

Educational innovation with technology

An international view

March 2019



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Introduction

From personalisation to blended learning. No matter what school you attend, you hear the same thing everywhere: everyone is busy with educational innovation. On a quest for the best and most suitable education for young people growing up in a time when society is changing rapidly – not least because of technology. Although schools in the Netherlands are already well on their way, the innovations are only progressing gradually. This is partly due to the technology itself and doubts about using it, but also due to the culture in schools. And that isn't surprising: change is just incredibly difficult.

For this publication, we peered over the shoulders of school leaders, teachers, experts and researchers and mapped out which developments are relevant for Dutch education. We went through the same processes as these questing professionals: speaking to people, listening to stories, looking at examples and gaining inspiration, making discoveries and coming to conclusions.

We spoke with people from primary and secondary education about inspiring examples of ICT use that they have seen abroad. For example, we spoke with administrators and policy advisors who are looking internationally to formulate a new vision on education and ICT. And also with teachers who have gone travelling to gain inspiration for their own teaching practice. In addition, we have reviewed various publications and asked influential experts to reflect on a number of important developments.





We chose experts with diverse perspectives in order to create a broad picture of educational innovation with technology. What are schools actually looking for and which international educational concepts are they focusing on? Schools want to mean more to students in changing times. They are looking for ways to connect education to the world in which students live and will live. Ways to better motivate students and respond to their individual needs.

Based on all these findings, the first chapters of this publication distil the most important current educational innovations with ICT into four domains, namely: authentic learning, commitment to skills, insight into learning and flexible learning. Technology plays a significant transformative role in these domains, but is not always used effectively. In chapter 5, you can read more about why this is and how it can be improved. There is also a lot of discussion in education about how to use technology for innovation: is it better, for example, to work solely on the basis of science, or is it necessary to experiment for yourself to discover what works? Chapter 6 provides more information about these and other discussion points in innovation with technology. Do you want to get started yourself? Then head to chapter 7 and find out how you can best orientate yourself on innovations and how you can implement them sustainably.

In the second part of this publication you will see, based on 3 educational concepts and 5 interviews with experts, how these developments are applied in practice in different ways:

- ▶ For instance, in chapter 7 you can read Karen Cator's plea about how investing in digital literacy can contribute to reducing social inequality. She states that there is a gap between the digital skills of students from different socio-economic backgrounds. We need to do something about that.

- ▶ In chapter 8 we follow in the footsteps of a number of Dutch education professionals who sought inspiration from High Tech High in California.
- ▶ Professor John Hattie argues in chapter 9 that education can get more out of the social aspect of technology and then specifically online communication. According to him, we should take steps forward together.
- ▶ In chapter 10, you will discover the role of businesses in developing the education platform at the AltSchool in Silicon Valley.
- ▶ Belgian researcher Pedro de Bruyckere focuses on the art of comparing education systems in different countries or regions. In chapter 11 he talks about the importance of context and warns against polarisation in the education debate.
- ▶ In chapter 12, educational sociologist Michael Fullan talks more about the power of collaboration and deep learning. He holds up a mirror to Dutch education: the great autonomy that characterises our system is a strength, but also a pitfall. It means that we only sporadically look at each other and that we don't learn enough together.
- ▶ Finally, in chapter 13 we look at how the Swedish Kunskapsskolan is flourishing in the Netherlands at the Notre Dame des Anges secondary school in Ubbergen.

This publication provides an overview of the many relevant international developments and paints a picture of what education professionals think of the innovations. We also make recommendations that can contribute to your own quest.

Chapter 1 informs you who exactly is speaking in this publication and what role they play in education.





Part 1



1 Speaking in this publication

In this publication, various experts from the field and from science have their say on educational developments and share their insights and experiences. Below you will find an overview of all the people concerned and how they work in and with education.

Experts in the field

Expert	Role
Mirjam Brand	Former senior policy advisor at Lucas Onderwijs (primary/secondary)
Marij van Deutekom	Director and Administrator at Notre Dame des Anges (secondary)
Eric van Dorp	Administrator at SPO Utrecht (primary)
Jos Gijzen	Director of Broekhin Episcopal College (secondary)
Arien Hartog	Director of Professionalisation at SPO Utrecht (primary)
Kasper Heesterman	Team Leader at HN Werkman College (secondary)
Ed van Loon	Deputy Director of Notre Dame des Anges (secondary)
Bert Martens	Mathematics Teacher at Agora (secondary)
Marjolein Ploegman	Founder and former Administrator of De School in Zandvoort
Frank Tigges	Administrator at the Stichting Klasse Foundation (primary)
Raymond Trippe	Senior Policy Advisor at Lucas Onderwijs (primary/secondary)





Research experts

Expert	Role
Pedro de Bruyckere	<ul style="list-style-type: none">▶ Researcher at Leiden University▶ Lecturer in Teacher Education at Artevelde University of Applied Sciences in Ghent, Belgium▶ Pedagogue, speaker and song maker
Karen Cator	<ul style="list-style-type: none">▶ Director of Digital Promise, an American knowledge institute in Washington D.C. and California, United States▶ Former Director of the Office of Educational Technology in the U.S. Department of Education and Director of Education at Apple
Michael Fullan	<ul style="list-style-type: none">▶ Education Sociologist and Founder of New Pedagogies for Deep Learning▶ Former Rector of Teacher Education at the University of Toronto in Ontario, Canada
John Hattie	<ul style="list-style-type: none">▶ Professor of Education at the University of Melbourne, Australia▶ His research includes the effects of educational interventions on learning outcomes
Steve Joordens	<ul style="list-style-type: none">▶ Professor of Psychology, Researcher and Head of the Advanced Learning Technologies Lab at the University of Toronto in Ontario, Canada▶ Creator of <i>peerScholar</i>

In chapter 2 you can read more about the four domains of educational innovation.





The four domains of educational innovation



Education is always in flux, but the ongoing digitalisation of society is accelerating the possibilities. We have distinguished four domains within educational innovation which schools are focusing on in particular. These have emerged from observations and conversations with school leadership teams and experts and from publications and studies such as the *'Horizon Report K-12'* (2017 and 2018) and *'Innovative schools: teaching and learning in the digital era'* (2015) by the European Parliament. The domains are not new in themselves, but technology enables us to shape and substantiate them in new ways. The four domains that schools are currently focusing on are:



Authentic learning 	Flexible learning 
<p>With the expectation that students learn better in situations that are close to reality, thereby keeping the learning content relevant.</p>	<p>With the expectation that the education offered fits what a specific student needs at a specific time.</p>
Insight into learning 	Commitment to skills 
<p>With the expectation that teachers, students and parents can better monitor how and what students are learning, rather than only having insight into the outcomes.</p>	<p>With the expectation that this will prepare students for learning, living and working in the future, taking into account the perpetual state of tension between knowledge, attitude and skills.</p>



Most schools don't opt for just one development domain, but are working on several innovations. The domains are closely related and are pursued in a cohesive manner. Schools that focus on **authentic learning** place emphasis on their students experiencing learning situations that are similar to real life, so that they gain **skills** that they can use later in life and at work. A key motivation for **flexible learning** is that schools want to give students more responsibility for the learning process, for instance via **insight into their own progress**. These innovations have a major effect on the organisation of education and the task and role of teachers, and each entails its own opportunities and risks for education. You can read more below about the different domains and how they are interconnected, illustrated with examples from international educational practice.

“Technology is visibly and invisibly so closely interwoven in this form of education that it has become indispensable”

Authentic learning

Authentic learning is a term used for various forms of education, such as project-based learning, context-rich learning and inquiry-based learning. Authentic learning means: learning in the 'real world', with real issues and experiences from society. In contrast to learning based only on abstract learning material within the school context, which is sometimes difficult for students to translate into action in the outside world. This traditional learning often results in a conscious simplification of reality, precisely because it is separate from daily

practice. In authentic learning, students work independently with rich, complex assignments or big questions – as they really exist in life. For example: what is the best solution for the city of Amsterdam to allow pedestrians to cross from one side of the River IJ to the other? Using all kinds of learning resources such as online sources, books and knowledge from experts in the field, students look for solutions. Authentic learning is different from 'natural learning', which leaves a student completely free to discover the world. In authentic learning, students work on a clearly defined assignment.

Many schools find authentic learning attractive because it helps students to become more independent. The richness of the assignments makes learning more fun, thereby making students more motivated and engaged. Jos Gijzen, School Leader at the Broekhin Episcopal College, observed how authentic learning differs from traditional learning at High Tech High in California. For instance, the school hardly uses any methods and mainly works with sources that are as original as possible. As an example, High Tech High students visit the National Archives in Washington to view the original text of the Constitution, rather than reading about it in a history book.

Technology is visibly and invisibly so closely interwoven in this form of education that it has become indispensable. Teachers and students use technology in all facets of their work to communicate, find information, consult experts, record processes, maintain an overview and create products.

Education researcher Pedro de Bruyckere points out that authentic learning offers opportunities, but that it also has a downside.





“Knowledge and skills can’t just be seen in isolation from each other”

Research has shown, for example, that taking the authenticity of the learning situation too far actually harms the effectiveness of learning. Real-life issues can be an interesting form of teaching for the students. On the other hand, a school setting, in which the learning environment is less complex, can also help students to learn better. The solution lies in gradations: a clearly defined assignment that puts students to work in ‘the real world’ can be effective, but fully authentic learning is actually less effective than normal learning at school, according to De Bruyckere.

Commitment to skills

We know that knowledge and skills belong together as a unit. And yet there is still the idea that too much attention is paid to knowledge in traditional education. Schools often compensate for this by paying more attention to skills. These include the “21st-century” skills such as collaboration, critical thinking, problem solving, communication and creativity, but also digital literacy.

Kasper Heesterman, Team Leader at the H.N. Werkman College in Groningen, illustrates why it is important for schools to pay attention to students’ skills: “The fact that 21st-century skills are important because the zeitgeist is changing and 70% of our students will go to work in a profession that doesn’t exist yet has almost become a cliché. But for us, these are very concrete reasons why we want our school to place so much emphasis on skills such as collaboration, communication and creativity. We are right next door to the University Medical Center (UMC) and doctors tell me they don’t want students who are only loaded with lots of anatomical knowledge. They prefer to see them working in a team making a problem analysis of, for example, a patient who is looking yellow, and then jointly arriving at a well-considered strategy.”

21st-century skills are not all that new, but the great interest in them does demonstrate a concern: what do today’s students need in order to function in the society of today and the future?





In his article *'(Non)sense of 21st century skills'* (in *Het Jonge Kind*), educational pedagogue Gert Biesta points out that the skills are largely aimed at adapting to or surviving in an as yet unknown future. According to him, that is not enough. Biesta believes that skills should not only be used in response to social developments, but in fact to be able to approach new developments critically. It is therefore important as a school to take a good look at how you can include this aspect in the educational vision.

A frequently heard argument for placing more emphasis on skills is that the role of the school as a knowledge institution is changing in the digital age. Don't students have much more of a need for skills than knowledge, now that information is always at our fingertips due to digitalisation? However, information is not knowledge. If you don't have a knowledge base, it is difficult to determine which sources on the internet are reliable and which are not. The current time, with its abundance of sources and fake news, also requires a good knowledge base. In his publication *Standing on the Shoulders of Giants*, Paul Kirschner emphasises that knowledge and skills cannot simply be seen in isolation from each other. "In order to be able to solve problems, you must first have skills and knowledge of the domain in which you need to solve a problem. You can't solve a chess problem without being able to play chess (knowing what the rules are, how the pieces move, what the common strategies and tactics are, and so on) any more than you can solve a maths problem without being able to count. In other words, a skill like that is domain-specific." De Bruyckere also emphasises that the heated discussion about knowledge or skills won't get us very much further: they are both important.

In any case, the increased interest in skills around the world means that schools are really looking for ways to respond well and responsibly to the many rapid developments, in large part caused by technology. That is a positive thing. Digital literacy as the most ICT-related skill is gaining attention. It is expected that schools will soon have good frameworks, guides and materials at their disposal to incorporate these into the learning content.

"Adaptive learning systems generate data that provide information about the learning process"

Insight into learning

We see a great interest in measuring better and measuring differently. Schools want to personalise and differentiate. This requires careful monitoring of how each student is developing, as well as an insight and overview of this for both the teacher and the student. Schools also want to be able to measure progress in other types of teaching methods (such as authentic assignments) and to reflect on this together with students. This requires formats other than traditional testing and it is expected that technology will be able to help with this, for example with adaptive exercise systems. It is therefore not surprising that formative assessment is receiving a lot of attention.

The expectation is that summative assessments will become less and less necessary, because learning resources are providing continuous formative assessment.





Adaptive learning systems generate data that provide information about the learning process. The teacher can interpret this information and use it to adjust the learning process. A great reliance on data can be seen at the AltSchool in San Francisco, which has its origins in the high-tech environment of Silicon Valley. After all, to measure is to know. Collecting and analysing data is therefore an important task for teachers. Attention is given to students' skills and knowledge. Teachers work with programmers to improve the school's learning platform based on the data collected about student learning. Teachers are explicitly given time for this, based on the idea that they can thus contribute pedagogical and didactic expertise to the development of the application and so that they gain more insight into learning.

