal machines are not able to learn.

at home

traveling

This scenario is based on the skills that will be relevant in 20 years for distinguishing humans from machines. These skills include literacy (reading, coding, mathematics, etc.), the ability to focus, the ability to use your body properly (kinetics), decision-making abilities through critical thinking and interpreting given data as well as the ability to interact with fellow humans using soft skills (emotional intelligence, communication, empathy, etc.).

Taking these skills as fundamental, the scenario is looking at 6-year old Samantha, who is evolving in a world where analysis helps to monitor and provide live feedback on her educational progress. Blockchain technology allows mobility through universal and decentralised certification. Traditional learning institutions have been disrupted and replaced by new formats such as forums.

In developed countries, these forums offer the space to work anywhere basically (parks, homes, train, open spaces, etc.) with fellow students. In developing countries, the forums are even more important as they offer the necessary facilities for making use of the available education opportunities. The forums are located in specialised buildings that provide smart learning facilities and mentors guiding the students.
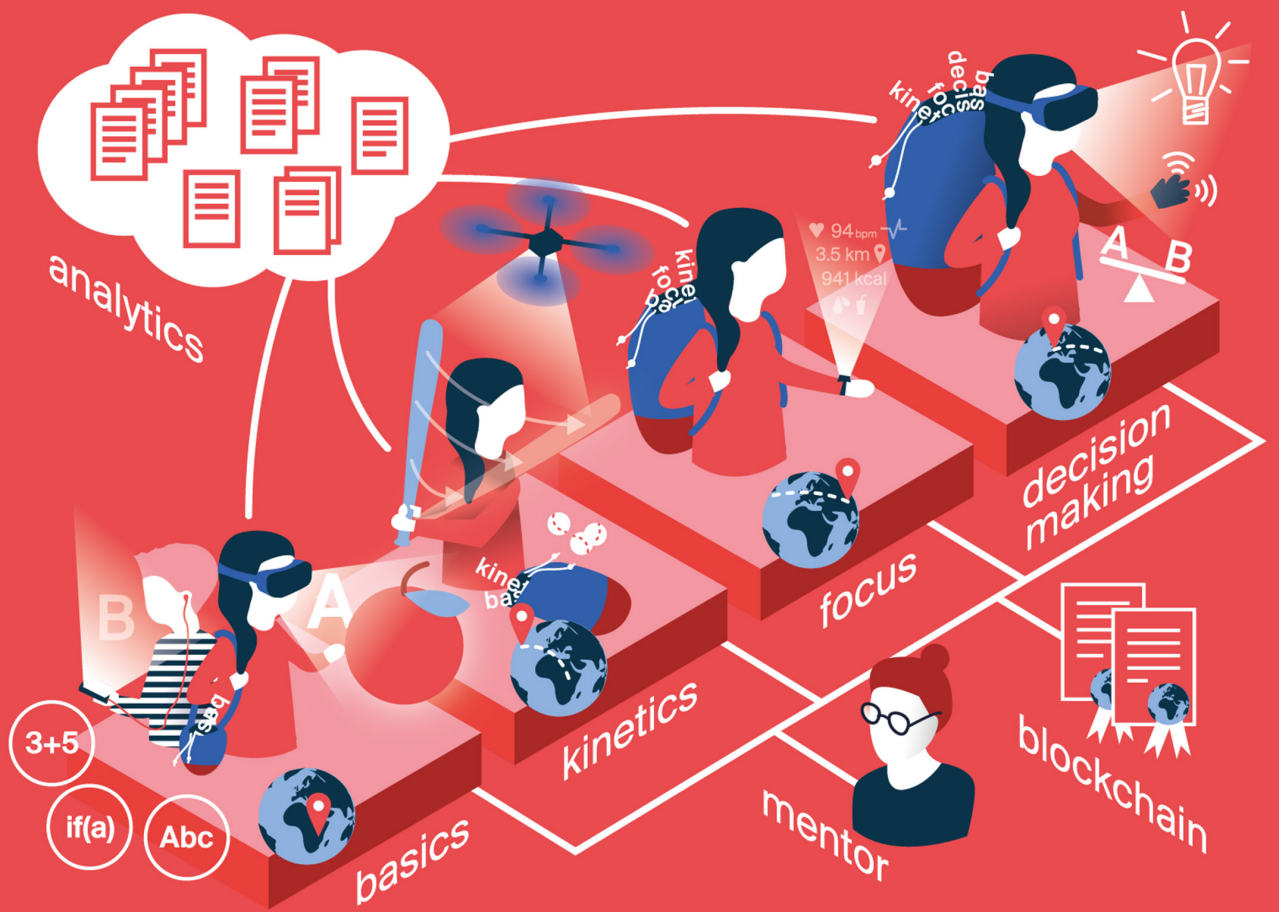
Mentors are trained individuals and they are your personal education guides, suiting your personal needs and providing you with the necessary information and tools.