“Technology makes it possible to bridge distances and still be involved in education”

Collecting data can support the learning process. However, too much trust in data can also be a pitfall. Can all relevant information really be captured in data? Is the data that is being used correct and neutral? Can the teacher understand the data and does this lead to new interventions?

Insight into learning is not only about monitoring knowledge and skills, but also about reflecting on the learning process. This could include, for instance, students keeping track of their own progress in a digital portfolio or giving each other feedback on assignments and

recording this. According to Steve Joordens, professor of psychology and researcher at the University of Toronto, education can place more focus on this: “We know from psychology that we learn best from people like ourselves – or our peers – but the usual school system ignores that. At school you mainly learn alone, while learning together yields more. If technology can reinforce collaborative learning in the educational process, that is extremely powerful.” Therefore, technology needs to be able to report back more than just figures.

Flexible learning

ICT makes it possible to learn more independently of time and place and therefore more flexibly. This is also linked to the need to personalise and differentiate, in short: to accommodate the differences between students. From an organisational point of view, this need implies that students will work on different things at different times. That their levels and tempos vary. This requires good support from technology that takes care of all this, in terms of learning caches, tracking, portfolio and planning.

Technology also makes it possible to bridge distances and still be fully involved in education. For instance, there are the vast areas in Australia where students can learn together virtually, or the massive open online courses (MOOCs) that make it possible to follow a lecture from a professor at Harvard while logging in from the Netherlands. In America, many students take courses at the Florida Virtual School that aren't taught at their own school. Flexible learning thus enables learning in many new ways. There are also plenty of closer-to-home examples of remote learning, independent of place and time.





It isn't always a question of interesting educational innovations, but rather innovations that make education possible despite the scarcity of teachers or subjects that are chosen by few students. Years ago, teachers of Frisian were already teaching Frisian simultaneously to different classes spread across Friesland via video conferencing. From a technical point of view, there is no longer any objection to focusing on flexible learning. Connectivity, software and tools for online collaboration are available and easy to deploy.

In the case of flexible learning, the question remains as to how sufficient use can be made of the teacher's pedagogical and didactic input. Many schools are still searching for the right balance between online and offline learning. Of course, education can't do without in-person meetings between teacher and student, but when and how do these have the most added value? When is it smart to practise independently in a learning environment or elsewhere?

The example of Kunskapsskolan shows that it is possible to properly organise this balance between physical encounters and flexible learning. The learning portal contains all assignments for all levels for the entire curriculum. The learning portal is linked to a student tracking system and forms the backbone of the concept. The (technical) organisation must therefore be tightly structured to make education flexible. Personal contact is guaranteed in the daily meetings between the teacher and students.

In chapter 3 you can read more about the role of technology in educational innovation.

Case: Uganda – a digital school in a suitcase

Flexible learning also offers opportunities in places where education is not available to everyone. In Uganda, for example, they have no concerns about an ageing population: there are more young people than adults. This makes it difficult to find enough good teachers. Teachers also receive low pay and often have other jobs to keep their heads above water financially. Classes are often without a teacher for this reason. Primary education is free for students, but because there are so many students, the classes are often overcrowded and there are insufficient resources, such as textbooks. Parents have to pay for secondary education themselves, which means that few young people continue their education after primary school.

UNICEF Uganda therefore came up with "Mobistations" that enable flexible learning: lightweight suitcases containing a laptop with educational software, a webcam, speakers and a projector. The suitcases run on solar energy. Ugandan students can learn with the suitcase anytime and anywhere via video lessons from Ugandan teachers. The suitcases are used in places with few teachers and facilities, and in areas where students receive insufficient education or where there are insufficient education options.



3 Technology in educational innovation

Educational innovations worldwide rely heavily on the power of technology. There is no question that new technologies offer opportunities to fulfil long-cherished ambitions. Effective differentiation in education is no longer possible without technology. At the same time, the use of technology also raises new questions.

Schools are investigating the possibilities of using ICT in education, for example to improve learning and to organise the educational and organisational processes more effectively and efficiently. For instance, in subjects such as literacy and maths, digital, adaptive programs support the student in learning more at their own level and pace and in effectively achieving the result that is within the student's reach.

By using ICT, students can also work with information in different ways – they can contact fellow students or experts all over the world and they can present the results of a project online.

Thoughtful deployment of ICT

ICT can contribute to all kinds of educational goals, for example by putting the needs of the student at the centre of the educational process, or by offering more modern education. But new technologies raise new questions. For example, what happens to the data collected about students by digital systems? And how can education design information management in an efficient and safe manner?

The discussion about the role of ICT in education is also becoming more and more explicit as a result of the increasing teacher shortages and lack of resources in schools.

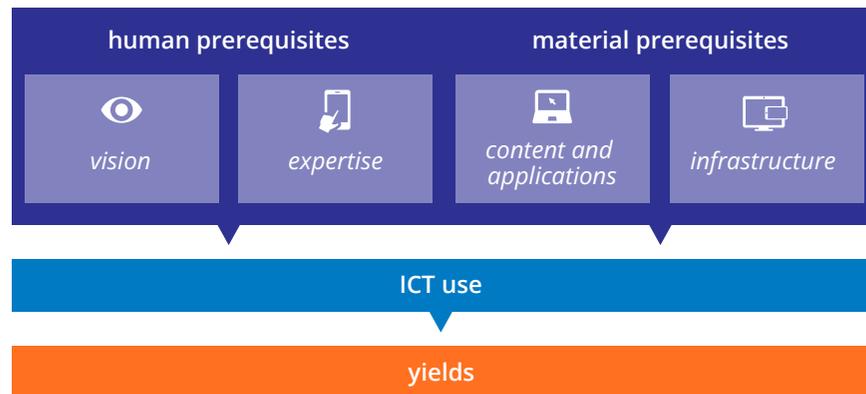




At the same time, it is important not to simply present the use of ICT as a pedagogical or didactic improvement. It must always be clear what exactly technology is being used for. For instance, to make processes run more efficiently and to save time, so that perhaps more can be done with fewer people, or to make learning better, richer or more flexible.

ICT can improve learning

Various studies have shown that ICT as a standalone tool has no clear positive effects on education. The teacher plays an essential role in the process. Every educational situation contains a force field that determines the learning outcome. This concerns the interplay between the characteristics of the student, the characteristics of the teacher, the learning content and the resources used by the teacher. The factors for effective education are all found within that force field. A good teacher knows which ICT application offers added value and when to use it.



According to Kennisnet's *Four in Balance model*, the use of ICT in education is only effective if there is a clear link with the schools' or boards' educational vision. The vision, the expertise of employees, the content and applications used and the infrastructure must be connected in order for ICT to really add value to education. The human and material preconditions must be in balance in order to reap the benefits of ICT use.

“A good relationship between change knowledge, pedagogy and technology is required”

In his book 'Stratosphere', Fullan argues that the use of technology can only really make a difference in education if there is a good relationship between change knowledge, pedagogy and technology. Unfortunately, this often doesn't happen in practice. In his paper '*A rich seam*' (2014), Fullan writes that technology has the potential to enable, extend and accelerate the learning process in new ways. But he also states that this potential is not being used at the moment. The large amount of money that schools have put into new technologies so far has not led to the results that they hoped for. How can that be the case?

The other experts speaking in this publication also find it difficult to talk about great successes with ICT in education. According to them, one of the main reasons for this is that the technology used doesn't always match the educational goals. At the same time, they also see that many opportunities offered by technology in education are still being underused.





Technology can connect even better with educational practice

Adaptive learning systems offer new possibilities for learning. Teachers can use adaptive learning materials to offer differentiation in their teaching. This already works very well for subjects such as literacy and maths, where students can continue to learn independently on the basis of exercises and feedback. In addition, adaptive learning material provides information about the learning process that can further support learning. However, the experts speaking in this publication emphasise that this technology is still under development. According to Cator, things are moving in the right direction, but the adaptive systems are not yet advanced enough to really do justice to the differences between students. They manage to do so at the learning level, but don't yet take into account other aspects such as memory capacity or emotional factors such as trauma or a low-literate home environment. Adaptive software now mainly consists of flowcharts that guide students through the various questions in the program based on their answers. For the time being, test scores will continue to determine the course of digital learning resources.

Whether technology can improve education also depends not only on what is already possible with that technology, but also on the way in which people view and interact with that technology. Joordens argues that teaching is a demanding profession, which means that new technologies are only really used if the added value is obvious to the teacher. If there is no clear educational goal, then teachers will rightly reject an application, he believes.

“If people aren't on board with technology, the curtain comes down quickly”

Cator and De Bruyckere cite as an example the commitment of working with learning analytics at the Carpe Diem schools in Ohio, which have closed in the meantime. Both argue that the use of technology can be so well thought out, but if people aren't on board with it, the curtain comes down on it quickly. The idea of schools where students spent part of the day working individually in office-like 'cubicles' was too unappealing to many. According to Cator, the societal gap between rich and poor also plays a role here. Families with more resources have more room to be more critical of schools where children are 'plugged in' to computers for a significant portion of the day versus families who are struggling to keep their heads above water.

The use of technology therefore only leads to benefits if the people who are using it have a good idea of what technology is used for and what educational purpose it serves. It is therefore wise to start the rationale about the use of ICT here. That is also the essence of the Four in Balance model.

The possibilities of technology can be better utilised

According to experts Hattie and Joordens, schools are still overlooking important new opportunities with technology. Hattie points out that





in the professional domain we still make too little use of the technological possibilities and platforms to learn together and share knowledge. This applies to working with students, but also to mutual learning between teachers.

Joordens also argues that we should be investing much more in the opportunities that technology offers for collaborative learning. He wants to apply knowledge from psychology in this process, for example in peer assessment. Cator also emphasises the importance of using technology in education for greater social equality. Research shows that less educated people and people with a migration background benefit less from technological innovations and can thus become disadvantaged. According to Cator, it is precisely for this reason that schools have the task of combating inequality by using technology, even more than is currently the case.

Nevertheless, a clear development can already be seen in the use of ICT in Dutch education. Examples include learning environments, digital learning resources, adaptive programs and testing applications. Resource banks have also slowly become commonplace, and teachers are rapidly gaining more experience with them. Concerns about the use of ICT in education must therefore be properly gauged. We aren't there yet, but there is a strong movement and eager interest in new developments – among more and more teachers. How do we find the right balance between the teacher and the technology? The experts speaking in this publication provide different perspectives on this.

In chapter 4 you can read more about the discussion points for educational innovation with technology.

4 Discussion points for educational innovation with technology

Although technology offers many new opportunities for education, ICT also increases the complexity of education. Schools have to make a lot of arrangements in relation to ICT, such as a properly functioning internet connection or good, secure information management.

Software that is easy to use and that provides added value is also important. Moreover, the use of ICT raises new social questions. What does the increasing use of ICT in education mean for the contact between teacher and student, for example?

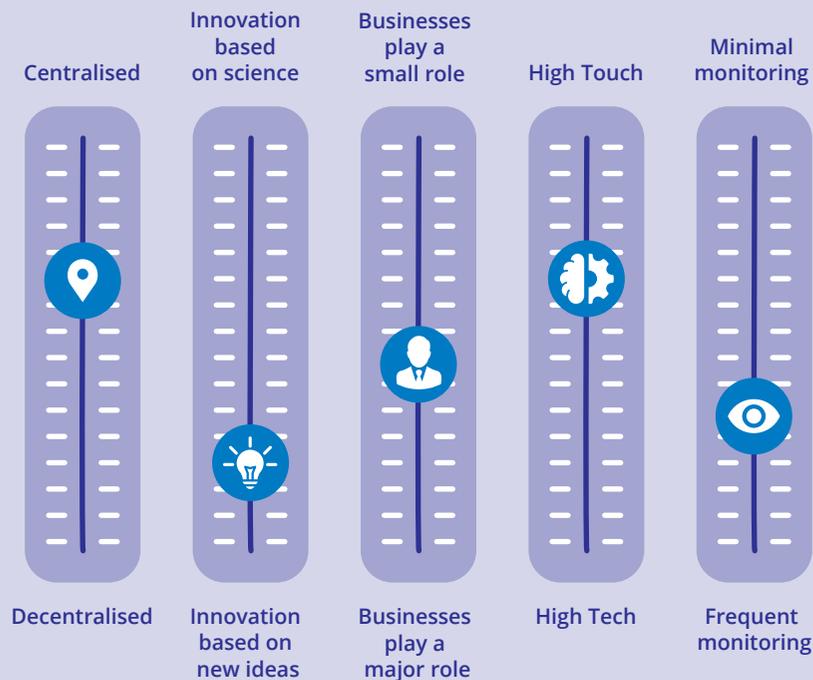
In this complex context, schools are faced with the challenge of making the most appropriate choices, seizing opportunities and at the same time dealing with risks and uncertainties adequately. Below we will describe a number of themes that are much discussed in education: for instance, should you work mainly based on scientific insights or should you dare to experiment? Should you seek cooperation with businesses, or is that not appropriate for education? It is often not about choices for one side or the opposite side, but rather a spectrum along which each school or board determines its own position. This is not to say that every position on the balance sheet produces equally good results. In some cases it is wiser to choose a specific direction; you can read more about this below.





The five themes

Five themes that are much discussed in education. In practice, schools often do not opt for one extreme or the other, but choose a position on the spectrum that suits the educational vision. In this figure the sliders are placed random and represent the positioning.



Centralised ◀▶ Decentralised

One of the important questions when using ICT in education is: do you arrange for it to be centralised or decentralised? As a director, do you make the policy choices or do you explicitly let the initiatives come from within the organisation?

The advantages of centralised organisation are clear: greater scale offers the opportunity to put valuable expertise to good use and to set up the preconditions in a professional manner. As teachers and students are increasingly working with digital learning resources, it is important that these resources work correctly, are available and are safe. This requires, for example, a robust ICT infrastructure, good information security and responsible choices concerning data and student privacy.

It is important to find a good balance between centralised and decentralised organisation. This can be done by creating support and finding connections about educational differences between schools and boards. It is therefore best if the underlying structure, such as connectivity and wifi, is arranged in a centralised way, while choices that directly affect education require participation or interpretation by schools themselves.

For some aspects of ICT organisation, such as purchasing ICT equipment or arranging for good connectivity, supra-administrative cooperation is even better. A cooperative structure such as *SIVON* combines the strengths of school boards for purchasing and organising ICT. For a portion of all facilities, purchasing can even be centralised at a national level. This is an option when it doesn't concern matters that vary between boards or schools, but rather basic facilities such as wifi.



💡 Innovation based on science ◀▶ Innovation based on new ideas

Insights from science can improve education. At the same time, the implicit knowledge and skills of teachers cannot always be directly traced back to science. Teachers make a huge number of pedagogical and didactic considerations every day, based on professional insight and years of experience. Acting solely on the basis of scientific insights is not possible in education.

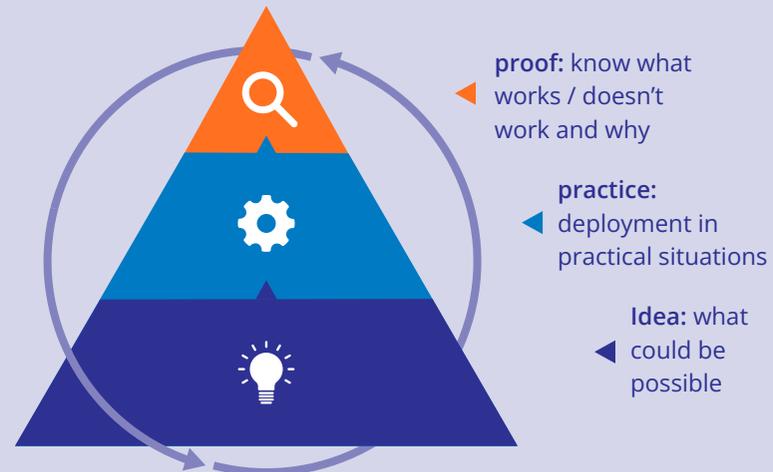
Innovation often means getting started with ideas for which there is not yet a scientific basis. The experiences gained from experiments in practice are an important power source for new research. At the same time, education is not a testing ground for science. Students only go through their school years once, they are a vulnerable group because of their age, and they have the right to a good education. It is therefore important to find a good balance between experimenting and innovating and working on the basis of scientific insights.

“Students only go through their school years once and have the right to a good education”

If schools start working with innovations that are not really supported by scientific insights, it is in any case important to monitor the new approach sufficiently and to choose an investigative approach themselves. What are the measurable effects of the change? And does the innovation deliver benefits that contribute to the intended goal?

The Knowledge Pyramid

For every educational innovation with ICT, it is important to take note of what has been shown to be effective according to research. Under no circumstances should you do things that have been proven ineffective and that have not yet been sufficiently researched. For teachers, this is part of their professional reasoning when it comes to the use of ICT in their teaching.



The insights that emerge from the research can in turn serve as a source for new ideas (see the knowledge pyramid below). Not all innovations succeed, but too often it is not clear why. And if the innovation does succeed, it is important to have a good idea of what exactly is causing it to do so. Often the intended goal is not defined, making success difficult to determine afterwards.



Businesses play a small role ◀▶ Businesses play a major role

It is important for administrators and school principals to consider what role businesses should have in the classroom. Schools use services and products from businesses to provide good education. Moreover, businesses come up with technological innovations that can stimulate educational innovation. At the same time, the increase in digitalisation also gives businesses more influence in the classroom, for example because algorithms in educational resources collect data about students. Algorithms need data to be able to improve; without that data, they don't function. But how far can that data collection go? This question is also relevant for the use of social media in education. Which businesses are behind those platforms and what happens to the shared data?

Agreements have been made about this with Dutch businesses in certain areas. For example, the *Privacy Covenant* stipulates that the data from learning resources is the property of schools. Discussions are being held about this with the large international businesses. Since 25 May 2018, they must in any case comply with the GDPR (General Data Protection Regulation), which equalises privacy legislation throughout the European Union. In the Netherlands, the AVG (*Algemene Verordening Gegevensbescherming*) has been drawn up for this purpose.

According to Cator, collaboration with the business community often offers great opportunities. In her interview, she shares how her organisation Digital Promise is collaborating with telecom company Verizon.

In the Verizon-sponsored Innovative Learning Project, underprivileged students at around 100 schools receive devices and internet subscriptions so they can do their homework outside of school. At these schools, learning performance in maths and literacy has now improved significantly and students are even finding school more enjoyable. According to Brand, former policy officer at Lucas Onderwijs, collaboration with businesses is even a responsibility that schools bear. Especially in times when new technologies such as AI are developing at a rapid pace, she believes it is important that schools, together with businesses, find a way to use ICT that is in line with the values and goals of education.

“As a school, you can make choices that reduce the role of businesses in education”

De Bruyckere, on the other hand, emphasises that the word school literally means 'free time'. It is a place where the student is given time to develop, to try things out: given free rein, in a sense. He believes that this may be in contrast with the influence of businesses in the classroom, which has increased with the proliferation of digital learning resources. Is that free rein for students sufficiently guaranteed?

As a school, you can make choices that reduce the role of businesses in education. A good consideration is, for example, to look at the availability of open learning resources platforms (such as Wikiwijs) and open learning platforms (such as Moodle).



High touch ◀▶ High tech

While many other sectors have already embraced AI and data collection and analysis, education is rightly holding back somewhat. This is not surprising because it calls into question students' privacy, among other things. Nevertheless, it is obvious that data and artificial intelligence will play an increasingly important role in the classroom.

The Rathenau Institute argues that the digital age calls for new human rights, including the right to human contact. This is also relevant for education, where students in the future are expected to work more with adaptive learning resources and receive less classroom instruction from a teacher. What does this mean for the contact between student and teacher? By letting students work with digital resources, the teacher can free up time and space to give students more personal attention and guidance. It is important to monitor whether this actually happens or whether the use of adaptive material leads to a reduction in meaningful contact.

Finding a good balance between man and machine will be an essential challenge in the future. In this context, we also discuss high touch versus high tech. These terms were introduced in 1982 by John Naisbitt in his book 'High Tech High Touch'. The aforementioned example of the Carpe Diem schools shows that a good balance between touch and tech is essential for the success rate of innovations, including when it comes to reputation. These schools apparently placed so much emphasis on learning with technology that parents no longer wanted to send their children there. In reality, the students spent more time with their teachers than they did in front of screens.

There are few conceivable situations for education in which high tech completely takes over: the teacher always remains vital. Kennisnet's *Technology Compass* indicates when and under what conditions it is effective and responsible to use new technologies to support educational ambitions.

Minimal monitoring ◀▶ Frequent monitoring

With new technologies, schools are increasingly able to measure the student's development and adjust accordingly. This is not only about learning outcomes, but also about behaviour. Adaptive programs don't just record student progress during an official assessment, but continuously, because their exercise results are also saved. Technology can thus make an important contribution to the ideal of personalised learning.

“A good balance between touch and tech is essential for the success rate of innovations”

Personalised learning requires measuring and recording, but how far should that go? And perhaps even more importantly: what do you do with the collected information, what significance and weight do you give to the data? For a long time, the AltSchools in California placed a camera in a classroom with the aim of collecting even more data about the learning process. Chinese schools collect data about students on a large scale to adjust the learning process. In extreme cases, the school even becomes a laboratory, in which learning is continuously analysed and optimised based on widely collected data.





The AltSchools also literally refer to their schools as labs, in which they are primarily engaged in improving the algorithm for learning.

The Rathenau Institute also mentions the right not to be measured as a new human right for the digital society. This is also relevant for education: are students able to say something about it if more and more of their behaviour and actions are monitored and stored? The discussion also concerns student tracking systems in which parents can monitor the progress of their children at school. With such tracking systems, are schools still a sufficiently free space in which students can learn, practise and fail?

The new possibilities for allowing students to learn more at their own level with digital resources therefore also raise new questions that schools and boards must make choices about.

In chapter 5 you can read how you as a school can get started with educational innovation.

Extreme monitoring in China

The largest education system in the world, namely China's, uses student monitoring on a large scale. This monitoring is part of a larger development in the country, in which the government collects as much data about citizens as possible. The data that schools collect about pupils and students is also registered at government level. The results of students in all schools are kept in centralised information systems. A school in Hangzhou even monitored students' moods with cameras in the classroom for some time. Every thirty seconds it was determined whether a student was happy, angry, anxious, confused or sad. The school has now stopped the video recordings because there was too much criticism locally. But other forms of tracking are still common in Chinese education. The collected data provides a far-reaching insight into learning: a picture of how the student is performing and future expectations. Schools also collect data including behaviour on social media, eating behaviour in the canteen and the times when a student is in the library.



5 Getting started with educational innovation

Education is moving forward together with the digitalisation of society. Each school does this in its own way and at its own pace. Most of the innovations focus on the four domains: authentic learning, commitment to skills, flexible learning and insight into learning.

This chapter details our recommendations for schools that want to get started with educational innovation. We supplement these recommendations with voices of people from within education itself. We make a distinction between orientation and implementation.

Orientation

To successfully embed innovations in education, it is important not to jump in at the deep end when you start innovating.

A good orientation of the possibilities and how they fit within the educational vision and context is just as important. For example, travel can provide inspiration, but do it with a purpose in mind. If you are considering a particular innovation, know that you don't have to reinvent the wheel yourself.

Build on what other schools have already done

Authentic learning, commitment to skills, insight into learning and flexible learning All the subjects addressed by the interviewees in this publication are endorsed as areas where schools are focusing their educational innovations. Yet it appears time and again that every school, after an inspiring visit abroad, gives its own unique interpretation to how the innovation is brought to life. This seems quite logical, but it also means that schools are not picking up where other schools left off.





Fullan therefore argues that the autonomy that characterises the Dutch education system is a strength, but also a weakness. Other schools or boards have often already done a lot of work. For instance, you can read the publications Scholen om van te leren *Schools to Learn From* and Dat kan bij ons niet! *That won't work here!* for inspiration. Find each other and build on each other's work.

Everything depends on context: look at your own situation

Few innovative school concepts are applicable everywhere. Experts such as De Bruyckere and Cator emphasise that each concept has been put in place to serve its own goals in its own geographical location, with its own community of people. They are therefore very dependent on context.

Arien Hartog, Director of Professionalisation at SPO Utrecht, also states that ideas from abroad cannot simply be translated one-for-one to the Dutch situation. "We must always keep in mind that these are different countries, with different educational foundations and different social systems. What works there cannot be directly translated into our education, and we don't want that either. Our own system has valuable aspects that we should not overlook."

Eric van Dorp, Director of SPO Utrecht, explains: "We have also been to private schools in the United States, for example. They have a technical department that continuously supports teachers in their use of technology, making teachers much more daring in their experimentation with digital resources. Which is all wonderful, of course."

But you have to keep in mind that such a thing is only possible because those schools have an abundance of money and are operating in a completely different system than ours." Another pitfall, according to Van Dorp, is that it is sometimes difficult to distinguish valuable new ideas from less useful but highly hyped topics. "You also soon end up with believers who are convinced that a certain way of working or a new technology is the holy grail. It is very important to continue to think in a nuanced and critical way when hearing such stories and to keep looking for a good balance."

"Keep in mind that these are different countries, with different educational foundations and different social systems"

This makes it difficult to copy a concept and compare it. It is therefore not easy to speak of successful and frequently copied new educational concepts. The Kunskapsskolan concept seems to be catching on in the Netherlands, but that is the only concept that, thanks to a well-defined system, is being applied in several places.

Travel with focus

Schools travel to orientate themselves on educational developments in other countries, but also for other reasons. The SPO Board explicitly uses travel – to California and Finland, among other places – to stimulate professionalisation: "Of course, you can learn a great deal by looking at the school around the corner, or a bit further away in the country."





Our school leaders therefore facilitate regular opportunities for their teachers to visit each other's schools. But a long journey has a different effect. It provides so much inspiration to see education that is totally different from ours – it helps you think outside the box."