Samantha started her education in Osogbo, a rural town in Nigeria, where she acquired basic skills such as reading, coding and basic maths. This was done with the aid of smart glasses, games that were provided in the forum with the help of a mentor, who tracked her progress. During her learning process, she was able to collaborate with other students from around the world through online forums. Ten years later, she moved to New York. The educational system helps her to maximize her physical appearance in order to keep her healthy. For instance, drones tracked her movements, holograms showed her posture, analysed it and showed her, if necessary, how to do it properly.

When she is 20 years old, she applies for her dream job. Right before the interview, her stress level is very high as is her heart rate. As she needs to focus (she knows this because chips are tracking her body stats), smart glasses give her instructions on how to relax and concentrate starting with her breathing. Finally, she gets her dream job and moves to Paris.

Five years later, she continues her learning process in the forum, working with other people on various case studies, which were provided by her company. Furthermore, to solve the case, she participated in an online discussion with fellow students regarding the pros and cons of each decision. Afterwards, the impact of each decision is represented virtually in a simulation in a VRroom.

analytics

B A

3+5

if(a)    Abc

basics

kinetics

kine
bas

focus

94 bpm
3.5 km
941 kcal

decision
making

mentor

A    B

blockchain

# Interviews

The students had the opportunity to speak with many international experts during the Global Learning Council Summit and to conduct interviews with them.

"The whole ecosystem has to understand that it needs to change in order to move on."

by Isabell Fries and Florian Dercks

At the Global Learning Council Summit, we had the opportunity to speak with Kati Tiainen (Microsoft, Director of the Global Digital Learning Strategy Team) about digital change in the educational system. What are future trends and what are the challenges to tackling them? And what is Microsoft doing to make their vision come true? As she explained "We want to help schools to teach their pupils to develop the skills that will be needed in the future." To make that happen, "the whole ecosystem has to understand that it needs to change in order to move on".

Right now, only single schools or teachers are taking the initiative and redeveloping education in their classroom with advanced teaching methods, such as Flipped Classrooms or Microsoft's offer to go on a virtual field trip. To change this single-motivated transition, Microsoft is engaged with important stakeholders in the education process; starting with ministries, businesses, publishers, the IT sector and schools in order to create a platform where digital teaching and learning is becoming an integral part of school education. "We have to do new things" with the technology provided and see where they can be used wisely. "Currently, we see a lot of failure, but that is also a reason why our team at Microsoft exists: We want to learn from success stories and from examples which are not working".

How can we realise the digital transformation? The challenge is how to get from speech to action. Policymakers overestimate the power of policies. They should set concrete goals and KPI's for this transformation. Kati Tiainen suggests new organisations at the intersection of national policy makers and industries to enable a dialogue with all stakeholders of the educational ecosystem on how to shape digital change.

The knowledge practices are so outdated, that "we lose the next generations." Being a digital native is not enough anymore in these times: "It's a big wake-up call that both teachers and policymakers have to decide how to build the digital transformation and the knowledge practices."

"It's a big wake-up call, that both teachers and policymakers have to decide how to build the digital transformation and the knowledge practices."

The demands teachers must fulfil have slowly changed over the years, but their education did not. The requirement profile of a teacher will shift even further over the next decades and universities should adapt their curricula to training teachers to be able to teach our future generations.

The future of education will require teachers to be more entrepreneurial, collaborative, creative and innovative.

Kati knows what she is talking about: "When I was studying, learning was about knowledge transformation, but teaching in the 21st century is about ICT and deep skills and scientific thinking." In 20 years, students will expect a mentoring relationship from their teachers. The future of education will require teachers to be more entrepreneurial, collaborative, creative and innovative.

Skills must be taught that will be relevant in 20 years to distinguish humans from machines. Writing with pens might not be a necessary skill anymore. Instead, coding and IT skills will be some of the most important skills needed in the future labour market. Education is going to be about competitive skill based learning and deep learning competencies, like creativity and critical thinking. Decision-making capacities, interpreting data, and skills for interacting with others with emotional intelligence and empathy must be imparted.

When we look into the future and approach big transformations in society, we have to reach equality in every aspect. Society needs more women and girls in the IT field. Politics and the industry should ask how to get more women into the tech industry. Coding classes in the curricula and more mentoring programmes for girls could be a first step.

Society really needs more women and girls in the IT field

The digital transformation is not only a topic in Europe or the United States, but also in developing countries around the globe. In many countries, there is a huge passion for the digital transformation. In a few years "in India, in ten years, there will be more graduates each year than IT-students in the UK, Germany and France combined!"