Frank Tigges, Director of Stichting Klasse in Gouda and the surrounding area, talks about a recent trip to Texas, where he went with the intention of gaining more insight into the possible impact of technology for education: "We know that the large-scale use of artificial intelligence is coming. We want to avoid creating hypes about things like adaptive software, but we do want to be able to use it in a good way. That's why we made the trip to Austin with a group of teachers, senior staff and administrators to see how this technology is being deployed in the United States at a conference (SXSW EDU) and in schools. We were under no illusions that we were going to see a perfect example. But by better understanding the technology, we can monitor the further development and use of adaptive software more critically.

We are also pleased that, despite and perhaps because of all the discussions, the ownership of data and the importance of privacy are much better regulated in the Netherlands than in the United States."

It is especially important to keep in mind that travelling also benefits one's own teaching practice. Hartog explains how they do this at SPO Utrecht: "To make travelling more meaningful, we have embedded it into a training program. The program covers a lot of ground. We ask questions like: What do we stand for, what are your goals, how would you like to change education?"

Implementation

After a good orientation, it is important to make the implementation of innovation as sustainable as possible, so that you can continue to enjoy it and see its benefits. This is a challenging task, but we do know which elements play an important role in this and we are happy to make a number of recommendations.



In times of climate change, is major air travel still necessary as a school? For some, sustainability is a key value that plays a role in the decision-making process. Nonetheless, for many in education, travel appears to be of great importance: it provides inspiration, unity and motivation to implement developments in their own school. At the same time, it would be a shame for each school to separately visit the same places abroad – schools can also learn a lot from each other's travel experiences by sharing them with each other. For those who do travel: at least compensate for your CO2!



Let innovation come both from above and from below

For educational innovation within your institution, make sure that you have a good combination of management from above and initiatives from ground level. You can't have one without the other. Innovation without teacher involvement is doomed to fail. Innovation that relies solely on a few well-meaning teachers runs the risk of not being sustainable. The solution is a smart combination of both.

For example, director Tigges started the conversation in his organisation about the role of ICT in education in the classrooms. He started with an exploration to see how ICT could improve education. Based on the shared wish of the schools to do more justice to the differences between students, the board made a centralised decision to use Snappet for literacy and numeracy. Stichting Klasse then organised training courses aimed at differentiation and created the position of 'expert teachers', who became available to all schools and could assist them. This created a good connection between the schools and the board.

Give the teacher space

It is clear to see that real changes are taking place in the educational process. Research has shown that there is a direct relationship between a teacher's didactic repertoire and their use of ICT. A teacher with a large didactic repertoire has many instruments in their toolbox to be able to offer variety and to use ICT effectively. Educational innovation with ICT thus relies heavily on the skills of the teacher. It is therefore important to pay sufficient attention to this. More information about this can be found in Kennisnet's *Four in Balance Monitor* as well as the *ICT Competence Guide* (only available in Dutch).

Let science feed you, but don't wait for all the answers

Insights from science form an important basis for successfully innovating education. At the same time, when it comes to innovation, education can't always do everything on the basis of scientific insights. There is much that has not yet been researched and, furthermore, science is not able to capture the entire complexity of daily educational practice. In addition, science requires the practical experiences of schools to be able to conduct any research at all. On the basis of these practical studies, scientists can continue to feed education. The NRO's *Knowledge Roundabout* is a good example of this. The developments in science are clearly described for schools on the Knowledge Roundabout website. In this way, education and science work together to discover how technology, when applied properly, can help students learn better.

“When it comes to innovation, education can't always do everything on the basis of scientific insights”

Kennisnet's *Four-in-Balance Monitor* and *Knowing What Works* cards also provide more insight into the effective application of ICT in education. The books 'Jongens Zijn Slimmer Dan Meisjes en Andere Mythes Over Leren en Onderwijs' [Boys are smarter than girls and other myths about learning and education] by Casper Hulshof, Paul Kirschner and Pedro de Bruyckere and 'Standing on the Shoulders of Giants: Inspiring Insights from Cognitive Psychology for Teachers' by Paul Kirschner provide a good general overview of insights on effective learning and education.



Kennisnet's *Technology Compass* indicates when and under what conditions it is effective and responsible to use new technologies to support educational ambitions.

One hand can't clap – we need to join hands

Many of the experts interviewed in this publication believe that collaboration is the key to success. But we also see how difficult it is to establish and, above all, maintain collaborations. Collaboration means trading a little bit of autonomy for a strong foundation to make the innovation sustainable together. We are aware of good initiatives in the Netherlands, such as the *SIVON* cooperative and the organisations *Zo.Leer.ik!* and *PLEION*: examples of partnerships in which boards or schools join forces to challenge the market in a good way. So seek each other out, because you're stronger together!





the 6 success factors for sustainable innovation

Marjolein Ploegman, founder of De School in Zandvoort, conducted *research into obstacles to educational innovations* on behalf of the Dutch Ministry of Education, Culture and Science. Based on this, she made a model for educational innovation with 6 factors that influence the sustainability of innovation in education. Her definition of sustainable is: ‘a change that continues to exist, without the effort of enthusiastic people or extra budgets.’”

1. Analyse

An important precondition for sustainable educational innovation is the thoroughness of the analysis that precedes it. What problem do we want to solve? How does that solution relate to the mandate we have as a school? Ploegman emphasises the importance of this connection: the stronger the relationship between educational innovation and the (legal) mandate, the more sustainable the innovation.

2. School environment

Schools are far from autonomous; they cannot exist without making use of countless products and services from their surrounding environment (e.g. training, learning resources, housing, collective labour agreement). If those products and services differ from what the school needs, this poses a threat to innovation. In educational innovation, the relationship with the surrounding environment can come under pressure if the school and that environment no longer match. A precondition for sustainable innovation is a harmonious relationship with the school environment.

3. Heat shield

An innovation is by definition a departure from the existing harmony between the school and the school environment. It is therefore important to protect the innovative school from disruptive influences from that environment. While the school and the environment don't match up, the school needs a 'heat shield'. This is formed by people who have knowledge of both the innovation and the mainstream. The heat shield has three functions: making the products and services that the school cannot get from its environment (e.g. education), protecting the school against threats from the environment (e.g. the Dutch School Leaders Register) and influencing the environment (e.g. flexible teaching times). Ploegman calls this the heat shield that protects the innovation, as a kind of buffer, for as long as is necessary.





4. Policy cycle

Innovations only have a chance of success if a consistent policy cycle is developed that ensures consistency and clarity. School plans, annual plans and strategic policy plans must be carefully coordinated so that the thinking behind the innovation is applied consistently in all facets of the organisation (for example, personalised learning also requires a different design for the student education tracking system).

5. Capacity

Many innovations would benefit from a broader budget for a longer period of time. With adequate capacity in the form of people and resources, an innovation has a much better chance of success. There is more to it than simply appointing a project manager and purchasing new materials. One must also consider the extra work that people have to do to implement the innovation: the preliminary research, designing the innovation, the pilot phase and then embedding. If the capacity is only short-term, the innovation will collapse as soon as the resources are gone.

6. Support

Good support is crucial for innovations to succeed. But it is never the only success factor for educational innovation; the interplay of these 6 factors is too important for that. Support is about two things: participation and decision-making. If employees at different levels are properly involved, this provides more motivation and knowledge sharing, and there is a greater chance that the innovation will be successful.

In chapter 6 you can read the vision of expert Steve Joordens about the power of collaboration.





Part 2: interviews

6 'Help students learn better together with technology'

Steve Joordens



According to Steve Joordens, technology is dumb, but it can help the teacher decide how and where to intervene. Joordens is a professor of psychology, researcher and head of the Advanced Learning Technologies Lab at the University of Toronto in Ontario, Canada. His research topics include memory, critical thinking, peer assessment, engagement and the effective use of technology in education. As an example, he devised peerScholar, an online educational tool that supports students in collaboration, learning and reflection.

How do you see the growing role of technology in society and education?

"Technology is nothing in itself, but it helps us do what we can't do ourselves. It is good with numbers, helps us with logistical issues and it has very few limitations. You can connect people from all over the world and enable them to work together in ways that would otherwise be impossible. Technology allows us to measure things with a finer grain than we can do ourselves. We don't have the time to look in great detail at how students learn, while technology can

closely monitor that. Which is exciting: if we can do everything we want, what would we then want to do? And how can technology fulfil that?"

How do teachers embrace technology?

"In Ontario and elsewhere, especially in the Netherlands, people seem to be more reflective about the value of technology. Teachers are extremely busy and the profession is highly demanding.





Therefore, it makes sense to use technology that helps the teacher and eases his workload. The question is: what are we trying to achieve in the classroom? And do we also know for sure that a certain technology is compatible with this? Only when the value of those technologies is obvious to the teacher will they really want to use them. If an application is not clearly based on an educational purpose, any teacher will reject it – and rightly so.”

What is your focus in your research and the associated products, such as *peerScholar*?

“It started as a personal passion project. I love teaching in large classes, the atmosphere, I feel like a performer in front of the group. But I also understood that lectures are bad lessons with superficial learning experiences. However, they don’t have to be if you use technology wisely. We want to create applications that build on what teachers already do and what works in education – applications that help make learning more flexible.

“We know from psychology that we learn best from people like ourselves – or our peers - but the current school system underestimates the power of this. At school you learn alone, while learning together yields more. If technology can better make room for collaborative learning in the educational process, that is extremely powerful.

“Teachers still spend a disproportionate amount of time on structuring and organising the learning environment and ensuring that the students receive attention; in other words, it is all classroom management. New systems remove parts of those process steps.

For example, by first having an essay assignment checked by fellow students in the *peerScholar* platform. The students improve their work collaboratively in several rounds, before it finally reaches

What is your main priority within your research?

“I mainly focus on the acquisition of skills. For teachers, a skill like critical thinking is often an unconscious thought process that they already use a lot, such as when marking homework. But how do you ensure that students also move through such a process? And how do you measure whether students have actually mastered that skill?

“Schools want students to work together on large, authentic assignments. One example is STEAM education, which gives students a lot of independence. The ‘*Global Teenager*’ project, for instance, brings students from all over the world into contact with each other and allows them to work together on authentic assignments. But how do you, as a teacher, monitor exactly what a student is learning during this process? We are researching how we can properly map the development of skills by allowing students to give each other feedback via technology. In this way, you bring the learning of **skills** to an **authentic** context that is interesting for the student, but you also retain control over the learning process.”

How does technology help to measure the learning process?

“Look at Max Verstappen and his Formula 1 team. Ten years ago the only thing you could measure in a race was lap time, but now you can measure almost everything about the car and about every moment of the laps on the track. All this information is collected digitally and enables the team to visualise the car’s performance in a much richer way.





“Some educational technologies do the same thing: they give us insight into the entire learning process. We used to only examine the result, but now we can use technology to look at the process that preceded it. For example, the feedback and comments that the students give each other provide us with a better insight into their knowledge.

“We used to only examine the result, now we can use technology to look at the process that preceded it”

“We can also see how they respond to the feedback and how they incorporate it into their revised versions. So technology captures all those moments, while the teacher has time for other things. Meanwhile, all that information is readily available when the teacher wants to look at it. If we are better able to bring the data together in a good way, then the teacher will get what Formula 1 technicians already have on their screen: all the relevant data to be able to make good decisions.”

What does it mean for education that we are increasingly able to measure the learning process?

“It offers many opportunities. We can shift the focus from measuring knowledge acquisition to measuring students’ **skills**. For example: critical thinking, creativity and self-reflection. Insight into the mastery of those skills provides us with so much information! But it’s still very early days in the developments in the visualisation of these important skills. We are slowly discovering valid ways to measure them.”

Why is *peer assessment* so promising when it comes to the acquisition of skills?

“We make a distinction between knowledge and skills. In the brain, there are very different systems for those two things. You can gain a lot of knowledge about karate in an hour, but if you want to gain competence in the skill of karate, it takes a lot more time. The process is slow and gradual – that’s how skills develop. Students therefore need a lot of time to practise these skills. The teacher doesn’t have the time to guide each student through this process. But by using technology so that students help each other in their learning process, that time becomes available.”

How do students respond to feedback from others?

“When someone critically analyses your work, your brain thinks you are being attacked. And when you experience that, your brain goes straight to fight or flight. So more attention needs to be paid to the emotional side of feedback. That’s why we also give students a questionnaire about emotions. We send that information back via the platform to the person who gave the feedback. For example, about the tone of the feedback. And the receiver of feedback learns again how to recognise and acknowledge an emotion, and how to concentrate on the content of the feedback itself. Separating the substantive feedback and the emotional response to it is an important skill that will help you for the rest of your life. It’s one example of how technology can be a powerful tool, when technology itself is actually dumb.”





What further role do you think technology can play in educational innovation?

“Actually, we already know a lot about what works in education. What is important now is to enable teachers to use and bring together powerful forms of learning in a simple way. Technology can contribute to this in various ways. By anonymising feedback, for example – making it easier for students to say what they think. Such a simple change with the help of technology already makes peer feedback much stronger.

“Technology allows us to play with the space-time continuum: you don’t have to be in the same physical space as each other and we don’t have to learn simultaneously. I am very enthusiastic about the possibilities of **flexible learning**. It means we can make education accessible to people who otherwise would not have the opportunity.

“Technology allows us to play with the space-time continuum”

“Massive open online courses, or MOOCs, for example, allow everyone to participate, which reduces inequality. It makes us think about the fact that education is usually a formal process in which only certain groups participate. With MOOCs, we suddenly look at those standard assumptions about education differently. All of a sudden, education becomes consumable in multiple ways. I hope this will enable many more people to learn more, longer and more often. Meanwhile, we also know that the number of people who complete a MOOC is 10% or less. It is a major challenge to discover what can improve engagement in such flexible forms of learning.”

How do you see the future of education?

“If you show a teacher the ease with which they can achieve their goals through technology, it stimulates their creativity. Think outside the existing systems! We all understand why we have a curriculum – there are certain things that we all think our students should know. But when those curricula become too dominant, we trap both the teacher and the student. We don’t give them a personal role, we don’t motivate them, we just say: run this program. We have to change that! Let teachers enjoy their work more, treat them as the specialists they are. And let technology support them in all sorts of ways, so they can do the things that they know work in education. Students feel that and will respond better. That’s the future of education that I’d like to see.”

Karen Cator talks in chapter 7 about how technology can narrow the digital divide.



7 ‘Use technology to narrow the digital divide’

Karen Cator



Karen Cator is director of Digital Promise, an American knowledge institute, comparable to Kennisnet. She was employed by the Department of Education under the Obama administration. Before that, she was in charge of the education department at Apple. What drives her is offering the current generation of children and young people more opportunities by investing in technology.

In your work and research you are often concerned with the ‘digital divide’ – where do you think it comes from?

“Educational innovation is in an exciting and inspiring phase. Technology offers many opportunities, but unfortunately they are not available to everyone. Not every child reaps the benefits, and this creates a digital divide and more inequality. In the United States, education is organised locally and that doesn’t help close that gap. The national government is hardly involved in this either. Research shows time and again that the digital divide is mainly related to social background. Both in the United States and in the Netherlands.

“A lack of digital skills leads to differences in social opportunities: less educated people and people with a migration background benefit less from technological innovations and can thus become disadvantaged. Education plays a very important role in this, because after childhood it is usually no longer possible to make up for that digital disadvantage.”

“A lack of digital skills leads to differences in social opportunities”





Can technology, via the four domains of educational innovation, contribute to closing the digital divide?

“I think the solution to closing or narrowing that gap lies in the combination of **authentic learning**, powerful technology as an educational tool and learning to deal with technology in general. Authentic learning experiences rather than hypothetical scenarios. So involve students in real-world problems, let them come up with solutions and focus on learning **skills** such as collaboration, critical thinking and demand-driven work. Add to that a good foundation in information skills and media literacy, and children will learn to use technology in all facets of their lives.

“I am counting on the power of adaptive technology to promote equal opportunities: this technology can help teachers to better respond to the differences in student development levels. Furthermore, there are developments in the field of **insight into learning**: based on data from digital learning resources, we can say more and more about the learning process. This is also known as learning analytics. However, this development is still in its infancy.”

How do you see the future of learning analytics?

“Learning analytics hasn’t yet taken off in education. There are several reasons for this. The data that comes from the learning resources is still very rudimentary. The question is: how can we extend, refine and interpret that data well enough so that we can really differentiate? There are so many factors that influence learning, such as memory capacity, emotional backgrounds such as trauma or a low-literate home environment. If we could take those factors into account, many more possibilities would emerge.

“The current generation of adaptive software mainly consists of flowcharts that map out a path to guide the student through the questions in a program. Digital education is therefore largely determined by answers to tests. Students would benefit much more if the software took more factors into account.”

Are there examples of adaptive software that can already do this?

“Some programs are already more firmly based on scientific research and therefore provide better guidance. For example, in language acquisition for English or programs for children with specific learning difficulties due to autism. These are promising developments, but more research is needed to take real steps in the further development of these programs.

“The translation from science to education is important. We know that there are different approaches to helping students learn best. From Digital Promise, we have therefore developed a toolkit that helps teachers to discover those differences. Based on those results, they can make the right didactic choices.”

Are there more reasons why learning analytics isn’t taking off yet?

“There is a constant tension between the implementation of technology and the way in which people can and want to deal with that technology. ‘High tech’ must be sufficiently balanced with ‘high touch’: the human need for contact and meaning. The balance between the two is an important condition for the success of educational innovations.





“The American Carpe Diem schools are an example of this, as are the Rocketship schools. The idea behind their educational concept was simple: students spent part of the day working at their own level with computer programs, thereby acquiring necessary knowledge. The rest of the day was left for more in-depth project work under the teacher’s guidance or working on arts subjects. During the morning program, the students sat in rows in a cubicle-like environment and worked behind the computer. This had a major impact on the schools’ reputations.

“Although the schools did in fact have a balance between ‘high touch’ and ‘high tech’, the predominant image was of students working very individualistically behind their computers – learning the compulsory material without speaking to their peers or a teacher. In the end, the schools went bankrupt, mainly because there weren’t enough registrations. Parents don’t like seeing their child sitting in a cubicle for a large part of the day.

“The Rocketship schools still exist, but they also struggle with their image. The interesting thing about these schools is that they are aimed at children of parents with a low socio-economic status. By focusing on a mix of adaptive learning resources, classroom lessons and lessons in smaller groups, they hope to give this group more opportunities and address the achievement gap.

“At the same time, in order to combat inequality, it would be great if parents with a higher socio-economic status also sent their students to those schools. But you see that it’s precisely those parents who have difficulty with the image of a school where their children are plugged in at the computer for part of the day and are monitored.

This further exacerbates the inequality. People with more resources have the opportunity to send their children to a school where ‘high touch’ is paramount, because there is simply more money and a student can receive more personal attention from a teacher.”

Can you give an example of how Digital Promise contributes to innovation in education?

“When it comes to innovation, it’s about solving an existing problem and the solution needs to be scalable. Technologies like the smartphone and the tablet are examples of this. However, about a third of children from poor families in the United States don’t have access to high-speed internet, which can cause them to fall behind with homework. With the ‘*Verizon Innovative Learning Project*’ we offer secondary school students from about a hundred schools devices with internet subscriptions. This allows them to also do their homework outside of school.

“But, we always keep looking at the context and the environment: what works in this context, and what do we need to adjust? In addition, you should always keep investigating the impact of innovation. The results of the Verizon project look very promising. For example, we are seeing that students at Verizon schools develop faster in numeracy and literacy skills than at other schools. Furthermore, they feel more familiar with and positive about technology and they even enjoy school more in general. The ICT skills of the teachers have also improved.

“The sponsorship of this project by the telecom company Verizon shows that business can indeed play an important role in education.





We don't always have to be afraid of it, as long as it happens within the right frameworks. If innovation can contribute to greater equality and inclusiveness, not only is it fairer, but it's also better for the economy, national security and social justice. And I'm so happy to see more of that!"

Is travelling a good way to gain inspiration about educational innovation?

"Take a good example like High Tech High in California. The school works on authentic learning and has technology well embedded in education. It is therefore a popular visiting destination for educators from all over the world. Nevertheless, I think the concept can't be copied, as it is highly context-dependent.

"Firstly, it's located in an area that has been declared the high-tech breeding ground of the United States. That attracts a huge number of technology companies and industries. At the same time, it is one of the poorest areas of America where there is a lot of inequality. High Tech High is keen to work on this and reduce the digital divide. But the school is so popular that they have a choice of the best teachers.

"If you compare that with other places in the world, you don't get that combination of urgency from poverty, the very high-tech environment and the luxury of a selection of teachers to choose from. In other words: without that context, the concept can't be copied. If you're going on a trip to gain inspiration for educational innovation, you will have to keep a close eye on the context in which a concept originated and is working. It's especially important to keep looking for a balance between high tech and the so-called 'high touch'."

Read more about authentic learning and collaboration at High Tech High in chapter 8.



8 You learn together at High Tech High

Jos Gijzen, Bert Martens



High Tech High in San Diego, California, is committed to meaningful, authentic learning. Students work on projects that are important to them, to their teachers and to their environment. These projects are not bound to the walls of the school: the routes lead out, into the city and back again. Jos Gijzen, School Leader at Broekhin Episcopal College, and Bert Martens, formerly School Leader and now a mathematics teacher at Agora in Roermond, visited High Tech High in 2017 on an education trip.

Gijzen and Martens found each other in the pursuit of a much more personal education system, meanwhile powerfully brought to life in Agora, where a school is not only a knowledge institute but also a living and learning community.

High Tech High: what kind of education is it?

Martens: "High Tech High is a group of 13 schools that covers the entire K-12 education (from kindergarten to 12th grade). The profile of the schools is emphatically technical. San Diego has always been a naval city. After the cold war, half of the navy disappeared. The city invested in technology. High Tech High's approach fits in with that."





What does authentic learning look like at High Tech High?

Gijzen: “San Diego is a major metropolis. The school emphatically lives with the city. They do everything in collaboration with the community and also at the service of that community. They bring in guest speakers and teachers from outside the school, or they go out with the students to companies and social institutions, for example. They say: when we talk about biology, we behave like biologists. And when we talk about archaeology, we behave like archaeologists. That is meaningful, authentic learning at its best: students get to work on projects and record their learning process as accurately as possible.

“There is a lot of focus on themes like arts and crafts, which engage the head, heart and hands. This allows them to learn in a completely different way than in traditional lessons and classes. They do it directly in the real world. And that world is a great place to work, learn and live. The students make extensive use of modern technology: they communicate, present and design using digital tools. But only where it works – it is not done exclusively digitally. They are always looking for the best next step for their project. Sometimes they use a book for this, sometimes they have to speak to someone and sometimes they work with digital learning resources.”

At this school, you learn together. What exactly does that mean?

Gijzen: “The students quickly discover that you don’t just learn for yourself. At High Tech High, it’s always about the question of what you can contribute to the community. And you’re not the only one learning. The teacher also learns from the projects and the people from outside who participate in the projects.

The school emphasises the collaborative aspect of learning. This also offers a nice counterbalance to an idea of personalised learning that has gone too far, where everything is only about developing the talents of the individual.”

What do those projects provide?

Gijzen: “They make this very clear with exhibitions that clearly show the process they have gone through. What was the question that the group started with? What steps did they then go through and what answers emerged? The people who were involved from outside, such as architects or biologists, often come back to see the exhibitions. You start the project together and you finish it together. Through the exhibitions, the different groups learn from each other’s projects.”

The projects are very free-form. How does the school still gain insight into learning?

Gijzen: “They are clearly looking to strike the balance between freedom and structure. The project-based learning has been elaborated in clear protocols and process steps. The teachers link well-defined learning objectives to the projects, provide insight into exactly how they are collaborating with the outside world, how the progress of the process is documented, what students have to record and how they are assessed. High Tech High works with a continuous feedback cycle. Reflecting on the process and gradually adjusting the process is not strange there; it’s the core of the approach. They make this reflection very visual, with boards and posters, but also by using a digital portfolio. Gradually, the process crystallises more and more.”





Who decides which projects the students will work on?

Martens: “The teachers have a lot of inspiration, ideas and experience. They all have different backgrounds and they also take that into account in the projects they come up with. This results in inspiring and varied ideas. The students are also involved: what would you like to learn? Does this project idea appeal to you? They then arrive at a new project, as a group. This could be about black holes, about food shortages or about threatened coral reefs. It’s something different every time, so the teachers themselves also continue to learn and continue to be surprised.”

““They are clearly looking to strike the balance between freedom and structure”

Can all subjects be captured in projects?

Gijzen: “Yes, it works quite well. In a project about black holes, you can incorporate learning objectives from different subjects, such as literacy, physics, arts and mathematics. Mathematics turns out to be the most difficult subject to fully integrate into projects. The really formal side of maths is taught in separate classes, in the morning, before they start working on their projects.”

How large a role does ICT play in this form of education?

Gijzen: “The teaching material consists of the world around the students. The school hardly uses any textbooks and students mainly work digitally: they make presentations, skype, email, google information and they make designs with creative programs.

Sometimes they might end up with a book, that depends entirely on the assignment they are working on. They’re looking for the best means of answering that question. ICT is ubiquitous at High Tech High, but not in a prescriptive way. It just works, and teachers and students know how to use the technology in their projects.”

Martens: “All students and teachers develop their own digital portfolio during their school time. Over time, you see these develop from a standard format into a unique reflection of someone’s development with its own design.”

Can any child go to High Tech High?

Gijs: “Certainly. The school has been set up to promote equal opportunities. Students are admitted on the basis of a lottery with zip codes and parents don’t pay school fees. There are children from various backgrounds at the school – some have very wealthy parents, others come from much poorer backgrounds. The great thing about the school is that it offers a counterbalance to the American system, in which your origin is very decisive for your further education. There are deans there who work very hard with the students to make their portfolios as good as possible, so that they have a better chance of admission to further courses and receiving scholarships. With a portfolio from High Tech High, doors open. These digital portfolios are unique and personal and clearly show what students have learned and achieved.”

How are the students grouped?

Martens: “The differentiation as we know it in levels isn’t there. The school has students with levels ranging from VMBO [pre-vocational secondary education] to VWO+ [pre-university education].