She is worried about progress in Europe, because Europeans always ask 'do we really need this?'. There should be more effort from the European Union: "It's more important to try and fail, than staying in the post-second world war education mode." That's why all stakeholders and society must ensure, "that all European kids are graduating, that they have the deep learning skills and creativity." Kati hopes, "that this transformation will be peaceful and positive."

She is giving the advice that "we have the cards in our hands: but do we understand that this game is going on? I'm not sure." She encouraged us: "YOU as students are the driving force for changing the system."

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LIFE - LIFE-SKILL
EDUCATION
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N3XTCO
INVENTING EDUCATION ... L ERA
BERLIN, JUNE 28

Joerg Altekruse is a producer, film director, social entrepreneur and president of youth4planet e.V. After his reconciliation work with youth in Britain, he changed his studies to psychology, with a focus on mass communications, marketing and linguistics. In 1984, he founded his own film company. His latest project youth4planet, engages young people in film making and storytelling to educate about environmental issues.

## by Loubna Doudouh

### Why do you think it is important to engage youth to use digital media when it comes to learning?

The great thing about film making is that you must apply lateral and multimodal thinking. You come into a situation, you experience it and you have a 360-degree view of what is happening. You are mixing with different cultures all the time and you have to create your own perspective.

When you start film-making, you have to decide on a certain perspective. You follow your route and your audience will be guided along that route which you have created. You can transfer this to new forms of available media, such as mobile phones.

We now have a situation where you can use technology to become a multimodal lateral thinking person by becoming a filmmaker or a director; it is empowering in many ways. Film-making is collaborative, you need other people to work with.

### How can we make use of filmmaking to create change?

We are in a situation where climate change is a huge challenge for all societies together. And societies are nation states that cannot really make a change. They lack the opportunities of creating new perspectives and of opening up to new challenges. We are now in a situation where we urgently need new solutions.

Young people today know much more than I knew at the age of 20. They are open to the many challenges. We only have to take them seriously as change makers. We need to empower them. With mobile phones and mobile cameras, they have the power in their pockets, whether they are in India, in Africa, basically everywhere. These tools allow multimodal thinking and working and interacting with people from other cultures. This is a great opportunity to make a difference and to change the systems.

*According to what you have just described, do we need more pioneers who will guide others in changing the learning methods by using the opportunities that are given through new technologies and (digital) media?*

Youth4Planet is an education and action system that is creating a model of how to make use of these opportunities. You could start in the kindergarten, by allowing kids to make their own films and their own perspective. This way, they already share a perspective and then show it to other kids. Thus, they have a very early experience regarding the differences between perspectives. With these differences, you have a creative space that allows for change. You always create new ideas based on different perspectives.

We created science power labs to provide young people with information and inspiration to help them find their own topics, build a team and then take the lead. We show them basic ideas of how to tell a story, following the ABT Model (And, But, Therefore), which is just a deductive model and the most convincing way to tell a story that children find very illustrative. Throughout our science power lab partner workshops, we show films and examples of what is happening with the climate. We give them an idea of how to start researching with their mobile phones. Some kids went to shops asking people what they thought about climate change and where their goods come from. They came back with lots of insights and short films, which they edited on their phones.

*Why are these methods and learning tools still so little used in schools or other educational institutions?*

It is revolutionary for schools. They operate in a different system. Their system is factory-based; you go into this factory – you get everything filled into your mind and then you leave the factory again and hopefully succeed in life. This is not what we need anymore. We need open-minded people with a 360-degree perspective in order to find new ways and to pioneer new things.

We aim to find ways to implement this system. The next step is to create modules that can be easily applied by schools and teachers in order to make their lives easier. Because the kids will then be doing the work, and teachers will help them to do their work better by guiding them on how to carry out an interview, how to make an appointment and anything else they need to do.

They need practice in order to experience that. We are now building modules on how to create inspirational films, a set of information for teachers, and a film that will be broadcast to teachers. We are further developing a skills cloud. The aim is to create a space where experience knowledge can be archived and everyone can access it or contribute to it.

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## About Hochschulforum Digitalisierung

As a centre of innovation and competence, Hochschulforum Digitalisierung (German Forum for Higher Education in the Digital Age) informs, advises and connects higher education institutions and policy makers on the path towards education in the digital age. Founded in 2014, HFD is a joint initiative by Stifterverband, CHE Centre for Higher Education and the German Rectors' Conference (HRK). It is financed by Germany's Federal Ministry of Education and Research (BMBF).

## About N3XTCODER

N3XTCODER focuses on providing high quality digital education through workshops and trainings. We teach technology skills such as User Experience/User Interface Design, Mobile & Web Development. Our educational programs are built around disruptive cases and challenges of social businesses and social entrepreneurs. Within our service pillar, N3XTCODER supports social organizations to develop their meaningful digital products with a broad range of services. We help to develop projects from concept to code from web applications to mobile applications and more.

Please feel free to contact us!

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