It's so beautiful to see how they listen to each other, give each other space and know that they can always learn something from someone else. This is something that the schools have been working on since kindergarten. In the projects, the students ask each other questions and give each other feedback. They write down their classmates' comments as material for their project and use it in their next steps. They learn very early on that the input of all their different classmates is valuable."

"They learn very early on that the input of all their different classmates is valuable"

Gijzen: "This solidarity and equality is a very important part of the way of working at the school. You often hear in the Netherlands: the best students shouldn't be held back by less smart students. At High Tech High it's about the group – we don't move on until everyone understands, we only move forward when we know how to move forward together. And such a dichotomy between fast and slow students is less likely to arise. Everyone contributes in their own way. Teachers and students are also treated equally. There are no separate toilets, for instance, and the teachers also have a development portfolio."

Wat is de rol van de leraren?

Martens: "The teachers are at the service of the students. They are constantly occupied with questions like: how far are you now, what do you need from me, what do you need to do to move forward?"

Students grow a lot from that. At the same time, teachers have a lot of creative space and autonomy. They can convey their subject to the students as they see fit. It's very important that their guidance is linked to the content. In the Netherlands, we sometimes divide up the roles of subject teacher and coach. But a teacher is more than just a coach – a teacher wants to transfer knowledge. You can't take away that part of the learning process. I see good teachers languish if they are just designated as a coach. At High Tech High, this is well balanced for the teachers."

It all sounds great. Did you also see any negative sides?

Martens: "Take the working conditions of the teachers. The workload is high all over the United States, but here it's even worse. Teachers don't have permanent contracts and have to continuously perform at the absolute best of their ability. They all work extremely hard, more than 50 hours a week. They do also like that: the teachers are very inspired and many people really want to work there. However, it's striking that hardly any people over the age of 50 work there. Maybe it's impossible to keep up at that age. That's a shame, though. It's good for a school to connect people to you and to give seniority a place."

New school concepts often face a lot of criticism. Is that also the case here?

Gijzen: "Not really. They're not under attack, because their performance is good. Every year there are even 5,000 visitors who want to see what exactly is happening at the school."





Is the concept already being adopted by other schools?

Gijzen: “During a visit, Bill Gates apparently said that this school concept is so good that schools all over America should be teaching like this. But you can’t just copy what they’re doing, that’s not how it works. To set up a school in this way, you have to experience the whole process for yourself.”

Martens: “We asked the director what the next step was. He then said: keep what we have and keep the quality high. We have no ambition to get bigger, we want to keep doing well what we’re already doing well.”

“You can’t just copy a school concept, you have to experience the whole process for yourself”

But if you only tackle inequality of opportunity on a small scale, aren’t you creating a new inequality of opportunity?

Gijzen: “You can inspire other schools by setting an example. Everyone is welcome to come and see and ask questions. The school’s working method is very transparent and open. The protocols they use for the projects can be viewed and adopted. Existing schools simply have to accept that you can’t get something like this off the ground in a year. It takes quite some time.”

What steps can schools take if they also want to work on a project basis?

Gijzen: “The first step is to set aside hours in the week for a number of people to get started with project-based work. Figure it out together: how does it work? What are the advantages? What questions does it raise? Free up space, time and manpower and allow some enthusiastic teachers to experience it. Start small and don’t immediately initiate any major structural changes. That would sooner lead to unrest and unwillingness than when a small group of enthusiastic colleagues is given time to start exploring the concept.”

What has been most memorable about this trip?

Martens: “In the Netherlands we’re still looking for forms and ways to introduce concepts like personalised learning. But here they naturally find their way into this approach to the learning process. Within a project, each student works on things and questions that motivate him or her from his or her own interests. But that doesn’t mean you do this separately from your group – you start working together and you achieve the result together. If you do things from your heart, it works. And that is unbelievably beautiful to see.”

In chapter 9 you will read John Hattie’s vision of the social power of technology.



9 'Really capitalise on the social power of technology'

John Hattie



John Hattie, professor of education at the University of Melbourne, gave a real boost to evidence-based work in education with his books on 'making learning visible'. But Hattie's own meta-analyses, which focus on the impacts of educational interventions on learning outcomes, are currently under discussion. Especially his choices in the use of statistical methods.

According to Hattie himself, his work is approached too absolutely: it was never his intention to present simple rules of thumb for working in the classroom, as that takes his research results out of context. His concept of 'making learning visible' nevertheless remains relevant for education. The idea: if teachers can better show the effects of what they are doing and talk about it with each other and with students, schools become learning communities in which everyone moves forward.

How do you view the role of ICT in education?

"Up until now, new technologies haven't fundamentally changed education. And that's strange. The development of the technology itself has been incredibly fast. Computers work much faster and run on much more memory and computing power than before. Yet education hasn't changed significantly. We've been expecting major effects for 50 years, but those effects haven't materialised."



“Up until now, new technologies haven’t fundamentally changed education. And that’s strange.”

What do you think is the reason for this?

“It’s because of the way we use that technology. Most teachers use technology at most to add to what they already do, not to fundamentally change the way they teach. We call that substitution. But you can only expect really impressive changes in education if we use technology in a way that can be described as a transformation.”

In that case, how can ICT change the way we teach?

“I think we’re overlooking an application of technology with the greatest transformative potential for education: the social side of digitalisation. Teachers and school leaders use an enormous amount of social media in their spare time and for students it is already an integral part of their lived experience. And research shows that learning collaboratively with others has very positive effects on learning.

“Social media has many negative effects on society. This throws up a cloud of smoke, which means we don’t value the important opportunities offered by this technology. Things like simplified communication possibilities and the enormous reach we have gained thanks to the internet. Teachers and school leaders fully share their ideas and knowledge with the help of ICT, formally and informally, but when asked about this, they always underestimate the explicit power of this. They’re unfamiliar with it and it isn’t really pointed out to them.

For example, 90% of teacher training colleges in Australia say they have excellent programs for their students on this subject, but only 40% of the students surveyed are aware of them.

“The impact of the social aspect of technology on student and teacher learning is underestimated. Create an online community like a learning platform where it’s normal to learn together and share knowledge, not only for the students but also for the teachers. You then learn together, not only within schools, but also between schools. In this way, innovation also gets much more of a chance, because you always end up outside the boundaries of your own system.”

“We don’t value the important opportunities offered by social technology”

What needs to happen to allow teachers to make more use of the social power of technology?

“That’s not easy. Teachers like to teach others, but they don’t like being taught themselves. It therefore needs to come from the profession itself. The best teachers in Australia professionalise with each other via social media and that works really well. Use social media in professional development programs for teachers. If they then start using it on their own and they see how it helps to share knowledge, they’re also more likely to use social media more for teaching.”





Can the social side of technology also help with the increasing teacher shortages?

“We have to start seeing the teaching profession very differently. If you really want to solve the teacher shortages, you have to focus on the teachers who are at the beginning of their career. How do you ensure that they remain enthusiastic about the profession? People no longer choose to become a teacher based on the idea that they will do exactly the same job for 40 years. You have to give people a chance much earlier to take a step forward and really change something for education. Train them to become leaders much earlier, so that they have sufficient career prospects.

“Focus on teachers who are at the beginning of their career ”

“And here too, you really have to ensure a lot more connection. The teachers who leave say: we didn’t feel supported enough. That’s what we have to change. How do you make the work of teachers into group work, how do you really make it a community? Technology can be very powerful in precisely that area.”

Does this also apply to your ideas about visible learning?

“Visible learning is a very public way of working. Teachers strive to make the effects of learning as visible as possible: every teacher can view the data of their colleagues. This data isn’t owned by the teachers, but by the students themselves. The students learn how to interpret the data about their own learning process in order to work further. If you approach learning and working in such an open way in education, very different conversations arise.

The aim isn’t to generate as much data as possible, but to work with that data together, to discuss the learning process and to move forward in a very targeted way.

“Teachers now talk a lot about students, the curriculum, the methods and other tools. But it’s much more important that they talk about their impact on learning and how it can be improved. Please go and watch each other in class and talk about the learning behaviour you see. Also try to learn from each other in all kinds of other ways, such as via social media.”

How do you achieve something like this in education?

“Transforming education into a system in which students and teachers are increasingly in contact with each other is not easy. This requires a large-scale change in the way we work. We have no language and no research literature on how to scale success. Every school leader thinks their job is to find problems and solve them, rather than focus on success and magnify it in various ways. If I could change that mechanism in education, I would be a happy man.”

Read about learning at the AltSchool in chapter 10.



10 Learning with your own playlist at the AltSchool

Mirjam Brand, Raymond Trippe



Silicon Valley has long ceased to focus exclusively on the ICT sector when it comes to innovation. In San Francisco's famous technology bay, many are engaged in community projects. One such person is Max Ventilla, a former Google employee who founded the AltSchool. Mirjam Brand and Raymond Trippe, senior policy advisors at Lucas Onderwijs, went on a research trip to San Francisco to see how technology is changing education there.

How did the AltSchool come about?

Brand: "Founder Max Ventilla was looking for a school for his own children and was disappointed by the classical and traditional education he encountered everywhere. He was working in Silicon Valley and saw a huge gap between what students were learning in school and the day-to-day work of the tech companies. He was looking for a school where students are better prepared for the future and where they can follow their own learning path to a much greater extent. He was also surprised that so little use is still being made of technology to support personalised learning."





“Ventilla couldn’t find his ideal school and decided to set up a new school with a strong emphasis on digital learning, as the basis for such a personalised approach. With capital from Silicon Valley, he founded a first ‘lab school’ in 2013, where developers, teachers, students and parents work together to improve the teaching material and a learning platform. There are currently 4 of these lab schools and 25 partner schools that work with the AltSchool method under supervision.”

What is the AltSchool committed to?

Trippe: “The AltSchool wants to prepare the students as best as possible for the world of the future. And each student is offered the program that best suits their learning needs. The schools believe that they achieve this best with digital learning resources and adaptive software. Therefore not only teachers but also software developers work on the educational process. The digital resources are an essential link in the whole concept.”

Brand: “However, the educational vision encompasses more than just a focus on technology. The AltSchool wants to offer a personal learning environment, where students have good relationships with each other and with their teacher, and where the education is customised.”

What were your first impressions when you arrived at the lab school in San Francisco?

Brand: “At first glance, it doesn’t seem anything like a school. The school is located at a busy intersection in downtown San Francisco. There’s no space around it, no playground, so it looks more like an office than a school.

In the team room, developers and teachers sat together to work on the development of the teaching modules and on the digital learning platform itself. “There were mobile phone bags at the entrance of the classrooms that students had to put their mobiles in. We also noticed that there were still old-fashioned projectors and that laptops were used a lot. So the ‘technical backdrop’ may be high tech, but the technology in the classroom is recognisable and comparable to how we know it in the Netherlands. The camera in a classroom was also immediately eye-catching. The camera was used as a means of observation to collect more information about the learning process and about the teacher’s interventions.”

What does learning at the AltSchool look like?

Trippe: “Of course they don’t work solely with digital devices. Students are also engaged in traditional activities. Project-based and **authentic learning** is an important part of the educational concept, with parents, people from the neighbourhood and local experts often visiting the schools as guest speakers for lessons. The children also go into the local area for projects where they work thematically. For the *science* theme, for instance, with assignments for subjects like geography and biology, where they make the connection between them.

“Developers collaborate with teachers on the teaching modules and the digital learning platform”





“In addition, the students work with a digital learning platform that has been designed for them. Teachers and data analysts use as much data as possible from this, with the aim of improving student learning.”

How exactly does this digital platform for students work?

Trippe: “The school uses the platform as a basis for learning. Teachers set out assignments in it and find an overview of their students’ progress. They work on assignments and record their results and reflection in a portfolio. Teachers give feedback on the work and may forward this to parents with a message, on an individual basis or in a group.

“Students create their own playlists based on the learning components that the teachers prepare. These parts are also called cards and usually consist of fifteen-minute tasks. The cards are small compact lessons and assignments inspired by Montessori education in four types: lessons, assignments, reflection and assessment. The teachers see which competences and learning objectives are covered in the cards, and then monitor in their dashboard which learning objectives (knowledge) and which competences (skills) students have already mastered.

“Students create their own playlists based on the learning components that the teachers prepare”

“The idea behind the platform is different from Snappet, for example. In terms of functionality, it’s much more like a program like iTunes. The teacher receives suggestions for assignments from the system and arranges them into a whole. It isn’t known to what extent complete learning pathways are well interwoven in this, and this raises questions. Are there underlying didactics that gradually accumulate over the years? Can you ensure that students are learning the right things with this platform? All in all, it still feels a bit thin.”

Learning in authentic assignments, working via a digital platform: is learning at AltSchools mainly student-led?

Brand: “No, the teacher helps guide the students’ learning process and determines, in consultation with the student, which assignments he or she will work on. So it isn’t a case of undirected, inquiry-based learning. Students do have a lot of space to structure their own program, though. They log into the platform where work is waiting for them in their own playlist, see the cards the teacher has selected for them and drag them into the desired order themselves or select extra cards. The work that the teacher prepares is compulsory, the rest is optional.”

What does the work of a teacher at the AltSchool look like?

Trippe: “Some of the teachers at the lab schools work collaboratively with developers and data analysts and think about further development of the learning platform, the underlying algorithm and the learning content. So they are also very technically minded. In their work with students, they are also guided by the system’s suggestions. For example, which learning material is suitable for a particular student at a particular time.





“It can make you wonder to what extent the system is thus taking over the teacher’s work. According to the people we spoke to, these are suggestions that further help the teacher, leaving the teacher with more time for the pedagogical process. The aim is to optimise the learning process in such a way that a lot of time is left available for the teacher to pay personal attention to students. How well this really works remains to be seen.”

The platform is being continuously developed by teachers and developers. How does that work?

Brand: “The platform runs on an algorithm similar to that of iTunes. This algorithm has to become increasingly smarter and to prepare the work for students in a better and more targeted way. Each school has a space where developers and teachers come together to improve the platform.”

Trippe: “You can find a video online showing that 60 programmers are working together with teachers to improve the platform, the content and the algorithm. Teachers are explicitly given time for this so that they can contribute their pedagogical and didactic expertise in the development of a technical application. The developers also ask very clearly about the teacher’s experiences and language: what works best for them?”

Students are tracked with a camera and monitored by the platform – what about their privacy?

Brand: “The school has an interesting story and vision, and the investors and the administrators are on board. But the media, parents and educators are rightly critical, stating that the students are

being monitored by the systems and used as guinea pigs for a super-algorithm. What does this way of learning do for the students?

“After our visit, we heard that the schools no longer work with cameras, because there was too much criticism from outside and they provided insufficient results. But the question of whether students are sufficiently free from continuous monitoring remains highly relevant. With the current platform, it’s possible to send the students’ work to parents at the touch of a button. Parents or guardians are of course important in the children’s learning process and this allows them to be fully involved. But critics question whether parents should have a continuous insight into the learning process of students and are concerned about whether this puts too much pressure on the children.”

“The question of whether students are sufficiently free from continuous monitoring remains highly relevant”

The schools want to be accessible to everyone from different socio-economic classes. How is that working?

Trippe: “That all sounds well and good, of course, but because of the school fees being 30,000 dollars a year at the lab schools, children mainly come from highly educated and wealthy parents. And because the schools are so small, it’s easier to offer truly personalised education – students say they are really seen. The question is whether this would also be possible if the schools really were accessible to everyone.”





Brand: “The AltSchool wants to eventually make the algorithm and the platform available to all schools, including public ones. So you could say that the people behind the school are focused on equal opportunities and accessibility. They want to harness the power of technology for all students.”

What insights are you taking with you from San Francisco?

Brand: “The visit provided a lot of inspiration and ideas about new possibilities in education, but also many questions and points for discussion. Besides all the reservations, we believe it’s important that there are parties involved in the possibilities of technology for education. What will be possible in the future with artificial intelligence and how can we ensure that it is used for education in a good, well-reasoned way?

“We’ll have to develop quickly in this area, also with a view to social inequality. If we aren’t careful, soon only the wealthy will be able to afford the better programs and algorithms. This will widen the digital and social divide. Business and education could work together to bring about good innovations. That is exciting, and we can expect a lot from that. We certainly won’t be copying the example of the AltSchool, but it will provide new ideas about how we could collaborate more with the business community.”

Trippe: “The AltSchool platform has now been introduced at a number of public schools, while a number of AltSchools themselves have been closed. It seems that the real core and mission lies mainly in creating and optimising a technological platform to support existing schools and not in establishing a sustainable school concept. This stretches the traditional boundaries between education and business enormously. Here we’re dealing with a business and marketing machine that does things very differently than we are used to. I’m very curious about what these kinds of developments mean for the future of education. ”

In chapter 11 you can read Pedro de Bruyckere’s vision of technology in educational innovation.



11 ‘Don’t get bogged down in big contradictions’

Pedro de Bruyckere



“The use of technology can be so well thought out, but if people aren’t on board with it, the curtain comes down on it quickly,” says Pedro de Bruyckere. He is a lecturer in teacher education at Artevelde University of Applied Sciences in Ghent, a pedagogue, songwriter, author and a researcher at Leiden University, among others. De Bruyckere has written several books, including ‘Boys are Smarter than Girls: 35 Myths about Learning and Education’.

Is it even possible to learn from schools abroad?

“In my work, I deal with the art of comparing education systems in different countries or regions, known as comparative pedagogy. The most important principle here is that you can’t properly compare the educational approach, certainly not if we look internationally. There are many factors involved: what the education system looks like, what vision a school has, but also broader factors, such as a country’s social policy.

“How strongly that context plays a role is shown, for example, by a study in which a direct link has been shown between the level of social rent prices in England and the learning results of students. This is related to the principle of toxic stress: stress is very easy to transfer. When parents have a lot of problems, the children experience this too. This example demonstrates how difficult it is to compare a school, several schools or even entire education systems. There are so many influencing factors. It is not easy at all to make comparisons in such a complex world.





Comparative pedagogy tries to provide insight into this complexity, so that we don't just compare things that can't be easily compared."

What do you think of the four domains in which schools want to innovate their education?

"The funny thing is that the ways in which schools want to innovate aren't new at all. The pursuit of more personalised learning, which is reflected in all these domains, has been around for at least two hundred years. Generations of teachers have tried to look at the personal needs and development of children, and this ideal has also been brought to life in various forms of education over the centuries.

"People often ask me what I think about gaining more **insight into learning** through measurement and testing. Because I'm committed to a pedagogical approach to education, they soon expect me to say: get rid of all those tests. But I'm not against measuring, as long as you know what you want to measure and why and what the possibilities and limitations are. If you have a lot of student absence, you need to measure something different than if the overall level of the learning results is trailing. Tests can be very useful for the learning process and they can show students what they are already mastering and what they haven't yet mastered. However, I do have a problem with tests that have a lot riding on them. I don't think these offer much benefit: they don't always measure what they should measure, and they can cause a lot of stress.

"With regard to the commitment to **skills**, I'd especially like to point out that developing a skill within one subject, such as creativity in music or problem solving in programming, doesn't necessarily lead to better results in that skill in general.

"A skill that you learn within a certain subject doesn't translate to outside that subject"

Research shows that it usually doesn't work like that. If you're good at problem solving in the context of programming, you might not necessarily get better at problem solving in general. It's good to keep in mind that a skill that you learn within a certain subject doesn't always translate to outside that subject.

"**Authentic learning** also has its downside, according to Dutch research. If you take the authenticity of the learning situation really far, the effectiveness of learning can actually decrease. It can be an interesting form of teaching to get students working in the real world. On the other hand, a school setting, in which the learning environment is less complex, can also help students to learn better. It's a question of gradations: a clearly defined assignment that puts students to work in 'the real world' can be effective, but fully authentic learning is actually less effective than normal learning at school."

Can technology improve education?

"People have expectations about education, such as a supercomputer as the ultimate tutor, and some even envision a computer that completely replaces the teacher. The reality, the development of adaptive systems, is intractable. Progress is only being made in literacy and numeracy, but for the other subjects it's quite difficult because the answers there are less unequivocally right or wrong.





“Just like the comparison of education systems, the question of what works and what doesn’t work with ICT in education is a complex one. The effectiveness varies per situation: who is using it, why, in what way and for which target group? Knowing the answer to all these questions requires a high level of professionalism from everyone involved. If you don’t organise it properly, you’re just throwing money away.

“The use of technology can be so well thought out, but if people aren’t on board with it, the curtain comes down on it quickly. A good example of this was the American Carpe Diem schools that had to close their doors in 2017. The idea behind the schools was simple: students spent part of the day working at their own level with computer programs, thereby acquiring the necessary knowledge. The rest of the day was left for more in-depth projects or arts subjects under the teacher’s guidance.

“In the end, the schools went bankrupt, mainly because there weren’t enough registrations. The idea of schools where students spent part of the day working individually in office-like cubicles was too unappealing an image for parents. They were concerned about the contact between teacher and student. If no one wants to send their children there, then it comes to a halt.”

How do you feel about businesses having more influence in the classroom with new technologies?

“The etymology of the word ‘school’ is interesting here. The word school is related to the Greek word for free time, but also the word for ‘hold back’ and ‘keep free’. In the classical sense, therefore, the school is a place to practise, try things out and be yourself.

And that function of the school is also very important: it’s a place where everyone can learn – regardless of their background. A place free of commercial influences. In South Africa, for example, businesses are taking over public education in the hope of making money from it. I find that very worrying. With all developments, it’s important to make sure that education always remains that free space, where educational goals such as qualification, socialisation and personal development are worked on, without any hidden agendas or wishes of companies.”

“School is a place to practise, try things out and be yourself”

What are your tips for Dutch schools that want to improve their education?

“I’d like to share three tips. Firstly: don’t do it alone, but work in sections, in departments, and in teams. And secondly: be healthily but not impossibly ambitious – teachers are in front of the class day in and day out, but innovating your education is a huge task. There’s a good chance that you’ll give up sooner if your ambitions are unattainable. And finally: think collaboratively about what your vision is, and translate it into very practical terms. What do you want to focus on? Then inform yourself very specifically and determine how you can achieve your goals.”





There is a lot of discussion about what good education is in the current time; what is your stance on this?

“Polarisation has arisen in how we speak and think about education. People dig their heels in, in false contradictions between conservative and progressive. It’s largely a discussion for the outside world that takes a lot of energy. There is a heated debate on social media about the sense and nonsense of knowledge transfer in education. It’s not a question of either knowledge or skills – they’re both important. And it’s not about either completely overhauling your education and throwing everything old overboard or leaving everything as it was and educating children for a world that no longer exists.

“I try to be as neutral as possible in my statements about what works for education. Which is a full-time job, and isn’t yet successful – it may even be impossible. But we should keep trying every day not to get bogged down in big contradictions.”

Read about Michael Fullan’s approach to education in chapter 12.



12 'Don't let your strength also be your weakness'

Michael Fullan



Students are better prepared for the future through deep learning, according to Michael Fullan. This well-known Canadian educational sociologist has advised many governments on educational policy in recent decades. He mainly focuses on making education more effective. His main research area is Ontario, where he started *New Pedagogies for Deep Learning* (NPDL) in 2014, an approach that is now being followed in more than 1,000 schools worldwide. According to Fullan, we shouldn't see technology, didactics and change management separately, but approach them from a system-wide perspective.

What exactly does 'New Pedagogies for Deep Learning' mean and why is it necessary?

"In deep learning, a lot of attention is paid to six related **skills** that you need to function as a student in the society of the future: character education, citizenship, collaboration, communication, creativity and critical thinking. These skills are essential because in the future, tasks that require superficial knowledge will increasingly be taken over by machines, computers and robots.

"As a school, you can achieve this deep learning by meeting four conditions: actively involve teachers and students in the learning process, ensure an effective and accessible learning process, make technology useful and accessible and ensure that the learning contains real-life issues – or **authentic learning**.

"This approach is being applied at more than 1,000 schools worldwide through the *New Pedagogies for Deep Learning* partnership. But it only works if you see the school and everything around it as a cohesive





and inextricably linked system. You can't see technology, didactics and change management separately from each other. Education requires a meaningful and didactically substantiated use of technology to change education in line with the technological and social developments that follow each other at an ever faster pace. Didactics is the real tool for change in all this, the engine – technology makes it possible and is the accelerator. Because of the importance of connectedness between all elements, organisations and stakeholders, I argue for a whole system change.”

What is ‘the system’ in a whole system change?

“The system is not only all the layers within the school, but also consists of other schools, the region and the national education system. It starts with good collaboration within the school. Facilitation in particular is needed from the layers above, such as the board or the sector: investing in making people free to collaborate. Look especially outside your own school, by working closely with other schools.”

One of the pillars and conditions of deep learning is the active involvement of the student, in close collaboration with the teacher.

Are we involving the students enough?

“Not at all! Students aren't involved at all yet and that is such a shame. The story of three schools in Australia – *‘Young Minds of the Future: Collaborating and Inventing to Solve Future Problems’* – speaks volumes. For 3 years, they let teachers and students work together on a project basis on solutions and inventions relating to the future of the world. The results are overwhelming! The teachers experience the power of involving the students. They share that they really change as teachers because of these kinds of experiences.”

How is it going at the schools that joined your network?

“The way they organise themselves differs in each country. In Uruguay, there are more than 400 schools working on NPDL from a special department of the Ministry of Education. In Canada, the United States and Australia, groups of schools connect from a district or board. In countries like the Netherlands, even smaller groups of schools work together. With varying degrees of success. The Dutch NPDL organisation shrank from 40 to 20 schools.

“Many Dutch education professionals visit us and say that they're engaged in deep learning, but that doesn't always happen via our network. And real collaboration between schools then becomes difficult. I think that teachers in the Netherlands have more autonomy than elsewhere, so they make their own decisions about their pedagogical and didactic approach. But there is definitely a lot of deep learning going on.

“School leaders and boards in the Netherlands also have more autonomy, so on the whole we see more ownership, potentially more depth, but they struggle with organising it. That's a shame, because we have a lot of material and knowledge to offer based on our many years of experience: models, rubrics, training courses and implementation models, including hundreds of videos about the practice of NPDL. And last but not least, the partnerships.

“Autonomy doesn't mean you have to work in isolation or solo”





“Autonomy doesn’t mean you have to work in isolation or solo. At schools that are successful with our way of working, the teachers have autonomy, but they also collaborate. It works both ways: individuals grow through the group and the group gets better through the individuals who grow. ‘One hand can’t clap’. The same goes for the students – personalised learning is also about connecting with other students.”

Why is it that schools in the Netherlands collaborate less?

“Dutch schools aren’t doing badly at all, let’s start by making that clear. In the Netherlands, education has many building blocks that enable interaction and collaboration, without forcing it. There are semi-voluntary networks – led, facilitated and run by schools. For instance, *Learning Labs* with a specific learning objective are facilitated with money and resources.

“Collaboration is certainly valued in the Netherlands, but often external funding is the impetus to start this. When that funding stops, the collaboration disappears again. Schools do interact with each other, but it’s more incidental, without a specific focus and not in a sustainable way. Continuity is the key here.

“We need more appreciation for the power of the system. Forming coalitions is second nature to the Dutch and that encourages all kinds of short-term forms of collaboration. But it also entails that pitfall: it doesn’t always lead to long-term sustainable cooperation, and lacks a focus.”

“Didactics are the engine that drives everything”

The innovations in some Ontario schools falter once additional funding for school development ends. Why is that?

“Administrators often treat this school development as a process from an external source and not as an internal, permanent development. In fact, you’re not taking it seriously enough. The second lesson we learned is that autonomy requires leadership. Leaders need to promote the long-term development of this innovation. Moreover, during the changes, investments need to be made in educating the leaders of tomorrow. Only then will it become a system change.”

What would you like to pass on to Dutch schools?

“Deep learning is also important for teachers. Didactics are one of the most important parts of my model, they’re the engine that drives everything. It’s great that Dutch teachers are autonomous in their teaching approach, but they don’t learn enough from each other about their didactic approach. They don’t reach a deeper level of learning. This is only possible by being completely transparent about what we expect from each other. We are yet to discover how we can support teachers to learn more together.”

In chapter 13 you can read more about the application of the Swedish Kunskapsskolan in the Netherlands.



13 Every student finds their own way at Kunskapsskolan

Marij van Deutekom, Ed van Loon



In the middle of nature, on the boundary of countryside and town near Ubbergen, you will find the niche secondary school Notre Dame des Anges. A school that has recently started focusing on ‘headstrong learning’, a concept based on the Swedish Kunskapsskolan. The school wants to use this basis to develop further into a learning and working community of students and teachers. But what exactly does that mean? Marij van Deutekom and Ed van Loon, director and deputy director of the school, talk about their discoveries.

What exactly is Kunskapsskolan?

Van Deutekom: “We want students to be facilitated throughout their education to take control of their own learning process. There are three key elements to this: the daily schedule, working from goals, and coaching. With Kunskapsskolan you offer students a fixed structure, a learning path that they make their way through individually. Education is therefore no longer determined by a fixed structure of subjects and tests. It is truly personalised education, but in a thorough and well-organised manner. An important tool for this

“Students are facilitated to take control of their own learning process”

structure is the digital portal, in which every student follows their own route. All the learning materials are digital and available as soon as a student is ready to get started. With the concept of Kunskapsskolan, students think very actively for themselves about what, how and why they learn. We also think that’s the great thing about it – we wanted students to be more active in learning again.”





Why was that necessary?

Van Loon: “Structured, reliable, safe – those used to be the distinguishing characteristics of our education. Those values are still important, but we do it in a very different way now. We have always been committed to good guidance in a traditional setting and our teaching team reflected those core values. The teachers are very involved with the students and they have a great sense of responsibility. However, this also has a drawback: it can make students passive. We noticed that the teachers were working harder and harder to continue delivering the same quality education. They paid a lot of attention to explanation and instruction. In doing so, they retained control, while the students began to lean back more and more.”

Van Deutekom: “We also noticed that the questions and expectations of parents changed over the years: how are you dealing with the changing society and expectations in society? What if my child can outperform the norm? What if my child wants to do something special? And how are you dealing with the declining motivation of students? Very valid questions, which we are asking ourselves more and more often. The new way of working has great answers to these questions, because students clearly follow their own program and can do what suits them. And because we are making more and more conscious use of the environment in which students learn.”

What does a school day look like from a ‘headstrong learning’ point of view?

Van Deutekom: “The teachers start together with a daily huddle at 8.30am. The student’s day begins after that, to make sure everyone is ready for the day, ready to start learning. They start every day together in their basic group. Each day is divided into 3 blocks of one and a half hours. For most subjects, these are divided into 3 lots of half an hour of instruction, workshop or learning environment. For arts subjects, physical education and practical sessions (biology, physics, chemistry), the blocks are one and a half hours. At quarter to three, students close the school day with their basic group. Each student is part of a basic group of 20 students, supervised by a coach. This coach is the point of contact for the students and the parents. The student and the coach have a weekly meeting and always start the day with their basic group. That way we can keep a close eye on how each student is doing.”

What goals do students set for themselves?

Van Loon: “A partial goal could be to attain Cambridge English. Or even smaller: in two weeks I want to be at this ‘step’ (the levels of Kunskapskolan) in geography. Students set goals for periods of a week, but also for a year. In this way they learn to plan for themselves and to think about their development.”





What role does the coach have in the concept?

Van Loon: “The role of the coach is very important. Every student has their own coach who they discuss their progress with, answering questions like: which learning goals will you work on in the coming period? What are your personal goals and talents? The work goals and progress are always visible in a portfolio for the coach, for the parents and for the student. This gives a good **insight into student learning.**”

How did you come up with the idea to get started with Kunskapsskolan?

Van Deutekom: “That idea came from our teachers. We had been discussing how we could better connect education for our students for some time. We started with a question to the staff: who would like to work with us to think up a different organisation of our education? We used a workshopping technique with statements where the teachers had to stand on two sides of the room. The statements were about the type of education we gave and where the group felt it should go. For example: traditional or personalised? Teacher-led or student-led? That led to interesting discussions.”

“The ideal picture of what education can be – the atmosphere, the way of learning and living together”

Van Loon: “In those sessions, the teachers were touchingly honest: ‘I feel that we can no longer keep doing things the way we always did, but I also find it terrifying to let go of the fixed structures and suddenly start doing everything differently.’ The teachers clearly had different degrees of interest in innovation. Some were very excited to change track, others were more reluctant. Ultimately, the sessions resulted in a picture of the type of education that we wanted to provide together: much more focused on the learning path of the individual student.”

Van Deutekom: “What was great about that was that the teachers then discovered Kunskapsskolan themselves and chose it. It suited the direction that we were all thinking of going in.”

Did you then go and visit a Swedish school?

Van Loon: “First, team leaders and teachers went to investigate in Sweden. They visited different schools and returned full of enthusiasm. 25 people have now been to Sweden, including ourselves.”

What impressions did you take with you from Sweden?

Van Deutekom: “I saw an ideal picture of what education could be – the atmosphere, the way of learning and living together. A learning and working space where students and teachers work together. It’s impossible to see from the outside who is on what level and how far along someone is. The students work together, they’re focused and relaxed, you can see that learning is happening there.”





Everyone is walking around and following their own program, and yet you feel that they are learning together. They are all dots that constantly move through the building, they come together in a certain place, and then they separate again. “Another thing we saw was that the students were very capable of talking about their own learning process. They know where they stand in their development. Without realising it themselves, they demonstrate the skills they have built up through this way of working.”

What effect has the trip had on your team?

Van Deutekom: “It has a lot to do with the belief in educational innovation. When you’re there you see: of course this is possible. It’s very easy to have doubts if you want to do something great and new with your education. In those moments it’s good to be able to recall concrete images that show that it really is possible.”

The concept of Kunskapsskolan has also been criticised. What do you make of that?

Van Loon: “Critics argue that Kunskapsskolan is like the McDonald’s of education: everything is delivered in standardised chunks and the company behind the education concept earns money from it. We don’t have a problem with the fact that we’re dealing with a private party, because the education and training are of a high quality. Of course our teachers are also critical when working with their products, but they are products in development and the great thing is that we as a school are intensively involved in this. What matters is that they deliver something good and that it fits our vision. We don’t see the education that this produces as impersonal.

At our school, we place great emphasis on the personal development of each student. The fact that we can make use of a stock of online educational resources in a learning portal offers the opportunity for the **flexible learning** that we want. And it helps that Kunskapsskolan offers a very useful structure as a basis for this.”

How did you embed the educational concept in your own school?

Van Deutekom: “We call it ‘headstrong learning’ – our own variation on the Kunskapsskolan concept. We also think it’s important that we emphatically give it our own twist, with as much input as possible from the teachers and students themselves. The term ‘headstrong’ fits well with the idea of students who all follow their own route. And we mean headstrong in the most positive sense of the word – willing to forge their own path.”

Van Loon: “The first school I worked for was a ‘clandestine school’, a place where students who had fallen outside all systems could walk in and receive education. That place was all about offering personalised education. During that time, I saw that there is a will to learn inside every person, but that you have to look very carefully at what suits someone. There’s a good reason why we say: ‘find your own way at Notre Dame’.

“We want students to learn from the goals that they set for themselves. Of course there are also things that you sometimes just need to know and be able to do. But because every student consciously thinks about what suits them, everyone eventually follows their own program.”





What does it mean for the course of study if students follow their own learning path?

Van Deutekom: “We have always been a ‘havo’ – a higher general secondary school. But of course there are many students just above or below that level. With this approach, we can serve all students at their own level. For example, the new concept allows us to set up two-phase pre-university education, so students can already start learning at pre-university level here and then obtain their diploma in 1 year at another school. Each student follows the route that suits them best. However, we can’t fully implement that: having the central exam for everyone at the same time is prohibitive, it should be much more flexible with possibilities for modular and differentiated completion.”

Why does the digital portal play such an important role in the concept?

Van Deutekom: “I see the portal as a tool, but it also has transformative power. Without such a practical learning system as the foundation, it would be very difficult to organise individual programs for each student. It provides a structure in learning objectives that we need in our school for personalised learning. These learning objectives are described in rubrics. These rubrics are explained in student language and adapted to the level that the student is on. We no longer use books – the digital portal is the foundation. This is where the student sees their short and long-term goals, how the work should be completed (with a written report, a test or a presentation) and what they should know and be able to do. All schools affiliated with Kunskapsskolan can use that material. Our teachers also develop material themselves and publish it in the portal.

We sometimes have some class copies of methods or atlases, but these are only meant to be supplementary. In addition to the portal, you can see that working online with the new concept is becoming more important anyway: there is much more need to exchange information, collaborate and coordinate quickly in groups.”

How important is collaboration with other schools for you?

Van Deutekom: “We’re affiliated with [Zo.Leer.Ik!](#), a partnership of schools within which we work together to implement personalised learning. For example, in developing a logistics simulation model that maps the student flows based on their choices, what this does to your use of space and the required capacity of employees. We will then be able to adjust our schedule accordingly. This is only possible because we do it together.”

How do you get such a big change going in a school that has been doing things the same way for a long time?

Van Deutekom: “It helps that we started the thinking process about new education with all employees and went through it together. This is so important! It means that everyone really gets behind the changes. Of course, some are more enthusiastic than others, but we chose it together. You have to feel the heat together, it makes no sense to impose changes from above.”

Van Loon: “We were actually able to use the strength of our school. The teachers are hugely involved, they really want to help the students. They do this in a very informal way. That atmosphere is still there, even after the shift to new education. You see it and notice it when you walk through the corridors.





When you're here you're not just teaching, you're part of a community. And that actually fits very well with Kunskapsskolan."

Van Deutekom: "Walking the walk is an important concept at our school. If we want students to be actively involved in their learning process, then we as teachers and school management must also be learning, open and involved. We create an attitude and atmosphere where being open to change and improvement is natural. That also applies to us as school management."

How is it for the teachers?

Van Deutekom: "The workload is high. We had to make sure that all the teaching material that we wanted to be covered was in the digital portal in the right way. Our team of teachers has taken the assignment very seriously: they have a great sense of responsibility, and with such a major change, they're ensuring that everything is prepared down to the last detail. Furthermore, they were keen to professionalise themselves in terms of thinking in the form of goals and coaching students, and that's what they're now getting. That also helped a lot in getting off to a good start, and we are now reaping the benefits together.

"Teachers feel they know the students better as they are working with them on their personal goals and have weekly conversations with all students. The guidance has become much better.

That is the constant reciprocity: it's more intensive, but we get much more out of it." Van Loon: "Many teachers have come to see more and more clearly the importance of connecting with the individual student. You can't treat everyone in the exact same way. You have to make a difference if you really want to help students. The teachers initially supported students mainly on a personal level. Now the support is also focused on learning: how can I help you to progress in your own learning process?"

"You have to make a difference if you really want to help students"

How do you monitor whether the new approach is really delivering better education?

Van Deutekom: "For the most part, we have to experience that together. We have enough educational experience between us to see whether students are learning more and differently. It's very difficult to monitor these kinds of innovations in a scientific way. You're talking about a paradigm shift: personalised learning, integral learning. You might want to measure whether that results in better education, but that's the whole question: what is good education? That's what we're exploring together. In any case, we're not the only ones who are working on education that is more in line with the individual student."



Colofon

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